AD_____

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TITLE: Transatlantic Telemedicine Summit

PRINCIPAL INVESTIGATOR: Mr. James Barron

CONTRACTING ORGANIZATION: Atlantic Rim Network
Boston, Massachusetts 02210

REPORT DATE: August 1997

TYPE OF REPORT: Final Proceedings

PREPARED FOR: Commander
U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

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FOREWORD

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____ In the conduct of research involving hazardous organisms, the investigator(s) adhered to the CDC-NIH Guide for Biosafety in Microbiological and Biomedical Laboratories.

8-20-97

PI - Signature Date

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Atlantic Rim Network
Boston, Massachusetts 02210

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13. ABSTRACT *(Maximum 200 words)*

Objectives Met: 1) Convened an historic summit of over 200 Atlantic Rim policy makers, health care practitioners and technology providers capable of leading the development of sustainable, cost effective global telemedicine to discuss critical needs, obstacles faced and recommendations for action. 2) Provided participants with important examples which largely use interoperable, standards-based, scalable building blocks adaptable to the needs of different regions and different clinical specialties without a huge financial investment. 3) Facilitated the development of specific initiatives which can contribute to the development of high quality, affordable health care.

Principal Results: Brought together fiercely competitive health care consortiums, vendors and other providers, from different regions, fields and perspectives to participate in frank assessments of telemedicine, exchange experiences and provide a firmer basis for undertaking own activities and engaging in cross-national and collaborative projects.

Provided a platform for representatives of G-7 global health care initiatives to meet together for the first time. Enabled US military, European, North American, Latin American and African (and Asian) representatives to address their concerns to a diverse international audience.

Significance: Broadened the definition of telemedicine, enhancing the roles of different stakeholders in the making of clinical, policy and technical and business decisions.

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ATLANTIC RIM NETWORK

Transatlantic Telemedicine Summit
Boston 1997

World Trade Center Boston, Suite 402, Boston, MA 02210, USA
Tel: 617-439-5393 or 617-423-7770 • Fax: 617-969-6640 or 617-439-5349 • E-mail: 73613.2436 @compuserve.com

Developed in cooperation with representatives of:

American Telemedicine Association

Canadian Society for Telehealth

European Commission, DG XIII
Health Care Telematics

European Parliament

Finnish Telemedicine Association

French Telemedicine Association

G7 Global Information Infrastructure

George Washington University
Cyberspace Policy Institute

Harvard Telepsychiatry Project

Massachusetts General Hospital
Telemedicine Center

MIT Macroengineering Society

Oxford University Telepathology Centre

Pan American Health Organization

Telecities Health Care Working Group

United Nations Habitat II

US Congress

US Conference of Mayors

US Department of Defense

US Department of Health and
Human Services

World Health Organization

... and others

ATLANTIC RIM NETWORK

Global Issues - Local Solutions - Regional Connections

PRESENTS

A

TRANSATLANTIC TELEMEDICINE SUMMIT

20-22 May 1997

Harborside Hyatt Conference Center & Hotel
and
World Trade Center Boston

Boston, MA, USA

ARN Secretariat
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Boston, MA 02210
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Contact: James Barron or David Noonan

ARN Telemedicine Europe
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75014 Paris, France
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email: symbion@mail.club-internet.fr

Contact: Jean-Pierre Thierry, M.D.
Co-Chair, Transatlantic Telemedicine Summit

"The Transatlantic Telemedicine Summit will bring together the international leaders in telemedicine and related fields to respond to common concerns and help create an action agenda to speed deployment of cost-effective health care for all people. The time is ripe, not just for another conference, but for a *Summit of transatlantic leaders*, from both the private and public sectors, to identify the critical issues impacting the deployment of telemedicine and to make recommendations for action."

Jay H. Sanders, M.D.
President, American Telemedicine Association
Co-Chair, Transatlantic Telemedicine Summit

ATLANTIC RIM NETWORK

Dear Delegates:

On behalf of all those who have worked hard for more than a year to create a regional forum in which to explore the obstacles and opportunities affecting the development of a global health care delivery system, welcome to this year's Transatlantic Telemedicine Summit.

Telemedicine, broadly defined, can be an engine for economic growth, providing better access to high quality affordable health care, creating jobs and new opportunities for investment. But first a variety of barriers -- legal, regulatory, economic and social -- must be overcome.

Together, we can respond to these challenges.

Sincerely,

James H. Barron
Chairman and Managing Director
Atlantic Rim Network

"The U.S. Army Telemedicine program welcomes the opportunity to be a part of this historic international conference and looks forward to a strong military - civilian collaboration in the future".
Brigadier General Russ Zajtchuk, MD, 1997

"The Atlantic Rim region is poised to become the keystone regional testbed for global telemedicine, through the Atlantic Rim Network. The ARN (should) develop a framework within which telemedicine issues can be aired, strategies developed, and benchmarks and standards established."
Global Telemedicine Report, 1995

The Atlantic Rim Network and Telemedicine

The Atlantic Rim Network (ARN) is a Boston-based nonprofit international organization dedicated to generating transatlantic collaboration through practical programs and projects in such areas as trade, tourism, transportation, telecommunications, and education. It was created by the First International Congress on the Atlantic Rim in 1994. Telemedicine was made one of its priorities at the ARN's 1995 meeting in Halifax.

Since then, the Atlantic Rim Network has organized and participated in telemedicine related activities ranging from international teleconferences to demonstration projects. It has frequently partnered with the US Department of Defense's Medical Defense Performance Review, charged under US Vice President Gore's "Reinventing Government" initiative with making health care technologies available for defense and civilian applications.

The Atlantic Rim Network was asked to convene the Transatlantic Telemedicine Summit by representatives of the American Telemedicine Association, the French Telemedicine Association, the US Defense Department and others to provide a forum where leaders in these organizations, policy makers and corporate leaders from both sides of the Atlantic, could candidly assess regulatory, economic, technical and clinical obstacles confronted in the international development of telemedicine (or telehealth) products and services.

ATLANTIC RIM NETWORK

TRANSATLANTIC TELEMEDICINE SUMMIT

20-22 May 1997 BOSTON
OVERVIEW AND OBJECTIVES

What is Telemedicine?

Telemedicine is health care at a distance. It involves the use of telecommunications and information technologies to facilitate cost-effective, high quality health care delivery. It is the process of and technologies used to transfer via voice, video and data, patient information and images, enhancing timely and effective physician consultations, distance learning, medical record availability, remote diagnoses and patient treatment. It is expected to represent a quantum leap for the broader distribution of medical expertise and access to health care.

Why a Summit?

The need for timely, high quality and affordable health care makes telemedicine a high priority topic for policy makers, health care practitioners and technology providers on both sides of the Atlantic.

Recently, professional telemedicine interests in North America and Europe have begun to organize themselves into professional associations. Telemedicine-related businesses have been eagerly exploring new markets abroad, and policy makers have been reexamining regulatory frameworks. The Summit will provide an opportunity for leaders, many of whom have never met, to identify common concerns, exchange experiences, recommend solutions, and help create an action agenda for better, faster and more cost-effective health care.

Why Transatlantic?

While ultimately telemedicine must be developed as part of a global health care system, much of the work to date has been nationally oriented. Opportunities to speed learning curves through the exchange of experiences internationally, and bench-marking best practices have frequently been missed.

The Atlantic Rim region has been described as "the keystone regional testbed for global telemedicine." Lessons learned from pilot projects in Atlantic oriented countries (not limited to those on the Atlantic coast, and including North and South Atlantic communities) can provide vital information for the development and deployment of telemedicine products and services globally.

1997 TRANSATLANTIC TELEMEDICINE SUMMIT OBJECTIVES:

1. Convene 100-200 key Atlantic Rim policy makers, health care practitioners and technology providers capable of leading the development of sustainable, cost-effective global telemedicine to discuss critical needs, obstacles faced and recommendations for action.

2. Provide the participants with important telemedicine examples which use interoperable, standards-based, scalable building blocks adaptable to the needs of different regions and different clinical specialties without a huge financial investment.

3. Facilitate specific transatlantic initiatives, projects and 1998 programs, based on the insights gained and lessons learned at the Summit, which can make a practical and timely contribution to the development of high quality, cost-effective health care for all.

THE VICE PRESIDENT
WASHINGTON

May 14, 1997

Mr. James H. Barron
Chairman, Atlantic Rim Network
Suite 402, World Trade Center Boston
Boston, MA 02210

Dear Mr. Barron:

Thank you for the invitation to participate in the first Transatlantic Telemedicine Summit on May 20, 1997. Unfortunately, due to other commitments, I am unable to join you. I would like, however, to extend personally my congratulations to Dr. Sanders and Dr. Thierry on the development of the Summit.

I am pleased to learn that after many months of hard work the Summit is coming to fruition. Telemedicine is beginning to make the delivery of quality health care services a reality in the lives of many Americans. The Clinton Administration has strongly supported telemedicine applications on the National Information Infrastructure and the Global Information Infrastructure. Advanced telecommunications technology can help to break down barriers of distance in rural areas, where access to quality medical care often means a long drive to the nearest big city. The Transatlantic Telemedicine Summit will also advance an important dialogue about efficiencies in health care administration and increasing the quality of care that is delivered.

The Clinton Administration will be represented by the Department of Commerce's Assistant Secretary Larry Irving at the Summit. The Department of Commerce's Telecommunications and Information Infrastructure Assistance Program has funded several innovative telemedicine projects, and we look forward to sharing the lessons we have learned. By participating in your summit, we look forward to learning what is happening worldwide.

I wish you all the best with the Summit and continued success as you pursue ways to improve health care delivery in the Atlantic Rim and beyond.

Sincerely,

Al Gore

AG/tak

EUROPEAN PARLIAMENT

ALAN JOHN DONNELLY MEP
TYNE & WEAR

STATEMENT OF ALAN DONNELLY, MEP CHAIRMAN OF THE EUROPEAN PARLIAMENT DELEGATION FOR RELATIONS WITH THE UNITED STATES CONGRESS TO FRENCH TELEMEDICINE ASSOCIATION NEWS BRIEFING (24 JUNE 1996) IN SUPPORT OF 1997 FIRST TRANSATLANTIC TELEMEDICINE SUMMIT

Two years ago I was honoured to be the opening speaker for the First International Congress on the Atlantic Rim, an event supported by the European Commission and the European Parliament as well as by private and public sector leaders on both sides of the Atlantic. At that time I said there was a great deal of common ground on which we stand with our American counterparts from where we can help stimulate Atlantic trade, promote a greater exchange of information and technology, and share resources which will draw our communities closer together than ever before. The challenge, I said, was to develop a network of activities based upon practical programmes and clearly focused projects.

The collaborative activities developed since the Atlantic Rim Congress in the area of telemedicine are excellent examples of the potential of the Atlantic Rim Network. The First Transatlantic Telemedicine Summit being planned for 20-22 May 1997 is the logical next step. It provides a forum for organisations such as the American Telemedicine Association and the French Telemedicine Association and others to work together with leading industry executives, policy makers and technical experts to address the critical issues and choices facing the development of telemedicine.

The Atlantic Rim Network's telemedicine initiative can help advance the goals of the Transatlantic Business Dialogue and the joint EU-US Action Plan, and play an important role in the creation of a Global Information Society. Most importantly, it can contribute to the creation of new employment opportunities and improved access to high quality health care. I want to do everything within my powers to assure its success.

CHAIRMAN OF THE EUROPEAN PARLIAMENT DELEGATION FOR RELATIONS WITH THE UNITED STATES

97 - 113, RUE BELLIARD ■ B-1047 BRUSSELS ■ TEL.: 322/284 5202 ■ FAX: 322/284 9202
PALAIS D'EUROPE ■ AVENUE ROBERT SCHUMAN ■ F-67000 STRASBOURG ■ TEL.: 33/8817 5202 ■ FAX: 33/8817 9202
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The American Telemedicine Association

June 18, 1996

Dr. Jean Pasteyer, President
Dr. Jean-Pierre Thierry, Vice-President
French Telemedicine Association
c/o Conseil National de l'Ordre des Medecins
180, Bld Haussmann
75008 Paris, France

Dear Doctors Pasteyer and Thierry:

On behalf of myself and the American Telemedicine Association, please accept our congratulations on the formation of the French Telemedicine Association.

We join with you and others in endorsing the Atlantic Rim Network's First Transatlantic Telemedicine Summit at the World Trade Center in Boston on 20-22 May 1997. We look forward to working with you in the development of cooperative activities which can be of benefit to the transatlantic community and beyond.

I am honored to serve as co-chairman of the Transatlantic Telemedicine Summit with
Dr. Thierry. Together with ARN chairman James Barron and the distinguished members of our International Advisory Board and Business Leadership Council, we have the opportunity to make a major contribution to the advancement of high quality, cost-effective, accessible health care.

The Summit is designed to promote and facilitate transatlantic cooperation in telemedicine. It builds on the achievements of the Atlantic Rim Network, especially its collaborations with the Medical Defense Performance Review and will complement the work of regional organizations. It is to be a forum for the leading decision makers from private and public sectors, on both sides of the Atlantic, to address common concerns and help create a shared agenda for action.

Sincerely,

Jay H. Sanders, M.D.

Jay H. Sanders, M.D., F.A.C.P.
President, American Telemedicine Association
Co-Chairman, Transatlantic Telemedicine Summit

901 15th Street, N.W., Suite 230, Washington, D.C. 20005-2339
(202) 408-0677 Fax: (202) 408-1134

ASSOCIATION FRANÇAISE DE TELEMEDECINE
French Telemedicine Association
AMU 92
Hôpital Raymond Poincaré
92380 GARCHES
Tel : 47 10 70 10 Fax : 47 10 70 07

June 24, 1996

Dr. Jay Sanders, MD, F.A.C.P.
President, American Telemedicine Association
901 15th Street, N.W. Suite 230
Washington D.C. 20005-2339

Dear Dr. Sanders :

The newly formed French Telemedicine Association is joining you and others in endorsing the Atlantic Rim Network's First Transatlantic Telemedicine Network at the World Trade Center in Boston on 20-22 May 1997.

The US and European health care systems have lot in common and a long history of coopeation in medicine. The Summit will permit us to address critical factors in advance and avoid the risks of unecessary complications in the development of telemedicine in general and international telemedicine in particular. We share with you the vision of an improved access to care for those who live in underserved areas of underdeveloped countries. Transatlantic cooperation in Telemedicine and Telehealth offer us a unique opportunity to lead the way in the search for new forms of delivery of health care for the benefit of European and American citizens.

The Atlantic Rim Network is the right place to discuss the complex issues of interrelated human activities such as Health and Tourism or International Developement.

The French Telemedicine Association, which gathers public and private sector representatives, is looking forward working with you for a successful first Transatlantic Telemedicine Summit as a first and important step to establish a cooperative framework.

Sincerely,

Jean-Pierre Thierry
Vice-Chairman
Association Francaise de Télémédecine
Co-Chairman, Transatlantic Telemedicine Summit

ATLANTIC RIM NETWORK

TRANSATLANTIC TELEMEDICINE SUMMIT

20-22 May 1997 BOSTON
PROGRAM

DAY ONE: Tuesday, 20 May 1997 **OVERVIEW AND CRITICAL ISSUES**
HARBORSIDE HYATT BALLROOM

10: 00AM- 2:00 PM Registration

11:30AM- 1:00 PM Special Exhibits, Workshops and "Hands-on" Demonstrations

1:00- 3:00 PM Press Briefing and Guided Tour of Demonstrations

3:00- 3:15 PM **Opening Ceremony and Welcome**
James Barron, JD, Chairman, Atlantic Rim Network, Boston

3:15- 3:45 PM **Introductory Remarks, Program Overview, Recognition of Sponsors and Special Guests**
Summit CoChairman: Jay Sanders, MD, President, American Telemedicine Association, Washington, DC
Summit CoChairman: Jean Pierre Thierry, MD, Vice President, French Telemedicine Association; President, ARN Telemedicine Europe, Paris
Joseph Kvedar, MD, Corporate Director of Telemedicine, Partners HealthCare System, Inc., Boston; Clinical Session CoChair
James McGee, MD, PhD, Director, Oxford University Telepathology Centre; Clinical Session CoChair

3:45- 5:30 PM **Keynote Panel: Critical Issues and Driving Forces in Telemedicine**
Hon. Reed Hunt, JD, Chairman, US Federal Communications Commission, Washington, DC (video)
Dena Pushkin, PhD, Chair, US Government's Joint Working Group on Telemedicine; Acting Director of Rural Health Policy, US Department of Health and Human Services, Washington, DC
Professor Niels Rossing, MD, Rigshospitalet, The National University Hospital, Copenhagen; former head of Health Care Telematics Application Unit, DG XIII, European Commission, Brussels
Colin Latham, President & CEO, MT&T, Halifax, Nova Scotia
David Brandling-Bennett, MD, Deputy Director, Pan American Health Organization / World Health Organization, Washington, DC
Bernard Lown, MD, Nobel Prize winner and Chairman, SatelLife, Cambridge, MA

7:00- 9:00 PM Reception

DAY TWO: Wednesday, 21 May 1997 **REGIONAL PERSPECTIVES AND STATE OF THE ART**
HARBORSIDE HYATT BALLROOM

7:00- 9:00 AM Registration

7:00- 9:00 AM **Breakfast Panel: G-7 Nations: Global Health Care Applications Projects**
Chair: Jo Hauser, MD, National Coordinator for Canada, Ottawa
Jean-Claude Healy, European Commission Coordinator, Brussels (live VTC)
Alain Lefebvre, National Coordinator for France, Paris
Jay Sanders, MD, U.S. G-7 Telemedicine Representative, Washington, DC
Bjorn Bergh, MD, Virchow-Klinikum, Medical Center of the Humbolt University, Berlin, representing Gottfried Dietzel, MD, Bundesministerium fur Gesundheit, Bonn
André La Croix, MD, Canadian Representative and Coordinator of the Telemedicine Sub-Project 4 of the G-7 Healthcare Applications Projects, Ottawa
Professor Marcello Bracale, MD, PhD, EU Coordinator, G-7 Telemedicine Sub-Project, Naples

9:00- 9:15 AM Break

9:15- 10:45 AM **Panel European Perspectives / EC DG XIII Projects**
CoChair: Jean Pierre Thierry, MD, Vice President, French Telemedicine Association; President, ARN Telemedicine Europe, Paris
CoChair: Professor Niels Rossing, MD, Rigshospitalet, The National University Hospital, Copenhagen; former head of Health Care Telematics Application Unit, DG XIII, European Commission, Brussels
James McGee, MD, PhD, Director, Oxford University Telepathology Centre
Professor N. C. Gorin, Department of Hematology, Saint Antoin Hospital, Paris
Jean-Louis Renaud-Salis, MD, Institute Bergonie, Bordeaux
Catherine Viens-Bitker, Commission d'Evaluation des Innovations Technologiques, Assistance Publique Hôpitaux de Paris (Telemedicine Assessment); Coordinator, TASTE Project EU DG XIII
Jean-Yves Chauve, MD, IBSV MER & VIE, La Baule, France

ATLANTIC RIM NETWORK

TRANSATLANTIC TELEMEDICINE SUMMIT

20-22 May 1997 BOSTON
PROGRAM

9:15- 10:45 AM **Panel (continued)** **European Perspectives / EC DG XIII Projects**
Discussants:
Michel Richonnier, Director, DG XIII, Health Care Telematics, European Commission, Brussels (live VTC)
Jean Pasteyer, MD, President, French Telemedicine Association; Director, SAMU 92, Garches, France
Bjorn Bergh, MD, Virchow-Klinikum, Medical Center of the Humbolt University, Berlin, representing Gottfried Dietzel, MD, Bundesministerium fur Gesundheit, Bonn
Denis Guibard, Development Director, France Telecom, Paris
Professor George Anogiankis, President, Biotrast, SA, Thessalonika
Juan Reig Redondo, President, SADIEL, Sevilla, Spain and Coordinator HECTOR EU Project

10:45-11:00 AM Break

11:00-12:30 PM **Panel** **Military Telemedicine Perspectives**
Chair: Lieutenant Colonel Ronald K. Poropatich, MD, Director, Telemedicine Directorate, Walter Reed Army Medical Center, Washington, DC
Colonel Edward R. Gomez, MD, Chief, Research and Development, Telemedicine Directorate, Walter Reed Army Medical Center, Washington, DC
Colonel Robert Vandre, DDS, Deputy Director, Telemedicine Research Laboratory, Fort Detrick, MD
Colonel Renata Engler, MD, Chief, Allergy & Immunology Department, Walter Reed Army Medical Center, Washington, DC
Commander Richard S. Bakalar, Head, Telemedicine Department and Executive Assistant for Navy Telemedicine, National Naval Medical Center, Bethesda, MD
Captain Paul Zimnik, DO, Director, Telemedicine Technology Area, Medical Research and Materiel Command, Fort Detrick, MD
Betsey S. Blakeslee, PhD, Coordinator, Center for Total Access, Ft. Gordon, GA

12:30- 1:45 PM Luncheon
Speaker: Hon. Larry Irving, Assistant Secretary for Communications and Information and Administrator, National Telecommunications and Information Administration, US Department of Commerce

1:45- 3:15 PM **Panel** **Legal / Regulatory Barriers and Potential Solutions**
Chair: Stephen Schanz, JD, Editor, *Telemedlaw*, Raleigh
Leo Whelan, JD, Legal Counsel, Mayo Clinic, Rochester
John Blum, JD, Assoc. Dean, Institute for Health Law, Loyola School of Law, Chicago
Doron Ezikson, JD, Partner, McDermott Will & Emery, Boston
Discussants:
Pierre Fernandez, Conseil, National de L'Ordre des Medecins, Paris
Curtis Rooney, JD, Legislative Counsel, American Medical Association, Washington, DC
Carolyn Hutcherson, MS, RN, National Council of State Boards of Nursing, Chicago
Joseph McMenamin, JD, MD, International Bar Association, Richmond, VA
Tim O'Malley, President, Viacron Medical Systems, Inc., Minneapolis
Wayne Bell, JD, CEO, Digital Image FX, Inc., Dartmouth, Nova Scotia; Canadian Society for Telehealth

3:30- 5:00 PM **Panel** **Southern Hemisphere and Other Regional Perspectives**
Chair: David Brandling-Bennett, MD, Deputy Director, Pan American Health Organization / World Health Organization, Washington, DC
Javier Castellanos Coutino, MD, Assistant Medical Director, Institute for Social Security & Social Services for State Workers, Mexico City
Jesse Mbwambo, MD, physician / psychiatrist, Tanzania; Harvard University School of Medicine
Kristen Levy, MD, Boston Medical Center-Armenia Project
Patricia Bittner, PAHO's Emergency Preparedness and Disaster Response Program, Washington, DC
Discussants:
Herman Weinstock, MD, Minister of Health, Republic of Costa Rica
Ramnik Xavier, MD, Chief Medical Adviser, SatelLife
Augusto Golan, MD, former Minister of Health, Columbia
Juan Tavernas, MD, Santo Domingo, Dominican Republic
Professor Samuel Ofos-Amaah, MD, Dean, School of Public Health, University of Ghana
Candy Day, Information Manager, Health Link, Durban, South Africa
Haik Nikogosian, MD, Yerevan, Armenia

5:00- 5:15 PM Break

ATLANTIC RIM NETWORK

TRANSATLANTIC TELEMEDICINE SUMMIT

20-22 May 1997 BOSTON
PROGRAM

5:15- 6:45 PM **Panel** **North American Perspectives**
Chair: Jay Sanders, MD, President, American Telemedicine Association
Paul Cochrane, Assistant Deputy Health Minister, Health Canada, Ottawa
Jeffrey Gelfand, MD, Chairman, Department of Medicine, New England Medical Center, Boston
Suzanne Tichenor, Director, Council on Competitiveness, Washington, DC
Margaret Cary, MD, MBA, MPH, Regional Director, US Department of Health and Human Services, Denver
Judith Kurland, Regional Administrator, US Department of Health and Human Services, Boston
Mark Goldberg, MD, Vice President, PAREXEL International, President-Elect, American Telemedicine Association
[Tentative: US Senator Edward Kennedy, US Representative Edward Markey, US Representative Joe Moakley (live VTC)]

DAY THREE: Thursday, 22 May 1997 **RECOMMENDATIONS FOR ACTION**
HARBORSIDE HYATT BALLROOM and ACTION PANEL ROOMS

7:30- 8:00 AM Continental Breakfast

8:00- 9:30 AM Preparation for Action Panels: Guided Tours of Telemedicine Solutions

9:30-11:30 AM **Facilitated Action Panels: Designing a Transatlantic Action Agenda**

1. Identify Clinical / Stakeholder Needs and Priorities
2. Identify Key Challenges and Obstacles
3. Recommend Actions and Solutions

Sessions to include representatives of industry, provider, regulatory and consumer groups.

Action Panel A: **Clinical Applications and Market Opportunities: Diagnosis, Consultation and Treatment**
CoChair: Joseph Kvedar, MD, Corporate Director of Telemedicine, Partners HealthCare System, Inc., Boston
CoChair: Professor James McGee, MD, PhD, Director, Oxford University Telepathology Centre
John Coller, MD, Director, Ambulatory Surgical Research Center, Lahey Hitchcock Clinic, Burlington
Jud Pratt, Manager, Health Care Division, System Resources Corporation
Tim McCallahan, American Medical Development / Welch Allen
Ken Greenwood, Director, Health Care Marketing, PictureTel Corporation
John Turner, VTEL Corporation / CLI
Steve Ganon, Director of Medical Applications, NYNEX
Tim O'Malley, President & CEO, Viacrom Medical System, Minneapolis

Action Panel B: **Medical Records / Patient Information / Smart Cards**
Chair: Charles Safran, MD, Director, Informatics and Advanced Technology, Beth Israel Deaconess Medical Center, Boston
Professor Lance Hoffman, Cyberspace Policy Institute, George Washington University
Jean-Louis Renaud Salis, Prompt Ecole European Project, Cancer Centers Federation, Bordeaux
Professor Norbet-Claude Gorin, MD, European Bone Marrow Association, Paris
Pierre Fernandez, Conseil, National de L'Ordre des Medecins, Paris
Lillian Clinard, PhD, Lockheed Martin Energy Systems, Oak Ridge, TN
Walt Zywiak, Epic Systems Corporation

ATLANTIC RIM NETWORK

TRANSATLANTIC TELEMEDICINE SUMMIT

20-22 May 1997 BOSTON
PROGRAM

Action Panel C: **Distance Learning / CME / Licensing and Certification**

Chair: Dennis Wentz, MD, Director of Continuing Medical Education, American Medical Association, Chicago
Cynthia Trutanic, JD, FCC Advisory Committee on Healthcare and Telecommunications, Washington, DC
Catherine Crawford, PhD, Associate, National Health Information Center, Washington, DC
Discussants:
Renée Ebert, Consultant, TSD Communications Services, Newport Beach
Lygeia Ricciardi, Policy Advisor, Federal Communications Commission, Washington, DC
Cheryl Peterson, MSN, RN, Associate Director, Federal Government Relations, American Nurses Association, Washington, DC
Alan Law, MD, Dean of Science, Memorial University, Newfoundland
LtCol Eric Allely, MD, Director, Center for Medical Education Technologies, Henry M. Jackson Foundation for Advancement of Military Medicine, Rockville, MD
Michael Caputo, C. Everett Koop Institute, Dartmouth, NH
Patricia Bittner, Pan American Health Organization, Washington, DC
Col Randall Falk, MD, Harvard University School of Public Health
Michael Allen, MD, Director of Community Programs, Dalhousie University Continuing Medical Education, Halifax
Andrew Morin, MD, Protagonists, Paris
Robert Leitch, PhD, Washington, DC

Action Panel D: **Disease Monitoring and Management**

Chair: John Woodall, PhD, Director, ProMED-Mail; Director, Arbovirus Lab, New York State Health Department, Albany
Michael Sharpe, MD, Global Information Access Strategy, Division of Emerging and Other Communicable Diseases Surveillance and Control, World Health Organization, Geneva
John Mullaney, Executive Director, SatelLife, Boston
Johan Giesecke, MD, State Epidemiologist, Swedish Ministry of Health, Stockholm
Steven Corber, MD, Director, Division of Disease Prevention and Control, Pan American Health Organization, Washington, DC
Erwin Hirsch, MD, Professor of Surgery, Director of Trauma Care, Boston Medical Center
David Ornstein, President and CEO, Pragmatica, Inc., San Mateo, CA
Discussants:
Wilson Engel III, PhD, Publisher and Editor-in-Chief, *Microbe-Virus-Vector Monitor*, San Diego
Jean Pasteyer, MD, President, French Telemedicine Association; Director, SAMU 92, Garches, France
Michel Baer, MD, anesthesiologist, SAMU 92

11:30-11:45 AM Break
Speaker: Rt. Hon. Jean Chrétien, Prime Minister, Canada (live VTC)
Introduced by: Wayne Bell, CEO, Digital FX, Dartmouth, Nova Scotia (live VTC)

11:45- 1:00 PM **Preparation of Session Summaries and "Next Step" Recommendations for Preliminary Action Plan**

1:00- 3:30 PM Working Luncheon
Reports and Recommendations from Action Panels
Discussion: Recommendations for Activities through Next Summit
Concluding Remarks: Towards a Transatlantic Action Agenda and Integrated Global Health Care System

3:30- 3:45 PM Break

3:45- 4:45 PM Post-Summit Presentation and Discussion: Asian Telemedicine Perspectives (details to be announced)

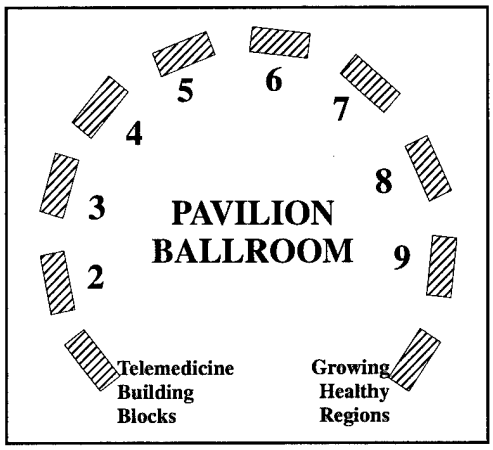
ATLANTIC RIM NETWORK

TRANSATLANTIC TELEMEDICINE SUMMIT

20-22 May 1997 BOSTON

PAVILIONS

A progression of thematically linked pavilions will complement the Summit panel discussions. The pavilions will provide the participants with important telemedicine examples which mostly use interoperable, standards-based, scalable building blocks adaptable to the needs of different regions and different clinical specialties. These special exhibits, workshops and hands-on demonstrations are leading examples of cost-effective telemedicine and medical training systems, products and services that are now or could be rapidly commercialized.



Pavilion #1: Telemedicine Building Blocks & Tools
Theme: Telemedicine, medical instrumentation and multi-media building blocks and enabling technology.
Contacts: Mark VanderWerf, Steve Ganon, Peter Masucci, Ed Crowley
Sponsors: American Medical Development; NYNEX; PictureTel Corporation; VTEL Corporation

Pavilion #2: Urban and Remote Telemedicine Medical Systems
Theme: Remote Continuing Medical Education (CME), Teleradiology and Telecardiology consulting, and G-7 Transatlantic medical system integration
Contacts: Jud Pratt; Eric Menn; Vincent Spoto
Sponsors: System Resources Corp; Partners HealthCare System, Inc.; Image Labs

Pavilion #3: Innovative Readiness Tele-Training: Civilian-Military Cooperative Project
Theme: Interactive internet-integrated distance tele-training, featuring world-class trauma care training and medical delivery; Continuing Medical Education
Contacts: Eric Allely, MD; Col Randall Falk, MD; Judith Kurland; Erwin Hirsch, MD; John Coller, MD; Rick Brooks; Lock Row
Sponsors: Henry M. Jackson Foundation; Tekamah Corporation; US Department of Health and Human Services; Boston Medical Center; Lahey Hitchcock Clinic; Harvard University School of Public Health; Electronic Systems Center Medical Prototypes; VTEL Corporation

Pavilion #4: Global Communications for Health: Disease Control Network
Theme: Global communication and cooperation for health information: Repository, transfer and access
Contacts: John Mullaney; Jack Woodall
Sponsors: SatelLife; ProMed-Mail; Microbe-Virus-Vector Monitor

Pavilion #5: Air Doc
Theme: In-flight telemedicine to respond to civilian disasters and military operations. Civilian-military collaboration and investment to rapidly commercialize a satellite, in-flight aircraft, and ground-based network responsive to combined aircraft maintenance, management and medical needs
Contacts: Lt Col Corey Kirschner
Sponsors: US Transportation Command; Boeing; Digital Express; MedLink; Medic Alert; Mayo Air

Pavilion #6: Sea Doc
Theme: Ship-to-shore telemedicine
Contacts: CDR Richard Bakalar, MD; Ulf Baumann; Jean-Yves Chauve, MD
Sponsors: Navy Telemedicine / MIDN; BT Global Challenge / OSII, Inc.

Pavilion #7: Home Health Care
Theme: Lessons learned and new developments in specialty health care to homes and residential settings
Contacts: Tim O'Malley; Jay Sanders, MD; Charles Safran, MD
Sponsors: Viacron Medical Systems, Inc.; Beth Israel Deaconess Medical Center; US Department of Health and Human Services

Pavilion #8: Army Telemedicine Experiences
Theme: The use of cost effective, mission critical, Commercial Off The Shelf solutions for low data rate mobile military consultations, drawing on recent experiences in Desert Storm, Somalia, Haiti, and Bosnia supported by a Tertiary Care Center
Contacts: Col Ed Gomez, MD; Capt Paul Zimnick, DO
Sponsors: Apple Computer, Inc; Walter Reed Army Medical Center

Pavilion #9: Patient Record Systems and Tools
Theme: Initial integration of data, voice, and images in second generation patient record alternative architectures addressing civilian and military medical requirements
Contacts: Karen Coombs, Walt Zywiak, Chuck Calhoun
Sponsors: Epic Systems Corporation, MDTV, Health Card Exchange

Pavilion #10: Growing Healthy Regions
Theme: Strategic perspective, regional map, and home page network of resources for evolving healthy regions, leveraging military and civilian initiatives to evolve a phased integration of telemedicine tools and reengineered clinical practices
Contacts: Missy Allen; Judith Kurland; Celeste Jones
Sponsors: Medical International Offices; City of Boston; Greater Boston Convention and Visitors Bureau; Massachusetts Convention Center Authority; World Trade Center Boston; Alsace Development Agency, Inc.

ATLANTIC RIM NETWORK

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20-22 May 1997 BOSTON 20-22 Mai 1997

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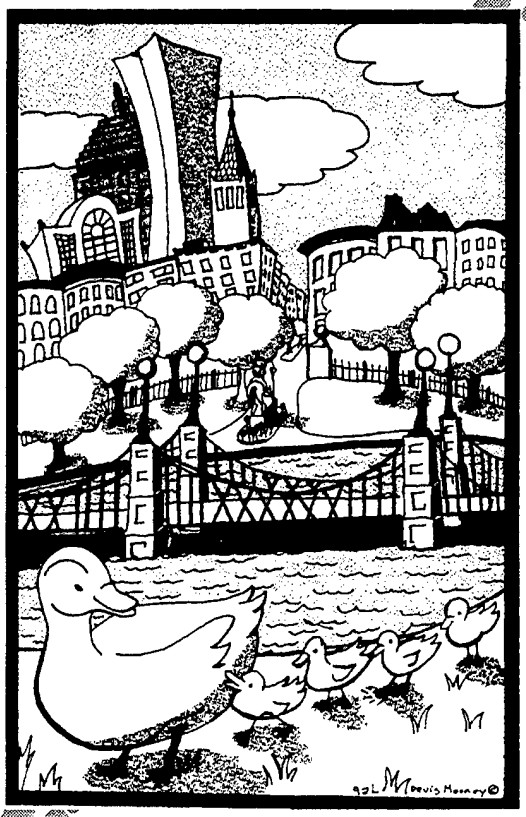

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COMMENTS ON THE TRANSATLANTIC TELEMEDICINE SUMMIT

The US Army welcomes the opportunity to be part of this historic conference and looks forward to a strong military-civilian collaboration in the future Brigadier General Russ Zajtchuk, MD.

We look forward to sharing the lessons we have learned. by participating in your summit, we look forward to learning what is happening worldwide. US Vice President Al Gore.

The Atlantic Rim Network's telemedicine initiative can help advance the goals of the Transatlantic Business dialogue and the joint EU-US action plan. Alan Donnelly, Chairman, European Parliament's Delegation for Relations with the United States.

The Transatlantic Telemedicine Summit was a very useful forum because it brought together members of the G7 subprojects from Europe and North America along with representatives of the private sector. The wide spectrum of views and opinions provided participants the an opportunity to examine these complex issues from all sides. The work of the G7 subgroups to date has had to integrate both differing knowledge bases and cultural differences in the approach to problems facing each country. The differing perspectives presented by participants in the G7 subprojects enriches the nature of the solution proposed.
Thomas Kalil of the White House stated, in his presentation at the Washington meeting of G7 Coordinators ealier this year, "international collaboration is an unnatural act". Only those who have attempted to facilitiate a process that brought together experts with strongly held opinions about their subject matter and come from different countries will know how unnatural the discussions sometime seem. Nevertheless, the G 7 discussions have achieved some very tangible and potentially useful outcomes. A meeting such as the Transatlantic Telemedicine Summit helps facilitiate the work of the G7 initiative.
Dr. Jo Hauser, Former Canadian chairman of G7 Global Health Care Initiative.

"The opportunity for collaboration is a major outcome of the Summit"
Dr. Jean Pierre Thierry, Summit co-chair and French G-7 telemedicine representative.

I will suggest to, the United States that we embace those [three or four post summit priority] initiatives as part of G-7 obligation, make that part of our G-7 projects. Dr. Jay Sanders, Summit co-chair and US G-7 telemedicine representative.

The Atlantic Rim network is absolutely a kind of break through in terms of getting people together. Medical companies tend to develop disease specific or procedure specific products successfully. but the medical community has not been as good at integrating all those technologies, all those procedures. The Atlantic Rim has provided the first international forum where that integration can take place--where the standards can be discussed, where technologies like ours and the outpatient can be merged; and I can talk to companies with video conferencing or telemedicine in other fields, and we can merge those solutions. that dialogue has not been taking place before this time. we've been in our little villages. The Atlantic Rim is providing that forum in both the US and internationally. Tim O'Malley, President and CEO, Viacron Medical Management Systems, MN.

How do we use "this wonderful platform which is the Atlantic Rim Network to work for the future. What is to be done, who does what, when do they do it and where do they meet next?"
Dr. Nils Rossing, European Commission representative to Transatlantic Telemedicine Summit.

ATLANTIC RIM NETWORK

Atlantic Rim Network and Telemedicine

1994

First International Congress on Atlantic Rim, Boston, 1994
(Telemedicine made one of twelve featured sessions at First Congress)

1995

MITRE Exchange of Experiences Symposium, Burlington, MA, January

Telemedicine 2000 Conference, Lake Tahoe, March

Atlantic Rim Network Forum, Halifax, June
("Halifax Mandate"- telemedicine to be ARN priority area)

Conference of World Regions/National Governors Association, Burlington, VT, July

MITRE/ MDPR Exchange of Experiences Symposium, August

NATO Partnership for Peace Symposium, Paris-Boston VTC, September

Transatlantic Telemedicine Roundtable, Ocean Cities Conference, Monaco, November

Conference of World Regions/ Council of State Governments, San Juan, December

1996

100th Boston Marathon, Boston, April
ARN brings DOD technology to aid injured non-English speaking runners

"Telemedicine and the Atlantic Rim Network" videotape produced, May

French Telemedicine Association Opening Forum, Paris, June
(ARN's Transatlantic Telemedicine Summit made priority activity)

European Commission Directorate General XIII, Health Care Telematics and European Parliament briefings, Brussels, June
(ARN Telemedicine Summit endorsed)

Global Telemedicine and Federal Technologies Conference, Williamsburg, VA, July

National Library of Medicine Briefing/ G7 Global Health Care, Washington July

Circumpolar Telemedicine Forum, Alaska- Boston, August

Capital Region Economic Development Association Forum, Harrisburg, PA, August

MIT Macro-Engineering Society Conference, Cambridge, MA, November

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Agenda
Medical Defense Performance Review (MDPR)
Technical Exchange Meeting with Dr. Jay Sanders

January 9, 1995

8:30-8:45	Introduction and Agenda Review John Evans, MDPR Program Manager
8:45-9:45	Tour and Demonstration of Telemedicine Building Blocks Mike Mekshes and MITRE Project Team
10:45-10:00	Break
10:00-10:15	Medical Defense Performance Review Objectives (by VTC) BGen Hoffman, Head of the MDPR
10:15-11:15	Georgia Rural Telemedicine Project and Home Care Services Dr. Jay Sanders, Medical College of Georgia
11:15-12:00	Requirements and Design Review Adaptive Mobile Doctor's Bag for Home Care and Emergencies
12:00-1:00	Lunch James H. Barron, International Boston & Atlantic Rim Congress
1:00-2:00	Doctor's Bag Development Program Planning Final Doctor's Bag Design Concept Concept of Operations Alaskan Telemedicine Testbed Pilot Military and Civilian Health Care Applications

Jointly Sponsored by
The Atlantic Rim Network and
The Medical Defense Performance Review

August 16, 1995

M.D.P.R.

Atlantic Rim Network Adaptation of the Texas Telemedicine Project to the Massachusetts Region

9:00 - 9:15	Introduction and Background Jim Barron, Atlantic Rim Network
9:15 - 10:15	Overview of the Texas Telemedicine Project Dr. Robert Brecht
10:15 - 10:30	Coffee break
10:30 - 11:30	Medical Defense Performance Review (MDPR) Overview, Planned Portable Telemedicine Prototype and Demonstrations John Evans, Medical Defense Performance Review Mike Mekshes, the MITRE Corporation
11:30 - 12:00	Massachusetts Health Care in Prisons, Clinics and Community Health Centers Jim Barron, Atlantic Rim Network Dr. Mark Goldberg, American Telemedicine International
12:00 - 1:00	Lunch
1:00 - 2:00	Concept and Action Plan for Adapting Texas Telemedicine Project and the Medical Defense Performance Review Prototype Insights to Massachusetts Health Care Centers
2:00 - 3:00	Discussion of Next Steps

MDPR

Joint Briefing by
NATO Partners for Peace
The Atlantic Rim Network and
The Medical Defense Performance Review (MDPR)

September 15, 1995
at The MITRE Corporation, Bedford, Massachusetts

EXPLORATION OF POTENTIAL COLLABORATIVE INITIATIVE

12:00 - 12:10	Welcome and Introduction Matt Mleziva, Program Director, Command and Control Systems Electronic Systems Center
12:10 - 12:15	Atlantic Rim Network/ MDPR Telemedicine Collaboration James Barron, Chairman, Atlantic Rim Network
	Live Video Link from Paris
12:15 - 12:20	Dr. Frank Davidson, Director, MIT Macro Engineering Research Group John Evans, Technical Director and Program Manager, MDPR Mike Mekshes, Chief Engineer, The MITRE Corporation
12:20 - 12:45	NATO Partnership for Peace Briefing Capt David Taylor, US Navy Lt Col Gunter Forstenichner, Federal Republic of Germany Lt Col Panayot Ivanov Panayotov, Bulgarian Armed Forces
12:45 - 13:00	Questions and Answers
13:00 - 13:10	Demonstration of Multi-Lingual Translator Developed by US Navy Commander Lee Morin Naval Aerospace and Operational Medical Institute Gregg Thibodeau, The MITRE Corporation
13:10 - 13:30	Discussion Regarding Next Steps

MITRE

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M.D.P.R.

ATLANTIC RIM NETWORK

SYMBION

"Ocean Cities" Telemedicine Roundtable
La Santé des Cités Marines: Relever le Défi Grâce à la Télémédecine
Une table ronde sur la télémédecine

Centre de Congrès et Auditorium de Monaco
14:00- 17:00 — 21 November 1995

A collaborative project of the Atlantic Rim Network, Medical Defense Performance Review and SYMBION with the support of the "Ocean Cities '95" Organisation Committee and SEE

Roundtable Co-Chaired by
Jean-Pierre Thierry, MD, SYMBION
and
Jay Sanders, MD, President-Elect, American Telemedicine Association

Purposes:
a) facilitate transatlantic exchange of experiences and identification of "best practices"
b) identify collaborative projects and clinical trials with practical applications
c) explore design, implementation and funding issues

AGENDA

14:00-14:10 Welcome and Overview
- **Dr. Lucien Deschamps**, Président du Comité d'Organisation Cités Marines '95
- **Dr. Frank Davidson**, Founder, International Association of MacroEngineering Societies, MIT, and Honorary Chairman of Ocean Cities Telemedicine Roundtable, Paris
- **Dr. James Barron**, Chairman, Atlantic Rim Network, Boston

14:10-14:20 Introductory Remarks by Roundtable Co-Chairmen
- **Dr. Jean-Pierre Thierry**, SYMBION, Paris
- **Dr. Jay Sanders**, American Telemedicine Association, Augusta GA

14: 20-16:00 Part I. "Best Practices" Examples (led by Dr. Thierry)
- **Dr. Christophe Duvaux**, Conseil National de l'Ordre des Médecins, Paris
- **Pr. Louis Lareng**, European Institute of Telemedicine, Toulouse
- **M. Daniel Herlemont**, Matra Marconi Space, Toulouse
- **Pr. Jacques Marescaux**, CHU, Strasbourg
- **Mme. Mercedes Iglesias de Gothberg**, Alcatel Business Network
- **M. Jacques Rougerie**, Architecte
- **Admiral Hervé Le Pichon**, French Ministry of Defense

16:00- 17:00 Part II. Recommendations for Action (led by Dr. Sanders)
- **Mr. John Evans**, Medical Defense Performance Review, Boston
- **Mr. Michael Mekshes**, MITRE, Boston
- **Dr. Christoph von Braun**, Consultant, Munich

Part I. "Best Practices" Examples (led by Dr. Thierry)

Presentations illustrating best examples of military-developed and other telemedicine technologies which have direct application to the delivery of cost-effective and high quality health care in the private sector. Examples of health telematics technologies which respond to end-user, civilian sector defined problems.

14:20- 14:30

- **Dr. Christophe Duvaux**, Directeur exécutif, Conseil National de l'Ordre des Médecins (French National Medical Order)

  Topic: Ethical and Deontological Problems Facing Telemedicine. *Les problèmes déontologiques et la problematique posée par le développement de la télémédecine.*

14:30-14:40

- **Pr. Louis Lareng**, President de la Société Européenne de Télémédecine; (head of the European Institute of Telemedicine at Centre Hospitalier Universitaire de Toulouse, largest regional inter-hospital telemedicine test bed and specialist in maritime telemedicine.)

  Topic: Telemedicine for Rural Areas and Isolated Populations. *L'apport de la télémédecine aux populations isolées.*

14:40-14:50

- **M. Daniel Herlemont**, Matra Marconi Space, Toulouse

  Topic: *Le Projet franco-italien de plate-forme de télémédecine multilingue et le rôle de l'industrie (projet du G7)*

14:50-14:55

- **Cdr. Lee Morin**, MD, US Navy, Naval Aerospace and Operational Medical Institute (via video)

  Topic: Excerpt from demonstration of Multi-Lingual Translator at First International Congress on the Atlantic Rim, Boston

14:55-15:05

- **Pr. Jacques Marescaux**, Strasbourg, responsable des projet européens MASTER (Minimal Access Surgery by Telecommunication and Robotics) et TESES (telesurgical staffs), head of a French-German consortium's telesurgery project combining robotics and telemedicine through ATM

  Topic: Telesurgery: Dream or Reality? *Les interventions chirurgicales assistées par ordinateur et la téléchirurgie: rêve ou réalité?*

15:05- 15:15

- **Mme. Mercédes Iglesias de Gothberg**, Responsable santé, Alcatel Réseaux d'Enterprise (Alcatel Business Network)

  Topic: Business perspectives on telemedicine. *L'implication d'un industriel dans la télémédecine: Alcatel*

15:15-15:25

- **M. Jacques Rougerie**, Architecte

  Topic: Healthcare and telemedicine requirements in the architecture of the future Ocean Cities. *La prise en compte besoins de santé et de la télémédicine dans l'architecture des cités marines.*

15:25- 15:35

- **Admiral Hervé Le Pichon**, Ministère du Défense, France

  Topic: Ship-to-Shore Telemedicine

15:35- 15:45 **Questions and Answers**

15:45-16:00 **Break**

Part II. Recommendations for Action/Topics for Consideration (led by Dr. Sanders)

16:00-17:00 **Participants' Discusssion (Débats)**

- Future of Telemedicine: Transatlantic Assessment of Principal Challenges and Opportunities
- Toward a First Annual "Benchmarking Best Practices in Telemedicine" Symposium and Exhibition, Winter 1996-97, World Trade Center Boston: Elements of a Preliminary Agenda

Commentators: Mr. John Evans, Program Manager, Medical Defense Performance Review, Boston
Dr. Christoph von Braun, Consultant, Munich
Mr. Michael Mekshes, MITRE
Dr. James Barron, Atlantic Rim Network
Dr. Frank Davidson, MIT

Topics for special consideration

A. Emergency Ship-to-Shore Medical Care
Application of telemedicine initiatives to MARIS (or Maritime Information Society) endorsed at G7 Global Information Infrastructure conference, relating to cost-effective and timely delivery of health care to remote off shore sites, such as on military or commercial vessels or cruise ships or remote sites such as "ocean cities" or offshore platforms. (Note: demonstration in Brussels at G7 conference February 1995 was of telemedicine delivery to North Sea drilling station) See also: PACMED, AMRIE

B. Creating Civilian Test Beds for Telemedicine: Corrections and Community Health Centers
Opportunities to demonstrate practical applicability of portable "doctor bag" technology in, for example, correctional institutions and urban community health facilities. Demonstrate cost savings and improved delivery of quality health care. Facilitate common standards and interoperability. Develop pilot projects in Atlantic Rim communities.

C. NATO or "Partnerships for Peace"
Explore collaborative activities with NATO regarding health care/emergency medical care programs using "Partnerships for Peace" or other NATO related programs as initial framework.

D. Organizing an Atlantic Rim Network Telemedicine Advisory Board and Business Leadership Council
Building a transatlantic framework ("information clearinghouse") to facilitate communication, cooperation and collaboration. Designing a workplan and timetable.

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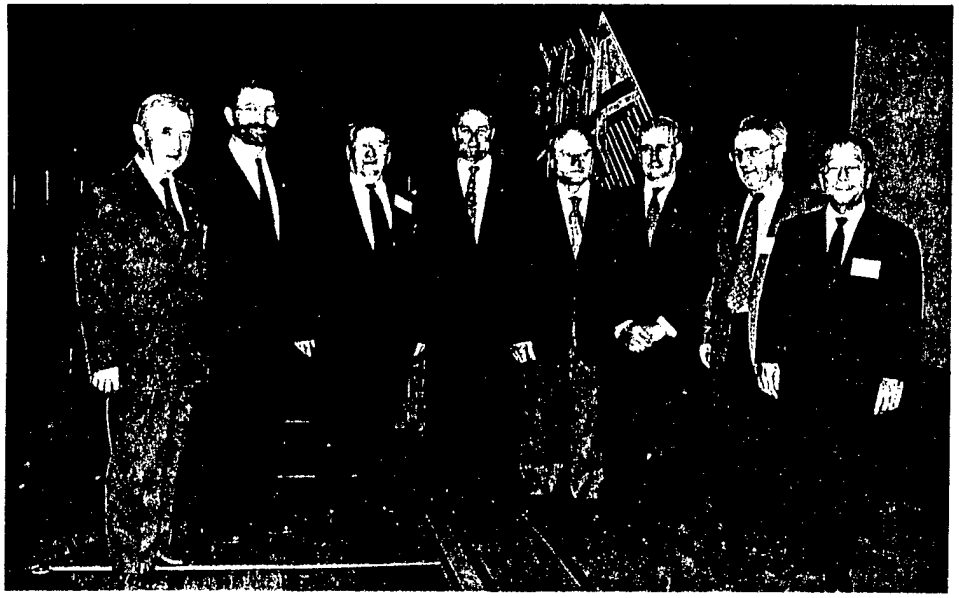
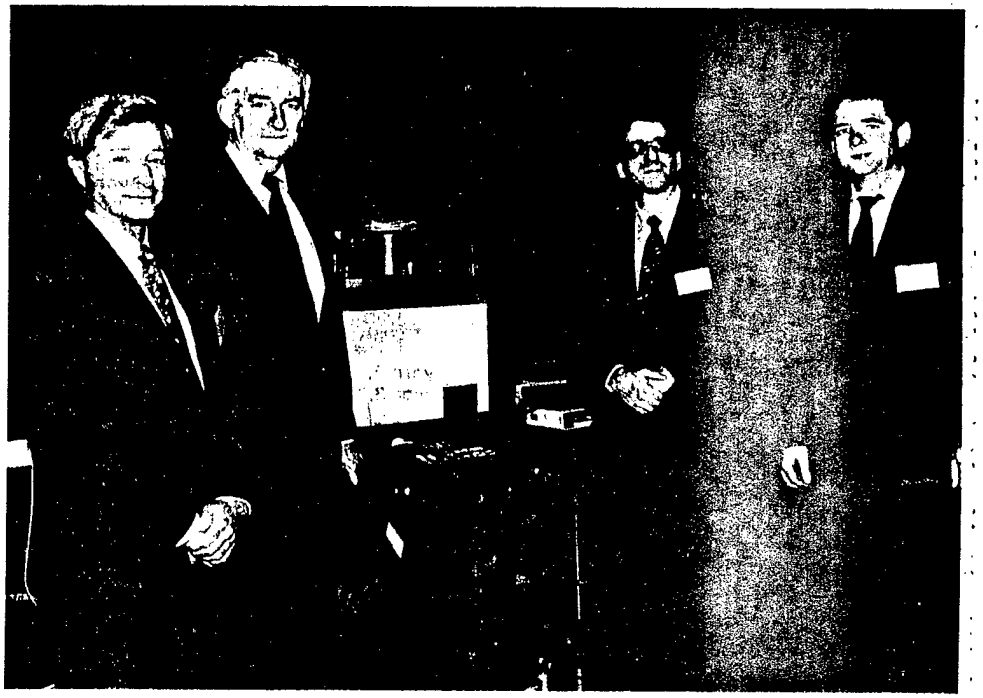
Télémédecine sans frontières

A l'aube du 21e siècle, une nouvelle façon de soigner se développe. Elle fait appel aux moyens modernes de télécommunications



MM. Georges Grinda, directeur de cabinet de S.A.S. le prince souverain et Michel Sosso, conseiller de gouvernement pour les Travaux publics et les Affaires sociales entourés des responsables du symposium.



MM. Evans, Barron, Thierry et Sanders, qui ont évoqué le devenir de la télémédecine. (Photos René Briano)

Il faut se faire à cette idée : les prochaines décennies verront une importante mutation dans le domaine de la médecine. Plus précisément de la façon dont seront établis les diagnostics et prodigués les soins, grâce à la télémédecine.

C'est ce qui ressort de la table ronde qui s'est déroulée au CCAM dans le cadre du symposium international *« Cités Marines 95 »*.

Autour de MM. James H. Barron (Atlantic Rim Network), John A. Evans (Medical Defense Performance Review, Boston), Jay Sanders American telemedicine Association, Augusta GA) et Jean-Pierre Thierry (Symbion), de nombreux spécialistes ont échangé opinions, expériences et avis dans une sorte de vaste tour d'horizon du sujet avant de participer à une simulation de l'examen d'un patient par télémédecine, en duplex avec les Etats-Unis (Lahey Hitchcock Clinic).

En fait, la télémédecine permet d'envisager de faire du domicile des particuliers le premier lieu d'observation et de soins des patients. Et les possibilités, avec cette technique, sont multiples : surveillance à domicile des cardiaques, suivi à long terme sans déplacement, etc. Mais c'est aussi dans le cas de toute communauté isolées que le procédé pourra, dans le futur, rendre des services de grande qualité. Qu'il s'agisse de communautés militaires engagées sur des terrains d'opérations, rurales, océaniques, etc. Dans cette optique, l'emploi des satellites de télécommunication sera prépondérant. Ainsi d'ailleurs que pour les personnes malades à bord des plateformes pétrolières, les isolés dans des conditions polaires, les stations spatiales, etc.

Par ailleurs, les pays du « G7 » ont en projet la mise en place d'une permanence planétaire d'un service de télémédecine d'urgence et de télésurveillance 24h/24, multilangues et multidisciplinaire. Cela afin d'étendre l'action des services d'urgence, assurer une meilleure qualité de soins, l'optimisation des sauvetages et, par l'impact social, améliorer la qualité de la vie. Tout à fait possible affirme le professeur Lareng, expert pour la France de ce projet. Pour peu, bien sûr que soient définis des centres de télémédecine, rendus complémentaires par des liaisons faisant appel aux moyens modernes de télécommunications, notamment les satellites.

Y. D.

Hanscomian
Vol. 40, No. 16 Hanscom AFB, Mass. April 19, 1996

Multi-lingual translator of service in peace and war

By Roy K. Heitman
ESC Public Affairs

Medical people at the 100th Boston Marathon finish line had some high-tech help from a voice-activated multilingual system similar to one helping U.S. troops in Bosnia.

The multi-lingual translator permitted medical workers to use a voice recognition and translation system, loaded into laptop computers, to talk with runners in more than 44 languages. Sets of words, phrases and sentences have been preselected for their utility in medical interviews.

"With it's large number of foreign entrants, the marathon gave us an opportunity to further test the system in the real world," said John Evans, Hanscom program manager for the Medical Defense Performance Review. The demonstration at the marathon was part of a Transatlantic Telemedicine Initiative led by the Defense Department Medical Defense Performance Review and the Boston-based Atlantic Rim Network, a non-profit information clearinghouse and framework for [illegible]atlantic collaboration led by James Barron.

"About 50 people were treated using the multi-lingual translators," Lock Row, senior systems engineer in the MDPR program office. "One German doctor was extremely enthusiastic about system as it allowed him to talk easily to foreign patients. He said it was almost like the difference between veterinary and human medicine in that the translator enables the doctor to ask questions such as 'where does it hurt?' and get answers.

"Also, the marathon gave our technical people a chance to see how the system works in the real, chaotic world of disaster-like medicine, and therefore they can build systems more responsive to real-world needs," Row said.

"The MDPR is a joint U.S. military effort, established under Vice President Gore's National Performance Review for reengineering government and this demonstration provided another valuable means of transferring useful military technology to the private sector," said Matt Mleziva, director of Electronic Systems Center's Command and Control Systems Directorate.

Paul Bamberg of Dragon Systems and Keith Duerr of the Medical Defense Performance Review program office, use the mult-lingual translator to assist a foreign runner after the marathon.

"The goal is to enhance the cost-effectiveness of medical care in both the military and civilian medical communities," Mleziva said.

Software for the translator system was originally conceived by Navy Commander (Dr.) Lee Morin while serving in the Gulf War. Today, the software is a joint development of the Naval Aerospace and Operation Medical Institute of NAS Pensacola, Fla., and Dragon Systems, Inc., of Newton, Mass. From the Hanscom community, Row and Keith Duerr of the Medical Defense Performance Review program office and Marie Normoyle and George McDowell supporting the program from the MITRE Corporation worked at the Marathon to make the multi-lingual translator demonstration a success.

Separately, the program office has developed a medical video-teleconferencing system deployed worldwide. "It allows Air Force Surgeon General Lt. Gen. (Dr.) Edgar R. Anderson Jr. to confer with all major command surgeons simultaneously displayed on his 'video wall' during weekly Monday staff meeting or as needed in real time," Evans said.

Evans, technical director for the teleconferencing system the Command and Control Systems Directorate, said there were three phases in developing the system from an idea to a useful tool for treating casualties.

"In the first step, we used commercial off the shelf equipment to connect medical centers for routine conferences," Evans said. "Next, we extended the use of technology to facilitate customer-driven reengineering of key management and clinical diagnostic and treatment processes. As a spin-off of these efforts, we have been able to put the technologies to use in the mobile marathon hospitals."

Should a patient in a community setting or near the front lines need specialized care not available there, these technologies and the teleconferencing network enable the doctor in the "MASH" unit to consult with a specialist almost anyplace in the world and show the doctor in the rear area the patient's wounds and condition.

The current system under development uses a normal commercially available computer workstation, with a camera added. It can transmit files, photos or video and provides video conferencing capability.

"The idea for the telemedicine system came from Massachusetts General Hospital in the 1950s, but it was plagued with poor quality sound and pictures," Evans said. "Now, doctors tell us that in many cases the teleconference can show better quality of photos and sound than in real life."

"We saw a need for help from the private sector, so we reached out to civilian hospitals through a Cooperative Research And Development Agreement with Lahey-Hitchcock Clinic near Hanscom. We deployed a terminal to Lahey-Hitchcock and we are learning from each other," Evans said.

Based on the enthusiasm generated in the Boston medical community in this event, program officials see greater cooperative involvement among civilian, international and military medical communities to accelerate deployment of cost-effective telemanagement capabilities.

ATLANTIC RIM NETWORK

Global Telemedicine & Federal Technology Symposium
Telemedicine Testbeds of the Atlantic Rim

Williamsburg Lodge, Williamsburg,VA
Tuesday 9 July 1996, 0830-1145
(Program Subject to Change)

0830 James H. Barron, JD, Chairman, Atlantic Rim Network

Atlantic Rim Network as a Framework for Collaboration
Atlantic Rim Network and Telemedicine (video)

0845 Jean-Pierre Thierry, MD, President, ARN Telemedicine Europe; Co-Chairman, Transatlantic Telemedicine Summit (1997)

European Perspectives on Opportunities for Cooperation
(VTC from Paris)

0900 USN Lt. Eric Rasmussen, MD, Naval Aerospace and Operations Medical Institute (NAMI), Pensacola, FL
Paul Bamberg, Ph.D., Vice President, Dragon Systems, Inc.

From Bosnia Peace Keeping to the Boston Marathon: A Dual Use Multilingual Interview System

0945 Break

1000 Paul Zimnik, MD, Director, Third Wave Technologies, US Army Medical Advanced Technology Management Office (MATMO)

1015 Mark VanderWerf, President, American Medical Development

Telemedicine Technology Overview: Now and the Future

1030 Roger L. Snow, MD, MPH , Assistant in Medicine, Massachusetts General Hospital/ MGH Telemedicine Center; MGH representative to Partner's Community Health Care, Inc.'s Telemedicine Advisory Committee

A Primary Care Provider's Perspective on Advanced Technology

1045 Maj. Audie Hittle, Chief, Technology Transfer Branch, Electronic Systems Center (ESC), Hanscom AFB

The Role of International Cooperative Research Development Agreements in Facilitating the Emergence of Telemedicine

1115 Discussion and Q&A (James H. Barron, moderator)

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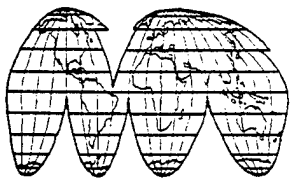

GLOBAL TELEMEDICINE AND FEDERAL TECHNOLOGIES SYMPOSIUM AND EXHIBITION

Williamsburg Lodge Colonial Williamsburg, Virginia USA
8-10 July, 1996

- ☑ Discover how federally developed National Productivity Review technologies, products and processes can enhance today's telemedicine capabilities, guide tomorrow's requirements and create the standards for the future.
- ☑ Experience first-hand state-of-the-art telemedicine exhibits.
- ☑ Call for papers.

The Pentagon has jumped far ahead of its civilian counterparts to test new technologies for improving health care. *Washington Technology*

According to experts in the defense sector, the image detection hardware of U.S. military programs is 10 years ahead of that used for medical imaging. This gap raises a provocative question: why do we as a country have the technology necessary to find enemy tanks in dense foliage from miles away, yet remain unable to discern the early warning signs of cancer and other diseases in our own bodies?
Ballistic Missile Defense Organization

"The Atlantic Rim region is poised to become the keystone regional testbed for global telemedicine, through the Atlantic Rim Network." *Global Telemedicine Report (March 1995)*

We are ready to use the fruits of tens of millions of R&D dollars to help develop pilot projects in the Atlantic Rim cities and regions around the world. Healthy cities can be more successful economic competitors. Cross pollination of ideas can help both the military and civilian sectors.
John Evans, Program Manager, Medical Defense Performance Review

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"This forum can help us benchmark best practices." James H. Barron, Chairman, Atlantic Rim Network

ATLANTIC RIM NETWORK

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BOSTON NAMED SITE OF FIRST TRANSATLANTIC TELEMEDICINE SUMMIT

(Paris, 24 June 1996) Boston has been named the site of the Atlantic Rim Network's first Transatlantic Telemedicine Summit, to be held at the World Trade Center 20-22 May 1997.

The announcement was made at a press briefing in Paris by Dr. Jean-Pierre Thierry, vice president of the French Telemedicine Association, Dr. Jay H. Sanders, President of the American Telemedicine Association (ATA), and James H. Barron of Boston, chairman of the Atlantic Rim Network.

"This will be a forum for the leading decision makers from private and public sectors, on both sides of the Atlantic, to address common concerns and help create a shared agenda for action," said Dr. Sanders, who, with Dr. Thierry, is co-chairman of the Summit. "We have the opportunity to make a major contribution to the advancement of high quality, cost-effective, accessible health care," said Dr. Sanders.

Telemedicine is the process and technology used to transfer medical information, including video and data, to remote sites to speed and improve diagnosis and treatment. It is expected to be a quantum leap for the broader distribution of medical expertise and access to health care.

- MORE -

"We look forward for fruitful transatlantic cooperation" said Dr. Thierry, speaking at the French Telemedicine (ATF) news conference, held in the offices of the French National Medical Order, called to announce ATF's endorsement of the Summit and the formation of ARN/Telemedicine Europe to help coordinate European participation in transatlantic activities.

Dr. Sanders added that the Summit builds on the achievements of the Atlantic Rim Network and will complement the work of regional organizations.

Along with the ATA and ATF, the Finnish Telemedicine Association has endorsed the Summit, and telemedicine leaders in other countries without formal telemedicine organizations have agreed to participate.

The Summit was initiated by the Atlantic Rim Network, a Boston-based international non-profit organization dedicated to generating transatlantic collaboration through practical programs and projects.

"A well-developed telemedicine industry can be an engine for economic growth, providing better access to high-quality health care, creating jobs and new opportunities for investment, but first a variety of barriers - regulatory, economic and social - must be overcome, " said James Barron.

(Statements attached)

- MORE -

...THE SIGNIFICANCE OF THE ATLANTIC RIM NETWORK'S FIRST

TRANSATLANTIC TELEMEDICINE SUMMIT

TO BE HELD IN BOSTON AT
THE WORLD TRADE CENTER
20-22 MAY 1997

This will be a forum for the leading decision makers from private and public sectors, on both sides of the Atlantic, to address common concerns and help create a shared agenda for action...
The Summit is designed to promote and facilitate transatlantic cooperation in telemedicine. It builds on the achievements of the Atlantic Rim Network...and will complement the work of regional organizations.
We have the opportunity to make a major contribution to the advancement of high quality, cost-effective, accessible health care.
Jay H. Sanders, M.D., President of the American Telemedicine Assocation and Co-Chairman, Transatlantic Telemedicine Summit

The Atlantic Rim Network's telemedicine initiative can help advance the goals of the Transatlantic Business Dialogue and the joint EU-US Action Plan, and play an important role in the creation of a Global Information Society. Most importantly, it can contribute to the creation of new employment opportunities and improved access to high quality health care.
Alan Donnelly, MEP, Chairman of the European Parliament's Delegation for Relations with the United States

This Atlantic Rim Telemedicine Summit presents a terrific opportunity to bring together key decision-makers in scientific, regulatory, legal and technology issues to impel the advancement of telemedicine. **Joseph C. Kvedar, M.D., Medical Director, Massachusetts General Hospital Telemedicine Center**

The Translantic Telemedicine Summit can make an important contribution to interoperable technologies and common standards. The military can learn from private sector uses and cost-saving techniques. The private sector can benefit from the military's more rapid deployment of telemedicine technology. **John Evans, Technical Director, Electronic Systems Center, MA; Manager, Medical Defense Performance Review**

- MORE -

I am especially excited about the opportunities for transatlantic deliberations to harmonize various emerging telemedicine practices, especially in the critical area of privacy and security, before differing government regulations, local standards, or insurance considerations make the practice of telemedcine more difficult than necessary.
Professor Lance J. Hoffman, Director, Institute for Computer and Telecommunications Systems Policy, George Washington University

Telemedicine is a rapidly emerging medical specialty using telecommunications technology to deliver health care to isolated or underserved areas...This summit will permit transatlantic collaborations to begin and proceed in a way that would not otherwise be possible. **Lee Baer, Ph.D., Director, Harvard Telepsychiatry Project**

We hope that the Transatlantic Telemedicine Summit will foster the development of appropriate technologies in all countries of the Atlantic Rim. **Dr. A.D. Brandling-Bennett, Deputy Director, Pan American Health Organization, a regional office of the World Health Organization.**

This will provide the leaders of telemedicine on both sides of the Atlantic the opportunity to formulate strategies for cooperation and integration in the usage of telematics to improve the quality and cost-effectiveness of health care on the Atlantic Rim. **Professor J.O. McGee, Director, Oxford University Telepathology Center**

A well-developed telemedicine industry can be an engine for economic growth, providing better access to high quality, affordable health care, creating jobs and new opportunities for investment. But first, a variety of barriers - regulatory, technological, economic and social - must be overcome. **James H. Barron, J.D., Chairman, Atlantic Rim Network**

This is an historic moment. For the first time, leading players have agreed to work together to identify benchmarks to build a common agenda. **Jean-Pierre Thierry, M.D., Vice President, Association Française de Télémédecine, Co-Chairman, Transatlantic Telemedicine Summit**

Telecommunications

Atlantic Rim Network Joins the Internet

NEWS FROM THE ATLANTIC RIM NETWORK is now available "on line", thanks to the resources of Bridgewater State College in Massachusetts. We've established a "list server" on the Internet, which permits e-mail dissemination of reports and other information. To subscribe to the Atlantic Rim list, send an electronic mail message to:

atlrim-l-request@bridgew.edu

In the body of the message, enter the listserv command:

subscribe atlrim-1<your name>

replacing <your name> with your first and last names. If you have any questions regarding the service, please contact the secretariat office or send e-mail to Karen Ann Metivier Carreiro at:

metivier@gwis2.circ.gwu.edu

Ms. Metivier Carreiro, co-chair of the telecommunications working group with Telecities leader Dave Carter in Manchester, UK, and others are investigating establishing World Wide Web sites for ARN bulletin boards for such working groups as trade, tourism and telecommunications.

"Being part of a network magnifies your impact and makes you more effective. The most useful and immediate value of the Atlantic Rim Network is to develop practical and innovative projects or pilot experiments—ad hoc groups getting together to work on specific topics, then sharing results with the larger group."

Drew Horgan, Secretary General, International Union of Local Authorities, The Hague

"The Atlantic Rim Network lives to the extent that the experiences from it result in the creation of economic value, intellectual capital, and a better quality of life for its cities, regions and peoples. I was encouraged by the beginning we made. On a practical level, I am putting the Congress to use (in health care and trade development projects) . . . "

Joel Freiser, Newark (NJ) Economic Development Corporation

Atlantic Rim Heralded as "Keystone" Telemedicine Test Bed

ARN asked to host November '95 program

TELEMEDICINE PROJECTS, USED ON THE BATTLEFIELDS to save lives in Bosnia and Somalia, are now being adapted to meet the needs of civilian care givers and their patients. Remote access services can help urban medical centers improve the delivery of health care to their local populations and those in distant areas.

Global Telemedicine Report (GTR), a Maryland newsletter which tracks the growing telemedicine industry, reports in its March 1995 issue that of all the regions of the world, "The Atlantic Rim region is poised to become the keystone regional testbed for global telemedicine, through the Atlantic Rim Network, established last November 11–13 in Boston."

An area traditionally rich in ideas for new technology, the Atlantic Rim "may well have a temporary lead," wrote Dr. Wilson F. Engel, III, Director of the International Research Institute in Newport News, Virginia, adding "The Atlantic Rim Network's most important telemedicine objective for 1995 is to develop a framework within which telemedicine issues can be aired, strategies developed, and benchmarks and standards established. . . . Then the ARN should facilitate telemedical testbed activities in the Atlantic Rim through which special capabilities can be planned, implemented, tested and, if successful, incrementally extended throughout the region."

GTR reported that the first steps had been taken by John Evans, Technical Director for the Electronic Systems Center at Hanscom, who chaired the telemedicine presentation at the Atlantic Rim Congress, with the support of the Medical Defense Performance Review, Dr. Jay Sanders, Director, Telemedicine Center, Medical College of Georgia, and members of the medical community in New England. Since the Congress, Evans has received management approval to make the personnel and equipment available for Atlantic Rim Network demonstration projects.

"We are ready to use the fruits of tens of millions of R&D dollars to help develop pilot projects in the Atlantic Rim cities and regions," Evans said. "Healthy communities can be more successful economic competitors."

The Atlantic Rim Network has been invited to participate in the telemedicine demonstration at the Fondation 2100 and International Association of Macroengineering Societies' "Ocean Cities" symposium November 20–23 in Monaco. Under the plans being developed, Atlantic Rim cities would observe the featured demonstration via teleconference then discuss among themselves how each is using or planning to use telemedicine to improve the quality of life of their citizens. Participants would discuss the creation of an applied Atlantic Rim "test bed" project, perhaps extending some part of the (Baden-Württemberg, Lombardia, Catalunya, and Northern England) TeleRegions project to the United States. The goal would be to demonstrate the potential of joint approaches to telemedicine issues and contribute to the development of standards and other enabling mechanisms. The project would be evaluated after one year as part of a telemedicine symposium and trade show demonstrating new products and services. For more information and to recommend local participants for the program, please contact the secretariat office.

Dr. Jay Sanders, Director
Telemedicine Center, Medical College of Georgia

Maine Sunday Telegram

A NEW ATLANTICISM

Atlantic Rim now taking shape

● Maine is among the regions that stand to benefit greatly.

There Margaret Thatcher was at the National Press Club in Washington the other day, talking about the Atlantic Rim. The former British prime minister, in a wide-ranging address, advocated a North Atlantic free trade area consisting of North America and the European Union.

This, she said, "would underpin NATO and reverse European protectionism."

I always knew there was something I liked about "the old girl," as she likes to call herself. If world leaders today had only half the vision she has for the role of democracies in rapidly changing times, the world would be a much better place.

Baroness Thatcher, as she is called these days, made her remarks at about the same time the first copies of the Atlantic Rim Network, the quarterly publication of the organization by the same name, arrived in the mail.

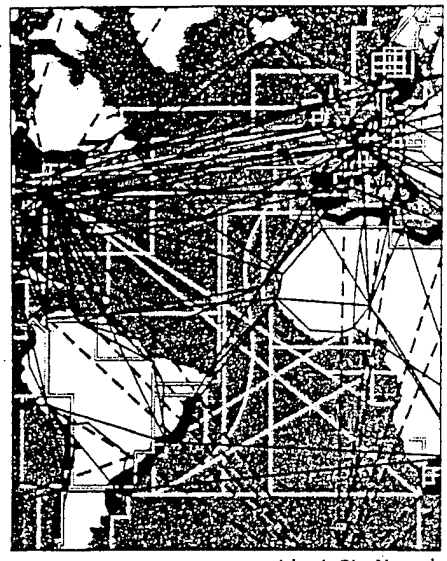
There was Jim Barron, the driving force behind the Atlantic Rim concept, saying: "Changing trans-Atlantic relations compel an examination of old ways of thinking and invite new frames of reference from which to view the world and our place in it."

There, elsewhere in the same issue, was Chad Gifford, president of the Bank of Boston, quoted as saying: "We share the vision of a new Atlanticism. We hope and expect other partners, public and private, on both sides of the Atlantic, will likewise embrace this important work."

Who said great minds don't think alike?

IT ALWAYS has amazed me that the much discussed Pacific Rim only began to move from concept to reality within the past six years, and a secretariat was established in Singapore just three years ago. The 18 member nations of the Asia-Pacific Economic Cooperation "forum" still haven't established an economic "community," as they intend to do in Osaka, Japan, in November.

Meanwhile, the more than 20 nations represented in the Atlantic Rim Network already have created the structure under which they can do business, operating from a secretariat in Boston.



Atlantic Rim Network

Atlantic Rim: Contacts already made.

George Neavoll

Editorial Page Editor

The map above can make you dizzy if you look at it for long, but it shows the contacts that already have been made among businesses and institutions under an "identifiable Atlantic Rim umbrella," as Barron puts it.

THE ATLANTIC RIM is different from the Pacific Rim in one very important respect. Whereas the latter will look to governments to make it succeed, operating in a decidedly "top down" way, the Atlantic Rim will operate from an urban and regional perspective in a "bottom up" manner.

This gets back to the belief expressed in the Declaration on the Atlantic Rim endorsed by more than 200 delegates to the First International Congress on the Atlantic Rim in Boston last November: that the "primary building blocks of the new global economy are dynamic metropolitan regions, anchored by cities."

As the map also shows, the metropolitan regions of the Atlantic Rim aren't just linked across the North Atlantic, or solely in an East-West axis. They extend all the way around the Atlantic, linking Africa and South America as well as Europe and North America, and all of those with one another, in a North-South as well as East-West axis.

Nor do these metropolitan regions have to be located directly "on" the Atlantic Rim; the guiding definition is that a participating entity be "Atlantic-oriented." Chile, for example, does business across the continents and across the seas, as do the nations of the Mediterranean and Central Europe.

THE ATLANTIC RIM Network can be a "framework for collaboration," as Barron says, joining companies and institutions engaged in new technologies, innovative business and manufacturing methods, or educational advances.

I watched a fascinating presentation on telemedicine, whereby urban medical centers can provide quality care to sometimes remote areas, at the Boston congress. The Atlantic Rim now is due to be the "keystone regional testbed" for global telemedicine.

John DeVillars, regional administrator of the Environmental Protection Agency, sees the Atlantic Rim Network as giving a "healthy boost" to New England's environmental technology industry.

In Portland, the University of Maine School of Law's "Vision 2000" statement sees possible future specialization in Atlantic Rim areas. Establishment of a resource center as a Center for the Atlantic Rim is one possibility.

The Atlantic Rim "umbrella" is big enough for many such approaches to trans-Atlantic cooperation and collaboration. Maine and Portland stand to benefit from that as much as any other region around the vast Atlantic Rim.

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— Editorials —

The Atlantic Rim Network

We often hear about the Pacific Rim, the Pacific Century and so forth. But what about the *Atlantic* Rim, with which we share far more interests and values than we do with Asia? Given that the Atlantic Rim's two economic superpowers — the United States and the European Union — are closer to each other than are many members of the Pacific Rim, people must wonder why this side of the International Dateline doesn't have something equivalent to, say, the Asia-Pacific Economic Cooperation Forum.

Now it does. It's called the Atlantic Rim Network, is based in Boston, and is run by James Barron, an international lawyer who is the network's managing director. There had been, until the formal founding of the network at a conference attended by about 500 people from some 20 nations in 1994, no other organization quite like this whose mission, Mr. Barron says, is to "generate trans-Atlantic cohesion and cooperation. . . ."

The Atlantic Rim Network is creating a framework for collaboration among business, academia, and all levels of government. It is running forums to encourage economic development, providing matchmaker services for new partnerships (such as interport agreements) among participating organizations, and developing relationships in many other ways, too. Priorities include tourism, trade, transportation and telecommunications. (Among the many areas of special interest to New England, notes John DeVillars, regional administrator of the U.S. Environmental Protection Agency, the Atlantic Rim Network can help boost the region's role as an environmental technology center.)

A major aim is to facilitate *nongovernmental* economic interaction among regions and cities in various nations. For instance, Rhode Island businesspeople could use the Atlantic Rim Network to set up trading relationships with metropolitan areas in Europe, such as Rotterdam, whose huge port could become a major bilateral partner of Quonset Point for transshipment of goods between the European Union and the United States.

There has already been much concrete work by the network. The organization has educated businesspeople on both sides of the Atlantic about a new computer network linking ports throughout Europe. The system allows shippers to locate available shipboard space at a moment's notice while also ensuring that ships sail as full as possible. The Massachusetts Port Authority is studying creating a U.S. version of the network. The network also helped organize an international conference on telemedicine this past fall — of particular interest in New England, where medicine is big business. And this year is chock full of activities.

It's surprising that the Atlantic Rim Network didn't get going before it did. Well, better late than never. We urge internationally minded businesspeople and others to contact the network to see how cooperation with other cities and regions in the Atlantic Rim can pay big dividends.

Contact: Atlantic Rim Network, World Trade Center Boston; Suite 301, Boston, MA 02210. Tel. (617) 423-7770 or (617) 437-7557; fax: (617) 969-6640 or (617) 439-5166.

TRANSATLANTIC TELEMEDICINE SUMMIT
BOSTON 20-22 MAY 1997

PROCEEDINGS
(UNEDITED VERSION AUGUST 1997)

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

OPENING CEREMONY
INTRODUCTORY REMARKS

MR. JAMES BARRON: Welcome to the first TransAtlantic Telemedicine Summit. I'm Jim Barron, the Chairman of the Atlantic Rim Network. We're proud to be the hosts for this historic event. This is the first time that such a diverse group of policy makers, healthcare practitioners and technology providers from both sides of the Atlantic have met together. In fact, listening to people talking around the pavillions one person said, "This is the top of the pyramid."

While ultimately telemedicine must be developed as part of a global healthcare system, much of the work to date has been nationally oriented. Opportunities to speed learning curves through the exchange of experiences internationally have frequently been missed. You are invited to participate because you were identified as leaders in the development of timely, high quality, affordable, accessible healthcare. We look to you for help in identifying critical needs and challenges faced and, most importantly, in making recommendations for action; each from your own areas of expertise. These recommendations will be combined into a transatlantic telemedicine agenda.

As some of you know, the summit had its roots in the first congress on the Atlantic Rim in 1994. It was there that the Atlantic Rim Network was formed. It was there in the session on healthcare organized by Judith Kurland and John Evans, the delegates learned of the challenges and opportunities of using telemedicine as an enabling technology to make high

quality healthcare more timely, affordable, and accessible. Another milestone was the Ocean City's conference in Monaco in 1995 where we were asked to organize a policy roundtable to compliment the conference's major technology demonstration. It was there that we brought together our two distinguished chairmen, Dr. Sanders and Dr. Thierry for the first time; and it was there we were asked to develop a transatlantic forum on telemedicine.

There are many to be recognized for their roles in developing this summit. We are grateful for our sponsors noted in your program, notably System Resources Corporation, Partners Healthcare, the World Trade Center Boston, and the telemedicine technology area director of the US Army Medical Research and Material Command. We are also grateful for the session chairmen and their participants who gave generously of their time and wisdom.

I'd like to invite them to stand up at the end of their names being announced. Not all are here at this moment, but Dr. Jo Hauser, Professor Niels Rossing, Lieutenant Colonel Ronald Poropatich, [Steven Chance], David Brandling-Bennett, Dr. Joseph Kvedar, Professor James McGee, Dr. Charles Safran, Dr. Dennis Wentz, Cynthia Trutanic, and Dr. Jack Woodall. Thank you all very much.

As we talked about the Atlantic Rim, would like to welcome a Pacific Rim delegation that we have here from Japan, to the Governor of Okinawa and other colleagues. You are welcome here because, as we said, ultimately telemedicine is part of a global healthcare structure, not Atlantic Rim or Pacific Rim, and these are all building blocks toward that goal. What I'd like to do now is to turn the session over first to Jay Sanders and then Dr.

Thierry.

DR. JAY SANDERS: Jim, thank you very much. It's a pleasure to help in the introduction and the opening of this conference. And what I was thinking just now about using the word "conference," I realize this really isn't a conference. This really is a gathering together of change agents.

When you look around the room, look to your right and left, look at the folks here, this is just not another conference. This is not simply trying to educate about information technologies and telecommunication. This is really a faculty gathering. It is a group of change agents. It is the end user. It is the champion that are gathered here.

We have all in our own countries acted locally. We now have an opportunity to think globally. It is very clear that our needs are very common. Whether we are talking about a natural disaster in terms of an earthquake in Kobe or Armenia or Iran or a devastating flood in North Dakota, or whether we are talking about the common everyday healthcare needs that exist in rural, isolated areas of all of our countries, or the functional isolation and the socioeconomic isolation that exist in all of our inner cities, our needs are the same. The things that we need to address in terms of access, in terms of consistent quality, in terms of cost, in terms of education, our common threads throughout all of our societies. We have a need, we have really an obligation to begin to look at this, not locally, but globally. The commonality of problems, the availability clearly of the technology to bridge geographic boundaries exist for all of us today.

We all deal with, on a day-to-day basis, barriers, human factor barriers which will probably end up being the hardest ones to deal with, the very real, practical, legal, and regulatory barriers. These barriers not only exist within our national construct but very critically in an international arena. And we need to begin to address those issues.

We are here to sort of insure that we are all on the same platform but, most importantly as Jim just mentioned, to really begin the process of taking the next steps, of taking some local initiatives and literally connecting them both functionally and electronically and philosophically to address the legal and regulatory and reimbursement and human factors issues that we all deal with on a day-to-day basis. I would anticipate that much of the positive things that will occur in this conference will probably not occur in talks similar to what I'm doing right now or some of the critical panel discussions, and I don't mean to take away from the importance of those, but as I have found in many of these types of sessions, it is the informal hallway discussions that lead to a lot of the subsequent interactions.

I have already had this morning two discussions about projects that I thought I was the only one working on. And found out that I am one of many working on these projects. And both with a little sort of anxiety in making that first realization and then the subsequent excitement about the partnering that could occur on an international basis, how we need with these types of conferences to get rid of the stove-piping affect that we see so much of and begin to connect those stove pipes into a multinational comprehensive initiative.

For me, that will probably end up being the most exciting part of this summit. So whether

it's in the formal discussions or whether it is in the informal discussions, I am very pleased that we are all gathered here today. It's going to be an exciting two days. I am particularly looking forward to what happens after these two days. Thank you very much. And I'd like to now introduce Dr. Jean-Pierre Thierry, who is Vice President of the French telemedicine Association, and also President of the Atlantic Rim Network in Europe.

DR. JEAN-PIERRE THIERRY: Thank you, ladies and gentlemen. It's very difficult to try to address an audience after Jay Sanders because it's very difficult to tell more, and also my role is much more modest than his role in the development of telemedicine not only in the US but also for its international view.

Listening to Jay and to Jim, there is one French term that came to my mind, well, this thing to Jim, I like the idea of the pyramid but pyramids some way it's something that goes with a top down approach. And maybe in telemedicine we want to avoid the top-down approach, even if policy-making is very important.

But also listening to Jay, we suddenly hear also early adopters. And early adopters are very important people because they bring the innovation to society. But also they don't like to respect to much the policies. And there is also a risk that we may know well in the healthcare system, for innovation to diffuse maybe sometimes too fast, and to avoid what is sometimes called side effects. So if you bring together the earlier adopters and the top of the pyramid, maybe we're just something very important which was coined several years ago at the Cannes Festival an avant-garde. I like the term "avant-garde" because it says also a

military resonance. It says what it says. So we're representing an avant-garde, and we have many duties to do. And I don't want to go again. I want to go through what Jay said about the issues we have to face.

Just let me first of all thank Jim Barron for his role. I was very lucky, sent on a contract by the French ministries to look at what has happened in telemedicine in the early '90s, and I found very good people over here. The first contact I had was with Jan Preston and then with Jay Sanders. And it happens that I've met also the Atlantic Rim and Jim and others like John Evans, and we have this committee. And we decided, Jim decided in fact, and convinced us to organize this summit. And Jim has to take all the credit, I think, for this organization. But it's up to us now to not to betray his faith and to do more. I would like personally to thank the European participants. It's not a lot of people, but again, it's the quality and representation. And I want to stress that fact of the approach we have in Europe about telemedicine. It's slightly different in a way that it's more structured -- not more structured, but it involves a European Commission approach of telemedicine, which is also part of a program called Telemedics. I don't want to be too proud, but Telemedics is also French for avant-garde. It's been coined in the '70s by an official report to the French government about what we were facing in the future, which was also called the info highways by President [Algo], I think.

So Telemedics is a contraction. You'll see for the American participants, you'll see these terms in the European Commission, and the European presentation over the three days. So Telemedics comes from telecommunications and info medics. And it's a contraction. And,

in fact, from a European point-of-view, Telemedicine is a part of Telemedics. Also, when you come into detail, and I know we may have the same [Inaudible] here, we don't know where the limits are. But I think with Telemedics we may be addressing through the representatives of European projects for electronic medical records up to the most interactive telemedicine.

And I'm very happy also, and I would like to thank Niels Rossing which is officially representing [Inaudible], Michel Richonnier, and Jean Claude Healy who would be better than me to explain where it comes from because he was running the medical part of Telemedics for many years before Jean Claude Healy that we will see in the video conference [Inaudible]. Again thank you for the European participants. We also have a real demo. There are many American demos here, not international demo, but there is one French demo that I would like to talk about it because it has been establish to really [Inaudible] the transatlantic dimension because we are going to have a telemedicine demonstration from abroad which is exactly between Cape Town and Boston.

It's a British boat with a British sponsor. It has French and European project technology on board. The race, which is called the British Telecom Challenge, anyway, is between Cape Town, which represents the rest of the world more important that ever, and Boston. So again, I'm very happy to be here, and I wanted to be shorter. I'm not sorry for that. So I give the floor again to Jay Sanders to introduce two other key cochairmen of this summit.

DR. SANDERS: I'd like to next introduce Dr. Joe Kvedar. Joe is the corporate director of

telemedicine at the Partners Healthcare System, which is made up predominantly, as many of you know, through Massachusetts General Hospital and the Brigham. And he is also a clinical session cochair. Joe.

DR. JOSEPH KVEDAR: Thank you Jay. I'll also be brief. It's somewhat scary to be in the room with so many early adopters I have to say, "Why have a scientific cochair?" I think is the question that I can address very briefly. Why not a technical cochair? Why are their so many aspect to this field? One looks at telemedicine I think one of the fascinations about it is the emergence of the technical engineering side of the world in the healthcare delivery side of the world.

The healthcare delivery side of the world is based on a core set of activities that are necessarily face-to-face. And we are bringing to it all of the opportunity that the rest of the business world has seen and already adopted to conduct business in an environment that is neither time nor place dependent. And in order to merge those two cultures, the end users of the technology in the end, the physicians and the patients, will need the comfort of data in order for them to be able to feel comfortable. At least in America I believe that this is actually something that makes sense for them because we have to compete with face-to-face the old way of doing it.

And the other point I would make in that regard is in an area where we have shrinking resources to devote to healthcare and how we deliver it, what we are proposing to add technological infrastructure which is notoriously resource intensive, it also behooves us to

look at our cost effectiveness and quality measures. So with those thoughts, I would encourage discussion around the topics during the meeting about those topics. I'm always fond of asking anyone who asks me, "Why do we need to bother with any research in telemedicine?" to go in front of your favorite department store and ask the first 100 people you see, what "telemedicine" is. And I think that gives all of the early adopters a little reality check about where we are with bringing the technology to the end users, and they will react more positively.

It's my feeling if we can bring it to them with some sound objective evidence that it's helpful to the final end user, which is the patient. Thanks.

DR. SANDERS: And finally it's my pleasure to introduce another transatlantic colleague and friend Dr. James McGee. Jim is chairman of the Department of Pathology at Oxford University. He also chairs the telepathology center there and is also a clinical cochair of this summit. Jim.

DR. JIM MCGEE: I think a lot of what I've planned on saying has already been said. But maybe I should just cover about four things I think from my perspective of the importance of this gathering today, and I refuse to call it a conference. The whole idea of -- or at least the thing that dominates my thinking is internationalization of healthcare. And there's only one way you can do that, and that's by the sort of technology that all of you in those rooms are familiar with. And why the Atlantic Rim because of historic reasons, the Atlantic Rim has

been very cooperative in the past.

But before we go on any further about the Atlantic Rim, I think you have to remember that the Atlantic Rim definitively, if you remember the map, includes not only North America but South America, and not only Europe but Africa. And in from the coast to there is a whole long way. There are several objectives I think which have been covered more than adequately in the program, but I just wanted to reiterate several points. The first point was that the people here have been invited here and were invited for a very specific reason: That they are leaders and policymakers in their own areas. That was object No. 1 to get the proper people together. Object No. 2 was to expose those people to what is going on on both sides of the Atlantic in terms of practical usage of the technologies that you're all familiar with in hopes that we are going to learn from each other and form a concrete plan of action, either formal or informal. By formal, I mean in this room; and informal, I mean in the hallways.

So we can go forward. And maybe one of the best end results of this whole meeting might be we come up with an agenda of a future meeting in a years' time where we have identified what our problems are and then confront them more promptly in one years' time. This gathering over the next two days was put together to get something larger that we could focus on in a year from now. Thank you.

DR. SANDERS: We are going to begin with the first keynote panel and coming to us by video conferencing, very appropriately, is the Honorable Reed Hunt, who is chairman of the FCC.

HON. REED HUNT: Greetings to all the participants in the transatlantic Telemedicine summit. I'm sorry I'm not with you in person, but I'm bringing you good news. We totally share your goal of increasing the development of telemedicine. In less than two weeks ago, on the 8th of May, an historic day for telemedicine, the commission issued rules and put into place the single most important policy for encouraging telemedicine in the history of not only the United States but of any other country. It was a universal service policy. And I want to talk to you today about what our universal policy specifically will do for healthcare providers and patients in the United States.

I'm immensely excited about this policy. I think that we have jump started a big revolution in telemedicine. I believe that we are going to see a change in the whole shape of the provisions of healthcare in the United States and on a global basis because of this policy. And you're going to make that happen. Let's go back to first principles.

The goal of universal services is to make sure that we have affordable telecommunications service for all Americans. That mean kids and teachers and patients and doctors and people in homes and people in businesses. Universal service funds are collected from a broad group of interstate telecommunications carriers in all areas of the country. In other words, we are taking from these very profitable companies a little bit of money, putting it in the pool and

then work -- redistributing it to connect everybody to the information highway. This is what Congress told us to do. And Congress told us to make sure that just, reasonable, and affordable rates would exist for all telecommunications services for rural areas and islands and for high-cost areas. And they told us to make sure that everyone was going to pay rates that are reasonably comparable to those in the urban areas where the price of communication tends to be cheaper.

Congress told us to connect all classrooms and all libraries at affordable rates. And to make sure that networks were built into classrooms and built into libraries. And Congress told us to make sure that rural healthcare providers would get prices again that are reasonably comparable to those in the urban areas where prices are cheaper. This is the first time ever in this country that we've had a universal service program specifically targeted the rural healthcare providers. Congress thought that rural healthcare should not suffer because of distance. It felt that it should not be the case that we went without communications facilities in the health clinics of rural America. Congress thought this because 60 million people live in rural areas.

And the rules that we passed directly link the 12 thousand nonprofited public healthcare providers who today service rural Americans. Two specialists who might be hours or days away. We should not have people who are worried about their health or has health problems be obligated to get in cars or get on planes in a great expense, with substantial time, drive hundreds of sometimes even thousands of miles to urban centers where they can find academic hospitals or other locations where specialists can give them advice.

If it's possible through video conference through all kinds of telecommunications services to do diagnoses, to give medical advice over the information highway, that will save money, that will save time, that will save lives. We would like to see charges go down and to see quality go up for rural healthcare. And that's what we're going to see because of the vote of the FCC. Congress knew that the cost of telecommunications services in rural areas was a barrier, and it has been a barrier to telemedicine in rural America. And that's what Congress told us to make sure the people do not pay more to go to a health clinic in Montana than they might be able to pay -- excuse me -- to use telecommunications for a health clinic in Montana than they'd have to pay if they were using telecommunications in the suburbs of Chicago or Washington where prices right now are very, very low.

The way we made this decision is we had a group of federal and state commissioners get together and they voted on our basic plan. Nonprofited public rural healthcare providers should be able to choose any level of transmission speed including G-1 lines, one and a half Meg bits per second. They said that the communication decisions should basically be made at the rural healthcare clinic level. They said that the rates ought to be comparable to those that are paid in urban areas particularly the distance charges which right now make up the bulk of difference between telecommunications costs in rural healthcare providers versus those in urban healthcare situations. Those per-mile charges ought to be covered through universal service funds for distance equivalent to the distance to the nearest city. They said that universal service funds will cover a limited amount of toll-free access to the Internet.

Right now some healthcare providers have to make long distance calls to get to Internet

providers. That doesn't make a lot of sense. The Internet is supposed to be very, very widely used. It's a terrific way to give medical advise to people and to communicate with data. So we had a specific recommendation that there ought to be much cheaper Internet access for rural healthcare clinics. More than 50 percent of the illnesses in the United States such as heart failure, and lung cancer, and AIDS can in fact be traced to behavior patterns. The Internet will bring the most up-to-date information on disease prevention and treatment to rural populations through clinics and health centers. That's the reason why we wanted to make sure that Internet access would be affordable everywhere.

Internet can be used to spread information about epidemics of rabies or lyme disease that frequently strike rural areas, another reason to make sure that Internet access is affordable. We targeted, pursuant to this recommendation from a group of state commissioners and FCC commissioners including myself, we targeted up to $400 million a year for universal service funding of telemedicine. That's $5 billion -- excuse me, that's $2 billion over 5 years. This is one of the biggest programs to support rural America ever passed at the federal level. Now, whether that $400 million a year really needs to be spent will dependent on the number of eligible rural healthcare providers who apply for this support, and will dependent on the types of services they choose. So we really want to spread the word.

Let's not let this opportunity go a wasting. If rural healthcare providers don't use it, they'll lose it. Other people would like this money, too. And we have to recognize that it's sometimes necessary to compete to take advantage of these sorts of programs. So I'd like everybody out there listening in this audience and everybody that you all talk to interested in

this area to visit our healthcare Website. Here comes the Web address: www.fcc.gov/healthnet. And if you will take a look at that, you will find all of the details about how to learn about this program, and you will see over time that we provide clear advice and guidance about how to apply it.

This program will be seen as a model for other countries. They will want to encourage the use of telemedicine to improve their healthcare. This will be another way that we show that in the United States we are always inventing ways to do it better, to do it smarter, and to do it fairer. This will be a way in which questions increase the quality of telemedicine available to any healthcare provider who has access to the Internet and other international information networks.

An example that many of you are already familiar with that tells us about the potential of international collaboration of telemedicine is work done at the Mass. General Hospital. A magnetic resonance imaging scan of a patient in Saudi Arabia suspected of having a brain tumor right now can be scanned into a digitizer, compressed, and sent via telephone lines to Massachusetts. Right now, a radiologist at MGH would view those images and consult with surgeons in Saudi Arabia. The expenses right now are very, very high. But we've already made it very clear that lives can be saved through this kind of bonding of expertise to patients around the world. We need competition and services between countries and between continents to drive those prices down. We need to make sure that monopolies among telephone carriers and global telecommunications networks do not drive these prices up. We need to make sure that our policies or competition on a worldwide level, make telemedicine,

tele-education that all kind of telecommunications cheaper and more ubiquitous everywhere in the world.

Those policies of competition are happening right here in the United States. We are trying to create a framework for national information infrastructure and a global information infrastructure that will foster economic development for all countries of the world. I think that as we show the world things like telemedicine, we will be making manifest, obvious, irresistible the appeal of a competition idea coupled with a sound universal service goal.

This is part of the deal we struck in the World Trade Organization with 69 different countries promising to adopt competition and universal service policies that I predict we will all find are strikingly similar to what we're doing here in the United States. So you can see there it's terrifically exciting to be able to think of ideas here, put them in practice, and watch them spread around the world. Among the most powerful contributions that we have to this international discourse is the opportunity to improve the level of healthcare around the world. We're delighted to participate. Your participation is crucial. And have a very happy and healthy day.

DR. SANDERS: I just want to underline something with respect to Chairman Hunt's comments, and that is how seminole the decision made by the FCC was in terms of addressing the problems of access to healthcare particularly in geographically isolated areas in this country. The one underpinning economic obstacle for rural healthcare providers has been not really the obtaining of the equipment but obtaining the string that connects the two

tin cans in the telemedicine system. And it has been the exorbitant rates that they have had to pay. Ten times the rate of two urban healthcare communities. And it was the decision made by the FCC to provide rates structures that were now distance insensitive that now facilitates the ability for rural healthcare providers in this country to have as easy an access to a subspecialty colleague as their urban primary care physician.

I just want to applaud the incredible work, enthusiasm and commitment that the FCC staff put in to educate the commissioners. I don't mean that in the negative way as you all know. It is the staff that does 99 percent of the work, and it's their educational process that helps the commissioners make the decisions. So while I also applaud the commissioners for their decision, I think the biggest hand of applause goes to the FCC staff in this.

Our next keynote panelist is a long time friend, Dr. Dena Pushkin. Dr. Pushkin is the acting director of the Office of Rural Health Policy and hopefully the full time director shortly of the Office of Rural Health Policy and the Department of Health and Human Services. She is also chair of the White House Office for the joint working group telemedicine committee which also had a seminole report that it has submitted to Congress in terms of the educational process.

On a personal note, I do want to mention that Dena and I have been at so many conferences together of late that her father is here today to make sure that this has only been a professional relationship. I'd like to invite the other panelist to come to the head table.

DR. DENA PUSHKIN: I can always talk. I've never been without a word. I do want to express my appreciation to Jay in particular for the many years of friendship and his excellent work here. And to Judy Kerwin whose place I'm taking actually. She has asked me to speak on behalf of the department in terms of the Department of Health and Human Services as well as the joint working group regarding telemedicine, and where we may be going. I think it's particularly important to sort of step back and sort of think about what maybe Martin Luther King might say about this experience here. Martin Luther King said we are caught in a inescapable network of mutuality, tied in a single garment of destiny. And I think in a word that says what we are. We are really together here in terms of a future that we may not know where it's going. But we know that if we don't go there together, we are certainly going to, at the very least, waste resources and certainly in the future may waste a potential for lives by not taking advantage of this technology.

So I think what we're here today and in the next couple of days is to learn from each other on how to make this a reality. Unfortunately, I can't be here. I have to go to Seattle to talk about the FCC and about the universal service provision of which I have the pleasure of serving on the health advisory committee on it, I think together with Jay, and talk about a number of other things in terms of trying to reach out to that world constituency as Reed Hunt has urged.

I think we have to recognize that indeed the world is shrinking, and that the telecommunications revolution has been largely responsible. It has been largely responsible for a revolution in telecommunications and now perhaps a revolution in healthcare. We

should strive for healthcare that knows no borders for quality healthcare. And that the only way to do that, I think, in the end is through collaboration. It doesn't mean that we won't see the competitive spirit alive and well. And I think we all have to recognize that a large part of some of our interest here are in commercialization of the industry and making it viable. And that means an element of cooperation as well as competition. For if we don't cooperate on the scientific end, I don't believe in the end we will effectively end up being able to compete.

Now that leads me to areas where I think we have opportunities for collaboration. In the area of evaluation, what works and what doesn't. I think it's very, very important at least my experience in rural healthcare, is we don't have enough experience in any one place or time to really understand fully what works and what doesn't. That's at a clinical end as well as in terms of a sociological. That human factors issue is very critical and not nearly enough to understand that. What is really the value added of this technology? And if we're going to sell it to people who have to make a decision between the issue of putting in a new piece of fancy equipment or essentially hiring a nurse practitioner, we better make sure that the equipment is worth the cost.

Now, in terms of technology development I think obviously there are tremendous areas we need to work together on. And in terms of standards development, there's no question that we're just in this country beginning to understand what, if any, kinds of standards we need to have in place. And that is very different than the European experience, which inevitably starts with standards. And this country has let a thousand flower bloom, and then we'll see

what happens. We can learn a great deal from the European experience on standard setting. But you may learn a great deal from us about from the thousand flowers out there.

I suspect much of the discussion today will be on the high end of technology. A lot of the European nations are far advanced in some of the applications. And I think that we need to stop and remember in some ways where some of the greatest potential to this lies. And in doing that, I'd like us to remember Dr. Benjamin. This is Regina Benjamin. She works in [La Batra Baiu] Alabama. She still does house calls. She works in one of the poorest areas of the United States. And I think you can see some evidence of that in the back. She works in areas that don't have indoor plumbing. They do not have clean water. She is in part, the public health department. She does immunizations. She is rural America in many ways. Not all of rural America but a lot of it. The part of it that most needs support. If you think she's unique, you find Regina Benjamins in South America and Africa and all over. We need to learn what helps Regina Benjamin, what makes sense for Regina Benjamin. And from learning what helps make sense for her, I think we'll learn how to reach into our urban isolated areas to reach isolated

homebound elderly people who cannot get out in New York City, in Paris. It is often said that the urban areas inform the rural. I would say in this case we're going to learn a lot from the experience in rural. And I would urge us to take that into consideration.

We heard the example of magnetic resonance imaging in Saudi Arabia. Do you think that's the real challenge of Africa? I don't think so. Emergency medical systems in public health. A lot is going to be, I hope, discussed about disaster medicine. And my experience, you

cannot have a good disaster medicine system without having in place a good emergency medical system. And in this country as well as many parts of the world, our emergency medicine systems are disasterous. They are a disaster. What can this technology do to help us put that in place? The key is how do we make this technology work for us.

It was mentioned earlier by Jay that I chair a group in Washington the Joint Working Group on telemedicine which is, in fact, the coordinating body for telemedicine policy in the federal government. And I see Mike Ackerman is here from it. And I don't know who else is here, Ron Poropatich and probably some others, Cindy Trutanic, a number of other people who sit on it. We are very, very much interested in what comes out of this meeting. We are particularly interested in the areas of evaluation, in the areas of what you determine are areas for international collaboration that makes sense. I've got to tell you that not a few -- just about a few weeks ago, a gentleman came in to see me from an unnamed country in Africa. And his idea was--how can we better control this influx of Americans coming in trying to sell technology into their country all different kinds of technology

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leading to an explosion of cost that were not well-planned, and in fact, perhaps would not do much good for most of the people? His idea was that we would have a node in his country and a node in this country. And anyone who wanted to consult in his country would have to go through both nodes. I tried to explain to him that there's a thousand flowers here, and in this country we'd never be able to find a single node. Would it be Massachusetts General? Would it be the Mayo Clinic? Where would it be? But his problem is real. It's a real

problem of how do we get effective collaboration? And I think it's a challenge that we need to discuss. I think we have a challenge in defining what kinds of evaluations we can do together. What kinds of standards do you believe make sense that would facilitate collaboration? Standard setting in the United States is one of the most difficult processes. Everyone wants his own standard. We, in fact, have a standard setting group at the joint working group, and we will be looking forward to hearing what you have to say. We're also very concerned about training and assessment. You know--how do you assess what technology works? Well, if it meets the standard who enforces that? How do you deal with assessment. And how do you train people appropriately so that they can make the best use of this tool?

In the end what we're looking for is help so that we get a favorable cost-benefit ratio that, in fact, the value is worth the cost. It's a very simple issue. It is one that I think remains to be proven. Certainly in this country there are a lot of skeptics. What we're starting here today, I believe, and what you started in your previous meetings is essentially laying the groundwork for the future that we can all build on. And since my father is here today, I would like to sort of convey to you a tale that I think conveys where we are.

There was a young man walking by, and he saw an old man planting a orchard. And these were little, little trees. And he stopped and he said to the old man, "Why are you planting these little trees? You'll never live long enough to see them bear fruit." And the old man said, "My father planted trees so that I would see the fruit. My father's father planted them for him. And my father's father's father for him. And so today I plant for you and all who

come after so that we too may bear the fruits of our activities and our future." And so I say to you, let us plant the seed to that we hopefully and those after us can see the fruit that is born. Thank you.

DR. THIERRY: What I appreciate most among other things is the implicit relation you've made between universal service and the equality of access. And it's right if you look at the rich country organization. It looks like if the countries that are spending most on healthcare have more inequality in their organization. In other terms we don't have to exploit that. And besides nobody is going to pay for that. You've put it exactly. And I just want you to remind you that if on the worldwide basis something like $3,600 million is spent, a thousand billion in the US, 600 billion in Europe and the rest is for the rich countries including Japan.

So we are all today dealing with an incredible inequality in the distribution of care on a worldwide basis. This is my conviction that we have to promote the building of the healthcare system for the rest of the world, especially the poor countries in advance with the introduction of good healthcare telemedics and technology. And I really do appreciate your -- this was more than a comment. It was embryonic worldwide policy. It is my pleasure to present Niels Rossing. In fact I was very pleased that Niels Rossing reminded us that I started something that changed my life. It is under the direction of Niels Rossing at the European Commission for Healthcare Telemedics that I was called as an evaluator and an expert of a project, the project that I presented to the commission and also evaluated. It changed my life because you have to imagine what it is to be in several rooms for four days

with Italian, French, Dutch, German even waiters. And the richness of it and also the complexity of it. It could change the life of somebody. And the way to look really -- [Inaudible] what is more than cross-pollinization, which is an integration process that Niels surely will address; and that will explain what we have to foster international cooperation. Because it changed your view of things. And it goes back to the universal service in a way when you have to go together and to look at real projects and to evaluate them with different, really different perspective. Because, of course, we have different perspectives even if the Europe of today is going to change. It's going to integrate.

I really wanted to mention that Niels was one of these people that made it happen, at least for telemedics; that group of people from different countries in Europe could work together and got an agreement on R&D and on projects that are so important for the citizens.

DR. NIELS ROSSING: Thank you very much, Jean-Pierre. I wonder if it would be possible to have some slides shown. Thank you very much for the introduction. Thank you very much for inviting me here. I guess although I do have some known friends and colleagues around, most of you wondered who am I coming from Copenhagen, to here and although Jean-Pierre has told the story, the reason is today I could wear a couple of caps. I shall try not to make them conflict. You'll have to excuse my language here, some Danish slips into it.

Anyway, I stayed with the commission from '88 to '94. I was the one who wae priviledged by implementing a research and development program as it was. Also with small funds to

get Europeans to work together. And I do believe that the one success criteria that was fulfilled was that of bringing people together and creating a platform of people knowing each other. I'm trying to replace today the Director of DG XIII the telemedics program, Michel Richonnier, and unfortunately he couldn't be with you, nor could my successor in running the specific healthcare program, Jean Claude Healy. Both of them sent their greetings and hope for a very successful meeting. And hopefully they'll be on the screen by tomorrow. I think I'm unable to go into all the details that they can because I'm a little bit rusty now, but I like to be in telemedicine. And now back in Denmark, I can tell you that we do a little bit of telemedicine serving Greenland, serving the Pharaoh Islands; but that's the other cap.

Now back to the key issues and the challenges for the future. What we are here to discuss and to further foster is really service to citizens and tools for professionals. Could I have the next one, please?

If we coined the term "telemedicine," I know it's medicine at a distance. But then Napoleon and his troops had telemedicine. And I think that the term was coined actually once we had the modern telecommunications because Napoleon had telegraph troops telling him where there were pests and cholera all over the place. Could I have the next one, please?

I'd like to be provocative especially to the Europeans who will say that everything is difficult, and it's very hard to implement. And whenever they see these Americans, as we just heard, plunge into the water in a special way or just doing things that cowboy fashion, then we got to tell our European friends that we do have the technologies. They are there.

And you shouldn't just dive into too much academic thinking. What is needed is actually integration. And Dena Pushkin said we shouldn't go for standards, but at least we should be able to speak together. Add the two ends of the line.

Therefore, there needs some standards and some protocols for communication, of course. But the integration of technology is what's needed. So technology is one thing. System and services is a different matter because -- I mean having the infrastructure, having the hardware, even the software, gives us nothing if we don't have the medical services on the line. There must be a content. And I think that is our real challenge. That is to make it work. And to give your colleagues [Inaudible]. We need information systems for the citizens. We need a service that provides a seamless care to patients, whatever institution or whatever unit they are in. We need the administrative system, and we need support from national and international authorities. We need to enable the medical professions, and we need links to adjacent sectors such the as social sector. So these must be available to those who authorize to use them, wherever they are. Next one, please.

There are lots of barriers. Healthcare delivery systems are different. And I was one -- once I was thinking, then the US, this vast country, the healthcare delivery system was the same all over. But know you're not licensed in more than one state or whatever you have, and you may have just as many difficulties as the Europeans do. But I do believe that the Europeans love difficulties and get drowned in these difficulties. But definitely we have various and different delivery systems for healthcare although we are more -- I mean the Americans would call a Dain socialistic or whatever, and so he is. But he has socialized

medicine. But on the other hand, we are all moving in this direction of separating provision from purchase, and that will move also in Europe.

Another barrier was touched upon by Jay Sanders. There is no will in the profession to change. I mean you are more safe if you do just as you did yesterday. Then, of course, there are a number of financial aspects, be it how you are reimbursed or how to get a program running. And coming from the European Commission, as I am today, I am a little bit embarrassed by the very good news by Chairman Hunt in so far as definitely the European program in this domain, the development program there is not funded the way we just heard. By no means, I do believe that there are other ways of doing it in Europe, but we will be looking to America very much because of this program we just heard about. Many areas, there is an insufficient infrastructure. We heard about that earlier. That goes for Europe, that goes for all the world. And there are, of course, those regulatory issues that will all come up and will be one of the key barriers to be overcome. Could I have the next one, please? Maybe we could skip that one because I mean everybody knows that the e-mails, that they are the Internet services, and there is the webfication, interactive video, and high communicational, high speed communications.

So let's move to some of the key issues which is the topic of this panel. So I mentioned some barriers before. I think that from what we just heard, and from what your president in the Telemedicine Association told you, from what Chairman Hunt told you, and Dean Pushkin told you, I think that you are on your way to break quite a number of barriers. Dena Pushkin was bold enough to mention the market aspect. I think that in order to

survive, we've got to stay self-sustained. And we've got to create a coherent market. People already mentioned latin America. People have mentioned the rest of the world. And to Europeans, not on Africa, but definitely central and eastern Europe, are key domains. But we should have the industry and service providers support us. We should dissimenate results. We should teach, educate, and see that technologies are deployed. And I'm sorry, Dena, standardization is on my list there.

Working hand-in-hand with local programs is a special European thing. If you are working in the European commission, you must make sure that several countries work together on the various projects. That's the whole idea. Or if just one country can do it, then they shouldn't be [Inaudible] from Brussels. So, therefore, it's often very hard to collaborate with European money. We're just one local or one national program. But in order to have a testbed, you really must use local programs because local programs are often supplied with much more money than coming from the commission. Next one, please.

That's what I'm saying. We must create synergy. In Europe we have something called digital sites. Those are places where the commission will sponsor some infrastructure work in the domain of telecommunications. And again, if these [Inaudible] decide to be supported, not only will research and development money but also with what is called the [Inaudible] funds or structure funds or regional funds given out from Brussels. Then suddenly we may be able not to compete with Chairman Hunts lump sum, but as least with some money. Then again, we must create synergy in creating markets. Next one, please.

Open new markets. Support those who have a strategy. There are plenty of Europeans. I only speak of Europe. There are plenty of Europeans who claim they have a strategy but are not able to fulfill it. And I think that one should spot those and eradicate those from these programs rather soon. Next one, please.

And, of course, that is better done if you act on a international basis and not only on a European basis. What's all this about? It's citizens and professionals to have a one distributed but virtually seamless now. There are some misprints; here's one. Healthcare perceived by the citizens as being without warrants with respect to health institutions and the level hospices, primary care, home care, individual patients, professions, and adjacent sectors. Next one, please.

So you can run telemedicine within your institution, between institutions, from institutions such as hospices, to primary care, to home care, storage and forward systems and video phones across regional and state borders. That's a very, very difficult subject in Europe. I tell you. Northern regional borders are much more important than national borders because you have your local kings really keeping the regional borders up. You can establish mobile units and work with ships, planes and the military, as we've seen. Next one, please. Well, I put one slide up because this is seen from the Preston development is seen really from the side of a patient and by a patient. I mean a patient. I mean one who is really concerned about he himself or his family being sick. Secondly, suddenly they do some surfing on the Internet in quite a different way than they do if they just surf. They really seek information about "cure for me and my family." And they need proper information from consumer

organizations. They'll find clinics in cyberspace, but they will also find misleading and polluting information. The future problem for the medical profession will be that the concerned patient will faster know more than his doctor. Next one.

Because he'll look it up in the e-mail. And the doctor will be fired. Purpose and consequences. Equal access to relevant expertise not to the highest expertise, to the relevant expertise. Again, seamless patient service. Two misprints, seamless and patient service. Across different treatment units. Increase or [Inaudible] competency. I don't believe very much that telemedicine will lower costs. But it will increase the peripheral competency. You'll have an altered economy. You need business reengineering and change of working procedures. That's the worst and the most difficult part for all of you. Having the lines open and seeing an empty office where only a technician is fooling around saying, "The doctor left me," doesn't give much support to somebody in need.

So to conclude. The necessary technologies are there. The communication ability is there to create coherence. So do not delay deployment. Create the environment. EU and national programs must work together. EU and the Transatlantic Rim must work together. We must act globally. Next one. And the last one. Got to break the barriers. We got to involve the users. The rolling costs must come down. We heard that already. We must teach, train and educate. We must standardize for modularity, scaleability, interoperability, portability, and for communication. Thank you very much.

MR. BARRON: Next, we have Colin Latham. I had the opportunity to first meet him on a

bus when the Blue Notes came to Boston promoting Halifax exports. Fortunately, one of the best exports that Nova Scotia and the region has is the delegation from Canada that's here with us these couple of days.

MR. COLIN LATHAM: Good morning, everybody. It's a pleasure to be here. For those of you who don't know of Nova Scotia and where Nova Scotia is, first, we do have foreign languages in Nova Scotia. We speak Gaelic and [Inaudible], which means a hundred thousand welcomes from Nova Scotia. Nova Scotia has a great connection with Boston. And it also has a great connection with this conference. Telemedicine is made up really of two pieces of words here. "Tele" from the original root of telephany which was invented of course by Alexander Graham Bell, who supposedly invented the telephone here in the Boston. I say supposedly, there's still a running dispute between Bradford, Ontario, and Boston, as to where precisely he invented the telephone. But the real tangential issue is that Sir Alexander Graham Bell used to summer in Nova Scotia, and there still is a great homestead that's owned by the Bells and the Grovenors in Nova Scotia. In [Inaudible] Nova Scotia. If any of you want to come and see it, please do. And you'll find the root of all telemedicine right there.

I thought I would just start off by just describing Nova Scotia. Nova Scotia has a land mass of about two-thirds the size of the UK and has a population of about 909 thousand. So you can see that we are somewhat sparsely populated. Nevertheless, we have been doing a number of things in the telemedicine area. And I thought I'd briefly describe what we're doing there, and in such a way be able to highlight the issues, and where the future is going.

Last year we did put a pilot which involved about four remote clinics, one regional hospital, and a national hospital in Halifax. We did a variety of different demonstrations of teleradiology, teledermatology, telecardiology, and also continuing medical education for the physicians. That pilot has proven very successful and am pleased to announce that Nova Scotia will, in fact, be the first province in Canada that will now role-out telemedicine throughout the entire length and breath of Nova Scotia, and to 21 major locations. In doing the trial, the evaluations that were made by both the physicians, by the specialists, and also by the patients, and, of course, the resounding endorsement coming from the patients. The patients are the ones that really clearly get the benefit. And this is wherein lies the first conundrum.

The patients very definitely get the benefit. But how do we prove this in a business case sense for physicians and for specialist and for departments of health and governments who fund these kind of programs. So that's one of the issues that really came to the floor. But clearly, we did a lot of work with the government, and we've actually started as a private sector to actually help them construct business cases where we can prove, through a variety of different savings through the healthcare system, of using telemedicine applications in the rural communities.

One of the major networks that we have put in places is what we call the "Kids Telehealth Network." Halifax again is a center for a childrens teriary care unit. It services not only

Nova Scotia but three of the others adjacent provinces with specialized cases for children. We put in place the Kids Telehealth Network. This really has to be seen to be believed. The issue is one of ensuring that children do not get traumatized in any kinds of situation by transportation. And the opportunity, through people like Dr. John [Finley] and others at the IWK Hospital in Halifax, have proven time and again that we really do not need to transport children in order to give them the kind of care that they would need, but can, in fact, deliver that diagnosis and that care in their home environment. I think that's another major issue that we deal with.

The continuing medical education area is probably the area that has actually created the greatest opportunity from a business case perspective. And this comes from a variety of points of view. Firstly, for the rural physician who is required in Canada and Nova Scotia to get so many hours per month of continuing education, the big issue for them may be a six-hour drive to a major center where they can pick up a particular education course and a six-hour drive back. And it would be anything from two to three days out of his practice. He has nobody to back him up in that rural practice. He is, of course, on a fee-for-service basis. So he's losing significant amounts of revenue in travel time and so on. That becomes a major issue for that rural physician. Second issue is that when he's looking and trying to adopt new procedures and new approaches to medicine, he feel somewhat isolated and vulnerable and he's looking for that support. As a result, many of the physicians decide not to be attracted to rural locations. So attracting and retaining physicians in these rural communities is a very difficult problem, which then creates more problems in itself on how do you actually provide that kind of service?

[End of First Tape]

...technology that delivers teleradiology, that delivers telecardiology or teledermatology. And that has really been a tremendous opportunity for them. But even more than that, we've actually been able to do a lot of team building for the small little medical units that are in those rural areas. If it's not practical for the doctor to come to town, it certainly is not practical for the nurses and the social workers and so on to come to town either. Again, using distance education, all can participate, and all can work together and build that team and have a common goal as they go forward with new procedures and new ideas. So clearly we've demonstrated that this is a tremendous opportunity for not only continuing medical education but also for the actual telemedicine procedures. And there are many opportunities of by-products of using telemedicine.

Dr. Hillis who is in [Geisboro], which is a very small tiny isolated community in Nova Scotia, was very, very leery of the teledermatology applications, one that you perhaps don't hear a lot about. Again, many of his patients would have to travel two and three hours to get specialist treatment and then travel two and three hours back. In the meantime, he stays on home base, doesn't really know a whole lot what the specialist is doing except from what he gets in a written report. But by having that consultation done right in his office with the consulting physician in Halifax, he can actually learn and increase his own learnings and significantly improve the care that he provides between consultations by virtue of being very knowledgeable about what is happening. It only takes 10 or 15 minutes out of his day. So those are some of the by-products.

In terms of some of the new areas that we're moving into, we are beta testing now, some telesurveillance kind of technologies which allows us to monitor ventilators, to monitor blood pressures, and so on for many people who are getting home care capability. And then we can then make determinations as to whether a nurse or a doctor or a home care specialist can be dispatched in the event of an issue. And this is becoming a major issue for Canada because Canada had the highest baby boom population growth in the western world, which is not a well-known factor. Most of this huge bulge in our population is becoming of the gray-haired variety. And these people are gradually becoming greater consumers of healthcare services and will be a major issue for Canada to be able to try and support that huge bulge in the population. And home care is our only opportunity to be able to deal with this in any kind of cost effective way. We have to keep people out of the institutions, for paying high cost of being in beds in institutions, in fact, getting better care by virtue of the fact that they are in a home environment and being around their loved ones. But they do need that strong technical support. I believe that that's one of the big challenges. That we are on a go-forward basis is how we get into the whole home care telesurveillance area. In terms of what we have overcome so far, we've overcome pretty well. The liability issue.

We've been working with CMPA and have approved that a procedure or a consultation done on a telemedicine basis has no greater liability than in the office. So the liability issue is off the table. We have the doctor's fees issue to deal with. Talking in very practical terms because in our experience, these issues are actually the harder ones to overcome, not the technology issues. But the doctor's fee, the one pair of issues that we have in Canada, we've had to overcome that so that when there's a physician, a rural physician on one end

and a specialist on the other, who gets paid. We believe that we have solved that problem again with the government's help. Lastly, I guess the issue of patient's acceptance is a major issue. On the one hand, those rural patients do, in fact, want access to the best care possible. But they recognize the practicality of not having cardiologists located in [Geisboro]. They do have to be able to be tied in. They really do believe that this gives them the best of both worlds. It gives them the opportunity to live in a very rural environment, but giving them very ready and capable access. We still have to win the hearts and minds of everyone involved in telemedicine. We still have the trust and faith issues that have to be dealt with. We have to ensure that we continually provide quality telemedicine. We have to ensure reliability of that telemedicine. It cannot be in any way, shape, or form, feel that it's not going to be there in an emergency situation, and it be endorsed and adopted. You have to provide the ongoing technical support to ensure that there is a continual learning exercise; that is continual growth in the use and the development of telemedicine. So those issues are the ones that we are dealing with along with developing business cases that make it economically viable. Chairman Reed Hunt talked about the universal access, the affordable rates program that the FCC has been charged with by Congress. It's no really different in Canada. We have a commission CRTC in Canada, Canadian Radio and Television and Telecommunications Commission that has done essentially the same thing. They have legislated lower rates for communication costs for rural and education applications. They have just instituted a subsidy program on the order of about a billion dollars that will, in fact, keep the cost of telecommunications access and access to the information highway at an affordable rate for all Canadians. So where do we go in the future in Canada? We will be the first to have a province wide deployment of telemedicine, and the three other provinces

will, in fact, be added to that list very shortly. That's out of a total of ten provinces, for those of you who don't know how many provinces there are in Canada, and two remote territories, which are the real challenge in terms of geography, much like Greenland and the Pharaoh Islands. The northwest territories in the Yukon are extremely remote and really do need very specialized telemedicine applications. I think we need more applications of telemedicine.

We need teleoncology and tele whatever as we go forward. I think that we are going to put these investment in. We need more applications and more uses. That is really what we have to move along fairly quickly. From our perspective, the next big challenge is wireless type services. We have, in fact, on July the 6th, we will be finally equiping every home in Nova Scotia with access to E911, which for the Europeans is the enhanced emergency telephone number, three digit emergency telephone number that gives you access to fire, police, or ambulance but in an enhanced way. It gives you an address as well as the calling telephone. We are coupling that with what we call a "trunk mobile" or a complete wireless addressable wireless system that will tie in these varying emergency services, ambulance, police, and fire. So that in the case of an emergency on the highway, you can transport information via wireless networks whether it be vital signs or electrocardiograms or whatever it may be for the patient. In some cases, where it may be a six-hour drive to a major hospital, there would be constant monitoring throughout that whole network that will be available. So that is the next major deployment that we are making within Nova Scotia. The future, I think Niels talked about medical records and the need to get access to those. There are many issues of privacy and security that go around. The European Union is probably far ahead of North

America in those issues. We have to establish those standards. That is quite foreign to us in North America, and it's going to be a major issue as we go forward.

In summary, I think what we have is the push of technology which is going to ever increasingly increase in it's capabilities. We have the decline in the communications costs which are going to continue to plummet as we move forward. Then we have the pull which comes from the health side, which is really the whole rising escalation cost of healthcare services particularly in rural environments. The need to provide equal access for all citizens in the nation.

Lastly, the poll from the aging population in terms of dealing with all of the home healthcare issues, as we move forward, particularly those nation that are the blessed or cursed with a baby boom. So that, in summary, is my perspective on telemedicine. I'd like to thank all my partners back home, provincial government, [Del Hausy] Medical School, the technology and all of the hospitals and clinic throughout Nova Scotia who have really worked in a very colleageal way. I think, as Dena said, this issue of cooperation is a very important one as we go forward because that is the only way we're going to get our minds and our arms around this issue as we go forward. Thank you.

DR. SANDERS: Colin, thank you very much. It's very interesting to see what is happening in Nova Scotia. I also want to remind everyone on the panel, as well as everyone, all the faculty surrounding the panel, that we will leave time for interactivity. This will not simply be a series of soliloquys. Our next panelist is Dr. David Brandling-Bennett. David is the

Deputy Director of the Panamerican Health Organization of the World Health Organization. David and I have spoken together many times on the phone, but actually this is the first time that we've met. David.

DR. DAVID BRANDLING-BENNETT: Thank you, Jay. I think I heard the hidden message and that is to be brief. I hope I will be. I bring you greetings from our Director George [Aleen]. I'd like to spend just one minute telling you what the Panamerican Health Organization is. We are the oldest operating international health organization. We grew out of a series of international sanitary conferences held in the second half of the 19th century, which were intended to address the issue of the relationship of health and international trade. A subject that is very much with us more than a century later. In 1949, we became the regional office for the Americas of the World Health Organization. Shortly after that, formally the specialized health organization of the Organization of American states. So we wear two hats. We are part of the United Nations system, as well as part of the interAmerican system. We have 38 member governments. All of the states and territories of the western hemisphere are members. Our strength is that we have 29 country and field offices with staff, and specialized centers scattered throughout the region. We are a technical cooperation agency and not a funding agency.

Just to highlight some of the important changes which are taking place in our region, and certainly are not unique to our region urbanization, approximately 75 percent of our population is urban, and that of course facilitates communications. The type of communications, we are interested in. Life expectancy has increased throughout the century in our region, and now averages over 65 years, with populations in many countries having a

life expectancy over 70 years. This is largely a result of control of childhood diseases. With the resulting appearance and importance of noncommunicable diseases and chronic diseases, of the two, which telemedicine applications are probably more relevant. Many of our countries, if not all of them, are really undergoing efforts at reform of the healthcare and health systems. These, in some cases, are involved efforts to contain cost and look for refinancing. They are also driven by other forces such as the need to involve the private sector and nongovernmental organizations as the governmental sector shrinks. We hope to ultimately improve access to and the quality of care. Now, this is all in the context of globalization and regionalization which you're all aware of in terms of trade, tourism, and most other things that are going on in our world. You know of NAFTA, of course. There are other subregional trade initiatives which are in various stages of development and activity. [Inaudible] of the southern country and the region is very active, and others involving the Indian countries, the central American countries are in process. We are looking at the free-trade area of Americas resulting from the present US administration's interest and considerable interest in the region. We have a target for the year 2005, which probably will not be met. Certainly there is increasing momentum toward this. I was pleased and priviledged to hear US ambassador Bill Richardson speak last night. He pointed out to his audience that latin America would become the largest importer of United States products early in the next century. And, undoubtedly, though health is a small part of these products at this time, health and healthcare will become increasingly important. The Panamerican Health Organization has been working in the area of telecommunications and health for many years because one of our basic activities is the dissemination of scientific and technical information. Our work has become more intensive in the last two years especially

as we have become partners with Carribean Latin American action, the [Inaudible] foundation, and many corporations, or several corporations, involved in telecommunications in [infermatics]. I use the term "telecommunications" and health quite broadly. telemedicine is a part of that. I use it because it represents both an enormous opportunity and an enormous challenge. My remarks will be taken and should be taken as cautionary, hopefully not as pessimistic.

The fundamental purpose of the Panamerican Health Organization is to promote equity in health status and access to quality health services including preventive health services and health information throughout the region. Telemedicine offers to provide us with tools to achieve equity and greater access to health services and improved health. It does not promise to do so. I think we need to be well aware of this.

When I discussed with Jim Barron what I should say to you this afternoon, he asked that I emphasize the limited possibilities for telemedicine faced by many countries in the developing world. And I'm sure that Dr. Mullaney will emphasize that also after me. I should point out to you, most of you I hope are aware of it, for example, telephones, while they are present perhaps in most main hospitals in countries, are certainly not present in all hospitals, and probably are absent in most health [Inaudible]. We're talking about a basic telecommunication tool. Computers are just beginning to appear. They are novelty items. Few have access to them. In fact, [Inaudible] access may be limited because they are novelty items. Internet connections are uncommon. In our region, fortunately they are increasing. We have been fortunate in promoting the ministry of health though we want the

ministries to gain their own access. But access to the Internet on the part of hospitals is still very limited. University hospitals, of course, have more access, but generally as university teaching facilities than for purposes of healthcare. Video and conferencing facilities are relatively rare. That is why we are pursuing our relation with the telecommunications industry because connectivity is tremendously important for the application of technology. I think our great concern is that the applications that are selected should not be technology driven or at least not primarily technology driven because these applications can be clearly very costly. It's not clear that they will improve quality or access to care. Indeed they can distribute to inequity. That is my cautionary note. I don't mean to be pessimistic, but I think we do need to be cautionary. As Dr. Pushkin pointed out, telemedicine projects are not necessarily cost effective. We should not assume that they will be, even if they are well designed. Indeed, many projects, unfortunately do not appear to be cost effective. Perhaps more importantly, it is not evident to me that there is an agreement on how to measure the impact, effectiveness, and value of telemedicine projects in general. But such an evaluation is essential if we are to decide first of all whether telemedicine can improve health and access to care, and if so, exactly what types of projects will best do so. I'm talking not just about evaluation of individual projects but evaluation of projects as a group, something which is terribly difficult because we have a limited number of projects, most of which vary considerably one from another, which makes evaluation as a group tremendously difficult.

Investments in information technology will provide minimum benefit if they simply overlay or automate existing processes. Therefore, we have to look at ways in which we can change present systems in order to obtain maximum benefit from the new technologies. This

requires that we look at new technologies at the same time we are considering and ungoing reform processes. This makes the challenge even greater. If you like, we have to be able to look at reform and new technologies together when we really don't know what's happening with either one alone. So we have to look into a crystal ball which is foggy and which is cracked.

So in conclusion, I would just like to say that telemedicine does offer opportunities, but in the course of doing so, enormous challenges occur. Connectivity will be critical and partnerships with the telecommunications industry, which will be the driving force and probably will not be financed by telemedicine itself, partnerships with the telecommunications industry, will be critical. We have to find appropriate technologies. That's very easy to say. It's a cliche, but it unfortunately is very true. And that technology has to be defined by what we want to accomplish, not by what appears to be attractive. That definition is going to come about by honest evaluation. Unfortunately, we do not have the evaluation tools at hand. We must find them; we must develop them. The effect that this will depend upon the application of new approaches in a constantly changing environment and even greater challenges. Hopefully we can meet that challenge. We certainly have to make the effort to move forward, but we can not assume that what is attractive and is out there will necessarily do the job that we want to accomplish. I wish you luck during the next two days, and I look forward to your deliberations. Thank you very much.

DR. SANDERS: David, a very sobering analysis of the realities that exist. Our next speaker, unfortunately Dr. Bernard Lown, who was to be our next speaker, who I had hoped

to see for the first time in 30 years; he was an instructor of mine when I was in medical school, unfortunately, is ill. Fortunately, Dr. John Mullaney, who is the Executive Director of SatelLife will provide the discussion.

MR. JOHN MULLANEY: Thank you very much. I was very thrilled to be here just for the thought that maybe for five minutes people would have thought that I had actually won of Nobel Peace Prize. I haven't. Dr. Brandling-Bennett has stolen most of the content of my prepared speech, so I'm going to speak very briefly and really echoing what Dr. Lown had asked me to convey to you today. He's got asthma and rather than burden you with a rather wheezy presentation, he asked me to present you with some words, which may be other things but certainly not wheezy.

I'm the Executive Director of SatelLife, an organization started by Dr. Lown about 10 years ago. It was started really after he had won the Nobel Peace Prize, and at the time, Ronald Reagan had decided to initiate star wars. He was outraged by the thought that space would be used for the further escalation of nuclear war and made a statement saying that "space should be used for peaceful purposes, and I'm therefore launching a SatelLife today to overcome the tremendous gap in information availability to position that I know in the then Soviet Union." He also was speaking for affiliates of IPPNW who were from Africa.

I think that the main purposes of SatlLife's founding was not to launch a satellite and become attached to one particular type of technology. It was really to overcome the tremendous gap in information. Unfortunately, 10 years later, what we find from much work in the field is

that nothing has changed much in that period of time. What we find is a continued horrible gap in basic information for physicians and healthcare workers in developing countries.

Now, the purpose of this summit was really to identify the critical issues in deployment of telemedicine. I think that some of the vinettes that I'll be providing you today, or thoughts that I'll be providing you today, will be just that, to really consider this whole sense of globalization of telemedicine. But really look at the context in which we are really talking. It does provide some rather sobering caution to what we're about here. I spoke of the lack of information in developing countries.

SatelLife is presently serving about 5,000 health workers and physicians throughout Africa, mainly subSahara in Africa, although our representives are in some places in Asia and some Latin America countries. What we find typically in most of the medical libraries in African countries is the tremendous lack of current health information. For example, the [Countway] Library here in Boston, it's kind of achieved mythics proportion in terms of the number of actual subscriptions that they have. We've heard that there are over 6000 journal subscriptions at the [Countway] Library available, whereas, in Kenya and Nairobi, they currently have 15. In [Brosiville] they have none. In fact, in [Brosiville], I was recently walking the halls of the medical library and saw the stacks filled with novels. There is just no medical information, and that is really because of budgetary cutbacks. The first to go are the libraries, if there is any budgetary cutbacks. Thus, you have people clammerring for information, particularly current information.

There has been efforts made by many organizations to provide, for example, CD-ROM systems. And that, in many cases, consists of telemedicine in the minds of many people there because it's on a computer. But what we find, too, is that CD-ROMs, first of all, are dated. There is not current literature. That often times what happens is that they undergo the same cycle of funding. They are totally dependent on external funding to provide information. So that when that particular donor stops funding the subscription rates for the CD-ROMs, the CD-ROM subscription rates stops. So that what we've shifted from paper. Whereas, for example, in [Rakai] Research Center in Uganda, I was walking through the halls there and found that they had the New England Journal of Medicine on the shelf. The last issue was 1982. That was because the Dutch government stopped the funding for the journal articles in that year. Nothing has come in for the New England Journal since then. So that what you find are these cyclical spurts of information on the shelfs or in CD-ROMs that are totally dependent on external financing of the donor agencies. As I say, that's not a popular budget item, and usually that's the first to go within the medical school.

We also have to deal with the rather sobering reality of the number of physicians that are currently working in Africa. We did a survey and found that the Minister of Health in Zimbabwe, which is relatively prosperous for most of Africa, you have one physician for 6,700 people. In Mozambique the Minister of Health gives an official reporting of one physician for 37,960 people. He estimates that that's probably very generous proportions. What we see is a tremendous lack of trained health physicians in these countries. Now, probably the most sobering account was the reality in which we work is the April 1996 edict from Save the Children, which described the fact that in most developing countries the

ministeries of health are crumbling. They are incapable of supporting the most basic human needs of the people of these countries.

When I come to these conferences, and we talk about telemedicine, it's really a very strange disconnect because we are talking on the one hand, very, very high bandwidth, distance diagnosis in radiology, pathology, which in effect most of the physicians that we work with don't even have the basic medications, aspirin, antibiotics to provide their constituency. So we find ourselves in a very difficult situation and trying to respond to the needs of our constituencies and yet trying to be current in providing them telemedicine. What's the result?

Well, the result is that in the past 10 years, what we've come up with is a system that provides very low-end technology. It's store and forward technology. It's e-mail. It began first with a satellite, using satellite applications. It's telephone infrastructure improved in the capital cities we shifted to using store and forward over dial-up networks. What we find is that these systems, which ultimately cost the end-user the price of a local telephone call, are really probably the most appropriate thing that they need for their system. We find that they don't need the worldwide web because the worldwide web has lots of wonderful beautiful pictures, 85 percent of which are not relevant really to the content. So that working with the people, what we try to do is what can you do with basic e-mail systems. The focus is on what kind of information are you going to pump through there? So that our focus has shifted as an organization. Less on the technology, which we can do, and provide low-end technology but really focusing on the people network. That is linking physicians from the

developed countries of the world with physicians in the under developed countries of the world, really to initiate dialogues.

We've done that through several vehicles, mainly, foremost of which is featured here at this conference ProMED-Mail, a program for the monitoring of emerging diseases where SatelLife provides a platform. We provide the low-end technology for physicians in places like [Vanga], Zaire the epicenter of the Ebola virus. Now, in [Gabon] with very low-cost radio transmitter, transreceivers, that they can talk using an Internet addressing system, get into our ProMED platform and be talking with some of the leading people in that field. The total price to the end user is probably about $3,000. That's usually funded by external sources as are most of the projects that we have with telemedicine. I could go through a lot of the issues related to kind of enhanced the horrible problems with disease and the lack of ability to the healthcare infrastructure to meet the needs in developing countries. But rather than do that, I think I'd rather end here with some thoughts of where this summit might want to go in terms of trying to figure out a way to address these problems.

I think the first area is to realize that telemedicine does not have to be expensive to be applicable. It can be done with very simple systems of store and forward digitized information. The digitized cameras can be used for educational purposes. We've actually telephoned with the Kodak company and are about to do some work in that with distance educational programs. Probably more important, however, is to work with the people in the countries, to train them. What we find is that people, often times in Africa, particularly in the public sector, don't even have the basic computer skills. We find ourselves going in

intending to do training programs on health information, what's available on the worldwide web, and we spend three quarters of our time training people on basic computers and computer use. As we move to more sophisticated networks, we find, for example, people that we've trained and ushered to higher levels of Unix-based systems for the higher bandwidth frequencies are often times taken up by the commercial sectors because there are so few people available and trained in those areas. They are naturally going to migrate to places where they can earn often times 10 to 15 times more than what we could offer them. So really forming a cadre of people who are trained in even the basics of Unix based systems and the like is critically important.

Finally working with people, particularly like librarians, medical librarians, as well as Deans of medical schools to form what we are calling "infomedics." People who are trained in getting whatever electronic information might be available. And making it available to the local users, the physicians in particular, in developing countries. Too often we see that, for example, in capital cities where Internet is coming, we will see a physician come down and type in, for example, "I want it do a medical search for malaria," goes into the worldwide web, types in malaria and gets hit with over 300 thousand possible places for them to go. Their reaction is not excitement. The reaction is just wanting to walk away because it's just information overload. What we're trying to do is work with people to train them on what kind of information is available. What's quality information, and where you can find that? Those are critical issues that SatelLife cannot do that alone but really needs the help of many organizations to do that.

And finally I think that Dr. Lown asked me to quote from an article. It's from a British medical journal that was really describing -- it's just talking about erasing the global divide in health research. It was really focused mainly towards health and medical research. It provided a methodology if you were conducting health research in the developing countries. It says that "when deciding whether to implement a specific healthcare intervention in whatever setting, there is certain basic steps that should be taken. These include appraising local needs and health priorities. Evaluating strength and generalized ability of the evident, and estimating the likely cost benefit ratio to both the health service and the community. In addition, inventions based on research in developed countries should be put to two further tests by health service planners in developing countries. Firstly, an assessment of the feasability of introducing the intervention within the existing health service, and secondly, an assessment of its cultural sensitivity. Studies must be relevant to the population in which they are carried out." Now, I think that if any thing speaks more true to what telemedicine is, which is effectively a health intervention, those basic steps really should be adhered to very carefully as we begin to talk about introducing telemedicine on a global scale into developing countries. I'm going to end there and just open it up to discussion to the whole panel.

DR. SANDERS: I'd like to take a prerogative as one of the cochairs of this panel to reflect on the perspective that both David and John have provided. To remind us all as change agents and as people who have some influence in terms of policy making and where monies may be allocated, we wish we had more of that influence. The objective of this summit is really not to talk about telemedicine as much as it is to talk about healthcare delivery and

improving access to it. Telemedicine simply represents an enabling technology.

I reflect upon, I guess I would say an opportunity or priviledge that I had in 1976 where a number of us who had just completed a three-year telemedicine project here in the United States funded by National Science Foundation were asked by the Shah of Iran and by President and Mrs. Marcos of the Philippines to visit their country to discuss the application of telemedicine to their healthcare infrastructure. We went over with a great deal of excitement about the potential and were struck with the reality of what existed in both of those countries in 1976. If you walked a hundred yards out of Tehran or a hundred yards out of metro Manila, you were literally back in the 16th century. What the leaders of the country were talking about was the application of telecommunications and information technologies to deliver healthcare, when in reality when you looked at what the people were dying of, they were literally dying of starvation and infectious diarrhea. The reason they were was because they had no food and they had no sanitation.

Where the monies should have been directed is not towards telecommunications and telemedicine but to providing food and sanitation infrastructure. And I would just hope that while in certain parts of our country and certain parts of our nations and many parts of our nations, we have resolved those issues. There are many many parts of the world where those basic healthcare issues have not been addressed, and it would be somewhat frivolous of us, if not totally inappropriate, to be talking about telecommunications when we should be talking about something much more basic.

I'd like to open the discussion at that point, and I know, Dena, you have a statement.

DR. PUSHKIN: Niels followed right after me and made some statements about standards. I thought I needed to correct perhaps what might have been a misimpression. It's not that we don't believe in standards in this country, we believe almost painfully in working on standards. Watch the debate about the electronic medical record. What I think the point is, is that we actually recognize now that we need standards, and the difficulty of developing them, and how to develop them appropriately. That there maybe certain lessons from our European counterparts and elsewhere; but how to do it and how not to, and some of our experiences in trying to allow for diversity.

Let me just point out that there are certain areas where we are working specifically, and we would welcome any findings from these deliberations. In the area of technical standards, we have a group working on them in the area of communications and equipment standards for compatibility. The FCC will be holding in July an one day summit on that issue as a result of the recent passages of their decision on universal service, one of the other issues that was raised was well, so you have universal service but what if people can't talk to one another. Secondly, in the area of clinical in our country we have had a mania about guidelines in the past that has almost led to the demise of one federal agency. We are still in great need of essentially clinical protocols or guidelines about what works, where it makes sense, and what doesn't as some of the panelist here said. And evidence about how to go about doing that is very, very critical from consensus panels to the kind of research on how you do it when you don't have perfect information.

That leads to the discussion of training. A number of people here discussed training both in terms of the opportunity of continual medical education but also the training of people in a ongoing fashion. In a sense you need standards for training. There is a question about whether you accredit in telemedicine. Most people don't feel, and I don't feel it's a good idea, but how do you train and insure that you have competencies at the very basic level at least in computer literacy? Believe it or not, some people are still getting out of medical school that are not terribly computer literate. And finally in the area of privacy, security, and confidentiality; those overlapped areas.

Clearly there's some need for standards in this country. We had recent legislation passed under Senators Kennedy and Kassenbaum that has generated a flurry of activity in the area of standards of protecting medical data. There are some unique aspects of telemedicine in terms of privacy, security, and confidentiality. I would suggest that those be considered here. We would welcome any recommendations on dealing with that. We have a subgroup dealing in that area.

From our perspective, it is very important whether you call it standards, guidelines, protocols or just good information that we move forward here because in our country it has major implications in the legal arena and in the payment arena. And I think that is true elsewhere. So lest you think that we're not interested, we certainly are.

The final point I wanted to make is, as you think about international, I would suggest that you have three areas of international concern. One is in the area where you're dealing with advanced nations and how you collaborate on the areas of technology and research in pushing

the envelope. I would say you have a mid developmental area where countries are pretty much where most countries are. And the question is, "how do you apply existing technology efficiently and effectively in terms of a country that has a basic healthcare infrastructure." And finally, those who may be considered the beginning developmental stage. We are dealing with many of the countries in Africa and South America and even parts of the United States where there's a lack of an infrastructure. What you're talking about is, "how can the technology advance the provision of healthcare services and healthcare information in those settings." That may be a reasonable question to think about as you develop recommendations.

DR. THIERRY: I'd like to make a comment because we're in the international arena, so we have differences we have to look for. There definitely should be a different economic model. When you're talking about cost effectiveness of telemedicine in Europe or in the United States you can say that it is going to work somewhere else, and then we have at least one model that could be true in Europe and in the USA that somewhere links telemedicine development to cost containment. We have to arrange ourselves to become similar should we begin to downsize. That's a horrible term, I know. But somewhere, we're going to reengineering the healthcare system to spend less money because maybe we spend too much.

By the way, if you are a cost effective, telemedicine or telemedics program in the US, then through managed care you can reduce 30 percent of the bill; it's still 1 [Inaudible] of what we spend on average in Europe.

So cost effectiveness is also a tricky issue. Then we may have developed an economical model for other countries, and it's completely different. We may have not, of course; we are not asking them to reengineer or to start over the conception of -- it's completely the opposite. We have to help them invest, and we're talking about integration. I just mentioned to Dena...

[End of Side]

that there is a relationship between of number of phone lines and the emerging democracies. Because after maybe 300 phone lines per thousand in evidence, then you can't [Inaudible] with a detacher. Because people are beginning to communicate a lot, and then you have to move into what is called "democracy."

We just make that comment, not to be very careful when we're talking about, for example, cost effectiveness. This is not going to be applied even between US and Europe. We have to talk together first identify the concepts, and maybe to learn from each. Because it's true that from the European perspective, you're moving ahead very fast in the US.

I mean with the blooming flowers, the innovation processes in terms of the organizational aspect is much faster than in Europe where we have in several countries, blocked the system a bit. We don't know yet to invest as you are investing here in the US. But when we look at the numbers in the US in investments, it's not for us. Look at just the 10 to 15 percent of what you're spending just to run your system represents maybe the whole healthcare

expenditure for France in a year.

Nobody could invest, for example, up to 15 percent in information management to run the European system. We are very happy with the 1.5. So it rises in other concepts. Maybe it's the cost effectiveness to run a black-box system and maybe rely on people working under it. And it has something to do also with the patient relationship and the role of the doctor. If somebody wants a comment at the table, maybe we should start.

DR. SANDERS: Let's open it up to the summit. There are microphones in the audience; and please, unless you want to be identified as unknown, please identify yourself.

DR. BETSEY BLAKESLEE: I'm Betsey Blakeslee, I'm the coordinator for the Center for Total Access. I guess my question is this to the member of the panel. We always talk about the sort of depravity model relative to developing countries and the fact that people don't even have telephones right now, and so you should really be talking about sort of just giving them base capabilities before we talk about telemedicine. But, in fact, probably within 7 to 10 years, we're going to have a rather instantaneous universal communication system launched whether that's Motorola with the [Inaudible] or whether that's [Macaw] and Bill Gates with the [tele D6] system with low-flying satellites that are relatively inexpensive.

We are probably going to experience a fairly instantaneous, low-cost communication universal system. I guess I'm quite curious about how it is that we strategize for that instantaneous communication capability. Because to me, the shock waves from a sort of

behavioral perspective, if you will, or connectivity perspective, or relationship perspective relative to the providers and those who are being provided for is going to be rather dramatic. So I guess I'm suggesting that perhaps we certainly in this summit need to start thinking about what that world will look like because that clearly will happen whether that's in five years or seven years or ten years. It's probably not more than 15 years out. And I was just asking for anyone's comments on that.

DR. SANDERS: Betsey, I totally agree with you. I think we will have one bandwidth on demand. I think we will have bandwidth as inexpensively as we have a telephone call. In addition to the two that you mentioned, as you know Hughes Corporation is putting up 27 geosynchronous satellites that will be on an ATM backbone which will be bandwidth on demand. The prices at least that they have quoted me at the present time are very, very reasonable.

Once again the reality of a telecommunications infrastructure that has a global footprint still won't wipe out, and I'm talking here more philosophically than anything else, still won't wipe out and deal with the person who is starving to death. The fact that they can get to a specialist won't help them. And it reminds me of something that dawned on me one day when I was an assistant professor of medicine just starting on my professional career, I was seeing my patients in the clinic. They were from the inner city, and the majority of these patients had diabetes. And I remember talking to them about the proper nutritional state that they should embark on. I was telling them that they had to decrease their carbohydrates and decrease their fats, and increase the amount of proteins. It suddenly dawned on my that the

kind of food that I was telling them that they had to eat, they couldn't afford to buy. The reality is that the reason they had type-2 diabetes and were overweight, the food that they bought was junk food because junk food was inexpensive. And I know that that's far afield from the low-orbiting satellite issue, but it really also is the reality of healthcare around the world.

And even in our inner cities, we don't have to go to Africa to see the same healthcare problems. We can go to many of our inner cities to see those same problems. So I think what you're addressing is a very critical point, and a very happy one; and that is one of the barriers that exists. That availability of communication infrastructure and the cost of communication infrastructure really will disappear within a five to ten year period of time. But it's still not going to resolve some of the basic healthcare problems that we have.

DR. BLAKESLEE: Well, I think that, if I could just respond, I think clearly that will be an issue. I guess what I'm suggesting for what I believe would be the purpose of this summit which would be forward thinking is that we can either come at the discussions for the next three days from a perspective of "Gosh, it's too expensive and the systems aren't there and so we're going to sort of wait until that all happens." And when, in fact, we could be coming at it from a sort of a place that says "We'll be there in five to ten years. What is this incredible process we have to go through to be prepared to do the kinds of things you're talking about when it hits." That's my point.

DR. KATHY MILHOLLAND: Yes, I'm Dr. Kathy Milholland with the American Nurses

Association, and I'm very pleased to be here with my colleague, Cheryl Peterson, representing not only the ANA but the nations 2.5 million registered nurses. What I have to say is it is a pleasure being here to help look at the international aspects. That is something we can consider very important in the whole realm of healthcare. It is a philosophical, and semantic, and actual issue in that the use of the term "telemedicine" is somewhat narrow and exclusionery.

Now, I know that almost everybody here is going to say that telemedicine really means healthcare and everybody's included. And I know that that's a belief that people really work for. But if you listen and if you read you will not see any reference to the other healthcare professions in what was said here, what's over there, what's being handed out. So I think, and I'm not going to belabor the issue, you're in luck. But I do want my colleagues here on panel and everyone to keep in mind that you're using the term based upon our long heritage, but the [perodyne] is changing. The world view of healthcare is changing, and telehealth to nursing and other healthcare professions is an umbrella under which this is nursing and medicine and dentistry and psychology and that nursing is not a specialty area of medical practice. We don't practice medicine when we use telecommunications. So that's commentary, philosophy; please keep it in mind. I know you're going to continue to use the term, but every now and then I just might be passionate and have to say something. Thank you.

DR. ROSSING: Thank you very much for that comment. I do understand that background, and I disagree. I want to rebut. Mid-wives, even nurses in the European program, there's a

project called "telenurse." And it dives deeply into the social sector. So if you want to call it "telemedicine" because it's a monopoly for the medical doctors, well then, of course, it's bad. But telehealth is too distant for me to have my own health. You've got to find something different; maybe healthcare delivery or whatever. I don't like telehealth. Thank you.

DR. SAKIS ZARTARIAN: My name is Sarkis Zartarian, I work in the technologies of low bandwidth, low-cost telemedicine. I want to make two points which might be interesting to the attendees here. First is, I'm missing a sense of the speed and urgency of the technology change as the panelist spoke. I view the change in communication like I view a ten-story high steamroller that's coming down at me. And I think that you don't realize that the Internet and the things it means about cost performance of communication have changed all the rules. In no sense are you strong enough to hold back that steamroller. The doctors will use this enhanced communication. They will use it by the hundreds of thousands. It will reach all parts of the world very quickly.

I also think that there is a cost performance curve which you've never noticed before, but it's the computer cost performance curve and the communication technology cost performance curve. We've just finished over 700 transmissions between rural North Carolina and a town in Armenia; and we spent a total of maybe 50 dollars of communication cost and worked with machines that only cost $3,000 for the PC. We were totally successful in a total range of human parts and technologies.

The technologies are pretty much there, and not everybody's spoken to them as if they are there in such a way that the word "telemedicine" is almost inappropriate now. Because what we're really doing is we're enhancing collaboration which has existed for hundreds of years between doctors. So to separate it is rather artificial. Doctors used to consult with each other. Thousands and hundreds of thousands of telephone calls have preceded us. Since we've now adding an image as required to the telephone call, we happen to be displacing the courier method of moving an image between two doctors. I'm not sure that this summit is recognizing that those external factors are really going to control quickly that you're challenge will not be so much in the standards areas and in the licensing areas. Because the power will be too strong that they will blast through. I hope that you can stay ahead of them. But my two points are, one, the cost performance is essentially already here; and the concept that telemedicine must reflect the fact that it really is enhances collaboration.

My final point happens to be directed a little bit to the question of healthcare. The fact is, sure we can connect. I went to India to see if we could do telemedicine inside an Indian telephone system. Again there are low bandwidth techniques doing perfectly adequate consulting between people. And in some of the other work, we will not find that any country can stop the movement of the Internet to that country. There is no way to stop that. It is happening, and since you can connect with a regular phone call into almost any diagnostic procedure you want to, just about any level of resolution you want, there is no way you're going to stop that rapid motion.

What really is the problem then becomes of normal healthcare that the classic problems of

doing health. And in these pure countries, that will be helped because the technology, which we're talking about, which is collaboration technology, which is evoked by the combination of computers and communications, will enhance commerce. And people will become stronger in their economics, and there will be businesses, and there will be money, and salaries. And that's the way healthcare must improve in-country. The technology for communication is essentially there. And what they really have to do is think of it as a collaboration tool. Thank you.

DR. SANDERS: Sarkis, I know Jean-Pierre wants to comment on this, but I just want to say that tomorrow the content of my address in terms of the G 7 initiatives will directly identify what you just commented on.

DR. THIERRY: Just maybe a European perspective on it. There's a nice German [Inaudible] made of a boot maybe 10 years ago called technology as a religion. You have to understand that in many European countries now the performance is to decrease the number of hours spent on television for kids. So in many respects, we don't think that because the technology is going to spread that will be a social benefit. With media many people are reluctant to consider that the [Inaudible] diffusion of [Inaudible] exactly as associated with a social benefit. That's why the European approach may be to work on the control. I think sometimes it may block a little bit of the diffusion. But at least we're very cautious sometimes, and it has already been said with the Internet the problem now is with the volume, and that it's better. We have to learn to swim. Bill Gates told us we have to learn how to swim. So the problem in Europe is we may be willing to stop the process a little bit

and then just to look at it and maybe to design standards because one of the objectives is to protect the citizen. Not to create a segmentation in America where you end up with 30 percent of people very happy with their tin box. You know, very happy with their TV, very happy with the Internet, and they are ending up with "potato couch." So we don't want medical potato couch. Couch potato, sorry. We know, too.

DR. ZARTARIAN: I think it's a fantasy to think that government can slow down the Internet. I don't think there's a way to do that.

The second point would be that the communication technique that we use between here and Armenia did not use the worldwide web. We used the Internet as a communication tool, and there is no need to complicate the technologies solution by going into web pages. It's a perfectly valid alternative to the other communication networks. And you don't have to deal with it at the sense of the dirty pictures on the worldwide web.

DR. MICHAEL SHARPE: World Health Organization division of the Emerge and other communicable diseases. In reference to the driving forces that were addressing this panel, there's an interesting dichotomy that we are facing in the case of emergent infectious diseases. And that is, on the one hand, we have the global network on CNN and similar news networks that are driving policy makers in the G-7 countries to answer the questions, "when did you know about it, and what did you do about diseases outbreaks thousands of miles away?" Consequently, on the other hand, the infrastructure in developing countries is rather primitive. But as the last speaker did say, we are working or starting to work very

aggressively with many collaborators, SatelLife included, all of our regional offices, like Tahoe, and various other similar low tech, medium technology solutions to try and address this amazing driving force on our policy makers.

DR. BRANDLING-BENNETT: If I could just make a comment. I'm a little bit concerned about some of the questions that have been made and the suggestion that perhaps we should sort of be laissez faire about this. I certainly don't take the perspective that governments or inner-government organizations should be exerting control over what happens in the telecommunications field because I agree that that's impossible in many ways. On the other hand, I think we also need to be aware about the potential impacts of what's going to happen in terms of the distribution and access to services. I made that point strongly.

I'm very pleased that most of the panelists felt that it was important to look for equity and improved access to care. The new technologies are coming. If you like, like a steamroller or freight train or whatever. But I think it's actually, if you think about it, quite likely that in a completely open environment that will contribute to inequity. I don't see the alternative being very likely. If groups like this are to have an influence, the reason for coming together, I hope, would be that they could have an influence on the results. Otherwise, there's no point in meeting. We just might as well go home and see what happens.

I hope that most of us are interested that those people who would not normally benefit from the technologies can benefit. There are a limited number of resources available out there, whether we like it or not. That means we'll have to be pretty clever about how those

resources are going to be used if we're going to benefit more people in the maximum way.

I hope that that's what we're about. That does not mean we're about trying to control what happens. We are out to try and influence and direct it so that we can get maximum benefit for the maximum number of people.

DR. SANDERS: Thank you, David.

DR. PUSHKIN: Taking advantage that there was no one at the mic, I'd like to throw out a challenge to you. One of the speakers mentioned that if we are really going to see the full potential of this technology from an economic model point of view, the investments cannot simply overlay existing processes. We need to reform the processes of healthcare, yet it is often the greatest source of resistance to telemedicine. The fear and anxiety that goes along with reforming the processes; a change that Niels mentioned. Unless we can figure out ways to really demonstrate to practitioners there's a lot of emphasis the ultimate customer is the patient; and there's a lot of use of the Internet by individuals. But in the end, much of this technology needs to be useful to the practitioners, be they nurse practitioners, PAs, physicians.

I think to move to where Betsey Blakeslee was talking about in the year 2010, we have to figure out how to move the human processes as well as the economic processes. They are interrelated, and I think particularly how we make this viewed as useful to the physician. This must be viewed as the telephone, and I don't mean the fancy telephone I have in the my

office that I can only use one or two functions because I've never figured out how to work it. I mean to make this so that people really feel it's part and parcel their practice.

I'd like to just mention that Jay, Mike, and I were up in Alaska last year, and we visited a place called "Stebbins" which is a village on the Arctic Circle; native aides, community aides they had up there. Basically it's their main source of telemedicine a Picasso phone, a picture phone, used analog lines, not digital, basically simple lines. And we said, "Well how useful is this?" And the aide said, "I would kill anyone who tried to take it a way from me." That's when you've achieved success.

MR. RICHARD SATAVA: Rick Satava from DARPA and now from Yale University. A measure of success, I think, answers two questions. "How would you use the technology if it were free?" And second of all, "what would you do when your wish comes true?" So for each of the panelists, I beg you to give me the answer. If I tell you tomorrow that it will cost you nothing to provide healthcare worldwide, how would you use this?

DR. SANDERS: This time I'm not going to be first.

DR. MULLANEY: I think in speaking for the developing world, I think it would be lovely if someone were to make that offer to us. Any medical technology is only as good as the system in the context in which it's being served. What we find is that the telecommunications infrastructure in most of the developing countries of the world are not there yet. There's a lot of work to be done just in terms of administration and policy.

Probably the biggest challenge would be not to link the availability of the technology but also go to some kind of funder, international funder, and have them support the training and work with the local ministries of health to develop the people infrastructure to make that technology serve the needs of those people. I think that would be a long way from that at this point if that offer were to be made.

DR. BRANDLING-BENNETT: I certainly would have to think about it. My initial response is perhaps that I wouldn't because I think that a lot of healthcare is not what's needed. At least what we here in this room would think about as healthcare is not what's going to do ultimately for people. What they need to have is more information about how to improve their own health. Certainly we need to provide more information and very basic facilities and capabilities to those people who would be providing the healthcare services most of which would be actually prevention, which would give a bigger yield. There are lots and lots of children who are not yet immunized, for example. By the time they need healthcare, there are often beyond real reach. That's probably, I'm sure, excessive, but there's a great deal that needs to be done that is not just traditional healthcare.

MR. SATAVA: The point of the question is, I'm giving you unlimited bandwidth for free, worldwide. How would you use it? The purpose of the conference is to plan for the future. If you get this, what would you do with it because this is one of the pathways that's going to tell you how you're going to get to do what [Inaudible].

DR. THIERRRY: If I may answer. I had a visit in Paris of a consultant. I discovered

afterwards I was working for [Inaudible] Microsoft and the question was, I would like to test the elasticity of bandwidth regarding several applications one of them is health. I said, "Well, very interesting." I was trained as a health economist so I said, "Elasticity, I understand what it is," and I was very happy. And the guy said, "Okay, what kind of decrease?" And he said, "Well, let's consider it's free." I said, "Okay. Interesting." So it's the same kind of question about elasticity.

The problem in healthcare is that 70 percent of the cost goes into workforce labor. So it's true that for telemedics, if the bandwidth equals zero, it's going to be a co-factor of acceleration of deployment, but it's marginal. And it will still be marginal. The human factor will be the primary problem. And my belief is that within 30 years from now, we still end up with a major cost in the workforce. Maybe it's even more than today. Then the problem that it will foster, the reorganization. Where do you place the workforce from the hospital, mainly, to home care. But this is a question for rich a economy. For undeveloped economy, we all know it's very dangerous to say that it's free. It's never free. We better promote under the control of the people for the [Inaudible], their self-development. It's better not saying that it's going to be free if it's not going to be free.

DR. SANDERS: Rick, the reason I didn't want to respond initially was I was going to respond with a slide that you use at your presentations, which is the slide that has Dr. Koops' quote and that is, "That if you think healthcare is expensive now, wait till you see what it's going to cost us when it's free." The reality is that even if we had that panacea of bandwidth on demand and free bandwidth, the real critical issue once again goes back to, I

think, what was stated at the beginning,

bandwidth availability is not really the major problem. Education is a major problem. And maybe perhaps by having that bandwidth, we could provide education, we could provide prevention. We don't come to grips with the basic reality that we see in all of our populations, and that is, the educated and those that we try to prevent illness in, don't respond. There's a basic human nature issue that we still haven't dealt with. And I always go back to my pet peeve and that is cigarette smoking as an example. We've educated our populations about the impact of cigarette smoking. Yet they still choose to smoke. It's going to be human behavior which is going to be a very basic fundamental reality. I also go back to a comment that I made in response to Betsey's issue and that is, once again I can tell my patient all the right things to do. But if they don't have the wherewithal, or society doesn't have the wherewithal to follow those appropriate recommendations, we're still back at step zero.

DR. ROSSING: I'll take your challenge naively. What would I do if I had all the bandwidth for free? One thing is that in my own country, a small place in the world, I'd reorganize the healthcare delivery to improve it for the citizens. Second, I would reorganize the work of the professionals. I would reorganize their 24 hour around the o'clock duty and have many hospitals work together in a different way. Then, thirdly, I would of course use the bandwidth also on the high speed capacity for international collaboration, not to give advice, and certainly use the changed environment for research. Just to mention one thing, we are sending from my place once a day at least one or two [pit scans] for [irrelation] on the west coast of the US and back again. Probably they know more about the cardiac

situations in Copenhagen out there at Stanford than we ourselves do. I think those are the three points I would use it for at the moment.

MR. SATAVA: Once again, if you don't know what you're going to do with something once you get it for free, what are you going to do when you have to pay for it? The essence of the question is, I'm trying to remove a barrier. Many people say we can't do telemedicine because the cost benefit ratio, it cost too much, we can't afford to do it. But if we do get rid of those barriers, then what are you going to do with it? Are you going to give it to the people, or are you to tell me even if it's free, even if our biggest barrier is for free, I can't do anything anyhow? Why am I at this conference?

DR. PUSHKIN: Rick, I think the question comes down to, bandwidth is only about in this country about 18 percent of the cost. So while it's very important to look at what Reed Hunt and the FCC has done, you have to understand it's only a small portion. So when you say free, one of the things you need to say, it's a free good total. It's not going to cost you labor, it's not going to cost equipment, it's a totally free good. Then you're saying what would you do to reorganize your healthcare system utilizing that equipment. Now after that question, it's a very legitimate question to ask, I think it's a very legitimate challenge. I think it goes back to what are the priorities of our healthcare system. What is it that you wish to achieve in your healthcare system, and how can the telecommunications help you? If you believe that prevention is a priority in your healthcare system, you're going to use it to help expand and use the preventive services. If you believe that your elderly citizens are going to be the biggest burden on you, you're going to use it to basically enhance your

services and try to lower your costs. If you believe that development of infrastructure is going to be a key to economic development in undeveloped nations, you're going to talk about how I'm going to use it to link schools and libraries and everything else to create a better information flow. That's the framework you have to say, used for what in the context of the healthcare system and the questions that are being asked. That's why I think an international perspective, we are to think of three kinds of sort of ways of categorizing the ultimate markets that we want this to go into.

DR. THIERRY: Just other example in the healthcare system which is the french system. The worst situation economically speaking in theory could be free band wdth, lower reimbursement fee for service. Then you have what we have in France for many years, and we have to cope with. We have what we call an inflationary volume effect. It's terrible. It does not only cost effect on your healthcare system because people are going to inflate tremendously the number of acts they could produce, but also it has a very bad effect on the organization. That's why we sometimes like to be very careful by linking the kind of free offer with the tradition fee for service. And we have this experience in France now. We have to change the system. We are behind you in terms of managed care orientation. We are behind countries like Denmark or Holland because half of the European union is now moving to gatekeeping with very well integrated systems. I mean that's the orientation. So they are less risky to have a low cost bandwidth in integrated organizational medicine with managed care type than in a still mixed fee for service and so social secure like in France and other countries.

MR. WAYNE BELL: Wayne Bell, Digital Image Effects in Nova Scotia. I'm a little confused. I guess what I would like to see is some sort of focus on -- we talk about technology. For me, my company is a virtual reality company. We're looking at stereoscopic imagery, color corrected screens. So someone who is a dermatologist is going to have something like color and texture prior to making a diagnosis. Now, that is technology to me. The technology of maybe a phone call to help others is something else. What do we mean by telemedicine? What do we mean by telehealth? I see the physician with the pickup truck. To me telemedicine begins at the patient. And I think if we think of the patient and move backwards, there will be less of a confusion. And all of us from our various technologies, the technologies we bring together, the experiences we bring together, we'll be able to add that together, and we'll have some focus. I guess that's just a comment to the panel because I was seeing different people going in different directions. I was seeing some confusion. I was certainly confused. I wanted to certainly ask that. Is there some terms of reference?

DR. THIERRY: Basically, the program from the European Union deals with R&D from the start. It goes to the problem of integration. We are discussing the policy issues there. Still we have to consider the technology. So we may take your comment and maybe talk more about the technology. But there's still, I think, going through the European program, we've spendt 8 years in R&D. Now we think the primary goal is to discuss the policy issues. Are we not going to use the good R&D results including VR or telerobotics? That's why maybe looks have opposing effect, which maybe a little bit frustrating. We are all convinced that if we have to go through that process and maybe exchange between the US and Europe, then

we'll do that in the new process. And we know how to invest and how to have the best results from the investment in the new tools we have been funding for the last 10 years.

DR. ROSSING: One short comment on that because I do understand your question. On the other hand, why I provocatively say the technologies are there, let's dive into the pool, that is because I'm looking at a more global situation than just virtual reality however important that would be or image processing which I'm doing back home. It's not that it's unfamiliar to me, but the point is that you have these development programs and research programs to such an extent that poor academics tend paradoxically to hold back the deployment of what is already there, as if you're waiting for the next antibiotic to come up before you use the ones you have. And this was my message, that although it's not perfect, although you can move forward, at least what we should consider some midline. Maybe Dena is right in stating the three levels. There's some midline there between the developing countries that makes my meal this evening stick in my throat. I don't know if I could ever eat or whatever. I don't know if I could be missed in a developed part of the world if I should think of all these problems all the time. Then on the other side, this high, high tech that is there to wait for. But maybe we shouldn't wait. We should make some cost efficiency analysis and then jump into the pool.

MR. LATHAM: I think just to reinforce that point, I think that's where Wayne is coming from. He's suggesting that we start with the patient, then the appropriate technology is the right technology. We do not want to put sophisticated technology into Somalia or Zaire. We need the appropriate technology to deal with infectious diarrhea or whatever it maybe in

those particular countries. And in other areas where the appropriate technology may require something more sophisticated, then that's also appropriate because that will also help to keep the cost of healthcare down on a worldwide basis.

MR. BELL: The two points are the technology of the future. What is coming down the pike? And what we have now in certain areas, of course, there is a difference in how we use them. I think that has to be a bonus as well. How do we use what we have, how do we use what is coming?

DR. SANDERS: We have haven't even learned how to effectively use the telephone.

DR. JOHN WOODHALL: Jack Woodall, Director of ProMED-Mail. I can give you some examples of what can be done with free bandwidth and some other examples of putting the patient first. John Mullaney spoke of the SatelLife node in Vanga Hospital Zaire. That was put there for them during the Ebola outbreak, but they were able to use it. Just bear in mind that in Zaire telephone service is very erratic, and in fact, Vanga Hospital had no telephone service the last few years. To get a reply to a piece of mail to Europe took three months. When they had this connection to e-mail, some people were sending the messages back saying apologizing for taking a week to respond, and they said don't apologize. It use to take three months to get a response. But as a result of this free connection to the Internet, they were able to do three important things. First of all, they got all the information on how to deal with Ebola patients without killing themselves. Secondly, they needed a cheap source

of HIV diagnostic kits. There were able to get quotes and receive shipment of this very quickly at a more lower price than they were able to get before. Thirdly, they were able to report to the World Health Organization that there was an explosion of cases an African sleeping sickness in the area. And through the World Health Organization, the office was able to get from the pharmaceutical company concerned, free shipments of [Inaudible] to treat these people. This is putting the patient first. And this was all free to them from a donation of equipment and done through the Internet and e-mail.

Second example, I hope a lot of people here have heard about the first test telemedicine and the first saving of a life which was in China with a young student called Zu Ling at Bejing University a couple of years ago. She was dying, went into a coma, and the doctors had no idea what she had wrong with her. Her fellow student at Beijing U sent an SOS out on the Internet just to the whole world saying our colleague is dying. Can anybody do anything?

End of Tape

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

G-7 NATIONS: GLOBAL HEALTH CARE APPLICATIONS PROJECTS

DR. JO HAUSER: We have Niels Rossing with us who is the former head of DG-13 within the European Commissionfor pre. He is going to speak for Jean-Claude Healy. Each panel member will speak about the activities of the G-7. I'm Jo Hauser, the Chair of the panel. I am the former coordinator for the G-7 initiative for Canada. I say former because I retired a few months ago, and I have transferred responsibility to [Jean Le Riviere] within the Ministry of Health in Canada.

I should perhaps say a couple of words about the G-7 initiative for those who do not know what it is. It was initiated in 1995 by the G-7 industry ministers. I understand it was one of the initiatives of your Vice President in the U.S. It has twelve projects dealing with all areas of human endeavor, one of those areas being health. The focus is to look at how information technology can improve work in those areas. The objectives for the health subproject, which is called Global Health Care Applications, is to build a consensus about what is needed to fully utilize information technologies to develop cooperation between the G-7 countries, to facilitate information exchange, and to facilitate the funding of exemplary projects. It has been running now for two years. It has done all these things, as you will hear this morning. Although it includes, as the primary members, the G-7 countries, it does include a number of other countries. Certainly Australia is a very major partner in the project along with Greece and Sweden and Netherlands, a number of countries. The position of the G-7 Global Health Care Applications project is that any country can participate in the G-7 initiative. However, the coordination and the guidance of the initiative will be provided

by the G-7 national coordinators. When the project was started there was six projects. There was: the (1) Global Public Health Network, (2) a project dealing with cancer which we will hear this morning, (3) a project dealing with cardio vascular disease, (4) emergency telemedicine, (5) a project called Enabling Mechanisms, and (6) a project dealing with data cards. A seventh project was added called Evidence and Effectiveness, which deals with the use of the new knowledge in medicine and how information technology can help apply that knowledge to the practice of medicine to improve the effectiveness of health care. Just recently at the meeting in Washington earlier this year, two additional projects were added: Multilingual Anatomical Database and an Imaging Reference Center. We will hear the last project this morning. So there are now nine projects in the G-7 initiative.

Niels Rossing has not been directly involved in the G-7 initiative but was certainly very much involved in its formation, its development, its incubation, and has watched it with some interest since it got started.

DR. NIELS ROSSING: Thank you, Joe. This may seem a bit unfair to you and I may add, a little bit unfair to me to have me welcoming you here on behalf of DG-13, the telematics application program dealing with health. However, I know that I can at this time today bring the greetings of Jean-Claude Healy, who is actually my successor at the office in Brussels. It's true that in one sense I was working in Brussels on this matter, being there as I was from 1988 to 1994.

How did this collaboration come about? First of all, we recognized that working in the domain of health telematics would globalize our dealings, and it would be not only for France, not only for Denmark, not on for Europe, but global. A global collaboration would

be established and also a global competition. In health telematics, we realized during the very early '90 that America, having its private-public partnership relationships established, was certainly moving fast ahead and so were other continents and other countries.

Working as we were in DG-13, it is the directorate general for informatics industries and telecommunications. That's what it was, and it was a certain mix of industrial promotion and development and research. We realized this global competition coming on in all domains, also in health care, and we realized that the not-yet Vice President Al Gore and other people were working on creating the infosociety. Then you had an upcoming president and his wife who dealt especially with health reform. That combination of having Al Gore and the American industries on one side, and the upcoming president and his wife on the other side, certainly made us feel busy at the health application domain in DG-13.

With all the reports coming out of the United States and Japan, it was decided that the Commission of Bangeman should make a report to compare what was coming from other parts of the world including the U.S. and Canada. Therefore in '94, a so-called Bangeman Report on the European version of the information society was published. When early in '94 this was known in the U.S., an agreement was set up between the President of the EU [Inaudible] in those days, and the new President Clinton that a meeting should be held on the matter of the information society in '95, on the condition that that meeting took place in Brussels, and it did. I had left Brussels by then. But definitely the Bangeman Report included also a sector on the implications of the information society for the healthcare area. When the meeting was established, they dealt with these application domains including health care. That is how I see that these seven or eight projects that were originally launched as global projects for the G-7 countries were established. Having the commission there, or the

EU there, actually enlarged the G-7 because it was not only seven countries. With the EU being around, you had suddenly an open door to the EU countries as well. I'm fully aware that some of these projects didn't get started fully, others were transformed, and some are doing fine. I'm also aware that a number of projects have arisen from this G-7 initiative not being transatlantic as such, but being among of the European or other G-7 countries. Therefore, the G-7 umbrella has been a very fruitful one and will prove to be a very fruitful one. I wish it very much success. I do know that the whole EU Commission and DG-13, Mr. Michel Richonnier, and Jean-Claude Healy will like you to be very successful in pursuing this goal of getting an improved health care, improved global information level for professionals and for the citizens in the world. Thank you very much.

DR. HAUSER: Now we are going to here from Bjorn Bergh, who is the head of the Department of Digital Radiology at the medical center for Humboldt University in Berlin. He gave me a few points of his background. I know from his background that he had a research period at UCLA which I think accounts for the excellence of his English. He is going to talk to us about the cancer project and the developments with the new project that was approved in Washington in January dealing with the digital databases.

DR. BJORN BERGH: Good morning, ladies and gentlemen. I'd like to tell you some parts about the Subproject 2 which has been introduced the cancer project. The work which has been done in Europe and [Inaudible] with Japan, also looking up the Subproject 9, which is right now called Medical Imagery Reference Center, which can from my point of view be easily integrated into the Subproject 2 regarding the image aspects.

There was a variety of objectives we had which I think do still exist for this Subproject 2. We would like to use the advantages of telematics for oncology. We wanted to create an oncology network. All this should be made very easy and very cheap because obviously, especially in Germany and all over Europe, the financial cuts in the health systems are very intense. We wanted to create groups in terms of standards to make it easier and to facilitate the incorporation within the cancer center.

An overall goal was to bring everything which is needed for the healthcare professionals (this means all healthcare professional, nurses, midwives and so on) to their desktop and, if possible, also to include the citizens to a very high extent. The groups, which I think are really important and have to be brought to them, are either information, education, and a variety of telematic services, including second opinion tools, et cetera. Video conferencing seems to be a quite important issue as well as broadcasts of educational programs. We did an analysis of the situation which was available when we tried the project and during the concept. We found that there are basically two [Inaudible] of course and abbreviation or simplification, but it is like it is. There is internet-based or internet technology-based communication, or direct noninternet communication and some other telematic tools also in use today.

Just to give you briefly the advantages of internet communication. It is available everywhere, which is a major advantage which you have. It is easy to use. It is cheap. It is quite good at standardizing and the software runs quite stable to date. But it has also disadvantages.

It is has drawbacks, of course. The information is extremely distributed. You can get much information on a certain topic, but you don't know what is validated, what is good

information, what is bad information. If it is good information, sometimes you have to pay for it. Speed, at least in Europe, is a general problem. So the internet is very slow, as long as we talk about the international connection which restricts you to certain applications. This can be solved possibly by the usage of fast mass networks or by applying data compression. Other huge problems on the internet, which are obvious of course are security problems. In the short term they can be solved by eliminization and long-term encryption, which has already been done. Then we have the point of standardization--which is a very important. Because if we standardize, we will have to figure out how we do this on a world-wide level. There is no standardization today.

We tried to figure out some standards regarding the client sites for internet-related communication. We said it should be very easy and very simple for everybody to determine: I'm standard IC1 or IC2 or IC3. This is the level I'm cooperating with. This would facilitate the communication with cancer centers where the doctors may not know all the necessary technical details of how to go on. We said IC1 is a PC and a modem. IC2 is a PC and an access for ISDN. IC3 is access from the local area network or metropolitan area network. Then we created subgroups for each client group including audio or video capabilities.

Direct communication usually is today a direct peer-to-peer communication. The use for this private networks means telecommunications networks which you have to pay for. It is usually applied for video conferencing. The peer data transmission is not very common.

The advantages are two very important advantages. The speed is equivalent to your connection speed. It is not like an internet where you hook up with 28K or whatever and you get only a few amounts of what you theoretically should have. But you have the full

speed and it creates a secure environment, which is an important point. It is also independent from your internet provider. Downtimes don't affect you. Of course, it can be established anytime. But this is also true for internet to a certain extent. Drawbacks to this are two main points. It is extremely proprietary. You can only connect a modem with a modem. You can only connect ISDN with ISDN. You can usually only connect the same operating platforms or operating system platforms. If you look at video conferencing tools, there are standards. But if you connect two different video conferencing tools, you will have problems. You will not have full performance or the best performance. It is necessary to have the same tools at both sites. If not, then you have a problem. This goes on through all levels of direct video communication. You have to pay the full cost for the international connection, which maybe extremely high at least in Europe. It does multiply with the amounts of ISDN lines you use. The equipment is not very cheap.

We said finally to avoid this platform, we will restrict all the stuff we have only to Windows 95 and Window NT for zero. We made three groups. One is purely dedicated to data transmission with a modem or ISDN. Basically to ISDN, interface ISDN. DC2 has additional video capabilities--also working on a basic rate ISDN interface. In the case of your DC2 standard, you have to specify the vendor because otherwise you will have the problems of proprietary aspects. The DC3 is video conferencing based on multiple BRI lines, which mean that you have a larger bandwidth capacity and perhaps also bandwidth on demand.

There are two other applications. Fact educational programs. There is a possibly to educate via satellites, which has been done in Europe and also in Asia. You have also the

internet as a tool regarding real video and audio tools to bring educational programs to your site.

What should our cancer network be? We would try to combine the best of both worlds--of the internet communication and the direct communication. This could be done by dedicating an internet service that services a region or hospital. By this you can use all the advantages of internet communication regarding the client site. It is open. Everybody can access it. They don't have to worry about what they do. They just use standard browsers. Access points will be a dial-up point using modem and all attached local area networks.

Service would be located at centers in Europe or in Japan. So it would be no problem to communicate with Japan and also other states regarding everything which has the same ISDN. One could be hooked into the system. The service would form a network replicating their content so that the content would be local at anytime, at a very high speed. Then it's only necessary to access your local internet point. You have full speed. You don't have to go from Spain to Japan. You just go to your local Spanish node and that makes it much quicker. This will provide you bandwidth on demand because you could do a video connection between two points. If you want more than one, you can just tell them to go high. Then you can go up to 30 channels and have the full performance. It allows you to feed broadcast into the system. It means that one point in Belgium could receive the broadcast and transmit them via the network to all the other points in Europe.

This is just a brief overview of how it could be. On the right level on the bottom, you have dial-up points for the user phone dial-up or LAN. All the nodes could be interconnected by BRI, which is cheaper than a PRI, or leased. You have one point on the

left side which has the satellite reception which can then feed transmission into the whole system.

One point in Belgium, Brussels, could distribute the whole broadcast to all of Europe and maybe even far beyond Europe, which I think is the cheaper way than to install satellite technology to each point in the network--which is more expensive and also more difficult.

This is what we thought the whole set-up should look. We should have an entrance. There should be three kinds of entrances. One for the public that means that citizens are allowed to go there, too. There should be one for professionals, open to the internet and a closed access (which doesn't correspond to dial-up points where you would have a closed and safe environment). The forum is there for discussion, which means closed news groups and cooperative tools that can be attached for editing of documents that are for review and so on. The MOIS, is the Medical Online Information Store. This is what usually understands an internet. It's just an information storage with a pile of authorized and validated web pages. Then you have the Videoshop attached to that and some databases that will provide generic database outlook. You can fill in what you want. The Integrated Tools Center does define whatever you can hook in there as your local tools. This is a bit compliant to the regional services. Everybody can shape this structure to the way he wants. There is a common amount of technology in the form and the MOIS, which can be replicated to all the services.

We think that this stuff will allow the usage of all the basic internet services at a very high performance level for all healthcare professionals hooked up on the network and the citizens, too. We can use advance telematics tools. You can do video conferences directly from your desktop unlike P bases so there is no need for proprietary elements any more. You combine it with a camera as long as you use a tool which is IP-based or internet

protocol-based. This works completely fine and makes it easy for the user. You can receive broadcasts that are actually secure and cheap. It can also be a test bed for technology in Europe.

I would like to give you some global prospects and problems I think we will have with Subproject 2 and also Subproject 9, but also some advantages. This concept we have chosen for the Subproject 2, at least in Europe, allows a very good integration of the Subproject 9. Subproject 9, the medical imagery for the center, will just be one of the databases that you've seen in these schemes. You hook it up there. You can also add any kind of databases. That is no problem as long as they are validated regarding the content. What we need definitely is a standardization for the direct communication and the network communication because the problem is, if we do this in Europe, we have an agreement right now. We could do this. We could do this with the Japanese together which also might work. The problem is, if we do not agree over the Atlantic, it's not perhaps very beneficial if we do this with the Japanese and you do something else. Then in five years we have to rework the whole system. This is the main topic where we need standards.

We had a lot of telemedicine projects in Germany, which were not successful. They were not successful because it is still too difficult. The communication itself works fine. The problem is that it takes too long to get the stuff into your telemedicine work station. You have either analog cameras and you put your films on there; we have resolutions like 400K or so, which gives you perhaps a very reduced diagnostic quality or you have to go to your scanners to copy all of the stuff to your machines, which takes time. It's rather complicated. If we want to get the whole thing working in a routine basis, it should be just as easy to go to your telemedicine work station, do a query to your medical record or image

archive, get the stuff, and then just do a conference. You should not wait or go to every machine to copy of the stuff to the work station first. This takes too long, and it is not routine.

It is also my impression over the last years that it was industry that came up with telemedicine technologies. Doctors said we can use it but nobody was really doing it. In a way there were applications as to where to use it, but my feeling was that sometimes the industry had the technology and we didn't know
how to use it.

End of Side A, Beginning of Side B

I think what we should think about is: what is really the plus of telemedicine? We have telephone and we have fax. What does telemedicine offer as a plus? That is the question. I can deal with a telephone fine. I can handle the fax fine also. The answer is video conferencing and imaging. One should look at the possible application of what really could be done. What do we need the pluses for? Then I think we can find the needs and the techniques. The techniques are available; we just have to figure out what exactly we need for which application. Standardize it, and then bring it to the global horizon.

DR. HAUSER: Thank you very much. Most interesting. I would now like to introduce Alain LeFebvre who is the G-7 coordinator for France. He works for the French Ministry of Health and is head of the program that deals with AIDS, communicable diseases,

environment health, and the use of new technologies in the health system. He is going to speak about the feasibility study for the Emergency Telemedicine Project.

MR. ALAIN LEFEBVRE: This G-7 is a Subproject number 4. It was a European G-7 feasibility study for 24-hour multilingual telemedicine emergency service with a world coverage. That was what we had to examine and decide if it was interesting enough to go on to a pilot project. I will present first the objectives of the study, then the study process, the results or the outputs, the problems we discovered because we had problems, which we had to solve, and, finally, the future of the project--what we are doing after the end of the feasibility study because we are now going on.

First, the objectives of the feasibility study. The objective of the subproject was the establishment of a transnational and multilingual health emergency system able to improve promptness and effectiveness of operations and service management through telematic interconnections of the emergency points of care and of all actors and services involved.

The feasibility study was based on extensive consultation of the actors involved in European countries. It is only a European feasibility study. We have explored whether a telematic network interconnecting major public and private emergency centers around the world can be set up to deliver 24-hour care. That means to organize a kind of world multilingual system by connecting centers of different nationalities and emergency medical teleconsultation. That is easy. We have the techniques. After these objectives, the process.

This study was launched at the World Congress of Telemedicine held in Toulouse at the end of 1995. It was led by Professor Lareng from the European Institute of Telemedicine in Toulouse and by Italy.

The work was organized through meetings and workshops. Telemedicine centers from many other countries, Germany, UK, Australia, and Canada were involved in this work. Professor Lareng also tested connections between the telemedicine centers like St. Vincent's Hospital in Melbourne, the University Hospital in Montreal, and the Institute of Aerospace Telemedicine in Koln in Germany. From these meetings, we got a feasibility study. Now after the objectives and the process, let's look at what we got from this feasibility study, the outputs.

The first output--an analysis of the need for the service and the medical and technical specifications. The report gives us a typology of potential users: that is, the potential market for the service. More important are the medical and technical specifications. I cannot synthetize in two minutes the technical and the medical content of this book, but I can give you some examples. It details a list of the images and data needed at the hospital and recommendations for security of emergency telemedicine. The report also contains a technical analysis based on the existing network infrastructure. Also, the content includes also a concept of emergency telemedicine network and a design for a technical architecture.

The third part of the feasibility study is a practical proposal for next phases. The recommendations. First, the users. Second the recommendations medical and technical. Then the practical proposal for the future.

You understand that the G-7 coordinators and the countries involved did not decide to continue the work on this subproject. We decided to widen it to general telemedicine and

not only to an emergency, 24-hour per day project. This year will be the year for building a work plan for the future in telemedicine. Though we had good outputs for the study we found many problems that need investigation so we can pass through the problems.

The most important problem is: the study contains a good analysis of the costs but has no financial plan. That is very important. Before going on, the G-7 coordinators want to have a clear idea of the potential resources for the service. Without an interest from the private sector, without money, it is not possible to implement such worldwide service.

The second problem is that we need exchanges on the emergency organization around the telemedicine centers to cooperate because we understood that to cooperate it is necessary to have a common idea of the management of emergency calls. For example, for the way of linking with the adequate resources, the procedure for taking in charge a case, and the basis of training the teams of the center. So we have to have a common method for taing charge of emergencies at all the centers involved in what we call the "backbone." This could be done by implementing the connections between volunteers among the telemedicine centers and by working on an organizational chart.

Next we looked at the future as we see it in France. First, we are implementing what we call a backbone of the future network of health telemedicine emergency centers. The cooperation between these centers is now going on. It is going on first for management of emergency calls, issued by identified site within the center area of competence and linked with the adequate resource. That was the beginning of the project. It is going on for the management of calls issued by the external emergency centers for a specific expertise; that is, calls from insurance companies for a specialized diagnosis. It is going on for cooperation between centers within the network or outside for training purposes. When the French

center of Toulouse is working with Melbourne or Germany, it is also for training the people, and perhaps it will be an important part of the next telemedicine work plan.

For the center cooperating within the backbone, current equipment should be upgraded with communication facilities-- because we have some problems. It will be upgraded by software for the management of calls and directories, standard interfaces with user networks. That is the technology tool part. Second, to look at the future, we think that there is a market for terminals to be used by healthcare professionals in isolated areas at a lower cost. Because we have a problem of cost. We have a big problem in France because we have a big need for telemedicine, but we are unable to have equipment for all the isolated areas (e.g. our Pacific islands). Such a terminal would provide communication facilities by satellite and offer standardized interfaces for medical devices and multimedia. We will work and meet with industries during upcoming months. That is very important for the future of health telemedicine. Health systems cannot spare much for telemedicine.

The feasibility study gave us a good technical base for national and transnational projects. There are many interesting things in this study. I think it is possible for all the countries of G-7 to use it to implement telemedicine system. We will use it in France to experiment in 1998 with an emergency telemedicine project in isolated zones--I think in the Pacific islands--and to make a cost effectiveness evaluation. It is very important work for us from the whole system. The important mass of knowledge we got from the feasibility study is a good way to speed up our project.

Last but not least, I think, why not a world emergency number? It was a suggestion of the study. Yesterday somebody told us that it is important to work for our children, but I think that it is also important now to work for many people in isolated zones. They are not

covered. They are not in the same kind of cities as the other people in the urban centers. I think through this kind of project we have a good way of improving the situation. Thank you very much.

DR. HAUSER: During the first two years of the G-7 initiative, as Alain has mentioned, we have focused on emergency telemedicine. The completion of that feasibility study, the leadership of the telemedicine subproject moved to Andre La Croix, who readily accepted that responsibility on behalf of the Canada. Dr. La Croix is going to tell us about where he sees this project going in the future. Dr. La Croix is a physician, he is an endocrinologist, he is the professor of medicine at the University of Montreal, and currently he is the President of the Quebec Interregional Telemedicine Network.

DR. ANDRE LA CROIX: Thank you, very much--not only for the invitation to participate in this symposium, but also for giving me the opportunity of becoming the Canadian representive to be able to initiate some very interesting collaborative projects with groups of experts throughout the world. In fact, this is not a presentation of what the subproject 4 is now, but just thoughts about a reorientation that it could take.

Our G-7 governments wish to share their expertise more efficiently in selected areas including health care. Health care ranks certainly very highly as a priority for individual citizens of all countries. The global telecommunications networks can contribute significantly toward a healthier world.

As Mr. LeFebvre mentioned, GETS was judged to be technically feasible and could be implemented gradually and stepwise. However, the G-7 coordinators met in Bethesda in

January to review the different projects. And at that time, it was believed that it was not yet economically feasible to fully implement the GETS project. However, it was mentioned that there should be reinforced cooperation in telemedicine which was clearly needed. It was suggested that the scope be broadened to telemedicine in general and to not focus only on emergency telemedicine.

The other recommendations that were made at that time were that the project should serve as a mechanism for sharing concrete experiences among individual member states, that greater emphasis on routine healthcare needs are desired, that lower cost technology should be explored and utilized, if possible, that non-G-7 countries such as Australia are strongly interested to participate, and that before the end of 1997 we should define new projects as becoming the Subproject 4.

Suggestions were made that cooperative work on the horizontal aspects of telemedicine should address subjects which are difficult, such as interoperatability of different systems in different countries. Obviously, the cost efficiency is very important if it can be implemented on a regular basis. As you know, there is tremendous amount that needs to be done on medical legal aspects if we want to do not only national but international connections. We really have to measure what the impacts are on healthcare management.

The suggestion was made also that the cooperation could include the setting up of a backbone between telemedicine centers willing to participate in such an effort. Why should we do international telemedicine? Because governments feel that the benefits, economic and social, are mostly where that they have the responsibility--for their own national healthcare delivery. However, the rapid sharing of knowledge and expertise in areas of sciences and human needs should bypass geographical and political barriers. We are getting into a global

world. The most industrialized nations really bear the responsibility of developing new technologies to make them available eventually to less industrialized countries. I think we have a responsibility, being relatively wealthy, to invest the time and money necessary to develop those new technologies.

In addition, physicians and scientists now need to have access to update knowledge. The biomedical knowledge is truly international. International meetings are of great importance, but they are far apart and expensive. Also as a physician myself, I am being confronted now with patients who consult the internet. They are really up-to-date. Physicians need to be up-to-date also. They need to have easy and rapid access to high standard quality care. High levels of travel and population migrations now require local physicians to be more knowledgeable of diseases that they were not accustomed to seeing because of the the geographical distribution. So we need to have international collaboration to face those new challenges.

In the Subproject 4 there is a series of new representatives who now have been nominated by their national coordinators. In fact, we are going to hold our first business meeting at the new version of Subproject 4 during the Kobe meeting in Japan next week.

At that time proposals for the reorientation of the project will be presented and discussed during the meeting. What I'm going to present today are just initial thoughts of what these could be and those are going to be discussed. But obviously, nothing has been agreed upon yet. There has been suggestions that we should have forums. I think Dr. Bracale will talk about teleplans, which could be one of these forums. Forums to bring together healthcare authorities, key decision makers, telemedicine experts, and users from G-7, but also it would be open to European Union, non-G-7 and other countries.

Meetings would be organized and chaired by national representatives of the host G-7 countries with the help of the steering committee. It is being proposed that five meetings be held at six month intervals. Each meeting would focus on one team. Up until now most of the meetings have been broad coverage. Maybe there is a need to focus on one team at a time and try to go more in depth in each of the teams. One very important one is the interoperatability between various telemedicine applications and networks. Another one would be the evaluation of cost efficiency of applications. Then the medical legal aspects of national and international applications. Technical quality and standards. Finally, the impacts on healthcare management.

There has also been a suggestion to build a backbone. The suggestions are: to look at an international multipoint project of advanced communication and telemedicine, or impact project; to try to develop a network backbone between selected telemedicine units in G-7 countries (in Australia initially); to develop the technical protocols and agreements with academic and industrial partners; to test the feasibility of multipoint meetings using diversified telemedicine equipment; to initiate the project with one site at each country, but eventually to link national networks which are being built upon now within an international backbone. The objectives of the meetings would be joint multidisciplinary and multimodality staff meetings of experts in diversified fields of clinical medicine, simultaneous interactive transmission of prestigious state of the art lectures, availability of teleconsultation in complex cases or during emergency largescale public health crises, telelearning programs in diversified fields, and facilitation of international collaboration research study in various areas of science. So the project can be useful for not only learning, but for medical care and research. I think we will need to plan on a stepwise implementation, to select initially the

protocols based on the forums that will be held on interconnectivity. Then to start point-to-point sessions between let's say the USA and Canada, Japan and Australia, UK and Germany, France and Italy. Then move on progressively to larger multipoint sessions between four countries together, and eventually the whole network over a three year period. Eventually all the national networks could be linked together.

However, you realize that there are major difficulties which need to be solved. The sources of public and private funding have to be solved as one major problem. Also we must avoid duplicating projects. When we hear of all the other projects going on, I think we need to make an effort to not just repeat ourselves but to fuse and integrate as many projects as possible. There are important human factors in telemedicine. The tools are there. But in our own projects we find that the human factors are important, language, cultural factors. The broader and broader we get, this is going to be become more and more important. All the medical and legal issues that we will have to work out. Time zone differences is not such a trivial problem. But eventually we hope that the reorientation of Subproject 4 will lead to the goal that we want to go towards an international collaborative network in telemedicine. Thank you.

DR. HAUSER: Now we are going to hear from Marcello Bracale, who you saw listed on one of the slides as the Italian representative on this Subproject. Dr. Bracale is the Professor of Biomedical Engineering at the University of Naples. He teaches automation and organization of the healthcare system in the School of Medicine. He will speak to us about the European project related to this initiative.

DR. MARCELLO BRACALE [Difficult Italian accent]: I have been presented as the Italian representative of G-7 within the Subproject number 4 telemedicine for emergency. I am a young child in the field because I was appointed by the Italian Minister of Health only last February. I am here also to learn from my colleagues. I am a senior in the telematics environment. Also in 1995 in support of the [Inaudible] DG 13, I was the local world organizer in Italy of a Health Telematics '95, an international consensus conference. The proceedings of it I offer as a complimentary copy to Dr. Barron as the key person of this transatlantic telemedicine summit. Extremely important.

What is the consensus conference for the European Commission? It is a conference like this one, probably a little larger with a very high participation of people. What does it mean, exactly, telemedicine? Excuse me, if I have presented myself as a learning child but I would like to present myself as representing a mission. Mission is not a duty. I think that a mission is possible to accomplish if we believe in the thing, in our actions. Excuse me also for a philosophical concept. You may be aware of the Aristotalian concept that to do an action, it is necessary for another place and time. But for a particular time the concept of telemedicine is a new link completely. It converges in a point. Professor LeFebvre mentioned earlier that from Toulouse--but also from Ischia--we teleconsulted between Belfast via Ischia with Australia. We completely destroyed the Aristotalian concept of space, time, of foreign action. And this is possible only if you have a very good integration, which not only means integration for structure and architecture for the computer, but for the network and the integration between peoples. This is the importance of these conferences like yours, like Ischia, like other ones where it is possible to have an exchange of ideas and of experiences.

This is a problem in the proposal for the next project within the DG-13. I was asked from some people to prepare a concerted action which we name the TELEPLANS, the telemedicine for citizen. The participants are participants within the G-7 European countries but not only...

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I would delay. It was not possible to include at the last moment. But we have a strong recommendation from Australia about this project. I invited the friends [Inaudible] who will be in Kobe, Japan next June to express [Inaudible] of Italy. But within these European and non-European projects the possibility exists to join as soon as possible, also with Japan, for an exchange of ideas and experiences for concerted actions within our countries. The main objective of TELEPLANS is to establish a forum that will bring together national healthcare authorities, key decision-makers and users to the telemedical application with particular attention to the emergency operators participation of European countries and extra-European countries. On this occasion to be here, Dr. Barron, it gives me the opportunity to ask the representative of United States to consider these opportunities. Concerted action, as you know, is a possibility when there are more funds, but it was an opportunity to exchange our experience, our ideas for transferring local experience to other people in the spirit of integration between countries and between experiences.

Obviously it is not only for a research and development approach or project. The research and development has been done in another place. We tried to converge and to discuss their these results for obtaining a co-penetration and integration.

Also in this one are some other, different actions. For example, to study and to analyze the pilots of other telemedicine services, like for instance, experience already done in some projects supported by the European Commission, like HECTOR which is emergency on land, MERMAID emergency on boats. Or like the experience in Canada, which is a very near to these previous pilot studies within the European Commission.

For preparing this concerted action, we have have considered a backbone which was not discussed during an early workshop where we integrated some pilot studies--emergency care for geographicaly remote lands, like islands, for instance. Another one is about environmental emergencies. The service is territorial emergency services. Then the simulation and education aspects. What does "emergency" mean? I am looking here at some military authorities. I think that the rule of military authorities in these emergencies is extremely important. The military emergency, in the opinion of some individuals, in my opinion, is unfortunately not only the emergency during a war. And during routine day-to-day living, in normal activity in civilian life, you have many facilities that canbe used. I am convinced of of these things. I will participate in the meeting later where I discuss the military emergency perspective.

I have tried to force some military authorities in Italy like in the customers and also in the army. You know that in Rome, Professor Rossing, there is an important military hospital [Inaudible], which now is connected in the teleconsultation 24 hours with Bosnia in [Inaudible] countries. I had the opportunity to check these [Inaudible] equipment discussing with the military nursery there and these young men are enthusiastic about this possibility. But there is a very good organization. The military men are very clever in this sense, and

they serve in a very good way. These are other possibilities. I know that European Commission is looking at the possibility of joining and strengthening these activities. Why not consider, for instance, the NATO activities within the civil a possibility of a cooperation. For discussing such a matter, we think that the timetable of our three years activities will start. We are starting workshops with other--two intermediate workshops and a final workshop. It continues to a [Inaudible] meeting where all the partners may discuss in realtime, day by day about the activities.

Finally, I would like to give a very short description of what we are doing now regarding emergency health care in Italy, in particular in Naples which is my town. We have a big problem with the connection with islands. Two islands in particular: Ischia, Procida. Procida is an important tourist island where there is no hospital, only an ambulatory location. Using the telephone-like speed 2 megabytes per second, we started a project for connecting the islands with hospitals on land for a general video teleconsultation with the video conference system where the medical doctors have the opportunity to visit, from this sense, the patient for all kinds of disease. Also, we have a radiological video teleconsultation with electronic scanner and also an [Inaudible] consultation. I am enthusiastic over these projects, but I am also enormously afraid for them. Just because I remind you of my comments at the beginning of my presentation-- integration is not only an integration between equipment. It is an integration between people, activity levels, medical doctors, physicians, nursery, et cetera. Probably the spirit of this summit and my mission is to try to transfer this sensibility to avoid some human barrier, where probably the connection of Pozzuoli with another hospital is considered a diminuation of importance and the power. In my opinion, if you are able to realize these kinds of links, all the partners, all participants

are very clever and will show a very high spirit of professionalism. These are my comments as a child of G-7 activities. But I believe strongly in these opportunities. And I will offer the possibility of cooperating with other friends in and out of Europe, in the United States, in Canada, in Japan. Andre La Croix referred to the Japanese people using them if we are able and if we like. We cross our fingers that our concerted action will be accepted by the European Commission. This will be my mission in the European environment. Thank you.

DR. HAUSER: We move to the U.S. representative who needs no introduction, Jay Sanders. I should point out that the U.S., although they played a major role in initiating this initiative, sat back and observed from the sidelines for the first year and a half, perhaps to see how it evolved. Then late last year pointed to Don Lindberg, the Director of the National Library of Medicine as the U.S. coordinator. They are now fully involved and Don has asked Jay to be the U.S. representative on the telemedicine project.

DR. JAY SANDERS: Joe, thank you very much. I, too, come as a student not as an educator in this forum only having been recently appointed as the Director for the U.S. in terms of telemedicine initiatives. My first opportunity to participate really was at the January G-7 meeting in Washington at the National Library of Medicine. I listened very carefully.

We presented one specific project that had not been identified previously. I'm going to ask Dr. Michael Ackerman, who is really the father and whose brain child this project was, to comment on this more extensively after my remarks, perhaps in question and answer

period. I could not do justice to the extraordinary work that Mike has done with the visible human project and our specific recommendation was to, at the very least, develop a multilingual visible human project.

The other thing that we learned at the January meeting was how far behind we were in a particular technology. The more we thought about it, the more crucial we thought that technology and that application was. That is the work that Germany and France are participating in with respect to the so-called health card or smart card or, as the military in our country, who are perhaps the most advanced in the United States in developing this technology call it, the meditag, although I understand there is some controversy about what it will be called. To us that technology, in many respects, perhaps represents the molecule upon which we can eventually crystallize what our real intent should be. I would venture to say, and it may sound somewhat heretical, that our real objective is not telemedicine. Our real objective is the development of an electronic medical record and that, in fact, telemedicine really represents a stepchild in the absence of a true electronic medical record.

Some generic comments. I make these comments more from a personal standpoint than necessarily as the representative for the U.S. and the G-7 nations. Perhaps we have overdone the concept of or the recognition of what we are calling telemedicine. It has almost certainly in the United States become more than it really is. We do hear people talking about the specialty of telemedicine. We do hear people talking about themselves as telemedicalists. To me that would be like saying that you are a stethoscopist because all telemedicine really is is the transfer of information from one location to another. It is simply an enabling technology. As a matter of fact, I think we have set ourselves up as a target

from a legal and regulatory standpoint because we have put this title on the top of this information in telecommunications technology called telemedicine.

All we are doing is taking technology that has been used by many other industries, many other service industries, for many years, and applying it to medicine to transfer information efficiently from one location to another. We have, for good or for bad, called it telemedicine. When, in fact, all it is is an enabling application of telecommunications and information technology.

The other thing that we have become aware of is the fact that, while we have been ringing our hands over the years about the availability of a telecommunications infrastructure and bandwidth and the economics of it, and the dispersal of it, it is very clear from the comments made yesterday during the question and answer period by Sarkis Zartarian and by Dr. Bergh on the project that he presented from Germany, we have a very rich infrastructure that is available to all of us and that is called the internet. Given all of the potential weaknesses, when you add up the risks and benefits, the strengths and weaknesses of this, it represents a very robust, very available, very cost effective technology that is available to all of us. It may be different in terms of what our server is and our router is in terms of how long it take to get to us. But the reality is that the internet and, in fact, a multimedia internet e-mail platform will represent for many of us, if not for most of us, the major platform upon which we do what we are now talking about in terms of telemedicine. Let me start with a little analogy.

Let's once again go back to where our starting point always should be and that is the end user. Analyze what the end user's needs are, analyze what the end user now does in terms of delivering medical care. Let me use myself as a primary care physician, which I

am, and you as a patient whom I now may be examining this morning, and I notice that you have a tachycardia. I listen to your heart, and I hear a murmur. The murmur is at the mitral area. I'm not sure what that murmur is. I've done this complete physical examine, and you are a little short of breath. I don't really know what's going on. What would I do today whether I'm in France, Germany, or the United States? I would refer you if I didn't know what was going on to the appropriate specialist. The appropriate specialist here being a cardiologist. Remember I'm not talking about telemedicine here. I'm just talking about standard practice of medicine. How would I refer you? Well, very simply I would call out front to my administrative assistant and say would you please make an appointment for Mrs. Smith at the cardiologist's office in a week. That call would be made. Then I would take my illegible handwritten record, the EKG, the chest x-ray, and perhaps I had even done a screening cardiac ultrasound, an echocardiogram, and I send all of that information either by tucking it under my arm, or couriering it over, or sending it in the mail to the cardiologist. A week from now you end up at the cardiologist's office.

Think about what we do on a daily basis and now think about it in a different term. I have actually now physically "store forwarded" you. What we do on a day-to-day practice is store forward our patients to the specialists.

Now let's use this enabling technology to do the same thing. Now instead of physically store forwarding my patient, I will electronically store forward my patient. In fact, when you look at it, I can electronically store forward my patient to the cardiologist much better than I previously could do when I physically store forwarded my patient. The one piece of information that I couldn't send under your arm, or send in the U.S. mail to the cardiologist was what your heart sounds were like when I was listening to you--the thing that

made we concerned about what was going on and that generated my need to send you to the cardiologist. Now using a multimedia e-mail platform, I send a typewritten medical record, a graphic picture of your chest x-ray and electrocardiogram, a video segment of the echocardiogram, I can send an audio segment of the heart sounds that I heard--and I now e-mail the cardiologist. When the cardiologist comes later that day or the next morning, he accesses his e-mail. The e-mail is from me asking him to see you as my patient with all of the data in front of him. With that multimedia e-mail platform, he now sends me back what his interpretive impression is on your particular problem. I have gotten the turn-around probably a lot sooner than I would have if I physically store forwarded you to the cardiologist's office.

I would predict for you that, with a multimedia e-mail internet platform, whether that cardiologist is around the corner from me, or at Stanford, or in Paris, France, I will be able to electronically store forward you a lot better, a lot more comprehensively, than I could have if I physically had stored forwarded you. It is certainly a lot simpler if the cardiologist who I thought needed to see you because of his or her specific specialty was only in Paris, France.

We really do have a very rich platform. Now, I'm not trying to say that that's going to take care of the needs in a trauma type setting. It's not. It's not going to take care of the needs in a telemental healthcare type of setting. It's not. And it's not going to take care of the needs of being in the operating room helping a general surgeon do a minimally invasive surgical technique. That's not going to work. But for the majority of consultations that now occur, that will work. It will also work from a continuing medical education standpoint. We have a rich infrastructure right now. I'm happy to say that the National Library of

Medicine represents one of the resources in terms of a massive digital library that provides me wherever I am global access to a wealth of information. From a patient standpoint, from a physician provider standpoint, from a nurse provider standpoint, the educational infrastructure is there on the internet. From a direct patient care standpoint, from consultation, I have the capability to use a very rich infrastructure that is it readily available. So I want to underline what Dr. Bergh and what Sarkis said yesterday about the need to look at some of the simpler enabling technologies and communication infrastructures that we now have available to us-- because it can do the job very comprehensively.

Finally, I'd like to make a comment about something that we are all wrestling with and seem to be ringing our hands about. We all seem to be taking on almost as crusade--and quite candidly, I think we are being very naive--the whole issue of standards. There is not a meeting that I go to in which the issue of standards is not brought up as a critical issue relative to the application of this enabling technology. From that standpoint that is excellent. But there is a fundamental weakness in what we are doing because the basic issue is, what is the control that we are using for these standards? Folks, we don't have a standard in our traditional system. There is an implied idea that, or an impression that, in fact, in our existing day-to-day healthcare delivery system (we are not talking about telemedicine) that we have standards. We don't. Everybody is rushing towards outcome-based reasoning, outcome-based data, so that we can actually figure out what the true standard is.

One of the problems in trying to get that information is the fact that we don't have an electronic medical record. Literally everything we do at the bedside is heuristic. It is evidence based. We don't have an existing standard. Although you may think I'm pushing the point, I'm really not. People may talk about what standard should an electronic

stethoscope have. We've got to get it to go through the same ranges of capability, as the best normal stethoscope. Whoever tested and who continues to test the hearing capability of the cardiologist who uses the stethoscope. Nobody. Who tests the vision acuity of the radiologist? Nobody. Who tests the vision of the dermatologist looking at that lesion? Nobody. Yet we are trying to create for the enabling technology something that sits on a house of cards. My suggestion would be that, as we continue to wrestle with the issue of standards, that we first develop a goal standard. And the goal standard has got to be what we do on a day-to-day basis. Forget what technology we use. Because I can say that the stethoscope also has never been officially tested. There are no standards for it because the cardiologist's hearing has not been continuously heard. I can actually give you scientific studies that have been done that describe the incredible variability of the hearing capability of board certified cardiologists.

Once we establish standards, then we need to make sure that any enabling technology that we introduce into the healthcare delivery system, whether it's a CAT scan, it's a right heart catheterization called the Swan Gans catheter...I specifically use that example because those of us who have been intensivist and have had patients in medical intensive care units all these years, what was the first thing that we did when their blood pressure went down and the urine output went down and we didn't know what was going on? The best thing was to put in a Swan Gans catheter. We put it in unfortunately naively. There never was an evaluation of the Swan Gans catheter. In the same way there's never been a clinical evaluation of the MRI, CAT scan, or ultrasound. Now we know that the Swan Gans catheter is probably not only not helpful in a number of situations, it probably increases morbidity and mortality. Finally, the studies have been done. So whatever the technology is, whether

we call it telemedicine, a stethoscope, a Swan Gans catheter--it's got to be evaluated. But it's got to be evaluated on a given standard and we don't have any given standard for the existing healthcare delivery system. The standard that I would apply for telemedicine is to insure that it in no way decreases the existing standard. But we've got to determine what the existing standard is. In all of the projects that we look at we need to address those two fundamental issues. I think the one thing we could add to the G-7 initiatives was the multilingual G-7 projects. Mike, would you mind making a few comments about that?

MR. MICHAEL ACKERMAN: The concept was that the real knowledge of medicine is not in words. The real knowledge of medicine is in pictures. For many, many years over the ages, we have been writing down what we see because it is so difficult to capture pictures. Pictures are inherently multilingual. There is no language dealing with pictures. The major pathway to the brain, the largest bandwidth to the brain, is by way of the eyes. It is the way human communicate in pictures in what we see. For those that don't know the Visible Human Project, it was NLM's project to create a three-dimensional library of CAT scan, MRI, and anatomy of the human body which is then capable--it is volume a dataset--of being rendered three dimensionally anywhere in the body. The visible male has a resolution of a millimeter and the visible female has a resolution of a third of a millimeter. You can literally put together the fantastic voyage if you have a big enough computer to do that.

For that data set to be useful, we reasoned you just don't need the pictures but you need to know the anatomical objects that are inside, so that you can say I'd like to see the heart. NLM now has a project to put together the anatomical objects. Of course, once you have the objects, then you label them. As soon as you label them, now we've removed it

from the nonlingual world to the lingual world and, therefore, we have limited the data set. The concept was very simple. The concept was to label the dataset but through G-7 to go to multilingual labeling. NLM also has another project called the UMLS, the Unified Medical Language System, which is a medithesaurus of terms, synonyms, lexical relationships, and so on that it is using in other parts of medicine.

The UMLS is surprisingly limited with respect to anatomical structures. The labeling of the visible human data set becomes an excuse for the library to add a deep knowledge of anatomy to the UMLS. We have discovered with UMLS and other concepts in medicine that UMLS, because of its lexical arrangement and because it works with synonyms, is able to do translation. The way it does translation is that we find the words in each of the foreign languages and we make them a synonym of English. If you go in with the French word for heart, that becomes a synonym of the English word heart. Therefore, all the concepts that are built into UMLS for heart now are available in French. After you've gone through the logic in English, you go pick up the French synonym of your output and your output is in French. So it looks like it is in the foreign language, but it is actually working in English. It doesn't really matter if the logic is in English. As long as we are putting in all the words and the constructs--and what I mean by constructs in the case of anatomy is: UMLS understands to the right, left, inside, outside, part of, and so on. Those are lexical concepts that it understands. If we ask the G-7 folks to help us put together the terms in foreign languages and we added that to UMLS, then it is quite possible for a researcher in Italy, using a white board, to point to something and have the term come up in Italian, at the same time that his French colleague is watching it in Paris and have the word come up in French through the UMLS concept and through the white board concept. After all, anatomy is the

basic building block of medicine. We are hoping not only as a teaching tool for students, but also as a patient tool. If you show the patient what's wrong, the patient will understand much better and will comply much better with what we hope will become part of that medical infrastructure. To do it in the language of the patient is not only the vision, but the concept. That is the basic outline of what this was about. It was accepted by the leadership of G-7 in January. We are working on a feasibility study for the next G-7 meeting, which is sometime in the fall, to at least show in one part of the body what this thing will look like in a multilingual sense.

DR. SARKIS ZARTARIAN: My name is Sarkis Zartarian. I am a technologist in the area of telemedicine and teleeducation, and I have some comments which I hope the panel will not anger over. I think I need to make them. First, I'd like to say that I am afraid that sometimes in the early time of developing a technology, you list problems and they take on a life of their own. I sensed that as I heard you. It is one of the problems of government that it by nature has to move slowly and thinks about cooperation and problems. I think that you are starting to work on problems that aren't there. For example, why would there be a need to make a telemedicine terminal. By the time you invent it and produce it, the PC will be much better than what you defined. It is moving too fast for you to do something unique. I sensed no problem with the technologies that we have today. They are totally multimedia. They do all the things that I think you would want to do. You might perhaps want to put a sensor on a standard port and limit yourself to that. There are companies that are making such sensors. You don't have to deal with the specialties any more. I started out with the idea that the PC could become a visual telephone. It is incredibly specific. If you go to

Windows, you can pick up the vocabulary of any country. It is already a Windows' font. When I send an image, if I'm sending to Armenia, I surprise the Armenian doctor by having the name of the image in Armenian. It was trivial. It took no time for me. That is not a development project. By doing an audio annotation, it is already personalized to any language in the world. You just speak into the microphone in your language. The sound board doesn't care what language was spoken into it. It is already personalized. A generic multimedia PC is multilingual. Already. Don't invent it. It is already there. And it is already cheap. If you let the technologies go with the incredible pace that they are going, they will go faster and give you more than what you need. Please don't invent what is already there for you and more cost effective. Because it is being driven by 65 million ships a year.

The same thing is true of your thinking in the area of networking. I appreciated the comment from Germany that, perhaps, compression will help the challenge of moving a large file down from the internet. But I suggest to you that it is not a maybe, it is a done. It is already there. It already moves fast. If I were moving images from Maryland to Yervan and did a high resolution image in a couple of minutes, that's faster than you need it. Many things went in 20 seconds. It is not a challenge. You need not put together a committee to work on it. Please don't.

Also, I don't understand why you might be considering a unique structure for your network, a telemedicine network. Why would one even think of an international telemedicine network? There is already an international telemedicine network. All you need is paths. One doesn't think of making a unique telephone connection. The nodes of the internet are already webbed, so you don't have to do something unique. Why do you want

to make a telemedicine network? It will just slow us down and raise my taxes. I don't want to be slowed down. I don't want my taxes to go up. I wonder about that kind of thinking. It must be common to government where you have to think about your relationships between countries. And it gets too complicated. If you leave the entrepreneurs alone, we can do a lot. We might do it cheaper and faster.

Databases. I don't understand this. Why is one constructing unique databases and unique networks? You need not. Databases are already inexpensive. We can put gigabytes on to a PC. Why do you want to put in monster servers and unique databases? We can move millions of images around on a little floppy thing. Why are you going to make a monster system? Don't do it. Don't make that superstructure. You can do better without that superstructure. Leave it alone.

The database on the PC...besides you could never keep up with the PC technology, which will already give you more database and more connectivity than you could define in the system. Because it takes you two years to have your meetings. In two years we go somewhere between two to ten times better in the technology. So you'll just be more behind with the more meetings you have. I ask you to not complicate your problems. The technology is really ready. You might have to just think about using it. I don't think there is cost to it. I think it is so inexpensive. I had some people I was teaching a little bit from the Ukraine. They told us how poor everybody was. I said, "Do you want to link with me through the internet on your PCs?" Yes. Well, you can't afford anything. He said, "I asked the people back in the Ukraine, and they got me a new PC." The countries are not so poor that they couldn't put a multimedia PC in some very important places and in an awful lot of the clinics and maybe that's all you need.

So I'd suggest that you stop there and not build an expensive slow moving superstructure on top of it. Thank you.

DR. BERGH: Have you ever done an internet-based video conference? Have you seen how quick or how slow it can be?

DR. ZARTARIAN: I am current doing internet based video conferencing. I'm doing it between modems at modem speeds. It is perfectly adequate. It is large in size on the screen. It is smooth in motion. It has sufficient detail.

DR. BERGH: No, it is not. We tried to use in Europe in certain purposes. It is not sufficient. If you want to do data transmission via internet, you can of course compress the images. If you have a 10 megabyte image, which is a standard conventional x-ray or if you have a collection of 20 images, you have an amount of 200 megabytes. You can compress it. If you compress it [lossy], fine. Then you have to prove the results. What comes out on the lossy's compression on the other side? If you do faults in this field and if somebody says then you're in the point to prove that you did the lossy compression and the other one didn't get what was on the original image. You can do that. You can compress to 50 times or whatever you want.

I'm not saying that you should not do it. You have to be aware of the fact that if you do only a lot less compression, you get an amount of 2.5, which is still 100 megabytes. The internet is quick in the States. There is also quick cards in Germany. But if I transmit an

image from Spain, I would check that, from Germany to Japan, this takes [Inaudible]. If you transmit 100 megabytes to Japan, you will have a problem. You can compress it more but then you have the problem that you do not know what is the original image content. Because it is not a loss-less compression. Who will tell you if the guy on the other side does a wrong diagnosis? Do you take the responsibility for having done a lossy compression. I would not.

In general, I agree to a certain point of what you said. But I think it is not that easy. The second point is: if you want to do real video broadcasts, how do you do that via the internet? You could do it today, but it is slow--it doesn't work. If you want to do real video broadcast, you need at least 128K. That is how we settled this concept--you will have to connect the servers. It is only one way. So one line is enough. I tell you if you get a performance for one telephone line for whatever the broadcast is, one hour at 128K guaranteed, I'll give a [Inaudible] for the internet with perhaps 5K. Because I just do then. Because it's cheaper for me, and it gives me the guaranteed performance.

Another point; the databases. I didn't say that we will build a proprietary databases. Everything I tried to say is exactly the opposite. I want to be open. I want them to make it as cheap as possible, as easy as possible. But where this is not, where I cannot use the internet--my belief is that we should use the internet at every point we can use it--but if it doesn't offer me what I need, then I will look for other tools. The other tools is, from my belief right now, is direct communication to a certain extent. Right now that is a problem of the technologies, which is not solved-proprietary. Have you connected PictureTel [Inaudible]. It doesn't work very good. So what do you do? You can do it IP-based. I'd agree IP-based conferencing is the best way it do it, but if you do that, how many images do

you have? You have one image per 5, 10, or 20 seconds. This is fine, if you just want to see the face. Now my question is, if I see the face in 10 seconds, why don't I do it just by phone? Why do I need the image? It doesn't bring me anything. If I want to copy a radiology image by modem, 10 megabyte by a modem takes 20 or 30 minutes. You see the problem is: there are products that are quite good and I'm absolutely on the way to making it as cheap and easy as possible. But some parts of unsolved. I think we cannot just say everything is there...

End of Side C, Beginning of Side D

This is absolutely not what I want. But I have to face what is there and what is not there. I think not everything is solved.

DR. BRACALE: It is not justification, because I agree perfectly with your comments. But probably, on my behalf, a clarification. I agree with you that we don't like to reinvent the wheel. We have already a very appropriate technology to be used successfully in medical environment.

But probably the medical environment is not completely appropriate to the use of these technologies. I am a son of gynecologist. I am the brother of a vascular surgeon. I have some responsibility of management of a private hospital in Naples. I am permitted to reply in this way. The problem is to prepare the medical environment to the correct and appropriate use of this technology. We are coming from a technical environment as another kind of philosophy, another kind of preparation. The standard is a common idea. The test

for the quality is a normal system used as a test in every kind of industry. The very interesting comments of Dr. Sanders clarified this position. The use of a technology can improve the reliability of all the medical environment in the medical systems.

For instance, this is a cheap card, an electronic card. For the short time I had not the opportunity to present in another project in Naples. We used this smart card in a project for the control of the pacemaker patients. These are big problems. Because every hospital, every center, every laboratory has its own methodology. No standard at all. So one cardiologist uses one method, another cardiologist, another one. This is reality. Where the filter is not a technical filter, it is a filter of school, education, group. Via this device, we can try to use an internet network to enter within the database over the different hospitals. Via these actions via this diffusion of the sensitivity, we also are hoping also to solve the problem of standardization. But don't reinvent the wheel. We try to use the technical support, the device, in a correct way in appropriate environment. It is necessary to clarify in that way, that demand, the supply. We are very clever to give supply, but we are waiting for demand from the environment. At least these are my comments.

DR. HAUSER: In my two years of experience with the G-7, although I was with the Ministry of Health, while I was the coordinator-- and I am no longer with the Ministry of Health--the majority of participants were in nongovernment, 99 percent are nongovernment. It really is a facilitating network, a facilitating process to allow people in different countries to come together to approach problems that they are each facing and share their collective knowledge so that it will allow better applications, better implementation application within

their own countries, and also interconnectability. I don't see this as a government-driven initiative but a government-facilitated initiative. Thank you very much.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

EUROPEAN PERSPECTIVES/EC DG XIII PROJECTS

DR. JEAN-PIERRE THIERRY: This panel should give you a unique opportunity to look at European projects, ongoing projects and, of course, evolving projects. There are something like 90 projects going on now, run by the European Commission DG-13. We have all together a representation of maybe ten, which is a good selection of what could be going on at the European Union level. First of all, Niels is going to tell you more about this telematics application program.

DR. NIELS ROSSING: Thank you. Just to introduce you to the subject of R&D in the European Commission and in the EU. It should be known to you that, of course, the EU raises the taxes of everybody everywhere in Europe and spends much money on various things that cross borders in Europe, such as culture and social developments, infrastructural development, et cetera. One aspect that they do work on as well is research and development. For the broad spectrum of energy, for maritime sciences, for botany, and for health care they spend in a period of four years about 13 million Euros. That will be somewhere between 16 and 20 billion dollars over four years. There are a number of programs. There are three programs actually of interest to this audience. One is called ACTS and is dealing with developments in basic communication. Another one is called Espirit, which is dealing with generic and basic informatics developments. The third one is trying to put this into applications, called the Telematics Applications Program. That program is divided over a number of areas as well: administrations, traffic, transportation, teletraining, teleworking, and telematics for health.

In Telematics for Health you have, over four years, somewhere between 70, 80, or 90 projects and actions. There are certain requirements to these projects. First, you must put up an application. Then you will have a technical evaluation. If you are on the short list and retained after the technical evaluation, then you have some political or strategic evaluation. There is an element of political horse trading between member states. Do we get our share? Don't we get our share? Out comes a number of projects that survived these two filters. There are certain conditions for them to move along. One is that they must form a consortium. This consortium should comprise academia as well as industry. Furthermore, there should be more than one member state partnership involved. If they can do it just in one country--it is nothing for Brussels to deal with--then they do it back home. This is the basic element.

Now it is all happening in one directorate called DG-13, where they mix industrial promotion and research and development. Basically, they fund too many projects. They claim that themselves. So there is too little money really to have the impact that is needed to really move. However, it is very useful seed money. These projects are clustered in a number of domains. One is called Departmental Systems for hospital use. Then in imaging they have 3-D virtual reality and robotics. A third line, or a third cluster as it is called, is Telematics Assisted Cooperative Work. Integration platforms. The health record and then telemedicine and information for citizens. These are the clusters that these projects and actions are separated into. Thank you.

DR. THIERRY: From the Rhone Treaty and the [Inaudible] Treaty, there is still not any unique policy for health care in Europe or for social services. The action of Europe for help

on the project is split between DG-13 for R&D and other DGs, like 3 for public health, 12 for biomed, for handicapped people still in 13, with other projects. There is no DG for health care yet at the European level.

Our first speaker was the co-chair yesterday, Professor McGee.

DR. JAMES MCGEE: Good morning. I am going to tell you about one of the European projects I am involved with. Before I do, it is about telepathology. I thought that since most of you in the audience are not telepathologists, you had better know something about what it is about. Telepathology is a subdivision of medicine. This is what I focus on. In the past it has been used for frozen section diagnosis. This is a rapid method of diagnosis where a piece of tissue is removed from a patient and within five minutes a pathologist gives a diagnosis. He does that by telepathology, by using robotic or real telepathology, which I will refer to as part of this project.

The second thing that it has been applied to is the interchange of opinion on the national and regional level, an international level. It is now being applied in this project to professional quality assurance. This is not quality assurance of the commercial product but assurance of my professional skills. Continuing medical education is another one. Standardization of examination and image archiving for teaching and other purposes. To introduce you to what the EU project is, which I am involved with, as the first speaker has indicated, all European Union proposals have to form a consortium representing a number of European states. This Europath Consortium, of which I'm a member, has players from virtually every country in the European Union. Those players are not academics like myself exclusively. They are, in fact, commercial people, software people, microscope makers, and

users such as pathologists. The whole thing is funded by the European Union. I think it is actually more than [Inaudible] as was indicated in the introductory remarks.

What are the objectives of this Europath Consortium? I will tell you what we have achieved so far, bearing in mind that we only started in January 1, 1995. The first objectiveand one very close to my heart is the clinical evaluation of the two basic modalities in telepathology, namely, static telepathology or real time telepathology. What I mean by clinical applicability is clinical utility. Does it work? Does it work well? And does it work as well as the conventional means of making a diagnosis of cancer? Static telepathology probably needs a few words. Static telepathology is a store forward technology when you simply capture the image and compress them and then send them onwards to that person whom you want an opinion from or a consensus view from. Real-time telepathology, on the other hand, is when I can sit here and operate a microscope ten thousand miles away simply using my PC.

In the field of static telepathology, we have already produced a piece of software known as the Europath software, which enables any user in Europe or anywhere else to transmit images to another machine which is made by another manufacturer. So we have all the interoperatability question as far as static telepathology is concerned.

The second objective is to evaluate cost effectiveness. But this has not been evaluated so far in the project, which has lasted for three years.

The next one is to look at telepathology systems or work stations that are available. We are not trying to invent something new but taking the available workstations and they are not only European, but also US workstations. One of the objects is to make these interoperable. As far as static telepathology is concerned, we already have the software to

do that. I will show some data which shows that, for real time telepathology, we have achieved the same object. The experiment was designed and conducted by myself and collaborators in Stuttgart. We are asking the question: what is the clinical utility of real time telepathology, robotic telemicroscopy, where I can operate a microscope from thousands of miles away or from the next room? Now, when you think about clinical utility, this is one of the results of this project. You divide clinical utility into two aspects. One asks is it reliable? Do you come to the correct diagnosis or not? Secondly, how fast can you do it? Is it much more tedious and time-consuming than what you would have done conventionally? All of these cases here were blinded for the operator or for the pathologist, namely myself. None of these cases had been seen in the past one to seven years. They were all lumps removed from the breasts of ladies. Here are the results in terms of overall accuracy.

TP is telepathology, LM is light microscopy, namely the conventional way you do things. TP Versus CD. CD is the consensus diagnosis. There was a consensus diagnosis available for all of these cases. The message is there was a 98.5 percent accuracy. This is as good as the conventional way of making a diagnosis of cancer or a nonmalignant lesion of the breast. If you make it a little more sophisticated than that, you can actually then look at [Inaudible] typing--because that has a prognostic influence on the patient and also influence patient management.

I made two errors, two discrepancies between telepathology and the light microscopic diagnosis that I made sometime in the distant past. Those two discrepancies wouldn't have had any clinical impact at all. Taking it one step further, but one other prognostic aspect in the grading of any tumor, in particularly breast cancer, is to grade the tumor. You grade that on a basis of various nuclear features and morphological features, none of which is

relevant to this audience. If you take CIS, that is an abbreviation for carcinoma in situ, namely non-invasive disease of the breast but will become malignant if left in the breast untreated, and invasive cancer at the bottom. Again I performed extremely well in all of these categories where you were comparing telepathology with conventional means and so on. None of them, in fact, virtually had any clinical impact with the exception of one case.

That shows you that it is diagnostically as good as the conventional way of doing it. However, diagnostic accuracy is in itself fine and is a sine qua non. You couldn't use the technology unless I was going to be as accurate diagnostically as the conventional way of doing it. But if it took me ten times longer to do it than I would under normal conventional circumstances, that is not a cost effective way of using my time or any one else's time. This plots the 87 cases that I looked blinded. Showing you what my performance and time was up this axis here, against the accumulated experience I had on the machine which is across the bottom, for the first couple of cases, I took about eight minutes. That is actually not very representative because one of those cases was normally difficult and I'm not even sure that I know the diagnosis yet, even though I have looked at it conventionally. Typically, it shows the learning curve in my rate by the middle of the first day had gone down to about three minutes. In fact, it has clinical utility in that its diagnostic accuracy is high. Secondly, it is almost as fast as what one would achieve conventionally.

Just going back now to the other objectives of the Europath project is that the third objective is to look at DNA ploidy. Again by just the sentence of reasoning behind this in this whole project, the objectives are as I have stated and as I will state--but they are all focused on cancer and breast cancer and survival cancer, particularly, because of its commonness in Europe. DNA ploidy is another measure of prognosis in these tumors. We

are looking at ways of evaluating that, with the hope that it might be done all centrally. That part of the project is coming on very well and is organized by some people in Berlin [Inaudible]. I have mentioned the business about interoperability of workstations. Those are interoperable.

So we demonstrated interoperability. We have demonstrated for static telepathology and also for robotic telepathology,

real-time telepathology. We demonstrated its clinical utility for both of these systems. And the other achievements I will very briefly show on two overheads.

What we also have available is that we have multilingual coding of all diagnoses made in a pathology lab, be it related to cancer or otherwise. One simply gives these things a code. That code would be a snowmed code, which was originated here in the US or some of the codes in Europe. Any of those can be used. The report translated to the receiver at the other end. This is a very important thing in Europe where there are so very many different languages.

The other thing is as far as databases are concerned. We are not constructing a new database from scratch. We are using databases which already exist in various members' departments and labs. These are being validated and currently being validated and put into the bank. We are complementing this by case reports, which are usual things that appear in the literature, and from these two other sites, which are indicated on the lower left. Those are stored in a server. That server can be accessed by the internet or by any of these other means which are listed along the top. That data there can then be put out to any user in the European Community, or in fact, anywhere elsewhere you have got the web page number in Grenoble. Thank you.

DR. THIERRY: Thanks to the Commission I would also like to say that there is one other area where there is a strong collaboration already existing with the US on many aspects.

PROFESSOR N.C. GORIN: Thank you. I am not an expert in computers and telematics and I do not feel very well at ease here because if I am an expert of something, it is bone marrow transplantation. I am the Head of the Department of Bone Marrow Transplantation in Paris, Hospital St. Antoine. In addition to this, I have the privilege of being the chairman of the Acute Leukemia Working Party of European Organization which you may know which is EBMT, the European Group for Blood and Marrow Transplantation. It is essentially on behalf of EBMT that I am here.

What we called, in the old days "marrow transplantation" and we call "stem cell transplantation" has become very complicated because you can see here that the nature of the transplant can be either an allograft, with the donor usually being in the family, or a syngeneic transplant if we are lucky enough to have identical syngeneic twins or an autograft by which we take the marrow of the patient and reintroduce it back after several manipulations. The stem cell origin can be bone marrow but also the blood. In fact, as of today, 80 percent of all stem cell transplantations are done with blood rather than marrow. The stem cells to engraft can also come from cord blood. In addition, the D cells remained a minority fetal liver blood cells can be used.

It is not only that. It is not only the nature of the transplant--the source of the stem cells--it is also that the pretransplant regiment that are used are very many. I have listed here: total body irrigation, chemotherapy, radionuclides. We are using lots of cytoclides and

nowadays about 20 cytoclides are available. The whole concept has been regrouped under the words of cellular or eogene therapy. The message I would like to convey is that it is really very complex. That is why we need some help in the telematics applications.

The graft itself is usually manipulated in vitro. It can be manipulated either to prevent very dangerous complication of an allogeneic transplantation which is called Graf versus host disease by which the marrow grafted may destroy the lymphocytes of the recipient, but it can be also in the context of an autologous transplantation to remove from the graft tumor cells.

Breast cancer is number one all over the world. Then you have testicular cancer, ovarian cancer, small cell lung cancer, and, of course, some additional solid tumors may come up. In hematology nonHodgkin lymphoma is number one. Acute leukemia is number two. Then you have Hodgkin's disease, multiple myloma, chronic myelocytic and lymphocytic leukemia. The last one which just arrived less than a year ago is the whole area of auto immune diseases, which mean internal medicine. In 1994 in Europe, you have ten thousand transplants a year. In 1996 we had 16 thousand transplants in Europe and that makes 32 thousand transplants in the world.

The program is called MARGRITE, which stands for Marrow Graft Integrated Telematics in Europe. We have five contractors. The first one is EBMT, which I represent, the European Organization for Transplants. The second one is BMDW, Bone Marrow Donor Worldwide in Leiden in the Netherlands, which is responsible for looking for a compatible donor in case you do not have a allogeneic donor within the family. The third one is the CITI 2, which is a French university organization working on telematics. Then

we have Francois [Inaudible] [Inaudible] and EFG which is [Inaudible] which is part of the French Ministry of Health.

In fact, the goals of MARGRITE are essentially two goals. The first one is to interconnect all the registries throughout the world so that through internet you can find at once possibly a compatible donor, unrelated donor, or a cord blood, stem cell source for a given patient. That is very important. The second one is to build an international registry of all transplants performed. At the moment we have this registry in Europe with a database of 44 thousand patients being transplanted. It covers almost the world. It does not cover the US and Canada where there is a corresponding structure.

End of Side A, Beginning of Side B

The goal is to interconnect all transplant centers within Europe. LT2, LT1, all these are individual centers. They will be all connected to national networks. The national networks will be all connected to an international server. Therefore, when it is over, the goal is to have workstations at each transplant center where the physician will be able to enter the data online immediately on all patients being transplanted. But this is just the entry part of it.

The query part of it is to be able to interrogate these databases and ask interesting questions not only on distribution of patients, or indications of transplants, but also on some easy results such as: how many male patients 55 years and older with a chronic lymphocytic

leukemia were transplanted with total body radiation in the world, or in Europe for the past year? Is it something wise to do for my particular patient?

So we built the tables to collect the information and what has been built so far is listed here. We have information on the center, the patient, the nature of the graft, allograft or autograft or cord blood transplants. Then you have the data being collected by different diagnoses.

The most important part of it will be the data retrieval and other services. As the other speakers mentioned, MARGRITE is not alone. MARGRITE is integrated in the action cluster which is in the DG-13. We are working with some other projects, one being PROMPT, the other one being Europath, and also Macro. I don't think I do have to detail these projects for which I am not responsible, except that we are working together. PROMPT Is providing a very interesting tool for MARGRITE in that it gives us the possibility to monitor patients being included in prospective randomized trials. This is going to be followed at the bedside, not on by the physician in charge but also by the students and the nurses. Europath is about collecting images because it is very important to add images to any database on stem cell transplantation, like CAT scans or biopsies. The last one is Macro, but I don't want to cover this, it would be huge. Thank you.

DR. THIERRY: I want to introduce Jean-Louis Renaud Salis. He is responsible for one of the projects in what is called the Cluster for Cancer Projects.

DR. JEAN-LOUIS RENAUD-SALIS: The European Commission has funded since 1996, a set of projects in telematics for health care which are for focused on cancer. This set of

projects is termed [Action for Action for Telematics in Oncology] and includes ten projects. Going from clinical research to clinical [Inaudible] through education and training and patient care applications. ECOLE and PROMPT are two of these projects.

They are closely related. They have been designed from the beginning to be conducted in collaborative way. They are intended to provide the knowledge level cooperative tools for collaborative working between experts and end users, or potential end users, involved in the development of clinical practice guidelines based on evidence. ECOLE/GRIP stands for one European collaboration in oncology [Inaudible] and grateful getting research into practice. I will not go into detail on ECOLE. What is important to understand is that it is going to provide the European countries working on this project with tools and services that can speed up, facilitate, and cut costs in the process of literature analysis, which is very costly. Also it can be shared between civil countries because it is more or less standardized around some well-designed and well-defined methodologies. These people can literally then put these to review to provide the world with raw material from literature analysis, which will service for each country to develop their own practice guidelines. Because everybody knows to date that it is not possible to impose from the top international guidelines that have not been [Inaudible] for national or even local use. ECOLE has a set of tools that have been designed by using existing technology based around Lotus, which is now Domino and which is the web server standard more or less with the nodes facilities. One point is that ECOLE/GRIP will provide structured knowledge coming from the development of evidence-based guidelines for use by clinical decision support for clinical users. The knowledge development work into ECOLE/GRIP is intended to provide the methodology and approach to extract the knowledge from clinical guidelines to guide the

guidelines as well into the process of providing very well-structured and consistently structured knowledge for used by the decision support system. PROMPT is intended to validate European standards or prestandards in the electronic patient or architecture and some of the standards we will see later. It is intended to validate them by validating on site a distributed electronic patient record with communication between professionals in regional networks. The guidelines-based decision support system. Practical knowledge is an old sector of messaging communication based on [Inaudible] and probably standards as well.

The main thing is that the European Community started these programs of R&D in medical telematics some nine years ago. One of the main outcomes of the first five years of this project has been the setting up a of European committee for normalization or standardization in medical informatics. PROMPT is using and trying to validate a number of the standards that are related to open distributed processing. This one is not a European one. It is [Inaudible] one. But the CENTC ones have been established by the community. We are using the healthcare information framework standard, the architecture for healthcare information system, and the electronic healthcare architecture, which has been designed by the Commission, and a number of standards for electronic data interchange.

PROMPT is based on the three-tiered client server architecture. The first deals with the legal system and with database and document database or image database tools--this kind of generic technology which are [Inaudible].

What is important to look at is the middleware layers, the one between the application layer and the database layers in HCC systems. All of the small squares with HCC means that these belong to the CMTC European healthcare system of architecture. These are services or competent objects, or business objects, which are generic and can be used as

[Inaudible] working together and working one with the application layer and with the database. There are six of them which deal with patient identification data, clinical data for the patient, the [Inaudible] server, the enterprise management server, [Inaudible] management servers, terminology and nonservers. The other ones are specific to [Inaudible] plan Z. knowledge-based management server, and the three ones are very generic web servers. You have a medical component and generic component at this level which can communicate with the applications. The applications can be built by using these services and combining these services to provide the set of information [Inaudible] according to the business of the users.

I would like to emphasize this. We have three layers as well here. One is the generic medical knowledge model. We have used the UMLS semantic network structure to implement this into a relational database. This provides medical taxonomies and terminologies and hopefully unified terminologies and maybe French terminologies in the future. The guideline knowledge model superimposes structure which is temporal when one use the acts in protocol and [Inaudible] without the secretary or competent acts which are to be used within guideline or protocol, and is built on the terminal G and the last [Inaudible] is patient record model which is compliant with the ECNTC model. We are on the way to solving the problem [Inaudible] Europe medicine and semantic network as well. The problem of having a control vocabulary, but this is one issue which probably will be discussed tomorrow morning because it is a critical issue. Thank you.

DR. THIERRY: What we are doing with telemedicine now in Europe, there is a convergence from the nice, easy-to-use interactive tools of telemedicine and the complex issue of the medical record, the health care record. Obviously, it is of strategic importance

for them to converge and in those projects we may have the kind of integration already showing.

DR. ROSSING: Thank you very much for the presentation which shows that data will not be information until structured. We will move on to Ms. Catherine Viens-Bitker coming from Assistance Publique in Paris. Collaborating hospital in Paris. I think there are 37 of them. You'll tell us how many there are where they do much evaluation of telematics.

MS. CATHERINE VIENS-BITKER: I am here also because the Assistance Publique Hopitaux de Paris is the coordinator of the European project which is a test project for technology assessment in telemedicine. We consider in our experience to conduct as to consider that technology assessment is a key issue for the diffusion of telemedicine services. Just some words about the Assistance Publique Hopitaux de Paris which is a very big regional university hospital institution, with 50 hospitals and 31 thousand beds, 9 hundred thousand admissions per year, and four physical ambulatory visits. This institution is implemented in the regional Ile de France which has 11 inhabitants. The background of the Assistance Publique Hopitaux de Paris in health technology assessment is rather important with the committee well-known under the name of CEDIT Committee for Evaluation and Diffusion of Innovative Technologies, which has been created in 1982. This committee is a full partner of the International Network of Agencies Health Technology Assessment, the INAHTA. Maybe some of you know these organizations. The project that is included in the European project, and I'm going to present to you, has received the level of the French Information and Service Highways; now it is included in the European Telematics

Applications Program, TASTE, for technology assessment in teleneuro medicine. This project TASTE is based on telemedicine services for neurosurgery emergencies, and the partners are the EPHP, that has set up a teleradiology network for the neurosurgical emergencies and also the hospital of [Inaudible] that has set up a similar network for neurosurgical emergencies, and three health technology assessment agencies.

Just to tell you why technology assessment is a key issue for us, I am going to give you some results of our experience. There is an organization for neurosurgical emergencies, and we have 7 departments, no surgical departments implemented in the APHP hospitals. They receive all the emergencies from the region. The medical needs have been known in 1992, medical needs for teletransmission system or teleradiology network. We wanted to know how many patients and what were the medical needs. On these charts you can see that each year there are six thousand patients that are transferred to neurosurgery on duty departments, but only 2 thousand patients are hospitalized in neurosurgery departments. All the others, the four thousand patients are retransfers, and most of them are retransferred in the sending hospitals. This is what we can call unuseful transfers of patients. The radiological diagnostic of these patients is normal in 35 percent of cases. The brain scanner can show in 32 percent cranial chromatism, and in 20 percent strokes. And strokes are not taken in chart in these neurosurgical departments.

After these studies, we considered that it was very interesting to set up an experimental teleradiology network between 15 hospitals of Paris. All the hospitals in the network have a red star; the hospitals with neurosurgical departments. This experimental teleradiology network has been set up to verify the fact that teletransmission of medical record with medical data and image data can avoid useless patient transfers. The

teleradiologies network is functional since 1994. The equipment and software, I suggest a few words to say that it's PC based with direct acquisition of image from the CT scan, and the telecommunications network is ISDN public telecommunications network. We have paid much attention about the confidentiality of data protection. These are measures that are integrated in the software of the network with the identification of the workstations and users, data encryption, and normalized transmission protocols, JPEG lossless compression nonerasable and automatic carving. Also the technology assessment conducted us to consider that this is not a teleradiology network, but this is telemedicine services. That's why we have conceived this network in this prospective, and it is a medical record which is transmitted, and the quality assurance procedures that are written. All these procedures are written and contractually based between the hospitals. Also ethical issues have been considered very important, and in the contract between the hospitals, the responsibility of each of the partners is very well-defined and precise.

The aim was to do the evaluation, the medical evaluation and economical evaluation of this teleradiology network. For medical evaluation, the aim was to verify the effectiveness of the system to avoid useless patient transfers. Also to verify that there is no secondary effect induced by the system. We have done prospective studies during three months, and the criteria of effectiveness was the probability for patients to be hospitalized in neurosurgery departments when addressed in emergency. As you can see below the result is very good. The system has been considered very effective because for the patients that have had the teletransmission of their medical record to the neurosurgical department, when they have been transferred to the department, they have been hospitalized in 82 percent of cases versus 33 percent when there is no tele transmission of the medical record. Globally we can

see that 50 percent of useless transfers have been avoided with this system. Most important, we see no secondary effect due to the system. From the economic point of view, we have done three things. The first is return on investment. Return on investment is on this diagram. You can see cost is on the investment cost. The gains are the transportation gains that we can obtain. On this diagram, you can see that we need to have more than one thousand teletransmissions, medical record teletransmissions to have a return on investment. Practically today the activity of the network is under; it is about five hundred teletransmissions.

The other point of the economical evaluation was the cost effectiveness in [Inaudible]. This cost effectiveness in [Inaudible] is based on these hyper[Inaudible], the activity which is in fact four hundred teletransmission per year for the neurosurgery, voided transfers, 50 percent, 200 voided transfers. Total exportation costs per year, is in US dollars. We have added all the costs, minus by the voided transportation costs. The final result is not good in terms of cost effectiveness because it is a net cost per voided transfer of $1800. This is a very interesting result because it shows that cost effectiveness in [Inaudible] in many times is not a appropriate for these technologies. Because it is a very reductive approach of all the benefits of these technologies, even medical benefits because, for example, the clinical outcome of this system for the patients is not measured and is not valued. It is very difficult from a methodology point of view to measure and to value these. Clinical outcome is not taken into account. A cost benefit analysis may be more interesting, but practically not available. Because we have so many effects to measure for the patients but also effects for the utilization of resources and effects for the hospital organization, and practically this

approach is not very easy and very effective. Some people consider that these technologies are diffused technologies.

End of Tape 1, Beginning of Tape 2

...framework of the welfare, but maybe more in the theoretical framework of the industrial economics. But this is not my subject today.

Just to say that the technology assessment has conducted the AP-HP to decide first to open the teleradiology network to nonAP-HP hospitals of the region Ile de France also to hospitals from the rest of France, but also to international. Now the network includes 22 hospitals, but in a few months it will include more than 30 hospitals. The second decision is to supply other telemedicine services on the same teleradiology network. This is not only from an economic point of view but also because for the physicians to get the habit of using it very easily. We need to have many utilizations of this sort of infrastructure and workstations. Now in evaluation osteo-articular imaging, hepato-gastro-enterology and pediatrics.

This is just to say that this is our experience. In the European TASTE project, the aim is to produce guidelines to assess telemedicine services, our first goal is teleneuro medicine. We want to produce guidelines for technology assessment of this. We consider that what is important is telemedicine services and not the infrastructure or the technology. Secondly, we consider the technology assessment is very important for decision makers to implement, to develop, to diffuse these technologies. We consider also that the project management is a key issue for these technologies. Because if you just implement and just

put the equipment of the software in the departments or in the hospitals, after you go out and leave everything like this, you can be sure that nobody will use these new technologies. Also, the fourth key issue, but it is a long term one but very important to manage and to study in the research towns, is change management. Because, in fact, what we are waiting from these is effectively change in medical practice and change in organizational issues. Thank you.

DR. ROSSING: Thank you. We will move on to a suggest that we haven't touched upon but which is very important applying telemedicine at sea in the maritime services.

DR. JEAN-YVES CHAUVE: I am the Director of IBSV which is first add assistant service for extreme conditions. The IBSV service will share its medical information with specialtists through said exchanges obtain appropriate advice. To improve the quality of this service, research is being carried out within the frame of European project like [IBSU] involving the Spanish and Greek official medical maritime assistance centers. Medical practice is based on procedures resulting of experiences accumulated by physicians since medicine exists. When consulting, a physician traditionally undertakes four distinct investigations to determine the symptoms of the disease: patient's interview, visual inspection, palpation, auscultation to which complementary examinations may be possibly added. These concern imaging and the recovery of various physiological data. Adherence to these procedures ensure the establishment of a correct diagnosis. Remote medicine is merely an adaptation of the conventional medical practice to the new telecommunication means. In doing so, the

procedures of the latter must be adhered to. All investigations and researches described herein are based on this principle.

Diagnosis eventually leads to the implementation of medical care measures. The prescription, however, must be adapted to the constraints resulting from distance and permit the implementation of these measures by an isolated person without medical training. This is also one of the targets of our project.

The first problem is remote collection of symptomatic information. The main difficulty in remote medical assistance is that the patient is far-removed from the physician and the sensations he feels are often the only elements available to apprise the complexity of a given pathology.

Two distinct issues result from this. First point, compiling medical information. This is carried out by the patient himself, in isolation and without medical experience: the patient must identify his own symptoms. The resulting anxiety is accentuated by physical pain and the conscience that immediate, direct help is impossible. This problem makes the compilation of medical information considerably more difficult. Despite the isolation, this inventory of symptoms, equivalent to the questioning by a physician during a conventional consultation, remains essential in establishing a diagnosis.

Second point, transmission of medical information. Difficulties at the level of language. Once the patient has identified his symptoms, he must explain sensations which are often very vague. For his part, the physician must "translate" this language into precise scientific data.

Method of transmission by radio: transmission is lengthy and difficult, with a low quality reception which may induce interpretation errors. Moreover, this kind of exchange is not confidential.

By electronic mail: this transmission method may be used on satellite networks. It is confidential but removes direct dialogue and, therefore, the "comforting warmth of the human voice." Furthermore, typing on a keyboard represents a considerable effort for occasional users. Finally, exchanges are subject to errors and difficulties of comprehension if physician and patient speak different languages.

In an attempt to solve these difficulties, we provide a medical manual book, a medical software, including transmission procedures. The general concept of these documents is a list of symptoms known as "leader symptoms," which are those which make a patient call the doctor. For each leader symptom, there is a list of secondary symptoms which specify the disorders associated with them, schemes to illustrate and locate the disorder with precision.

The patient transmits only the relevant symptoms codes, allowing a minimal transmission time, fewer difficulties in drawing up the document and fewer inaccuracies and errors both in the transmitted text and in localizing the disorder. Teleconsultations of this kind have a significantly positive effect on cost and efficiency.

The doctor is able to complete his information using the same method. For example, he can ask the patient if he is suffering from another disorder by using the relevant code. In this way, the speed and efficiency of the patient-doctor dialogue is greatly improved while reducing the risk of errors or misinterpretations.

The medical software with the SAMAID Software, the patient uses the same principles. Starting with the symptom he observes, which he selects on the screen, the

patient navigates among the symptoms associated with the lead one and collects those he also observes. The file he so creates is then sent to the Assistance Service. Within this configuration, the information collected by the patient is sent to the physician, using a codification specifically developed for this purpose.

After decoding, the physician has access to this information and to all sketches, which appear on his screen, in his own language.

These two methods, which provide an exhaustive collection of symptomatic information, may indeed fit into the sequence of conventional investigation procedures. The patient may so provide information on his own medical history, on the appearance of the symptoms, the troubles he felt and the side effects, the physical consequences and their evolution. Once gathered in a single transmission, this information will be used by the physician to establish a reliable diagnosis in a short lapse of time and propose an efficient treatment.

The second problem is the prescription and setting up of treatment. Two point: the prescription of drugs and the prescription of care. No remote medical assistance can be efficient if the isolated individual does not have medical equipment or drugs at his disposal. This must be efficient, especially in an emergency. It is in such a situation that correct and rapid action is decisive. The drug must be easy to use by a person who is not medically trained, practical and simple. The anxiety inherent in such acts limits the use of sophisticated equipment; complete, in an isolated situation anything can happen; versatile, one product must have multiple uses; light, transporting the case must not be an obstacle; resistant to aggressive climatic conditions; the last point is of reasonable cost.

Since more than ten years, we have worked on the development of a medicine chest for isolated sites. We tested its content during numerous competitions, such as the recent "Vendee-Globe." It is comprised of a medicine case in which products are stored in accordance with a standardized setup, of a utilization guide and of a manual describing the basic gestures of first aid and small surgery.

In order to cover all the pathologies which maybe encountered, it is important to propose care measures adapted to the traumatic accidents which are very frequent in remote isolated locations, where hostile or even aggressive conditions often prevail. The care techniques developed here must meet the same requirement for simplicity and interactivity in order to be accessible to subjects without medical training. The procedures are described in the patient's language and the different sequences are depicted on sketches in order to permit a step-by-step follow-up.

The software is so organized that the completion of a given sequence must be confirmed before the following is initiated. In the case of an emergency, an animated description of the procedure is given for a better efficiency. These techniques are not meant to provide the person providing care on the spot with capacities he does not possess, but rather to facilitate the remote monitoring of the whole operation.

During this summit, we have an experience which is running on a boat during the Captain Boston race on the BT Global Challenge race. The same boat arrived in Boston in two or three weeks. In these experiments, exchanges are symptoms felt by a simulated or real patient, electrocardiograms SEG, done by the medical doctor on board and simulated prescription transmitted by a doctor on shore. Within the frame of the Atlantic experiment, the [Inaudible] the medical board [Inaudible] [Inaudible]. In turn the supervisor will ask

advice of a cardiologist if an SEG is transmitted. This specialist of database is able to show the received SEG and to feed computer-assisted analysis.

The medical work on board will consist in the checkup and the following of all the crew. All this information will be regularly sent to the medical service. When a medical problem occurs, [Inaudible] has accurate information and the situation and is about to inform correctly the services that would be required for repartriation for example, insurance companies, public emergency services. Exchange during this experiment, we transmit SEG and the main of our research is to assist the collection and use of complement examination such as an SEG. This involves assisting the [Inaudible] of qualification required for using the equipment depending of its ease of use. It is also involved in defining procedures of use and training of those who will carry out medical support on isolated sites. The digital-electro cardiographic recordings would be legible on shore in a very short space of time, directly on the computer screen. There are several advantages using this technique. The numeric coding enables transmission without loss of quality despite the different means of communication used. Interpretation of the recording is carried out by the doctor consulted despite the distance. By [Inaudible] the recording, it is possible to show the medical file as a complement with all calculations to obtain a clear diagnosis.

All this technology is very cheap, and it is one of interest of this type of transmission. Thank you.

DR. THIERRY: There is some kind of EKG standardization for EKG transmission that has been an ongoing project in Europe called I4C. Just because we are in Boston about the rules of engagement I would say a company from Boston is associate contractor in I4C in Europe

because it has an established R&D in Europe. It is Hewlett Packard. It is real work going on there also. Within the standards for [Inaudible] will be a real standard.

MR. MICHAEL ALLEN: My name is Michael Allen. I am from Halifax. A question for Dr. McGee about your real-time telepathology project. Is there a time delay between the time you give the command to move the remote microscope and the time you get the feedback saying that it has obeyed your command?

DR. MCGEE: There is no delay. We were using ISDN for with 8 coupled lines in there. In operating the microscope at a distance, you can operate it directly from the PC. But in addition, there is a little joy stick there. There wasn't any delay in doing that. There was a delay in changing objectives because there is a physical delay in actually changing the objectives. That is all done robotically. On your monitor, it actually tells you objective being -- it happens as quickly as this. Objective being changed, elimination being adjusted, autofocus being performed. Those are the delays, but those would be the delays which you would encounter using a regular microscope. I was very happy with it, I have to say.

MR. ALLEN: So they are not a long as the time delay you get when you are doing a video conference, and you ask a question, then you have to wait a second or so?

DR. MCGEE: No. The nice thing about it is the menu or the monitor actually tells you what the machine is doing at a distance. So that if it is still focusing or is still adjusting the

elimination.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

MILITARY TELEMEDICINE PERSPECTIVES

LIEUTENANT COLONEL RONALD POROPATICH: Good morning, everyone. I am Ron Poropatich, a pulmonary critical care physician at Walter Reed Army Medical Center in Washington, D.C. Military telemedicine started back in 1992 with deployments to various peacekeeping and humanitarian missions overseas. Our focus is now on continued support of those missions, and also on developing telemedicine in our regional areas, where we take care of patients and teach and train our staff. Our goal is to provide a cost-effective means for delivering patient care as we downsize our force. This group will be covering a large range of topics, from international telemedicine to immunization tracking to low-cost solutions for doing telemedicine.

I'd now like to introduce Colonel Edward Gomez, a vascular surgeon at Walter Reed Army Medical Center and Chief of our research and development efforts for telemedicine.

COLONEL EDWARD GOMEZ: Good morning. I see telemedicine going from a very immature to a very mature stage, as we begin actually to incorporate it in our clinical practices. The key element missing, however, is a fund of clinical trials. I want to show you one of our ongoing clinical trials which has passed the Internal Review Board; and I will present to you the solutions we propose.

I want to acknowledge our research team, which includes not only myself but also two pediatric surgeons, a neonatologist, a research nurse, and a Ph.D. candidate who is doing the biostatistics for us.

Let me give you a little background. A lot of times when we look at telemedicine we first look at applications, and then we look at requirements. In the military right now, we are undergoing a consolidation of our services. The neonatal unit at Walter Reed was moved to the National Naval Medical Center, but the pediatric surgeons have remained at Walter Reed. This created a gap in time and space in our consultation work, which led to a very ideal research project. Certain pediatric surgical problems required the physician to drive across town to the National Naval Medical Center. This trip takes 15 to 30 minutes, depending on traffic conditions. We thought this would be an ideal situation for evaluation of telemedicine technology, because those 15 minutes can be very crucial. As a surgeon you can make a diagnosis and institute care immediately, and these initial interventions are very important in terms of critical care management.

The objectives of this research project exceed the demonstration project concept. We wanted to carry out a formal prospective clinical trial and look at telemedicine technology in terms of efficacy, efficiency, and provider and client satisfaction. As a physician who has worked with this technology for several years, I've noted that we have insufficient user acceptance. We really needed to figure out why. Another focus of the research was cost containment. We can't go in the high end. I wanted to use a desktop because I think that's where we all work. What is really interesting is doing this in an intensive care unit. In addition, we determine not only the provider satisfaction but also the client satisfaction. Finally, there are technical questions we wanted to address, involving both major modalities of telemedicine.

This was our solution. We needed a record of clinical trials. You can tackle this medical record in inpatient or outpatient trials. In the military we have what we call Form

513, which is a consultation record. And we created an electronic record. We developed client server architecture so that the medical record always resided at Walter Reed. You can access this record through the local area network. It is a relational database, so you don't have to enter the same information twice. Another objective we worked on was developing medical image transfer and storage. I think the most exciting part of this was that we were able to write scripts, so that if we generate a consult, we can page the pediatric surgeon. We can track the consult. We can track the consultation. What is even more exciting, we developed the evaluation database into the medical record.

Our video teleconferencing software was built into the system, and was easy to use. We got away from the techies like myself to the end user. We really needed to make this easy to use, sort of plug and play: just pull it off the shelf and use it. We wanted white board capabilities. We wanted not only to be able to look at each other; we also wanted to be able to project an image, be able to interact with that image. In addition, we wanted the ability to capture and digitize the image taken by the video camera. Our network is very straightforward and low-cost. We use ISDN for our video transfer. And we use a second ISDN line through the Internet for creating our client server medical record.

In terms of our research design features, we set up a controlled, randomized, blinded prospective study. We've selected 14 of 30 patient subjects we need. I cannot tell you what the results are because the study is blinded. We did our Phase One pilot project, testing equipment which was completed in December of this last year. We are now in the actual phase which ends in August, 1997. We are well on our way to getting all the 30 patient subjects in line. These are very sick children. We have been very pleased so far with the project.

Here is a real challenge: when you start looking at telemedicine, you have to put these through IRBs. We had to do it twice: once at Walter Reed and once at the National Naval Medical Center. This took us nine months. If anyone has written a clinical protocol, this is work, hard work. This is the algorithm. We have a problem that's identified. We have a consent form because research participation requires consent. Then we randomized the telemedicine or conventional means. In the conventional approach, the surgeon just gets in his car and drives to the National Naval Medical Center. Then we break it down from there.

We developed a consult database which allows us to enter our new patient. We can track the patients down. We can follow the consult status. What I really want to show you is that we have the research database that is part of the consult database. You really can't get out of this telemedicine consult until you have completed everything.

The system is menu driven, very easy to use. We incorporate the images. These are actual real cases. This is a child that had colitis and a colostomy. We can embed images within the consult form, which is really very useful because the physician doesn't have to open up a number of applications. He just clicks on the consult database and the images appear along with the corresponding record.

In summary, what we have developed, basically, is a desktop telemedicine project. When we visualized this two years ago, people thought we were a little bit crazy because the desktop system wasn't really mature at that time. But we had been working with the industry and with a nondisclosure briefings, so we had an idea where the market was going. We also knew the detail that it takes to do a clinical trial. We knew it was going to take us at least six to nine months to do the IRB process. We were right on target with that when

we laid that out. We had to get the communication system set up in the intensive care unit. We can't move the patient to the unit; we have to move the unit to the patient. Within the intensive care unit, we have to come in and put four individual drops that serve the entire intensive care unit. We got the clinical protocols designed and approved. It was very interesting to formulate the hypothesis. It is not like other clinical trials where you have a gold standard or placebo, and you want to be better than the standard. Here the hypothesis was that we achieved the same quality as the standard. The standard here is conventional. So when you wrote the hypothesis, it was a little bit different. The other objective which we achieved quickly was developing the medical record. It is integrated with the evaluation database and the tools have all been developed. We have shown that low-cost ISDN works very effectively. The costs really are minimal. ISDN costs in the Washington, D.C. area are $50 per month. So the project itself is inexpensive, but nonetheless it is able to give us the answers. Thank you.

LIEUTENANT COLONEL POROPATICH: In telemedicine collaboration among military, civilian or international personnel, it is the people rather than the technology which ultimately makes programs work. Colonel Gomez' research is a good example. Next on the list is Dr. Robert Vandre. Dr. Vandre is a double threat. He'll be addressing us about teledentistry in the U.S. Army. Dr. Vandre's other hat is Deputy Director of the Telemedicine Research Laboratory at Fort Detrick, Maryland.

COLONEL ROBERT VANDRE: Thank you. When we think about telemedicine we often don't think to include dentistry. We actually are investigating how to use this equipment in

dentistry. Of course, our first priority is patient care. Within the Army and within our military as a whole, we have quite a few locations where there is only one dentist; there are no specialists at those locations. I happen to be the only dentist at Fort Detrick, where our lab is. If I have a patient that I can't treat because his problem is beyond my ability level, I have to send that patient to Walter Reed, which is about 40 miles. This may not seem like very much, but when a patient is transported that 40 miles, it is very time-consuming. Many other things are done en route, like stopping at the PX and the commissary, and they don't get back to their units very quickly. We also use telemedicine to consult with dental laboratories. Our laboratories make all of our crowns, bridges and dentures. If you have an extracted tooth which you need to match, you can tell the lab what shade you want. But to closely match the lines and the colorations on teeth, you have to have a picture. It is very difficult to use 35mm film for this job. If your camera is on picture number one, and your patient is in your chair and you take that picture, you'd have to waste the other 23 frames to develop that one picture at the lab. And you'd have to wait a couple of weeks for the photograph to come back from the lab, before you could mail it. Obviously electronic technology is a much better way to do this.

Our dental residents are also using this technology. They use it for continuing education, and for residents' telementoring. We have residents going out to posts like mine where there is only one dentist. If we have a lot of root canals that need to be done, we can send an endodontic resident there. He can work for a month or so while remaining in his residency. If there is a special lecture back at his original post, he can watch and listen to it. If there are case reviews by other residents, or if he wants to show a case to his mentor, he can do that using VTC equipment. We have done some studies between Fort Gordon and

Fort McPherson, which are 120 miles apart. McPherson has only a few dentists while Gordon has many residency programs.

We are looking at post-surgical recalls. When a dental resident performs a surgery, he needs to monitor the healing a week later, when it is time to take the sutures out. If the surgeon has not worked carefully, blood supply can become compromised causing flaps to slough, a very adverse outcome. If you don't see those things happening, you'll never realize that you have been making mistakes. Residents have to monitor this healing process. The patient might be coming from 120 miles away just to have his sutures taken out; whereas any dentist can take sutures out. But the resident needs to see the healing. Obviously, if you can send those pictures electronically, you can save that 120-mile trip.

We investigated this issue, and discovered that they were wasting a whole day's work when they went for those trips. All of our patients work for us. We lose not only the travel cost, but we lose the patient's man-hours that day. We found out that we save about $206 every time patient travel between sites could be eliminated. Now we also found out some other things in our preliminary study.

There were only two patients out of the 40 that did have to travel. In both cases, you couldn't see at the other end what you needed to see. One time the equipment didn't work correctly. The other time they just couldn't achieve a good image at the other site. One criticism we heard was that you're not saving any money by using a doctor at both ends; you're are actually making more people work than normal. Our method was to have a dental assistant at Fort McPherson, the referring site, who would seat the patient and take the images. There was no dentist involved. The specialist at the other site would look at the images and make clinical judgments. So there is only one assistant and one dentist involved,

which is the normal complement of people that you would have in your regular office at Fort Gordon.

On six occasions, though, problems arose, and they needed to get the dentist from down the hall at Fort McPherson to come in and help. Four times they found serious problems with the healing which necessitated procedures that the assistant couldn't do, for example, placing drains. In these instances, the other dentist's help was needed.

We are currently doing a business trial of teledentistry in Europe. Every Army dental clinic in Europe has teledentistry right now. There are 30 systems using plain old telephones, a system called Sharevision which is made by Creative Labs, the sound-blaster people. That system cost $500. We are using that for the patient care part. We are also using 8 ISDN Picturetel desktop systems for business meetings and for continuing education. You can't do multipoint with POTS Systems at the present time.

We are gathering data about the different costs and how much money can be saved. This is the cost for a single site. We are using an uninterruptible power supply for our computers. We placed the equipment on a cart, and of course there are telephone lines all around the clinic, so they just roll it to whichever chair where they are going to be treating the patient. You don't have to take the patient to the system. If you have an UPS, you don't have to turn anything off. You can just let it keep running and just plug it in from one plug to the next.

The most expensive pieces of equipment are the intraoral camera and the document camera. The cameras tend to be very expensive, but we found we needed both. We were hand-holding the intraoral camera over things like radiographs. But it is hard to get the right height, and to get it in focus. So we had to buy document cameras with it. The Sharevision

costs about $10,000 per site. The desktop systems using ISDN cost almost the same amount. Instead of the Sharevision, we are using the Picturetel PCS 50 system which costs about $3,000, about $2,500 more.

LIEUTENANT COLONEL POROPATICH: Thank you, Dr. Vandre. Colonel Renata Engler is the Chief of Allergy & Immunology at Walter Reed Army Medical Center, and is a champion in developing an immunization tracking system, which she's going to discuss with us now.

COLONEL RENATA ENGLER: Thank you. When you talk about making a difference worldwide, it is no small difference to immunize our population against diseases. Immunization delivery and tracking is really a global challenge. In the *International Journal of Immunology*, the World Health Organization reported that the deaths of three million children could have been prevented, but that vaccines that are available to prevent the disease were not delivered to them. The main target has been children, but in fact, we are talking about cradle to golden years. Vaccines can prevent deaths, morbidity, and untold dollars expended in health care. Yet immunization programs aren't as glamorous and CCUs and ICUs. Immunology is really an orphan in many medical communities and institutions. Delivering vaccines is definitely a challenge. Many of you may have read that President Clinton has just begun to a assign an NIH section for AIDS vaccine development. The target goal is to have that available in ten years. I would propose to you that the challenge of delivering a vaccine is as great as the challenge of developing the vaccine. This is certainly true of the 30 vaccines in the investigation pipeline right now that can prevent major

diseases.

I come from the trenches. I am a clinician who runs a training program. We have struggled with this problem of delivery and tracking for many years. Everyone knows that vaccines are cost-efficient and beneficial. If you remember the iron lungs of the '50s and '60s, we would be crippled by that cost today. It is a lifelong requirement with increasing complexity and a limited capacity for deployment, because we don't actually have very many trained personnel. There is talk about pharmacists delivering vaccines. I would suggest that there are some problems with that unless we give them intelligent tools and protect the recipients.

We have a desperate need for a universal database. In the military, where we have 8.2 million beneficiaries for whom we do lifelong tacking, we need that data to be entered in real time, and we need to review it in real time. Not just for the mission of readiness, but for what I call immune wellness and readiness for living.

The Allergy and Immunology Department of Walter Reed is just a microcosm, but I suggest that the problems exist at the level of the microcosm. You get all the microcosms together, and you begin to solve the bigger problem. We have been involved with physician and nursing training in immunizations for greater than 20 years. When I speak of immunizations, I'm talking about immune surveillance as well tuberculosis skin testing, panel testing, et cetera. These are overlapping missions. It is a reference site for problems. Our system gets worldwide calls because there is no one else available who is knowledgeable enough to help solve problems. Should we vaccinate this person or not? This person had this side effect. Are they excluded? Etc. The volume has been so high that we have had a desperate need for over a decade for a user-friendly, educational facilitative system for data

collection and management. Despite the fact that there has been a call from the Centers for Disease Control, that the World Health Organization has been out there, that paper after paper has been written, we are really still not very far.

As I began on this journey as a really frustrated clinician, looking at POTS products and looking at what administrators had planned for us, I realized that they did not understand our pain. What we needed was the ability to have a universal database. So I tried to learn, as I began the project of creating and developing something that would solve the problem. In that context, the issue of data standardization came up over and over, as it has at this meeting. I said, well, is there a standard? Does it exist? Lots of people have sites, and in the military we have numerous stovepipe automation systems. They can't talk to each other. It cripples us in our population that is mobile. Lo and behold, I discovered that the Department of Defense had actually invested several million dollars, I think close to nine, to contract to write a business model for data elements and for data connectivity. This is called the FAM-D, which stands for Functional Area Management of Data. It incorporates data standardization elements HL 7 SnowMed, et cetera. There is also FAM-A, which stands for Functional Area Management of Activity, or the business model of connection of those data elements. Because what we are really talking about is the largest database that has ever existed in the world. Lifelong; not store it and find it, but online, available, indefinite immunization. Also, this overlaps to many other missions like preventive medicine measures. This connectivity of multiple areas, I think, is an area that clinicians need to drive because It is we who see the connectivity; the administrators don't.

This is an evolving model that identifies the scope of business activities and the external interfaces. It can be updated and extended to reflect improved business processes

and policy changes. It is in the public domain because it was funded by tax dollars. It is a common functional architecture for system migration and compliance. It is a beginning for change management, in terms of immunization and tuberculosis skin testing. As all of us know, both software and hardware are likely to be different in five years.

Data are the key. The rapid evolution of hardware and software, whether Macintosh or IBM--it shouldn't matter. What is really important is that, when I do something for a patient and review his immunization record and what is needed, and then put in a plan, no one else should have to do that over again. If you talk about wasted work, the pain. My nurses cry. In fact, the nurses who don't have a voice are the ones who do this work, and they need some relief. I am up here speaking for them.

We have a model here that potentially provides us a framework that can eliminate stovepipe systems. So what I do in my little project is already positioned to plug into a larger whole. It can move to common operating environments. It can identify duplications in future systems that arise. It can allow for technology and dependence. It can be a framework to build consensus. It can be reused and extended. I think, internationally, we need immunizations, which is the single most important part of preventive medicine, disease prevention and dollars savings. We need some universal standards, and we need to figure out how to create user-friendly educational systems, because who is going to deploy the vaccines? There are not enough allergists, infectious disease doctors, preventive medicine doctors, or primary care doctors. There aren't even enough nurses to do the job well. So the challenge of doing this well is a win- win, and I cannot imagine a politician objecting that this as a project that isn't worth doing.

In our little space we looked for partnerships, because what I do impacts on

occupational health. We also looked at other partnerships--the Walter Reed Army Institute of Research, USAMRIID--because they are the ones who are testing vaccines that are going to be deployed. Then this is going to be a site among many others--potentially there are 140--that are going to give the vaccines. We know that we will learn a lot about drugs and vaccines after they are deployed anywhere in the world. Many vaccine studies are done in developing countries in Africa. That data is supposed to be stored indefinitely. We must achieve unique identification of people in that context. We have so many challenges. It isn't going to be social security number, it isn't going to be a number. It may be a thumb print, it may be facial structure. We in our microcosm, as we learned more and more about this, truly became aware of and committed to the value of doing this well. I also became frustrated because so many of the planners and the administrators seemed not to understand the way we work. I applaud each of you who said it's time for the clinicians who do the work. Whether nurses or physicians or other health care providers, we need to get a voice.

We need to look at overlapping needs. If we do something in the military that can benefit the civilian sector and vice versa, let's work together. I personally look at us, the military medical and nursing corps, as a national resource for vaccine and urgent health care delivery. Many of you may know about the biologic threats that exist, for example, anthrax that is antibiotic-resistant. You can kill and decimate a population very cheaply and easily if you are a nasty person. But what is the defense? Immunize, either actively or passively. Who is going to deliver that, and how do we track it? We desperately need a tool, and that is what we have been working on.

Our little project, the I-Trax System under Medicive, which is a partnering with private industry and our intellectual input, is constructed to be 100 percent FAM-D and

FAM-A compliant. We hope to be ready to partner with anyone, and our hand is out, both within our system and outside. It is designed to relate to health care delivery and to the electronic medical record. It is designed to be very simple; so that it has largely already got content, and there is almost no typing at all. It is already planned to be a system that can evolve to support vaccine research, so that we can do it better. What if there is a recall of a lot that is contaminated? How do you instantaneously get information out so people stop giving it? There is no system to do that right now, and this is part of the overlap with telemedicine.

End of Side A, Beginning of Side B

...into to look up the record and then enter new vaccines, they don't have to check their fax; they don't have to read the newspaper. It will pop up and say you don't want to order this because we just got a notice that this is on hold. As we get more and more materials and increasing complexity to this arena, along with increasing power to prevent disease, we have to have tools like this. These tools have to be portable and low cost. We have to figure out many different ways to access--from the jungles, to the desert, to the sea.

This is my dream. That there be a DOD-civilian problem-solving cooperative with multispecialty expert subject matter input. We need remote learning. We need to be able to educate people. Right now, I can't even describe to you the horror I experienced with the quality assurance of vaccine delivery. It is one size fits all. From the two-star general who loses his yellow shot record down to the rest of us. I don't know about you, but most of us are pretty bad and don't remember. We need a lifelong immunization record system that is

accessible. Just like Medalert only including that. This will improve health care services. This will be cost-efficient and cost-beneficial.

We need to multiply physician and nursing experts, people with a lot of straw bone experience like myself and the personnel in my clinic. We want to reach out. We have people call all the time. I don't have time. I'm trying to figure out tools to help people from remote areas. We need to have a tool that can go into the inner cities. A colleague of mine at USC has done an outreach using a Winnebago into the inner city schools to try to tackle asthma, which despite all the availability of drugs is on the increase, with deaths are increasing. He has been so successful in a year, they have asked him to do immunization as well. We are sharing what we have learned with him, so that he can more rapidly get this online. I've already mentioned PPD infectious disease screening, and also health education. Everybody, including the healthy, interfaces with the health care system during vaccination. What a wonderful opportunity to educate at all levels, whether about tobacco avoidance, AIDS precautions, you name it. It is there to do. Why not a Hertz Rent-a-Car touch screen with a few screening questions and feedback, make it fun! Then we can put it in the pharmacy--in a Giant and everyplace. That is the vision that we have.

Our system suffers from the same problems as does the civilian system. To me, this is a double win. For the military, DOD, we can improve combat and overseas deployment of forces, immune readiness. We do not do a superb job of immunizing our forces. We can enhance the wellness and disease prevention of all our beneficiaries, as I said, cradle to golden years.

In the civilian sector, population-wide public health issues can be addressed by the same kinds of problem-solving, so what works at our site can work in other areas and in

other countries. It should obviously be multilingual. And we need disaster planning for delivery of vaccines and antidotes to potential biologic and chemical agents. We really don't have an emergency plan for dealing with this problem, in terms of tools to do it right and a framework for delivery to underserved areas. Thank you.

LIEUTENANT COLONEL POROPATICH: It is a pleasure to introduce Commander Richard Bakalar. Dr. Bakalar is the Head of the Telemedicine Department at the National Naval Medical Center and is the executive assistant for Navy Telemedicine. Dr. Bakalar will be presenting the Navy view of telemedicine.

COMMANDER RICHARD BAKALAR: I want to share with you some of the experiences we have had in the Navy with telemedicine applications over the past year. 1996 was a landmark year, not only for the Navy but for DOD in general. It was an opportunity for us to move from the demonstration of telemedicine applications in an R&D environment to an operational prototyping of applications over a sustained period of time. The Army, of course, achieved the well publicized project, Prime Time 3, in Bosnia and Hungary--a peacekeeping mission. In the Navy we have had a similar opportunity to deploy telemedicine applications aboard ships at sea. This is what I would like to tell you about this morning.

Basically, Admiral Koenig, our Navy Surgeon General, had four sound bites which have been popularized over the last several years. The first of these is move information, not people. I would like to change that to include not moving patients and providers. As was previously discussed, I think it is very important for us to protect our providers because those are the people who protect our patients. If we can move information for them, they

can do a better job of taking care of patients. The other issue, which is already addressed as well, is the issue of having a single entry database. We have worked with prototype and test bed at Annapolis to have a single point of entry of all information, which reviews the data to verify its accuracy. I think that helps us promote interoperability and seamless integration downline. Finally, there is the issue of network quality, especially health care at deckplates. Deckplates is a Navy term for the place where the point of encounter occurs. In the case of a ship, it is at the deckplate and in our branch clinics. I think this is important because in order to have acceptance by our providers, quality has to be maintained. It doesn't necessarily have to be better than what we are currently doing, but it has to be at least as good. I think that time will prove it actually to be better, but it has to be at least as good as what we are currently doing. Finally, we have to build on the hands-on experience of our users. A lot of this can be done in the laboratory initially, but you actually have to put it in the hands of the users to get the business practice issues and business re-engineering issues solved at the deckplates.

I will review what telemedicine is. It has two key words: time and distance. Over the last several years in telemedicine, a lot of emphasis has been placed on the telecommunication of data between one site and another over distances. The issue of time is a much more profound one. In fact, that is the part that has actually made it much more difficult for us to function seamlessly as we apply these applications worldwide. To apply telemedicine over periods of weeks, months or years or weeks, depending on the nature of the encounter, it has to have a supporting database technology. That is something that we are learning as we deploy telemedicine in an operational setting as opposed to a brief demonstration. When you basically do a single encounter, there is no need to refer to a

previous encounter. But in health care practice, patients' conditions change over time and need to be monitored over time.

This is the telemedicine MIDN Project. Admiral Koenig asked me to start this about two years ago. It started out as an x-ray assignment because I was a nuclear medicine physician in a hospital, but now it has become a full-time career. It became a full-time career because I learned that we don't have business practices to support these newly emerging technologies. That is where this all started. We have an operational continuum in the military which supports not only the sustained base in the continental United States, but also the hospitals and the clinics in our region, as well as supporting our responsibilities in theater. We have to have a system that can meet those requirements across that continuum. In order to do that, we have a telemedicine support center at the National Naval Medical Center in Bethesda, with a technical integration site at Johns Hopkins Applied Physics Lab. One of the things we learned is that we can't do technical integration in a clinical environment. Clinical environments don't provide the needed technical expertise, and hospitals tend to give first priority to clinical work. So we actually have an off-site telehealth lab at Johns Hopkins Applied Physics Lab in Columbia, Maryland. This lab actually does the initial break-in burning of the equipment, making sure that the technical problems have been solved before we put the equipment into the hands of our providers--who will find other opportunities for enhancement.

We also have a clinical testbed in a region of the national capital area at Annapolis, Maryland, which is where our Naval Academy is located. This originally stemmed from the vision of Admiral Koenig, to save some of the time unnecessarily lost from training for our midshipmen. That was an ingenious idea. Basically it is a very well circumscribed problem

in a very local area. We can solve the problem and we can apply our practices. Those lessons learned can then be applied much more manageably to our ships eight thousand miles away. So I think it is that combination of a local as well as overseas and remote network that makes this a potentially powerful project.

We also have branch clinics at Arlington Annex, Dahlgren, and Sugar Grove. All of these clinics are within region, but a little more distant than the Annapolis experience. This provides us varying experiences, since some of the clinics don't have a physician. There is an independent duty corpsman we call, which is something fairly unique to the Navy, to have a pre-nurse practitioner-level trained person deliver health care with the supervision of physicians at a distance. This technology provides a great opportunity for that.

In addition we have to be able to cooperate and coordinate seamlessly with our other major hospitals in the national capital area and beyond. So we have to have a wide-area network capability for other locations.

Finally, our main mission for being here is supporting our theater opportunities. In our case, we are using a Carrier Battle Group which is an aircraft carrier with its escorts, usually 11 to 12 ships. That range could be up to 200 miles, and encompasses a population of over 14,000 men and women. So it's a fairly substantial deployed unit of active-duty people far from home. A lot of times these aircraft carriers are well beyond the distance where they can Medivac to shore, and so they have to be able to manage their problems on site.

What are our clinical challenges on board an aircraft carrier? First of all, we are blessed with very good resources on board the carrier itself. From a clinical standpoint, we have a senior medical officer who is well trained in public health, preventive health, and in

reaction to biochemicals and nuclear potential accidents or warfare. In addition, we also have a flight surgeon skilled in taking care of the aviation community on board the ship, and also a nurse practitioner. So we have a lot of clinical expertise at the primary care level. What we don't have is a sub-specialist. The ship also is blessed with hardware, including an intensive care unit, ventilators, EKG equipment, laboratory x-ray capability, all of which you would need for a major hospital. What they don't have once again is specialty care. So telemedicine offers us the ability to insert that specialty care at the deckplates.

Telecommunications is a challenge aboard a carrier. Fortunately, carriers have instantaneous communications all over the world because of their mission. Medical practice gets only a small portion of this communications capacity, for obvious reasons: the main mission of the ship is not medical; it is the war-fighting or peace-keeping mission of the ship. We get roughly one channel or two channels out of a total T1 link. The other thing is that this aircraft carrier doesn't usually steam in a straight line. It tends to make turns. The reason it does that is to keep into the wind, so to speak, as the wind changes and as the mission of the ship changes between receiving aircraft and launching aircraft. The ship is constantly turning and moving, and access to the satellite antenna is often limited. We found that basically transmissions longer than 30 or 40 minutes are usually unreliable because of this constant turning of the ship. So we need store and forward technology in the Navy.

The other issue is limited Medivac capability. Our patients are sometimes very ill. One of our patients had a major heart attack about four days ago, and EKGs were done. The patient had a cardiac arrest, received a thrombolytic agent, was resuscitated very quickly, and has done remarkably well, subsequent to this significant myocardial infarction. This is the kind of management they have to be able to perform at sea, in their intensive care unit

with shore-side support. The other issue is that it is very difficult to get our technical assistance out there in real-time or with commercial vendors. So we actually have to have telemaintenance built into our telemedicine system to provide that capability remotely. That has actually worked very well. A lot of our video conferencing equipment has helped this telemaintenance, in addition to teletraining and telemedicine.

This is our workstation which we are currently using right now. It is basically an aggregate of multiple systems. One of the things we learned in our military system--we have a hospital information system called CHCS, designed to be a comprehensive system for health care--what we learned very quickly is that it is very difficult to have a timely comprehensive system. So what we are looking at now is a modular approach, taking those components we think are essential and providing them at the workstation. Basically, in the interest of time, we have got text-based information on the left and multimedia information on the right, bound by security and a common operating environment, to provide us interoperability among other users. This is available on the Web, by the way, on our home page.

This is an overview of what we currently deployed on our USS George Washington. This is our filmless radiology solution for teleradiology at sea. We started out with a filmless AC3 solution for data capture, which actually has a Fuji bus to a Dejarnet box which provides us a [dicom] open standard to make it an interoperable data format. This is then set to the LAN which can be accessed either through the two workstations on the ship, or can be sent to the Imation 8700 drive view imager. In that way the patient can take a film, if he has to be seen outside of our military system while he is in Europe or other places around the world. This provides us both dry film and soft copy reads of radiologic images,

not only on board the ship but at Bethesda, Fort Smith or San Diego, California.

This is a brief diagram of the telecommunications link between the medical department on the ship. It uses a satellite link with variable bandwidth depending on VTC versus other store and forward technology, going through a LAN earth station in Norfolk, and then the link to the Naval Hospital at Bethesda or anywhere else in the world. We have an ISDN connection which allows anybody, essentially, to dial into this earth station in Norfolk and gain access to communications on a secure basis.

Finally, this is utilization during the first year. This is on George Washington during the six-month deployment. We had a very aggressive x-ray capability which generated 3500 films. "Films" is a misnomer, since there were no actual films generated, it was all electronic. But 3500 images were generated and 690 were transmitted. The reason we only transmitted that many is that there are only a certain number of hours in a day, and with 10 megabytes per film without compression, we could only transmit a limited amount. One of the things you will notice is that we had a significant increase in our utilization of interactive conferences, and that is because of the good customer service which we developed between the two operations. We coined a dual-use telebaby bonding, for 85 members of the ship who were first-time fathers, and whose babies were born in Norfolk while they were at sea on deployment. Each father had the opportunity to see his child and the child's mother by video conferencing, using the same equipment. This is a very popular program. We had 25 out of 81 in this deployment, and we hope to increase that in the future. It is a great moral help, and it allows us to use the same technology for varied humanitarian issues.

In summary, a basic lesson learned is that continuity over time is critical. We need to look at database technology with just as much vigor as we have looked at

telecommunications technologies. When you have a modest budget, you have to have a lot of low cost solutions in a lot of places, rather than a lot of expensive solutions in a few places. Finally, the central points of a patient record: to be interoperable, not only within our own service but also with the other services in the military, with the commercial or private sector, and in a worldwide context. This is crucial. Thank you very much.

LIEUTENANT COLONEL POROPATICH: Thank you, Dr. Bakalar. Again we have a hard time getting a handle on the definition of telemedicine. It is now my pleasure to introduce Dr. Betsey Blakeslee who will be our next speaker. Dr. Blakeslee is the coordinator for the Center for Total Access at Fort Gordon, Georgia. She has been appointed Director for the Consortium for Telehealth which is comprised of Georgia Technical, the Center for Total Access, the Medical College of Georgia, and Emory University. She is going to talk about the civilian coordination of operations other than war, and partnership to peace, and some final remarks on the consortium.

DR. BETSEY BLAKESLEE: Thank you very much. Sometimes when we talk about military telemedicine applications, people who are not in the military say, "So what?" I mean basically, you have this huge budget, you have all these capabilities. We are not really sure that the work you do relates to the work that we do out here in the civilian world, what we call the real world. The common perception is that the value of the military to the nonmilitary organizations lies in advancing the technology far ahead. Hopefully, there would be some trickle-down capability that would benefit the civilian sector. What I'd like to suggest to you is that there is a rapidly emerging model which is going to make the

relationship between the military and the private sectors much more important and much more critical. This is happening much more quickly than anyone of us would anticipate.

Essentially I will talk about is the rapidly emerging involvement of the military in what we have traditionally termed "operations other than war." The work that we do in the U.S. military, abroad as well as on our own domestic shores, is increasingly going to involve a partnership with other militaries, especially those of the European nations. Delivering medical care in these operations-other-than-war scenarios poses unique problems, which necessitate connectivity within your military medical organizations. As we move forward in this arena, we will also need much greater connectivity with civilian capabilities, in order to support these operations-other-than- war actions.

The Center for Total Access is the DOD telemedicine test bed located in Fort Gordon, Georgia. The Center for Total Access serves as the test bed for what we call the Theater Medical Information Program. Here all capabilities for applications in telemedicine and medical information to be deployed into any kind of international situation have to be tested and evaluated both technically and functionally. The operations-other-than-war scenario that I am discussing with you this morning reflects an overall change in the military focus for the United States, something we are grappling with on many levels. Essentially, it reflects the post-cold war movement toward what is termed "preventive diplomacy." Preventive diplomacy maintains that you spend a lot less money in doing preventive operations that you would in actually fighting wars. Throughout the military as a whole, as well as in military medicine, we are going through this transition or change in focus. We are moving from this continuum that said "fight and win" to conflict prevention and to peacetime engagements. The OMO stands for Other Military Operations.

Military medicine has already been involved in these operations other than war. We have been involved in what we would call traditional war zone care. We have been involved in the day-to-day care of the 8.3 million beneficiaries which Dr. Renata referred to earlier. What we see happening in a world in which our resources are being constrained, is that our day-to-day care is being transferred to a great degree to the civilian sector through the TriCare contracts. Our traditional war zone care is changing because the traditional war zones no longer exist, and hopefully in the future will not exist to the extent that they did in the past. Our operations other than war are expanding dramatically. That has real significance for us.

It is important to understand that the operations-other-than-war definition includes more than our presence in Bosnia, for example. It encompasses support to state and local government in the United States, disaster relief, ration assistance, drug interdiction, peace keeping support to insurgencies and counterinsurgencies, non-combatant evacuation and peace enforcement. It is a very broadly defined concept, a focus of great responsibility in military medicine. If the military is shifting to this focus, then the frontline people become the engineers and the doctors, and not necessarily the infantry. This is a radical shift, a transition for military medicine.

The peace-keeping mission in 1996 utilized over 80,000 U.S. military personnel, who supported peace and humanitarian operations at an annual cost of $2 billion, quadruple the amount expended in fiscal year 1992. You might look at that statistic and say, "Goodness!" This is an extraordinary investment on the part of peace-keeping operations.

Look at the cost of war: $60 billion for the Persian Gulf war; $300 billion in today's dollars for the Korean war; $480 billion for Vietnam. The equation here from an economic

standpoint is pretty basic: peace enforcement is a better economic investment, particularly when we move into a situation in which early warning systems for impending confrontations and conflagrations are needed.

A new approach is required to leverage the resources of the military. In this game, we in the military have to interact with the non-government organizations who are already active: organizations like Save the Children, USAID, UNICEF; industries which have an interest in emerging countries; and governments and local communities themselves.

Here is a potential model that shows that, if we are in this war/anti-war continuum, essentially in a target country or in a region of the United States, you are going to have a primarily military presence as you are trying to create stability. Once you have created some kind of stability from a military perspective, you are going to begin to provide care, working with both the local providers and the nongovernment organizations. Over time, as you are providing medical treatment, you are going to see the military's role begin to diminish. You are going to see the NGOs carrying on their work. Our dream is that ultimately, NGOs will provide the health care in these countries in which they have historically done excellent work, but will also set up bureaucracies to maintain themselves permanently in these countries and move toward a self-sustaining healthy community which is managed by the local state or community.

In our current world of reduced resources, the question for the military becomes: can we contribute our technology while limiting the physical presence of our troops, to provide excellent health care? This is the model that we are trying to understand, how medical infomatics, telemedicine, and bioengineering applications all make a difference.

Through Partners for Peace, the Congress and the Department of Defense have

allocated millions of dollars to develop connections between the military organizations of former Soviet countries and the United States' military institutions. There are 19 cooperative topic areas, including emergency assistance and military training exercises, in which this network will....

End of Tape 1, Beginning of Tape 2

...use telemedicine. I represent the Center for Total Access, the location at which the data management for telemedicine will take place. In response to what you say about developing capabilities for translatable language in some of the work you are doing, I am telling you that we have a specific application for this technology in the exchange between these various countries.

Essentially, we are in the business of retooling the military relationship of the some of these countries to the citizenry. We are very up front about this. We believe that if military personnel become involved in community building, they may become less involved in coups. It is about building democratic institutions to create regional stability. This is a basic framework which shows some very prestigious military medical institutions in the United States that will be linked through a central processing center in Brussels to various military entities of the European Command.

These are the countries that are involved; all of these countries will eventually be connected. The Ukraine begins this month, next month in July Georgia will begin. The only two that can't be connected at this point are Armenia and Azerbaijan--because of political sensitivities.

The Center for Total Access is involved in this data management. We are also establishing a military medical partnership with the Republic of Georgia, in which we will be connecting the military medical school and the military medical hospital.

The consortium for telehealth is a new construct that represents a partnership between the Department of Defense's Center for Total Access, the Georgia Institute of Technology, the Medical College of Georgia, and the Emory University Medical Center. Its purposes are twofold: first, to join the military with the civilian sector for cooperative work on projects; and second, to join the technologists from Georgia Institute of Technology with the medical applications physicians and providers at Eisenhower Army Medical Center at Fort Gordon and with other entities here. We also maintain very strong connections with the Centers for Disease Control. And so, Dr. Renata, I would propose to you that this is your model and your test bed, we would like to develop that capability with you.

The consortium for telehealth is relatively new. We have just been invited to China to help them to create their strategic plan for applications of telemedicine linking Beijing Medical University and the provinces. I will say that the Center for Total Access, as a member of the Consortium, is not allowed to participate in that project because of political sensitivities at the highest levels of the State Department. There will be projects the Consortium does which cannot include the military because of those political reasons. Most of the time those projects will include all four entities, and we are in fact bringing a team over. It is a new hypothetical construct. Thank you.

LIEUTENANT COLONEL POROPATICH: I would like to congratulate Dr. Paul Zimnik, a physician up at the Telemedicine Technology Area Directorate up at Fort Detrick. He is

has recently been promoted to Major. He is here representing General [Inaudible], the Commander of the Medical Research and Material Command.

MAJOR PAUL ZIMNIK: Thank you very much. I will summarize what you have heard from these fine panelists. My boss, General [Inaudible], is responsible for creating a strategy for telemedicine research. From a research perspective, telemedicine can be defined as follows. First of all, from the technical perspective, it is very broad in scope: any technology that facilitates the management of information within medicine. That is about as broad a definition as you are ever going to get. There are definite research reasons why we feel this way. A final thought with which I want to leave you is that we in the military have been leaders in the field of telemedicine, research and development, and implementation really around the world. That is a measurement of the cost and the dollars that we have put into this field. It is a measurement of the willingness of our leadership to adopt these technologies, and a measurement of the aggressiveness with which we are applying our research skills. With that in mind, we also recognize that telemedicine is now maturing. It is becoming a key component of the emerging 21st century medicine. For this reason, collaboration not only with people within the DOD who sometimes don't work together real well, but also with other federal agencies, other non-federal agencies--and also in international expertise--is essential to the application of information technologies. We are currently experiencing an explosion, a revolutionary time. Strategically and programatically, we have adopted this concept of working together, using these information tools to facilitate virtual collaboration. We are sponsoring conferences such as this where people can get together and share their ideas, and we can further the field of medicine in terms of that

ultimate goal that we all have of moving into the next century.

We have over 100 projects in the field of telemedicine within the DOD, and the other federal agencies are also very excited. We work internationally. We work closely with academia and industry. Thank you.

LIEUTENANT COLONEL POROPATICH: What we tried to convey during this last hour is a Triservice, with a broad scope covering operational telemedicine, research development, and deployment telemedicine.

DR. DANIEL CARLIN: My name is Dr. Daniel Carlin. I am a private practitioner of telemedicine. Two years ago, I met Major Poropatich in his office to get an idea of what would be necessary take to take care of people when they left the United States and they travelled overseas, and how I could stay in touch with them and care for them. I did not have the tools of the military, a built-in communication system. I am coming to you from the trenches. I am a practicing physician. I have cared for people successfully. I do have a couple of questions.

Two years ago, it was phones and fax machines and a very simple digitized medical record that I would transfer to the emergency room, for example in Sao Paulo, Brazil, so that the physician could see that old EKG. At the same time he would fax it back to me, and I would confer with him. I would send vital information on to them. That worked pretty well. Of course, there was always a phone link back to me. I still do carry a phone and a beeper 24 hours a day. I have actually had very good success with this.

About six months ago, my ocean sailor started getting into e-mail. As a result, I have

had to modify my practice significantly. It is now established that I turn around an e-mail in about two or three minutes. Now we are moving more into a multimedia e-mail. I was wondering--you guys who preceded me probably by two years on this--what has been your experience with multimedia e-mail applications? Were there any particular packages that you found better than others? Did you ever encounter problems in caring for your people overseas?

CAPTAIN ZIMNIK: You are exactly right. In looking at all the various technologies that are used within telemedicine, the store and forward technologies, the lower bandwidth, lower cost technologies have the greatest practical value, in terms of volume of utilization. So other than the phone, e-mail is the most valuable telemedicine tool there is. The DOD has been pushing the envelope on the concept of extending that text based e-mail message to multimedia, including sound bites and video. I know that Commander Bakalar, is also very proactive in the utilization of that technology. When you ask what tools are the best, we found in our development efforts there are a lot of nice proprietary solutions. But ultimately, almost without fail, we reach the conclusion that proprietary solutions are not valuable and cannot be justified based just on their sexiness at first blush. So our general rule of thumb right now--and we still use e-mail very heavily--is to adhere to industry standards. Whereas previously the fax that was the vehicle of telemedicine, today it is the Internet. We look at applications and packages that meet Internet standards, that communicate by TCPIP, and that require folks to use nothing but a browser or a standard e-mail package to utilize it.

COMMANDER BAKALAR: One thing we have learned from a clinical perspective is that

the referring physician--the "pitcher," as we call him--is responsible for giving the information that is necessary for identifying the problem and making the consultation. The consultant is responsible for insuring that the quality of the information is sufficient to make a consultative diagnosis. That analogy comes from the American College of Radiology guidelines for deployment of teleradiology. We apply that across the board for telemedicine. We have had our dermatologist, for example, help us define what the standards are for dermatologic images. For example, they have determined that a 24-bit colordepth is important because of the ability of the eye to recognize 21 bits of color data. The size of the file matrix should be 600x800, because that has been found to be the best compromise for both quality and size of the file for transmission. Finally, we found the compression issue to be very important in using compression algorithms for color photographs. For example, JPEG seems to be the most efficient system for maintaining the quality that we require. I think the issues are quality and setting standards; and by standards here we mean what the consultant will accept and sign his or her name to as a diagnostic quality data set.

DR. CARLIN: A good deal of what I do is driven by the communication system that my patient has. I was wondering, do you guys have any experience with these global digital communication networks such as COMSATC, [Inaudible] digital, globe wireless? Has the military looked at any of these and applications? They are extremely low-cost. A typical two-page dense text is about 95 cents. A lot of ocean sailors are using them, and now I have had a couple of people who are expatriates operating in fairly remote areas starting to use this system. I was wondering if you guys use that at all or have any experience with it?

CAPTAIN ZIMNIK: It is basically an internet server. The concept of the pipeway that you are going to use is always a big issue. Traditionally, the most expensive piece of any telemedicine system is the communications infrastructure involved in the system. We are constantly looking at new communication systems. That is one that is effective. I might say that I do not believe there is a universally perfect communication medium for all telemedicine uses. So in my mind, I think probably for the next 10 or 20 years we are going to look at a very eclectic approach to networking. For that kind of solution, we are looking at very exotic pulse laser transmissions from around the world that you can get gigabyte per second speeds with. We are very excited about the low earth orbit satellite technologies that will become available commercially in the very near future, technologies which in my mind are going to revolutionize telemedicine. All of those technologies are valuable, but again I think the message is there is not one perfect technology that is out there.

DR. CARLIN: I am an emergency physician, so I want to know if anyone in the military established a call center virtual digital emergency room. In other words, a fellow steps on a mine in Laos. Is there a place that he is going to call within the Army or Navy and get immediate guidance? Is there a model for that?

CAPTAIN ZIMNIK: I think Walter Reed is certainly one.

LIEUTENANT COLONEL POROPATICH: The concept is to take advantage of the awake clock and work at medical centers that are stationed around the world such as the one in Germany at [Inaudible], at the Navy in Balboa in California, Walter Reed, Eisenhower,

Wilfred Hall in Texas, and going around the world in Tripler and Hawaii. If there is a problem that occurs, someone is always open for business. We are not nearly as well developed in global use of satellite communications. That is our dream. At Walter Reed we are 24x7. When you call in after hours, you call into our emergency room where you will have a staff person or doctor seeing you. They in turn can bring the neurosurgery resident or the orthopedic resident into the emergency room. There are staff radiologists in-house after hours, as well as staff anesthesiologists, but we are not a Level One trauma center and don't have a staff neurosurgeon or orthopedic surgeon in-house. We can provide 24x7. Our telemedicine consult people carry beepers, and they can come in and facilitate. Within the last month we had a consult from Haiti that came in around 9 P.M. and another consult from Bosnia around 11 P.M. We turned those consults around within three hours. This was clearly not an emergency response, but for the kinds of sub-acute problems that were presented, it was acceptable turn-around time.

COMMANDER BAKALAR: I would like to state very briefly one of the things we have learned in the Navy: it is not very cost- effective to put a telemedicine office in your emergency room. The majority of your cases are not emergency. In our experience, in more than 150 cases over the last year, we have had about four emergencies. All of those were handled by using a pager. I have a nationwide pager that I get paged on if there is something after hours. The consultant will send the data electronically to our [Inaudible] site or e-mail, and we will respond to that within the time period required. A lot of times it requires a phone call back to the individual if they are at sea in the middle of the Mediterranean. We can do that, and we have done that. I think the issue is that to have a

high-cost emergency room scenario for something that you are going to use five to ten percent of your time is not very cost-effective.

DR. JEAN-PIERRE THIERRY: For civilian applications in Europe, it may be after a general consult, one of the barriers--the most important barrier we may face in the next may be ten years, if the system begins to reorganize--is that we have to reassure the users that the data will remain confidential and secure. My question is, how are you going to deal with this issue, especially in other than war operations abroad or for the immunization database? For example, in many countries in Europe we are still not clear about the final architecture. Some experts would say that we don't need to put all the health care records on one database, and we should avoid that, and maybe give the information to the patient himself on the second or third generation of smart cards. So it is not so easy to jump right to the solutions. There is an extra reassurance the military must give to our populations. Awareness may be different in Europe on this issue because it is also linked to our past in World War II. On the other hand, we know a lot about privacy, security, and confidentiality.

CAPTAIN ZIMNIK: Security is a very big issue with us. When you have an electronic medical record, frequently you will hear people say, well, it is certainly more secure than the record that is sitting on a desk in a hospital, a paper record. But one critical difference is being able to take an electronic medical record, and at the speed of light create a million copies of it and send it all over the world. Psychologically, security is a very important issue. We are very acutely concerned with that. In our offices, we have been looking at a

number of different technologies that provide authentication, which is very important in electronic medical records (e.g., knowing that Dr. Zimnik did in fact sign this prescription), as well as encryption of the data for security. We are generally looking at many of the models that have been adopted by the financial community for their security measures, RSA-type encryption, various public, private key type encryption systems, hardware-assisted for [Inaudible] card type security measures. We have also found that if you can separate out from the electronic medical record all patient identifiers and then link those patient identifiers to the medical record data through a public/private key encryption system, then you don't need to have the burden of encrypting a 10 megabyte chest x-ray. All you need to encrypt is a few bits of the identifier information. Again we attempt to adhere to industry standards for those types of tools.

DR. JO HAUSER: What is the advantage of connecting your system to countries such as Kazakhstan which may have very few computers and very few computer literate people? What is your expectation when you connect them for them to use or to access from your system?

DR. BLAKESLEE: Let me clarify that in terms of the network connectivity, this Partners for Peace network is military to military exclusively. We would be connecting military organizations in the United States, be they medical or other types of military organizations, with military organizations in the Kazakhstan to exchange information. However, we have already begun to enlist folks like AIHA. Then once the already-funded connection between the United States and Kazakhstan takes place, we would go in and create the next link to

regional hospitals and clinics. I understand the essence of your question, which is, how can you provide telemedicine into a country where you are basically talking about something that would sound like it's from Mars to people who don't have basic health care? But the idea is that if you can connect the military medical folks here with the military medical folks there, you can create a kind of Epcot Center for telemedicine for that country. After all, if you are going into a country where they have no clue what you are talking about--and you say it is really a value for you to use telemedicine, and they say are you kidding, we can't heat our clinics, we are resharpening our needles--how can you possibly imagine that we could be participating in the communication age? But you can show them by use of the military to military connection what it really means. Then you have, in fact, made real to them the capabilities and possibilities. My personal feeling is that if you make that real to the nurses, they will take and drive that faster than the physicians will in though countries. The dream here is to make the military-to-military connection, through which you can then bring people to the country. You are killing two birds with one stone. And they can say, we could take this with certain communications capabilities, etc. A footnote on my part: one of the very frustrating things about working with the military for the past two or three years is to see the extraordinary capabilities that have been developed with no mechanism for translating those into the civilian sector and into these countries where they are so desperately needed. Our capability to take a mobile vehicle with communication systems and drive it into a country and instantaneously create a communication system is extraordinary. I can give you 55 examples of that. What we are hoping is that by creating the initial Partners for Peace connection, it will then be the door opening to being able to transfer some of these other incredible capabilities which the military has developed. Hopefully that will be of help.

COLONEL ENGLER: As to the previous question, I think the challenge facing any health care delivery system can be shown in the following example. We have known for a long time that tobacco is harmful, but we don't see a lot of improvement. Teenagers are still starting to smoke worldwide, and we are not making a difference. For immunization, the cornerstone of the problem is actually misconceptions and suspicion, not just record confidentiality. As some of you may have heard ten years ago when AIDS started, people thought they got it through a vaccine administered in third world countries. The whole concept of immune defense and immunology and the immune wellness--we need to start teaching this exciting stuff in grade school. I think that the telemedicine arena is the place where we need to reach out and touch people in ways that they understand. If we don't serve technology in holistic ways, it will go nowhere. In our country, alternative medicine is a 50 billion dollar industry which ain't high tech. It is people touching people. The real challenge for us as clinicians is to interface with the techies to make holistic systems that touch people and reach them in a language they can understand. Make it fun. Immunology is a lot of fun--Pac Man cells that are going to defend you against the evil monsters. I teach to lay groups all the time, and I'm proud to say I have made a lot of lovers of immunology. Then suddenly immunizations become a friend, not an enemy. This translates to a lot of arenas and the way in which we really deliver the knowledge we have.

CAPTAIN ZIMNIK: The question has been raised about the international value of it all--why are we going into Kazakhstan or South America or some of these other places, the former Yugoslavia, the former Soviet Union? My way of thinking, and what really motivates me to work in this field, is that what we are all talking about and experiencing is our medical

piece of the information revolution that is really reshaping the entire globe. This is not about putting in video teleconferencing systems or putting in a really neat computer or electronic scopes; it is about information. We believe this will facilitate a global health care system that will benefit everyone. There are many motivators to do this within the United States; the exportation of US health care around the world is a budding business that I know Dr. Jay Sanders is very acutely interested in promoting. This area is not about the computers, it is not about the hardware, it is not about the software; it is about information and how that is going to reshape 21st century medicine.

DR. BLAKESLEE: The Partners for Peace Network doesn't go in anywhere unless the country invites us in. That you need to know. In other words, this is just not thrown out there. We have to be invited by the Minister of Health or Minister of Defense, etc.

LIEUTENANT COLONEL POROPATICH: I would like to thank the panel members for their time and information.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

LEGAL/REGULATORY BARRIERS AND POTENTIAL SOLUTIONS

MR. STEPHEN SCHANZ: We are fortunate enough to have some key players here, and I just want to take a few moments to very briefly introduce who they are. On my left and your right is Doron Ezikson, who is a partner with McDermott Will & Emery. Down from him is John Blum, who is the Associate Dean for Health Law at Loyola Law School in Chicago. I want to focus just for a moment to try to get some idea of an overall perspective on what the legal and the regulatory repercussions and issues are on a global basis that could directly or indirectly affect the overall practice of telemedicine.

As you all know, in the field they come in all shapes and sizes. One of the big ones is licensure. Now certainly here in the U.S. that's a very, very big issue. And some part of unknown import is what effect licensure issues would have on a trendy global basis because you're looking at all kinds of different legal systems. You're looking at various definitions. From country to country to country the laws and the perspectives are going to change.

Privacy and confidentiality is yet another issue. Legally, any time we're talking about the transmission of data, one of the key things that most practitioners, and I can assure you most lawyers, worry about is the overall protection of that information being transmitted. How is it going to be routed? To whom? What kind of security measures are there in place? Once it arrives at its destination, what kinds of protections are in place so that we can retain that in its proper form, and so that it does not lose the privacy and the confidentiality that we would otherwise automatically think of in terms of a medical record?

Obviously then as to the medical report itself, all of you in the medical record field know from institution to institution, from specialty to specialty, region to region, you can have a substantial difference in the content, the composition, and the presentation of the medical record. I think these issues are paramount for being resolved, for perhaps being harmonized, as we look at an overall global telemedicine practice. In order to foster telemedicine, in order for telemedicine to really reach its fullest potential, we have to come up with ways from the legal and the regulatory environments to try to harmonize some of these things so that there are no artificial barriers which hinder the progressive implementation of telemedicine practice.

One area that the providers often don't like to talk about, but that lawyers always talk about, is liability. I can tell you from informal discussions with some carriers that they are on kind of novel ground on this matter, too. They don't have a whole lot of objective, well-founded underwriting criteria that can help guide them. To the extent that you have a provider interacting from country to country, we're really pushing the envelope in many respects as far as underwriting practice, insurance availability, insurance coverage are concerned. As providers get more in depth on the whole telemedicine practice, certainly liability coverage and risk underwriting are two things that should be dealt with up front.

From a lawyer's perspective, I would warmly embrace a provider who came to me in advance and said, "Steve, here's what we want to do. What do we need to do?" Or, "I'm sure it's okay, isn't it?" And, "We are covered, aren't we?"--instead of coming to me after the fact, after there's a problem, dashing in my door and saying, "This is covered, isn't it?" Asking the question then is a little bit late. I don't think at this juncture there are any

obstacles that, with prior planning and with good communication, cannot be worked out in some fashion.

As we embark upon a global perspective, I think these are things that will need to be addressed. The actual clinicians can help do this in large part because you will know at the very outset what kind of endeavors you are embarking upon, what countries you are interacting with, and what kind of new procedures you might be exploring.

Intellectual property: Obviously as we explore the explosion, if you will, of telemedicine, there are all kinds of new software that are involved with this. Just as we have intellectual property copyright and things like that, those issues prevalent on the Internet, we're going to have that also from country to country to country. Even though I'm not a copyright attorney or a patent attorney, I do know that you can have patent protection and company-right protection in clusters of countries that have reciprocal agreements with each other. So in a field where you're embarking on a new software, and you're using these things, you have to be mindful of the jurisdictional limits of whatever protections your software may or may not have.

One other area I'll briefly touch upon is products liability. Lawyers have long argued over liability attachment to certain products and certain overall devices. This is an area that I think as time goes on, as telemedicine expands, one should also look at; so that the potential liability issues with that are minimized as much as possible.

The area of credentialing is also very important. Right now from what we've heard around the country and speaking with other folks at various seminars, there's no rigid, formal or uniform credentialing policy or practice yet in place for everybody in telemedicine. I would ask the question: To the extent we get into more of a country-to-country transaction,

is there or is there not a place for this? And if there is a place for it, what kinds of rules do you think would facilitate meeting your needs without creating undue barriers?

Reimbursement, of course, is a big issue that everybody is looking at. The area of reimbursement is one that's ripe, not only here in the U.S., but as we move towards a total global market. How is that going to affect reimbursement, not only with various governmental programs, of governments from all countries, but also of private payors? Will there be limitations or should we work on agreements and treaties and things like this that address reimbursement between countries?

Accreditation is one issue that I'm sure most of you are familiar with. Accreditation can mean different things in different countries. Once the global telemedicine impact is felt, these accreditations issues take on new significance. The choice of law is a huge area, I think, for global telemedicine. It's much akin in some respects to aviation law. Way back when, when I was in law school, one of my final exams in aviation law caused me I don't know how much gastric distress and headaches when we went through a passenger that bought a ticket in New Jersey, embarked in New York, was refueled in Chicago, encountered in-flight problems over New Mexico, and physically crashed in California. And the question was: Now, if all these relatives want to sue, which state law applies? I knew what the questions were, but the answers were a whole different perspective.

If you take that kind of analysis and overlay it country to country to country, you just multiply the various perspectives. The analysis has to be understood and resolved, so that we can understand if a glitch or an error should occur in a transmission, how we are going to handle that. Whose law would apply? Would it be France? Would it be Germany? Would it be the United States? These are real key issues.

Informed consent: It's the same thing. We'll talk about culture in a minute. All these things can be affected by culture, by custom, by language, things like that. What we here in the United States may believe to be the rule or the standard for informed consent may be different from country to country to country. I think all these things have to be recognized to the extent that an institution or a provider is looking at a global exchange.

Lastly, medical education: A pretty good field from country to country, but there can also be very important cultural differences from country to country. As we go towards global education, these are things which would probably have to be harmonized in some respects in order to get a full and true benefit. Another issue just on the surface is scope of practice. If you look around the world at the various countries as to who does what, who's authorized and who's licensed to do what in a medical provisions setting, you'll find that we are not totally in harmony. This may reflect a difference of the legal system of licensure of custom, culture or actual practice.

The same thing is true of allied professionals. If you take various countries, some professionals have a greater scope of practice than others. To the extent that they are going to be involved in a global telemedicine counsel, these things have to be harmonized.

Fraud and abuse: Here in the United States most providers know what foreign abuse is. There are federal statutes on it. There are some states, like my home state of North Carolina, where there is a separate state statute on it that specifically applies to medical providers. I throw out the question to you now: If you're a medical provider, and say you're in North Carolina, you're doing a telemedicine consult in Germany, be mindful of what the regulatory scheme is for that statute. Does it apply to you? Does it govern? Does it alter

what kind of contractual arrangements you can enter into and what you can do as far as that consult is concerned?

I just want to throw out a smorgasbord of other complications. Culture obviously has a drastic impact on almost everything we talk about here because there can be very distinct differences from region to region and country to country. The same with language, with practice standards, and with legal systems.

With legal systems, think for a moment how different countries offer various alternatives for dispute resolution. They are not all the same. They have different policies. They have different procedures. They have different systems in place. The same for the liability structure.

I did a presentation last year, and afterwards there were some doctors from France and Germany who pulled me aside and said, "You mean that if there's a glitch in the transmission then I might get sued in the United States? You have all these rules. You have all these laws." And I said "Yes." They were absolutely stunned because the legal systems in their countries are substantially and dramatically different. I think when we do things on a global basis all these things have to be recognized.

I just wanted to briefly show you some of our existing state statutes that reference the effects of other countries either being licensed in another country or doing business in another country. One is the California code that talks about interstate consultations being permitted if the provider is licensed in another country. Next is the Colorado Medical Practice Act. That requires the reporting to the agency of a disciplinary action if you are licensed in one country and another country takes action against you. Again we're automatically recognizing these cross-jurisdictional issues. The D.C. code even references

the perspective of being licensed in a foreign country, so there's a recognition of foreign jurisdiction there. Similarly, the Illinois Nursing Law, and in Iowa where they specify that one criterion for the issuance of a special license is evidence of an unrestricted license by the holder issued by a foreign country.

We are already more or less integrating all of these things. As this global exchange increases, we really have to be mindful of what kind of harmonization, what kind of legislative changes we should be looking at. That's just a quick overview to show what the potential issues are.

I want to now turn it over to Leo Whelan. Leo is with the Mayo Foundation in Rochester, Minnesota; and after Leo, we'll go to Doron Ezikson, of McDermott Will, who will talk about some of the liability aspects; and then John Blum from Loyola who will talk about more of the treaties and the international aspects.

MR. LEO WHELAN: I want to thank Steve for the introduction. I'm going to focus on the professional licensing aspect for international telemedicine. What I'll look at and you'll see are, first, the purpose of professional licensing, because I think it's always important to start there. That will set the parameters of what is possible.

Secondly, we're going to turn to the definition of medical practice. I do this with apologies to my colleagues in the allied health professions. A lot of the policy attention has focused on physicians. I'm going to focus my talk there as well.

It's important to realize that there are a lot of other issues, issues unique to the allied health professions, that will also have to be addressed. And it is equally important to understand that to use one of the great benefits of telemedicine, that is, to significantly

increase access of services to under-served populations, we're going to have to rely on the services of allied health professionals directly treating patients. But with apologies again I'm going to put that aside in this talk.

Finally, we're going to look at the consultation exception, really the basis for all of the international telemedicine that I'm at least aware of, and discuss the difference between the regulation of a) physician-to-patient contact or communication and b) physician-to-physician communication. I will then discuss something about the models for harmonization of international laws regarding licensure and what kind of prospects there are, at least in my estimation.

Common to all licensure schemes, and this is true whether we're taking about health professions or not, there are two basic purposes. One is to establish the minimum qualifications for the practice of that profession. These would be the education, the examination, the character, and the qualifications that allow you to enter the profession. Secondly then would be the kind of an adjudication and investigation of complaints against an individual professional. This has both a consumer orientation and a professional orientation.

From a consumer perspective, it allows someone who feels that they have been wronged or observed some unprofessional conduct to initiate investigation that is carried out by the board, the licensing board, without much expense or inconvenience on the part of the reporter. The basic purpose is to establish those minimum qualifications. The second is to create a means to investigate and adjudicate complaints. That has both a consumer orientation and a professional orientation. From the consumer side it allows initiating an investigation without much trouble, inconvenience, or expense on the part of the consumer.

From the professional side, it gives them the assurance that the adjudication is going to be by an informed board. These will be members of the profession who should be very familiar with both the knowledge base that that profession requires and the standards of professional conduct. If it were just these two purposes, I'd be a lot more optimistic about the possibility of harmonizing international laws or state-by-state laws.

There are a lot of other purposes, however, that are attendant or ancillary to licensure. Many of these are either state specific or culturally specific. For example, each of these licensure laws will require definition of the professional standards of conduct. Obviously it's necessary to do that. These, I think, are necessarily a product of the state's history and socioeconomic structure. For example, some laws are going to define the relationship between the physician or healthcare professional and the patient.

For example, informed consent/patient autonomy. What are the physician's obligations to inform the patient of the risks of the proposed treatment? To what extent does the patient have the right to refuse treatment? To insist on certain treatment? Who makes decisions regarding incompetent patients? That will vary from culture to culture.

Advocate with payors: To what extent is the physician responsible to the patient vis-a-vis that organization that is paying for the patient's care? What do you do when the physician is employed by that organization? How do you resolve that kind of conflict of interest that the physician has?

Confidentiality: What is a physician's obligation to keep a patient's medical record or medical information confidential? What authorization is necessary for the release of those records? Public health reporting: Many states require physicians in the U.S. to report infectious diseases or injuries that may have resulted from violence to public health

authorities. A surprisingly high proportion of the work of licensing boards, at least in the U.S., has been dealing with either allegations of sexual misconduct by medical professionals or chemical dependency; that the physician is impaired by alcohol or drug abuse.

Those standards and how those problems are addressed will vary from culture to culture. For example, within the U.S. physicians are often required by their states to report when they suspect that one of their colleagues has either of these problems or has violated some other professional standard.

In addition there are other types of relationship issues that will be defined by the standards of professional conduct. The relationship between the physician and other physicians, between physician-trainees, between allied health professionals, scope of practice questions, which also vary from state to state, can be hard to change; in particular scope of practice can be hard to change because it determines who gets paid to perform a certain procedure.

Billing and advertising issues: What promotional activities are allowed? What reimbursement is available? Documentation requirements: Sometimes these are driven by reimbursement concerns, but they may also be driven by quality-of-care concerns, accreditation concerns, taxes. In my state, Minnesota, the state taxes health professionals in order to fund its programs, state-sponsored programs, to pay for the care of people with low incomes. This includes both a surcharge on the licensing fee of physicians, and then a tax on revenue that either physicians or dentists make from treating Minnesota patients. I throw that in just as an illustration.

There will be other requirements like that either tied to revenue or tied to insurance requirements, etc. The point really is twofold. And that is, if professionals are subject to

licensure, they are subject to a wide variety of legal requirements. They are going to need to have knowledge of those applicable laws. They will need to be accountable to the state's regulators. They will need a shared language and to some extent cultural sensitivity in order to meet the expectations of their patients based on those laws and the expectations of the regulators.

Now I want to focus on the definition of medical practice. And this is going to be a statutory definition. It will define what conduct is subject to licensure requirements. My belief is that in all countries there are basically two common elements of the definition of medical practice. One is a broad statement of what it means to practice medicine. This is very broad and would cover even a parent's decision to treat a child with some kind of over-the-counter remedy.

Then the second one would be to any kind of statement regarding any use of the term "physician" or "M.D.," etc., the designation of professional qualification to solicit business. This last one stems from the fact that licensure is meant to protect the public from solicitations of unqualified persons who shouldn't be practicing that profession. If you fall into that definition of the practice of medicine, then you are prohibited by law from engaging in that conduct unless you have a license, or there is a statutory exception.

The common exception, which is the basis for virtually all telemedicine at this point, is the consultation exception. That allows an out-of-country or out-of-state physician to participate in the diagnosis or treatment of a patient if there is a locally licensed physician retaining responsibility for the patient's care. I think the basis for this is that physicians, unlike lay people, can evaluate the credentials of other physicians. This may be part of a statute or it may be an informal exception that simply could have been a matter of practice or

a way that the licensing authorities have enforced the law and allowed this to take place. The other benefit is that it allows the physicians of that country access to the expertise of physicians around the world.

You know, of course, that the U.S. is an aggregation of 50 different jurisdictions, and that professional licensing has been the province of the various states. The experience of those states in dealing with telemedicine is illustrative of what can happen internationally. So far, it has not been favorable. Twelve states so far have adopted legislation to address telemedicine. Nine of those have extended their licensing requirement to include regular consultations; so they have expanded the licensing requirement and narrowed the consultation requirement and made more physicians out of that state subject to the licensure. This is despite the fact that there really has been no evidence of abuse of this consultation exception.

We don't have situations where physicians are consulting with unqualified physicians from out of state. This affects not just telemedicine, but any kind of physician-to-physician communication between states or between countries. In terms of harmonization between countries, I think there are a variety of models. I am specifically not speaking to the Union's experience because I am simply not familiar enough with it to be comfortable speaking about it.

As I see it, there are five different models that we can use. One would be reciprocity. Under a reciprocity arrangement, two states would agree to treat the license awarded by each of those states as good in that state. In the U.S., almost all the states have something like this on the books. So far there are no reciprocal relationships, so that no state regards the license from another state as good in that state.

The second one would be an endorsement model, which is where the state or country would require out-of-state physicians to obtain a license, but would require them to meet their own licensing requirements. They would consider the physicians' credentials. They had to qualify for their initial license in doing that. The problem with this approach is that you still have to meet the state's own requirements. In the U.S. this has been terribly problematic because they have required a lot of the original documentation. There's been no centralized credentialing function. There is often a requirement that the licensing exam be retaken if it hasn't been taken within a period of years, such as ten years. There are often requirements that the physician appear within that state for an interview or another state-specific exam.

Another model would be the mutual recognition model. This is the model that's used in Australia where a physician licensed in one Australian state can practice in another state upon registering with that state. The model does require that the states have uniform initial licensure requirements. Next, there could be a special-purpose licensure requirement. This has been proposed by the federation of state and medical boards within the U.S. It would be a license allowing outside physicians to practice telemedicine in that state. They could not physically be present in the state and practice medicine, but they could practice via telemedicine. It's not been well received by the States. Two states have adopted this as part of their licensing statutes, but they've both restricted it very significantly. The criticism of it is that with telemedicine you can do virtually much of what you could do if you are physically present in that country. Then why would you allow someone to do that with lesser qualifications than you would require if they were present in the country?

Finally, there could be a separate international license. This is an idea that was

initially proposed by the National Council of State Boards of Nursing for a multi-state licensure model. It would establish a separate license for multi-state practice. States that accepted these multi-state qualifications would allow those practitioners to practice in-state. It would deal with the enforcement and discipline system either by putting those practitioners subject to the state's own discipline model or by creating a separate disciplinary model that would be attendant to this multi-state licensure.

As you can probably tell, I'm not very optimistic about our short-term ability to harmonize international licensure requirements and allow physicians licensed in one country to practice fairly conveniently in other countries outside of a broad-based regional affiliation like the European Union, which I regard as a rather unique set of circumstances. I'm not optimistic because there are a lot of state and culturally specific laws that relate to the health professions, and because of the interest in each country in insulating its professions from competition.

In terms of at least the short-term practice of international telemedicine, we can certainly say that the consultation exception is absolutely vital. It's a critical component of quality of care, and also the vehicle for international telemedicine currently and, I think, for the foreseeable future.

Formal efforts are needed to harmonize licensure requirements. A dialogue at least has been initiated with the international conference on medical registration. The second international conference was held in Melbourne, Australia in October of '96. The third is scheduled to be held in 1998 in South Africa. That's at least a dialogue sharing information on different approaches for regulating medical professionals and addressing the problems common to the licensing affiliates authorities. To my knowledge, it has not so far been an

effort to harmonize those requirements and come up with an internationally acceptable licensure approach. But it is at least the beginning of that dialogue and maybe the place to start formal efforts to begin the harmonization.

MR. SCHANZ: Thank you. Doron. You are going to share some thoughts with us, I hope, on the overall issue of liability?

MR. DORON EZIKSON: I will. I'm here to discuss the dark side of telemedicine, if you will, as if the prior presentation wasn't depressing enough.

Let me tell you that I am a proponent of telemedicine. I am here simply to identify some issues that I think are likely to emerge. Notwithstanding the fact that I am involved in telemedicine internationally, I'm going to focus on issues under U.S. law, which I really think are some of the more complex, given the number of different systems, the number of different standards we have to deal with, and our propensity to, in effect, ensure through our legal system against any conceivable risk when it comes to the provision of medical services. And as Leo reviewed, physician licensure is a critical underpinning of any liability analysis.

I would like to focus on liability issues which relate to unlicensed practice of medicine independent of the failure to provide, according to an appropriate standard of care, the inadvertent or negligent disclosure of confidential information. The corporate practice of medicine, which is a doctrine under United States law that is actually not as well known as you would think, involves prohibitions on certain forms of entities conducting the practice of medicine and issues relating to technology failure and where responsibility might lie in the event of a misdiagnosis or a problem.

I want to focus on malpractice liability in part because in its February 1997 report to Congress, the General Accounting Office repeated a statement from the Council on Competitiveness, which basically said that telemedicine is facing its greatest barrier in the unknown risks of malpractice liability. Let's talk for a few minutes about what the case law says. What is the actual law out there?

To the best of my knowledge there haven't been any finally decided telemedicine cases in the United States. There have been several which insurers have reported euphemistically to have been settled out of court. To my knowledge there are no malpractice cases per se. Certainly, there are analogies in the case law. I'd like to discuss a few cases quickly. Under most state law, malpractice liability is determined on the basis of a three-part analysis: Whether the physician owed a duty of care to the patient, whether the duty of care was breached, and whether that breach was the proximate cause of the patient's injury. Each of these standards involves a somewhat unique analysis in the context of telemedicine. For instance, when does a consulting physician or telemedicine doctor owe a duty of care to a patient? A telemedicine doctor can have many functions. He or she can be a consultant to a primary-care physician, the source of a second opinion or a specialist, or a direct provider of care to a patient.

There's little question that if a doctor has established a relationship directly with a patient and advises that patient or treats that patient, then a duty of care has been established. The more interesting question relates to the consulting doctor. As was mentioned, a consultant can be exempt by law from licensure requirements and perhaps liability. But there are precedents that indicate that when a consulting doctor's expertise is relied on, even if that doctor had no direct contact with the patient, there is a notion of an implied physician-patient

relationship from which flow all types of obligations including the duty to inform and other obligations under the law--which can give rise to liability. It's critical for people to understand what relationship they are entering into or what the risk associated with that relationship is.

Let me just talk about a couple of cases here in Massachusetts. There is a case of a family consulting with an emergency room doctor over the telephone. This particular case was ordered to go to the court on these facts: The parents of the young boy called the hospital due to a child's illness. The child had been dehydrated, but under the care of a physician, and had improved earlier in the day. Later that night, the parents spoke to an emergency physician because they were concerned about the child. That physician left them with the impression that it was appropriate to wait until the morning to bring the child in to see a physician. The physician maintained that he understood from the conversation that the parents would be bringing the boy into a hospital-- not his hospital, a different hospital. He admitted that he did not state emphatically that they should do so; they were left with that impression. The parents did not take the child to the hospital, and unfortunately the next morning the child died.

Now the Court reasoned that the mere phone call, "Should we come to the hospital?" and the miscommunication that resulted created a physician-patient relationship for which that physician might be liable as a result of the child's death. Telemedicine, as we said, was over the telephone. But you can spin that logic out into a number of the consulting arrangements that we anticipate here.

Similarly, in a New York case, a patient called a doctor to schedule an appointment. The doctor allegedly offered some preliminary advice and said, "Come in and I'll see you

and we'll deal with the problem." Although the patient never came to the doctor's office for the appointment, the Court found that the patient-physician relationship had been created by virtue of the phone call. Again it was up to a jury to decide whether or not the injury that resulted was the physician's fault.

Another set of cases relate to the duty to inform the patient of risks of a medical procedure. Many of you who are practitioners are familiar with the duty to inform. Obviously critical to this analysis is whether or not there is a duty of care owed. In a Massachusetts Supreme Judicial Court case, the Court found that both an admitting physician who was the surgeon in charge, but was not the surgeon rendering the service, and a second surgeon who discussed the operation with a patient each independently had the obligation to inform the patient of the risks. By contrast, a surgery assistant who merely assisted in the surgery did not have a relationship or duty. It is not clear what the consistent logic is, all it highlights...

End of Side A, Beginning of Side B

Another interesting issue is: When does the relationship begin? When is it superseded? And when does it end of its own accord?

Another case here in Massachusetts involved two obstetricians who had been contracted to deliver a patient's baby. The Court found that the delegation of the delivery to a first-year resident breached the duty to ensure that a specialist's standard of care was applied. In other words, the patient came to the obstetricians and thought they were purchasing that level of care. Their delegation to a resident of the service was sufficient to

create an obligation on their part to follow up and make sure that the first-year resident did his or her job. Their failure to be at the hospital was deemed to be an action that could lead to liability.

I could go on with examples by analogy, but I think what is critical is to understand that each system in which you will operate, be it by state or by country, will have its own set of standards. And there are two different issues that relate to where the service is provided or where, unfortunately, providers might find themselves subject to legal action. One is determining which standard of care applies. If we're speaking internationally, the question is: What country or what country's law or standard will apply in assessing whether or not the care provided was up to the appropriate standard?

Obviously, within the United States many of you may be aware that we have standards, local standards, that differ state to state. We have urban and rural; those are really tending to be moved out of the law. We have certain specialties for which there are national standards. There's a very complex matrix here. Depending on which Court you end up in, you may end up with different answers as to what the standard of care is. This relates in part to the licensure of public policy issues.

Clearly, if you are providing care that is going to be relied on by a patient in a particular jurisdiction, that patient has the right to expect that the care will be up to the standard of that person's community. That means that the consulting physician, the telemedicine doctor in the other state or the other country, has to be familiar with what standard of care they are being required to apply.

Similarly, jurisdiction is even more complex. There are principles in the law about where someone can bring a lawsuit that could result in actions being brought in either the

state or the country, certainly the country, but also the state where the patient resides; where the advice was rendered, if that's different; where the physician or physicians reside; or where the care is deemed to have been provided.

These issues are not resolved, and I don't believe can be resolved, in advance of telemedicine being implemented in our country or internationally. Clearly, providers have to be thinking about the economic implications of being subject to lawsuits, unfortunately, in multiple jurisdictions and being held to standards which they are not aware of.

Let me quickly end with just a note with regard to technology failure and potential vendor liability or limits on vendor liability. The point here is that as between a purchaser of technology and the vendor of technology, you want to try and define the obligations up front. If you're a purchaser, you certainly want a meaningful warranty of performance, one that recognizes that what you're going to be using the technology for is the provision of medical services, which is a very high standard. It's my judgment, although I'm not in the business, that you want a vendor with some track record who can be there in terms of support, and who can provide the training necessary to use in its intended manner the technology which you are deploying.

On the vendor side, clearly the vendor wants to make sure that so long as the technology works and the training is provided, the vendor is not held liable for errors that are the result of operation; that errors by the doctor, by the nurse, by the technical staff do not result in vendor liability.

We're hoping we'll have questions because I think a lot of questions are raised by the liability issues. Let me make a couple of recommendations for continuing dialogue on issues relating to liability. While I'm not optimistic, I think that dialogue in these areas is critical.

If we can have specialty-specific telemedicine practice standards continue to be developed in as many areas as possible, those will inform the legal standards. So to the extent that we have an international radiology standard for telemedicine, or in other areas, this will limit the amount of difference among jurisdictions as to whether or not the telemedicine system and how it was deployed was appropriate in a particular case.

I believe there's room for the development of minimum or common technology standards to ensure that, to the extent possible nationally and internationally, we are working off a minimum set of standards. On that basis or to that end, the FDA has started a work group to look at redefining medical devices, looking at whether or not its regulation of software in a telemedicine context is sufficient to ensure even the U.S. standards being met.

I personally am a proponent of national telemedicine licensure in this country and reciprocity between countries who have national standards. Unfortunately as we've noted previously, we don't even have two states that really will cooperate that way; but we have some hopes.

Finally, I think it's critical that we develop some international standards for the creation, transmission, receipt and maintenance of confidential patient data. The number of points at which data can be intercepted, inadvertently transmitted to the wrong location, or interfered with, are exponentially large as you move to a number of different providers.

To the greatest extent possible, we should have protocols. We encourage all our clients to have protocols internally for record-keeping purposes because, unfortunately, when it comes to the insurers who are looking at this issue--and who, as previously noted, have not really developed specific underwriting criteria--they are going to increasingly demand, I believe, record-keeping that can record who knew what, when, when questions were asked

by which physician, and the maintenance of those records in a secure way. So that if and when there is a problem, they can defend against the case as is appropriate.

I'm happy to take any questions following this. Again, we have far more comments; but we're out of time. Thanks.

MR. SCHANZ: Thank you. Next we're going to hear from John Blum regarding NAFTA and some other aspects.

MR. JOHN BLUM: Thank you, Steve. It's a pleasure to be here. I have no slides or transparencies, so I feel compelled to tell a story. Every afternoon speaker should have one or two stories, especially after lunch.

It was a dark and rainy night here in Boston at Logan Airport, and all the flights were delayed. There were three people, all deans from a university. One was a medical school dean, one was dean of a college of engineering, and one was a law school dean. And, of course, as the conversation wandered, they spoke about the inevitable political intrigues in their institutions and sort of ran out of things to speak about. And they got on a very strange topic, not a very meaningful one, about which of their professions was the oldest.

And the dean of the medical school, being a very assertive gentleman, said, "Well, gentlemen, of course medicine is the oldest profession. I mean think about it. God created Eve from the rib of Adam. This is evidence of the first transplant surgical procedure many thousands of years ago. "

The engineering dean smugly said, "Well, doctor, obviously you haven't read your Bible in a long time." And the medical school dean said, "Well, what do you mean?" And

the engineering dean said, "Well, look at the Book of Genesis. God created the earth out from darkness and chaos. Think about it, darkness and chaos. Think of the civil engineering feat of creating the universe, much less the world.

And the law school dean very smugly sat back and asked, "But gentlemen, who created chaos?"

I'm always reminded of that story as I think about the law and the implications of law on scientific development. I almost have a sense that those us in the law are always running after people in science and technology and saying, "Well, what you are doing is wonderful, but did you consider the fact that you may be liable for this? And there's not a rule for that? And there's not a standard for that?"

I know it must seem very tedious to the people in science when we have these kinds of discussion in panels because there's a lot of enthusiasm about telemedicine, about the application of technology. And I hope as a lawyer and a legal educator the one thing that we don't do is dampen your enthusiasm. As I'm sitting here listening to all of this, I'm sort of scratching my head thinking, gosh, do we really want to do this after hearing about the legal liability and the licensure problems and the of lack of standards? But I think, of course, the answer to the question is obviously yes, we do. And the obligation of us on the part of law is to find a way through the shoals of legal complications to assure that in fact we can do this, and do it successfully, both domestically and internationally. What I want to do is just focus on a couple of areas because my time is quite tight. I would like to just reflect on some of the comments that have been made very generally and concur with a lot of the very excellent information that you have gotten from the panel so far.

From my standpoint, one of the major issues that was mentioned by all of the speakers is the scope of medical practice, and I've been involved in medical law for over twenty years. It was never really a major issue up until recently. But with many of the changes in American medicine and worldwide medicine, people are beginning to ask again, "What is the scope of medical practice? And what is the appropriate scope vis-a-vis something like telemedicine?" And I would argue that in point of fact it's really an open issue. We aren't sure what the scope of medical practice is as it relates to telemedicine. We keep coming back as you've heard in the discussion to the issue of consultation. And what it means to be a consultant and where that stands vis-a-vis licensure requirements; and there, too, there's a bit of uncertainty.

I think the one thing you can say with some certainly, at least under American law, is that consultative services are a form of medical practice. Because they are medical practice all of the other factors that attach to that, mainly liability and licensure factors, are realities that have to be taken into consideration.

Let me draw an analogy as Doron has aptly drawn several analogies on liability. To me, the closest situation to the telemedicine doctor is the advent in the U.S. of managed-care physicians who are responsible for utilization review. Those of you who are from the States realize and have heard stories about the so-called 800-number doctor. Those of you who are from other countries may not be as aware of this. What's going on in American managed-care is a requirement that a physician get prior approval from a physician to treat patients. Generally, the prior approval is a requirement for elective procedures.

How it works, basically, is that via the telephone, the treating physician calls 800-number doctor--who may be in a different jurisdiction, though most times isn't--and

requests permission to treat Mrs. Smith. Well, the 800-number doctor examines the medical record and says yes or no. It's usually in terms of coverage. Is Mrs. Smith covered for this particular procedure? We have seen the evolution of this utilization review 800-number doctor to the point where the 800-number doctor is now actually giving medical advice: "Yes, not only is Mrs. Smith qualified for this procedure, but, treating doctor, this is now you're going to treat Mrs. Smith. You're going to follow this particular protocol. I'm telling you this because my mission as the 800-number doctor is to reduce expenditures for the managed-care plan." Well, a lot of people have looked at that in positive. In point of fact, that's no longer advisory.

In point of fact, this is not benign consultation, but active participation in the practice of medicine. There is a movement in the States in fact, to require that utilization review doctors, who are giving information over a telephone in that fashion be licensed in the jurisdictions in which they are providing advice. That's a very controversial area but a very unsettled one. But of all the areas of medical practice, at least in the U.S., it seems that the analogy there is very tight.

Another point that I think is very important to realize is that we as Americans are very quick to want to go abroad. We're very quick to want to export our technology. We're not as comfortable with the reverse. We're not as comfortable with having doctors from other jurisdictions come into our jurisdiction. All of a sudden we pull out every licensure rule in the world and say, "Well, it's interesting, I'm glad we have this Lithuanian who has all this advice, but he is not licensed to practice in the United States. But, of course, we can go to Lithuania; that's fine."

There is a bit of tension about foreign medical practitioners in the U.S. That tension is underwritten by the reality of funding. Right now there is a great controversy in the U.S. about foreign medical graduates and their role in American medical practice. As many of you probably are aware, we have depended very heavily on foreign medical graduates for providing services in inner-city and rural American. With changes in medicine, and with excess in specialty physicians, there is no longer as great a need for foreign medical graduates as there once was.

It's a very political issue. It depends upon what state you're in as to how you come out on this issue. If you think about telemedicine, and you think about the U.S. receiving transmission from abroad, there is a reality there that is a cultural reality. We may not be very receptive to that fact. That's something I think is important, and it needs to be discussed in a forum like this. It's not purely a legal issue, but I think it's one of those practical issues that needs to be thought about.

Let me speak very quickly about international law. As was pointed out in some of the presentations yesterday, there are a series of subregional agreements that we see around the world that have been entered into dealing with various parts of the world: the European Union is one, ASEAN in southeast Asia, and we have the NAFTA agreement. As an American I don't feel qualified to talk about anything but NAFTA. I do have some thoughts on the E.U., but we've got a lot of Europeans here who probably could educate me about the realities of the E.U. in medical practice.

Let me spend a few moments talking about NAFTA because it's one of the most well-known regional agreements. Before I get into some of the details, though, one of the points I want to make is that on the one hand these regional agreements do facilitate

cooperation and cross-border practices; and on the other hand, we have to be aware of whether we are expanding the borders in the sense of collapsing certain borders but actually putting up a bigger fence around three country borders instead of a smaller fence around one country border.

I think a lot of people are concerned about that when we look at these subregional agreements--that, in point of fact, we're actually creating stronger regional barriers than what existed prior to the agreement. NAFTA has several provisions in it that deal specifically with cross-border practice of medicine and healthcare generally. In this context, particularly if you focus on the U.S. and Canada, I don't think you can find two jurisdictions that are closer in terms of general commonalities; and I apologize to Canadians in the audience because I know the Canadians don't like to hear this, but we are very close in many respects. Yet, interestingly enough, if you look at the application of NAFTA to medical practice, I think it provides a very insightful lesson in the tensions that do exist among nations even with strong technologies, strong commonalities, and strong cultural identities.

Under Chapter 12 of NAFTA there are three fundamental obligations which are pretty uniform in these subregional kinds of agreements. Each NAFTA country must treat service providers of another NAFTA country no less favorably than service providers in its own country, the so-called National Treatment Provision. Secondly, each NAFTA country must treat service providers of another NAFTA country no less favorably than treatment it may give to providers from any other country, the so-called Most Favored Nation Clause. Thirdly, no NAFTA country can require a service provider from another NAFTA country to maintain an office or any form of enterprise or residency in its territory, the so-called Local

Presence Provision. Those are the provisions that are referred to in the professional service area as the three fundamental obligations.

As far as licensing and certification are concerned, there are provisions under NAFTA that deal with that: 1) the licensure needs to be predicated on objective and transparent criteria; 2) it needs to be no more burdensome than necessary; and 3) it need not or should not constitute a hidden barrier.

Now, on its face that sounds very favorable. But the reality of all these international agreements is that there are provisions that allow for what we call reservations under all of these international agreements so that the signatories may essentially raise their hand and say, "Well, we object to that particular provision."

Under NAFTA there are what we call two annexes that allow, in the professional service area, for specific objections to occur. I'll just mention one of the annexes, Annex 2, which deals basically with the country's ability to say, "We want to waive the provision," in this case, waive these three fundamental obligations, and there are limitations on how you do that. There are timing factors.

Let me just illustrate the Canadian situation because it's one I'm more familiar with. In the case of Canada, when NAFTA was signed, they looked at those three fundamental obligations and essentially they said, "We have a reservation. We would like to exercise our International Treaty Right under Annex 2. We would like as a country to adopt or maintain any measure with respect to certain services, including health, to the extent that they are social services established or maintained for a public purpose."

Those of you who are familiar with the Canadian system, which is somewhat similar to some European systems, know that it's a provincially based health information

system. By and large, it is a public system. Essentially what the Canadian reservation is saying is, "We want to have the right to protect the integrity of our provincial health program." And inherent in that right is our ability to restrict the entry of certain professionals from performing medical services, nursing services, allied health services in Canada. Even though on the face of NAFTA that would be prohibited, it's allowed for under the Special Reservation Clause. Well, what's really happening? Of course, this is another reality of law. There's the law, and then there's the reality of what the law really means.

In this case, the Canadians were very concerned particularly about the tremendous influx, potential influx, of American for-profit medical care. As you probably are aware, there is a tremendously large proprietary sector in U.S. healthcare that is looking at other markets. Of course, since Canada is geographically so close to the States, sharing the same border, it's a very logical market. The Canadians were concerned about American proprietary companies and that really is the genesis of this particular reservation. The reality is somewhat different.

The reality is that Canada, like many countries, is experiencing tremendous change in its healthcare system. If you look particularly at the province of Ontario, where there is a dramatic movement to privatize a lot of the system, it becomes even more attractive for Americans to go into Canada. Thus, the NAFTA reservations become even more important. What we are seeing is a very dramatic change of attitude. When we spoke with American practitioners even two or three years ago, they might have had some interest in the Canadian markets. But the interest was more in drawing Canadians to America for medical treatment and not going into Canada.

With changes in the medical economics of the States, there are, in fact, more and more American providers who want to go into Canada. We are about to see some tension. This NAFTA provision has never really been tested, but I suspect that it will be. There are also, vice versa, many Canadians who are looking at American consumers and American managed-care plans, arguing to the managed-care plan that they can, in fact, provide services cheaper than American medical centers.

If you look at areas like Michigan, which has a very large unionized population, there are many Canadian hospitals that are thinking in London, Ontario and Toronto about going into Michigan to attract patients in managed-care plans to Ontario to have services provided at a much cheaper level.

I guess the point of all of this is that these international agreements are there. They are evolving. They are very new, but there's a lot of cross-border tension now. And the natural inclination of every country is self-protection. Certainly in healthcare the inclination toward self-protection is at a height, probably more so than in most other enterprises.

We've got a long way to go. Hopefully, as we begin to deal with these international agreements, we will begin to understand and appreciate some of the nuances that we need to think about when we're negotiating and signing these agreements. So with that I will conclude.

MR. SCHANZ: Thank you. We have just a few more minutes, and I wanted just a quick look at the feedback from a couple of groups who are here, and then also in another few minutes take any questions or comments that you may have.

First, we have Curtis Rooney, who's a lawyer with the Washington office of the AMA.

MR. CURTIS ROONEY: Thanks, Steve. My compliments to the panel. I think it was very comprehensive and definitely impressive. I just had a few thoughts. I was looking at your list, and you had probably 15 issues up there. It was a little daunting, actually. I had never thought about all of it at one time, and I would actually add one more, ERISA, which is something that we have to deal with here. Well, actually, we may have to deal with it on the international front given the fact that so many multinationals are self-insured plans. I guess the bottom line of your list was you've given at least 15 new reasons to hate lawyers, you know. So I think your job is well done.

I think Leo's concept that we've had a hard time in the area of licensure is accurate, in my experience anyway. I'm sure Leo and I don't agree on all the issues, but certainly if you're an observer there are 50 states; and they might as well have not fought the Civil War. It's going on out there, and it's a pitched battle. I expect that experience will translate to the international arena.

I also think in terms of the overall picture, this is really a public policy issue. Law in a sense is kind of the history of public policy. It's kind of a look-back. I was thinking about what Doron had suggested about the sick child who died. In any public policy debate, if you get on the wrong side of the anecdote, you're in trouble. And if telemedicine starts to be shown as something that is detrimental instead of helpful, then telemedicine is cooked.

I could regale you with stories about legislative process and all that and how that works, particularly in the liability area, but I won't. I guess the last point is I, too, agree

with Doron in the sense that maybe these issues are very difficult. But yes, they can be resolved. These issues will be resolved over time. You might not like the answer, but they will be resolved. Those are my thoughts. Thanks.

MR. SCHANZ: Thank you. We also have Carolyn Hutcherson from the National Council of the State Boards of Nursing. Carolyn?

MS. CAROLYN HUTCHERSON: Thanks, Steve. I feel a little awkward being the first person to talk who's not an attorney. So I'm not really going to talk about legal issues particularly and not too much about nursing, except to say that we have diligently worked on the issue for about the last two-and-a-half years and are actually making some progress.

I think as we look at the whole issue of the change in the healthcare delivery system from a broader perspective there will be pressures to look at the licensure structure. The organization that I represent is the organization that deals with licensure. We have just over three million nurses in the United States if you count RN's and LPN's both. We have 61 different nurse practice sects in the country. And to some extent that's sort of a microcosm of the sort of issues you deal with and looking beyond the state or the country boundaries.

Now that is in some ways simpler because we all have a similar constitution. We have the same basic approach to law and to healthcare provision. We had the opportunity to participate in a project that arose out of NAFTA, and we had a trilateral initiative for nursing.

One of the most stunning things to me is that after several face-to-face meetings between representatives from Canada, the United States and Mexico, we went all the way

back to what Leo talked about in what licensure and regulation are all about, to protect the public. And we were just sort of breezing along like, "This is great. It makes sense." And our colleagues from Mexico looked at us and said, "What?"

And it really was quite an amazing perspective to look at it from a licensure perspective. It gets us all the way back to: What is the role of government? And healthcare provision? And in determining who provides healthcare? And in determining who's authorized to provide healthcare? There was a quote out of a [Inaudible] State Medical Boards Journal about two years ago that said, "There's no such thing as a U.S. doctor." I think that's one of the issues that we in this country are going to have to deal with, but it's certainly not the only one.

Uniform standards are an issue that regulators have to deal with. After having two years of dealing with organizations that are primarily female and all bureaucrats, we learned that having uniform standards means: That's great, I agree with you, as long as you change yours to mine. I wonder how that's going to play out in an international arena.

The good news is we've made enough progress that we've even moved on beyond the multi-state license to a model that's very much like mutual recognition and a drivers' license, which will only require one license in any state in the United States, hopefully to practice throughout the United States. But when technology bypasses geography, the statement that was made at the outset yesterday is that this is not just about telemedicine, it's about the internationalization of healthcare.

If you look at the internationalization of healthcare from a regulatory point of view, it seems that the fundamental question in credentialing healthcare providers is not the U.S. system or somebody else's system, but what matters? What matters in protecting the public?

What matters in assuring that consumers have better access to safe care? Is it somebody's system that we know right now? Is it that the fact that everybody who calls themselves a certain thing, be it a physician or a nurse, has an education, has met a credential, has met a standard? Is it that consumers understand what they are getting when they access the services of the different providers?

The bigger question is: who decides? Who on earth is going to decide whose standards will count? Whose standards matter? From having worked at the state level we learned that there are 270 different entities in the world that grant a credential as a nurse. It's real easy, as the panelist said, to say that our standards are what everybody's going to want, but probably not so. How then do we, as a worldwide community looking at healthcare, make those decisions?

So it seems that the ultimate issue is how we globalize while maintaining the integrity of the system. And how we move forward with the technological advances and keep totally focused on the fact that what this is all about is improving the health status of citizens of the world.

MR. SCHANZ: Thank you. John McMenamin is a J.D., M.D. from the Virginia law firm, [Maguire Woods Metal and Booth].

DR. JOSEPH MCMENAMIN: Thank you. I'd like to join everyone else in complimenting the panel in a job well done. To the charge of practicing law I'd have to plead guilty. But in the interest of getting out of here alive, I'd like to point out that most of my clients are with the healthcare professionals and healthcare institutions.

I'll be real brief because I know we're running late. The first is, I think, an issue that lawyers that have addressed this area have neglected to some extent--and this panel has not neglected, I think to its credit--is the possibility of products claims. I think there is a real potential for that against those that make the hardware, software, and the peripherals mainly because of the deep pocket attractiveness of such defendants and the attractions of strict liability, the concept of liability without a showing of fault. We have not seen that yet, but I think it's coming.

The second point is that, although I think there's a lot to be said in favor of development of standards, I'm not sure we should view it as a panacea, because in other areas where we have tried to set up standards since in the end it's a matter of expert testimony. There's a real risk that standards may not necessarily be the answer.

And the final thing is, and this is a pitch for which I make no apologies, lawyers do try actually not merely to identify problems and not even entirely to cause them, but occasionally try to solve them. In recognition of some of the problems that you all have been identifying here today, the International Bar Association, of which I am a member, is meeting this fall to discuss a great many issues, one of which is telemedicine. At that meeting we hope to have a conference that will address and begin the process of putting together a treaty to be presented eventually, we hope, to the U.N. for its consideration that, if all goes well, will provide some rationality in the way in which this type of healthcare can be provided in the future across national boundaries.

And for any of you that might be interested, I'd be delighted to tell you more about it. And I'd love for all of you to come and give us the benefit of your wisdom. Thank you.

MR. SCHANZ: Excellent. Thank you. Would Pierre be here?

MR. DINESH PATEL: My name is Dinesh Patel. I am an orthopedic surgeon at MGH, and a member of the telemedicine committee. More important, I spent the last 11 years as a member of the Board of Medicine in Massachusetts, including Chairman of the Board, and the last five years as a member of [Inaudible] medical board.

I know a lot about licensing. That's all I've done for the last 12 years. I could spend half a day talking about why licensure discipline. The fundamental principles of each state medical board in granting a license is to protect the health, safety and development of the public. The Board of Medicine doesn't consist just of doctors. We have attorneys, [Inaudible], we have orthopedic doctors, and all of these are there. The Board of Medicine gives the license.

By giving the license they are informed by the legislative mandate, and the legislative body is elected by the public at large. The public at large tell the legislators, "This is what we want to do." The Board of Medicine follows those legislative mandates. If you know [Inaudible], so I sympathize with international [Inaudible] more than anyone else. But in a lot of medical schools--Caribbean medical schools, Russian medical schools--the credentialing, the qualifications, the education are really uncertain.

If you look at the ABC [Inaudible] ABC [Inaudible] or CBS, there's a constant battle for this licensing, unlicensed, not an adequate license. So I think we have got to be very careful in seeing that we've got to be licensed, that a telemedicine license makes up one licensure. It's not going to be possible.

Federalism exists in this country. And every state--out of its ego, out of whatever--wants to maintain control over licensure practice, for one or another reason. So if there are

any questions about licensure or any aspect of it, I know so much about it, because I spent 12 years in licensing. But the fact still is it's extremely difficult to get a uniform license across the country unless we have some guidelines.

I was talking to Jay this afternoon about how when I was the chairman of the board in Massachusetts, we were willing to risk what we were going to name our system. If someone comes from England, a Ph.D., FRCS or whatever, they vary at one point. And if someone comes from India they probably don't have that. If someone's from the Caribbean system, we would have to look into it.

So if you know this system and education in those schools, then we have a guideline. Maybe there are ways to do this. Restricting the license of telemedicine licensure brings an unusual state and brings on the qualification, education of that person. Thank you.

MR. SCHANZ: Thank you. Let me ask real quick, Wayne Bell, do you want to make just a brief comment, and then I have one announcement.

MR. WAYNE BELL: Okay. Well, first of all, I'd like to say I'm very surprised. It would appear that in healthcare there's some sort of hatred between lawyers and the medical community and I don't understand that. In Canada, we've got a very close relationship. We really do. The lawyers, the attorneys, work very, very closely with medical scientists. I guess they figured out that there were some things rats just wouldn't do.

But regarding the licensing issues, just to touch base on that, many of the concerns that we have in Canada, I think, are shared in the United States. And looking from one

province to another, out of the 55,000 physicians that we have in Canada, there are only 600 that are licensed to practice medicine in more than one province.

That's just one point. As I think my learned friend said, "There is no case law." And as an attorney I guess we're all playing catch-up. We're used to that. The law is made in the courts it changes, we play catch-up. So nothing different here. I think that in most of the areas privacy, confidentiality, legal implication and technical failure are the main concerns in Canada. I don't think, in my opinion anyway, that this should differ in any of the other areas of medical practice, where technology is a component. And there are so many. I think that's what we have to look at. We can't lose sight of that. Thank you.

MR. SCHANZ: Thank you. Would Pierre Fernandez be here? While he steps up to the microphone, let me just remind everybody, if you would, please, on your way out, sign up for whatever section you want to attend tomorrow. Pierre?

DR. JEAN-PIERRE THIERRY: Pierre Fernandez and I represent the National Medical Counsel in France. He follows all the work here, but he was a little embarrassed by the language. Mr. Fernandez couldn't come.

Just to give you some input of what's going on in Europe, first of all, we have the common recognition of medical degrees for Europe. We have a very limited cross-border flux of doctors. We also have what we don't have here: the language barriers. Secondly, there's a strong influence of what happened and what is still happening in the U.S. One goes with, for example, the approval.

The FDA is some kind of a model that is now being replicated in Europe. But it started with the drugs, and maybe we have to work on other medical devices issues. So there is a time lag somewhere. It's a very good influence from the FDA. There's a very good influence on accreditations of utilization review quality assessment. There's a very good influence on CME.

We're working closely on the relation between new technologies and CME. Now with the lawyer issue, it's a little bit different because as you may know, but I don't want to elaborate on that, Europe is prone to try to work before the disaster. We're dealing less with liability issues than you are in the U.S. So the pressure of the liability on the European healthcare system is much lower.

It's a concern because somewhere liability protects the citizens, but also from Europe we might say liability is a national sport here and deficit medicine is a side effect we don't want to pay for.

That may be a slight difference. Besides there are a limited number of lawyers in the world outside the USA. Actually it's 30 percent outside the USA, 30 to 40 percent. I don't know if you know that. They didn't have them in mind to invest in the health care field. They have a lot of things to do elsewhere.

I think one of the side effects, and I'd like the idea to go to the international bar for the treaty, is that I don't want people from Europe to try through telemedicine to go to the court in the U.S. to get a lot of money.

MR. SCHANZ: I didn't know that statistic, but I've been educated. Thank you very much. That concludes our panel, and I really appreciate your attention and participation. Thank you.

End of Recording

SOUTHERN HEMISPHERE and OTHER REGIONAL PERSPECTIVES

MR. JAMES BARRON: One of the important issues in developing the Atlantic Rim Network was the concept that the Atlantic Rim goes north-south as well as east-west. This panel is, therefore, one of the important parts of the development of a framework for collaborative activities.

Without further adieu, I want to introduce David Brandling-Bennett, deputy director of the Pan American Health Organization (part of the World Health Organization), who has been instrumental in helping to shape the participation in this panel and other parts of the overall summit. Thank you.

DR. DAVID BRANDLING-BENNETT: Thanks very much, Jim. Well, to those hearty souls who are still here, welcome to this session. I think you'll be pleased to see that we've reduced the number of presenters. We should be able to get through this in approximately an hour.

I hope the session will be useful to put a perspective on the situation at least in some of the developing countries and one of the newly independent states. We have a different situation there from what we have here in North America or in Western Europe. This really must be taken into account in considering the type of telecommunication and health or telemedicine projects which can be successfully undertaken.

Let me quickly introduce the members of the panel who are up here. To my left is Patricia Bittner, a Program Management Officer with the Emergency Preparedness Program

at the Pan American Health Organization. She will be talking about some of the experiences we have had in developing a communication system to develop disaster preparedness and emergency response in the region of the Americas.

Next to her is Jesse Mbwambo, a psychiatrist from Tanzania, currently a research fellow with the Department of Social Medicine at Harvard Medical School. Next to her is Kristen Levy, administrative manager of the Armenian Medical Partnership Program, who is with the Boston University Medical Center. Finally, joining us on the panel is Dr. Haik Nikogosian, chairman and chief executive officer of [Diagnostica] Medical Corporation, a professor and former chairman of the National Institute of Health of Armenia, and currently a visiting professor at the University of Maryland.

So welcome to our panelists, and our first speaker will be Pat Bittner.

MS. PATRICIA BITTNER: Thank you, David. As David mentioned, PAHO is the World Health Organization's regional office for Latin America and the Caribbean.

What I would like to speak about today are several projects that have been going on for two or three years in Latin America that fit into the definition of telemedicine or telehealth if we look at it. I'm sure we've all discussed the definition of telemedicine numerous times. But the definition that seems most agreed upon, and one that I read in the conference materials and think is the most applicable, is the application of technology to the improvement of healthcare.

In this case I'd like to talk about these projects to develop disaster health networks in Latin America, joint projects of NASA, European Union, and PAHO; a marriage of unlikely donors. Perhaps you can consider the bride the health sector coordinators in Latin America;

also unlikely partners. Nonetheless as you'll see, some interesting things have come out of these projects.

Let me tell you how this came about. PAHO's disaster program is 20 years old. Every year for at least thirteen or fourteen years we've brought together health sector disaster managers in Latin America and the Caribbean to subregional meetings: the Andean region together, the Southern Cone central region, the Caribbean. We brought them together once a year, face to face in rotating countries, and they sat down and discussed common problems and solutions and strategies for overcoming some of the different aspects at the national level. They were full of goodwill and camaraderie, and they made great recommendations and promised to do all kinds of things. They returned to their countries and never spoke to each other for another year until we brought them back together again face to face.

We thought: What can we do to improve this communication among people, use technologies to improve day-to-day communications for disaster managers in the region? We decided to apply a project of promoting connectivity to the Internet to improve this horizontal communication among disaster managers, a) within a country itself, b) between different sectors within the country, and c) between institutions in subregions and regionally throughout the Americas.

Besides promoting communication, the second objective of the program was to provide access to global sources of information that people aren't able to tap into at the present time.

There are a number of strategies that we had to look at. In 1995, when these projects started, they were still rather new. It was a matter of changing political attitudes: how

decision-makers in the countries saw the whole issue of exchanging information. It was a bit of a lobbying effort at the beginning, just as it was 10 years ago convincing people to allow the fax machine to replace a formal, written communication. People began to accept, finally, letters and formal documents signed by fax. It was the same process of changing the way people think about exchanging information, loosening of some of the barriers. It was an investment of training of users. It wasn't a matter of technology; that was the easy part. It was a matter of focusing on the users.

Within the training of users, we were looking not at the most sophisticated aspects of technology, but at the basics: something that would provide them with access to these sources of information and to communication with each other. So we focused first on those more basic aspects of Internet which were e-mail, list serves, and later FTP and some other aspects.

Finally, we provided ongoing technical support in terms of identifying focal points in the countries whom we would leave behind to serve as hand-holders, if you will, when the project was over.

Who were the people we were looking at? Our primary audience was the disaster focal points in each country in Latin America and the Caribbean, but disaster management cannot exist in a vacuum. At the national level we had traditional partners for many years. Those include: the Civil Defense, who traditionally is responsible for disaster response; foreign affairs, ministries responsible for regulating incoming humanitarian assistance in most countries; parliaments who pass the laws and legislation that can affect building codes and therefore affect the safety of health infrastructure; and Red Cross and health-related or humanitarian nongovernmental organizations (NGOs).

In 1995-96 we targeted the six Spanish-speaking countries of Central America. That phase of the project has been concluded in terms of funding, but there is a great reservoir of goodwill that remains in Central America. A lot of committed individuals have been hooked through a very modest investment and are continuing this type of communication on their own.

From 1996 and into the present we have been looking to replicate the same type of strategies in South America: identify disaster managers at the local level, provide training, and leave a support mechanism in place when we move on. The Caribbean will be the last step, and hopefully funding will continue.

As with any project, these have not been without their problems. I'm sure they are some of the same problems that apply in some of the other telemedicine projects that we have seen. There are political monopolies in many countries. It's been difficult breaking down some of the traditional administrative barriers that exist, and there have been regulatory monopolies. Several years ago a number of the countries had state-run telephone systems. Things are changing, but those were some of the obstacles that had to be overcome.

This is more people-intensive than we had believed at the beginning and does require a lot of encouragement and hand-holding. It is a process of change the level of which many of you here--unless you were actually involved in it--wouldn't appreciate because you all seem to have a tremendously high comfort level with higher levels of technology. But when you're beginning to change a whole series of attitudes toward the way people have done business for a long time, it does require constant hand-holding.

Then in terms of communication across borders, throughout a region, language

becomes a barrier. Within Latin America it's not a problem. Between Latin America and the Caribbean, two regions that we serve, it has become a problem. So there are issues that we have to look at, and I'm sure this is applicable to all of telemedicine.

Briefly, a couple of the achievements of the project. Sure the list serves have worked, and people have discussed things; and we've seen actual exchanges of e-mail in disaster situations. Fortunately, in the last two years we have not been burdened with major sudden-impact disaster. But there's been serious flooding, a couple of hurricanes in Central America, and the countries themselves did quite a bit of exchange of information and strategies with their counterparts by e-mail.

We've begun to see a rise in their taking advantage of access to global sources of information. We've left nodes in place in Costa Rica, Guatemala, Honduras and Nicaragua. They are underway in Peru. They are up and running in Chile, and in Ecuador they're on the way. I should note that this has been on a cost-sharing basis. These projects are modest in terms of funding, but the political commitment of the countries themselves and other agencies have allowed us on a cost-sharing basis to reach a much wider audience than we had originally intended.

One thing that's particularly pleasing to our target audience is the notable increase in information up there on the Worldwide Web in Spanish now. Everybody feels a much greater comfort level in their own language, so there's a lot of disaster information out there in Spanish on the Web including training manuals and guidelines. There is also a regional Disaster Information Center that PAHO created in Costa Rica six years ago, which is now online with a 10,000-record database that can be searched with information requested from the center free of charge.

What is probably the most promising achievement seems unimportant, but it has been the greatest step in breaking down these barriers of resistance to using these types of technologies. This is the two discussion groups going on in Central and South America right now on different aspects of disaster management. They were originally created as a free forum , but we see the need now for moderators and specifically assigning themes and topics. Now that a comfort level has been reached, we will begin to do that.

So what are we going to do in the future? We are going to continue to direct the modest resources that we have available in this area to non-users rather than target what we consider the already overly well-fed population and give them even more. We want to expand the user base to a greater number of people in the region. In doing this, we're going to have to intensify a lot of the political lobbying, concentrate on training, and leave that technical support in place.

We are going to look for new partners with NASA and the European Union, the Council of Europe who has been involved in this; they've already joined efforts with PAHO. A number of other agencies can see applications where our partnership with them would be a benefit to this region, and they continue to raise the political awareness of the need for this in developing countries.

The final thing I'd like to mention, the final practical step for the future, is a major meeting that is scheduled for this November in Bogota: a meeting of Latin American and Caribbean countries together with North American, Canadian, and U.S. agencies and European agencies, as well individuals from other regions; but our primary focus is the first regions.

In using the Internet to manage public health crises, we're teaming up with PAHO's

Emergency Program and a division of disease control is teaming up with WHO's divisions to organize this meeting on managing public health crises, disasters, and epidemics over the Internet.

I left an advanced copy of the brochure which is going to the printers. There may be typos, since it's not there yet in flat version; but it's out there on the sign-up table. If anybody would like more information on this, our e-mail address is provided. We would be happy to get more information to you.

As I mentioned, this started out as a marriage of convenience between the health sector and the technology people; fortunately, we've seen that the union has some promising signs, and we expect it to continue. Thank you.

DR. BRANDLING-BENNETT: Thank you very much, Pat. I'd now like to ask Jesse Mbwambo what she sees or has experienced in her country, Tanzania, that we need to be aware of when we're thinking about the application of potential telemedicine projects.

DR. JESSE MBWAMBO: Thank you very much. Maybe I should start by saying Patricia should have talked after me because some of the solutions she had to offer are things I was thinking of myself, and I think are quite useful, though the condition I am going to be addressing is not emergency situations. Rather I'll be talking about mental health care.

I'm going to talk about the role of telemedicine in mental health care in Tanzania. I'll draw from experiences as a clinician as to how difficult it has been to supervise and to offer mental health care to patients in a country which is very diverse and which is very large.

This is Tanzania, and it's located in East Africa. It's a very poor country with a very

[Inaudible]. The size is about 950,000 square kilometers. The transport infrastructure is very poor except for the areas around the eastern part of the country which, as in most other countries in the world, provide access to the external world. That is where all the resources are usually directed. We have a reasonable amount of electricity, but not tapped. We have a fair number of telephone networks, but there is potential for improvement.

Now, let's look at the mental healthcare system and how it is structured in Tanzania. It's a bit crowded because it tells us about what mental healthcare there is, what functions it has, and the healthcare system in Tanzania in general. The mental healthcare system is mirrored against the healthcare system in Tanzania where the first port is the rural dispensary. In the rural dispensary, which serves about three villages, one is not supposed to walk more than five kilometers to a rural healthcare facility.

Just above that you have the rural health center. The rural health center caters to three dispensaries and refers its patients to the district hospital. We have quite a number of districts in Tanzania. We have at least 25 regions and at least three districts per region, which is a huge number of districts. Then we have the mental hospital and tertiary care and consultant hospitals, one of which I am working in, which is the [Inaudible] University Hospital of Health Sciences; and we have the Ministry of Health.

Now, mental healthcare in Tanzania is not given a priority, but I can't say that healthcare other than mental healthcare fares any better, as this is a country which invests 1.9 percent of its GDP on health. The training of mental health caregivers: At the first level we have a rural medical aide who has no psychiatric training whatsoever and is limited to recognizing psychiatric emergencies because they present with disturbed behavior, and people are unable to care for them at home.

When you move to the second level, you have a medical assistant who is not a psychiatric staff member, but has one or two sessions of training to learn how to recognize acute psychotic conditions and epilepsy and complications arising from epilepsy.

At the district hospital, we have psychiatric nurses who have 18 months training, who serve as the district mental health coordinators. Every district in the country has a district nurse. The district nurse is able to recognize psychiatric conditions and treat them, but we've had problems because treatment is not given with adequate doses of medication, so full remission does not take place.

At the next level you have the regional hospitals. A few regional hospitals in the country actually have psychiatrists. This is very rare, however, since most of the psychiatrists prefer to remain at the mental hospitals or the consultant hospitals. So we have five psychiatrists in four regions, including two in one region. Then we have assistant medical officers who are trained in psychiatry, who have 18-months training in psychiatry in [Mohambili]. I'm not sure how many of those are part of the mental healthcare system in Tanzania at the present time because private practice has taken over. It is more lucrative to treat other conditions than to treat mental health.

Then we have 23 regional mental health coordinators who are psychiatric nurses. But they are no different from the district nurses with respect to their qualifications. We run into similar problems with these psychiatric nurses as well.

At the tertiary level, we have 14 specialists or consultants and five of them are in training. The problem we have is that the majority of them are in Dar es-Salaam. I think 11 of the psychiatrists are in Dar es-Salaam City. The remaining are in either consultant hospitals in the country, and that is KCMC, which is in the northeast; [Baer] Hospital, which

is in the south; and one which is in the lake region. So the whole western part of the country is not catered to by mental health services.

At the ministry level until recently there was no acknowledgement that psychiatry was a problem. But with struggles we have managed to get a desk at the ministry, and we have a national mental health coordinator.

Tanzania has 20 psychiatrists for a population of 29 million. Even this enormous ratio, however, is understated, in view of the fact that ten psychiatrists are working in Dar es-Salaam, which has a population of four million. So there is a huge inequity as far as specialized mental healthcare is concerned.

During the inception of the whole mental healthcare system, it was expected that the psychiatrists centrally would be able to offer supervision to [Bisons]. And that meant the six zones in Tanzania were all allocated a centrally located psychiatrist who would have to make on-site visits and talk about issues related to mental healthcare. Because of the difficulties in the economy we have not been able to implement this for a very long time, but the system could be changed. We could look for a different way in which somebody in Dar es-Salaam could continue supervising healthcare in zones, in the regions, and in the districts.

What am I saying here? I'm saying we have a physical infrastructure. We don't have enough people to assist in mental healthcare, but we're saying there are mental health problems which need to be catered to. We need to look for a way to supervise people so that all referrals from the rural health center, or referrals from the rural dispensary, do not actually end up at the tertiary level because people feel that they are not getting adequate care at the periphery. This means telemedicine has a role to play. That's one.

Second, this healthcare system was thought of jointly by the Tanzanian government

and donor agencies; and by this I mean [Inaudible], WHO, and the Tanzanian government. It did work to a certain extent until the donors were unable to continue financing the healthcare system. It is important that when we think of telemedicine, which is technology that at this point in time might not be affordable, we have to focus in looking at how best we are going to be able to continue supporting the system once it's in operation. Otherwise during the five years we have funding for running this project we will manage that, but at the end it is going to collapse.

We need to look at ways in which we are able to offer supervision and are able to continue with the supervision once the other partners have left. Thank you very much.

DR. BRANDLING-BENNETT: Thank you very much, Jesse. Perhaps I should point out that though one would assume that most of you know that psychiatric illness, mental illness, is an extremely common problem throughout the world, those of you who are not familiar with the Harvard report published last year might want to refer to it. It represents the tremendous burden of illness and disability throughout the world, certainly a fair share of that being felt in Africa where, as Jesse has pointed out, psychiatric services are seldom available at the specialty level and medications to support treatment are also in short supply. So the types of projects that she's talked about can be very important for the community, especially since we would like to see most people treated in their communities and not sent somewhere for temporary care only to return home and subsequently have no further care available.

Well, going on from that very interesting presentation, let me ask Kristin Levy to tell us about the Armenian Medical Partnership Program between Armenia and the Boston

University Medical Center.

DR. KRISTIN LEVY: Hello, good afternoon. We're coming to the end of a long day, and I'll be brief. I'm not going to talk policy or clinical use. Our program is an educational program and what I'm trying to do today is to present to you the use to which we've put the telecommunications technology at Boston University in our Armenian-based program.

In the current debate about the cost of telemedicine--the use of it, access to it, who gets it, the quality of it--this program can perhaps shed some light on the use of telemedicine.

We're referring to the Boston University program as an integrated communications package of media assets. Now what are "media assets"? We're defining them as resources collected from various media: the print media, the video media, computer, Internet combined into a program collectively and individually. When they are combined they add value, hence the term "assets."

By way of background, the program started in 1992. That was a very complex operating environment. At that time Armenia had just become independent the year before. It was at war with its neighbor, Azerbajian. A blockade was in effect and remains in effect today. Turkey imposed a blockade in solidarity with Azerbajian and although there is a cease-fire in effect today, there is no peace treaty and the situation is improving. Political isolation and medical isolation have decreased, but there does remain this conflict.

We chose to focus upon emergency medicine and trauma, and we partnered with a hospital by the name of The Emergency Hospital. Signatories to the memorandum of understanding include the School of Medicine, Boston University School of Medicine, the

hospital, the emergency hospital, the Armenian Ministry of Health plus the [Aerovan] Municipal Authorities. And we are sub-grantee to the American International Health Alliance, which has a cooperative agreement to set up partnerships like this through U.S. aid.

Now in focusing upon emergency medicine and trauma, we chose an educational development strategy; and the areas of education that we are active in include postgraduate medical training and emergency medicine, involving the establishment of a medical residency program for emergency medicine. Emergency medicine has not, until today, been recognized as a recognized discipline for that area of the world. Now there is a 24-month medical residency, the curriculum for which was developed by the partnership.

In addition, if you are a fourth-year medical student in an accredited medical school in the United States or Canada, you can sign up for a clinical externship which is available at the hospital. We have sent to date about seven medical students to participate in that program.

I want to make a distinction. This is an educational program, not a clinical program. Also this is a grant-supported endeavor; it is not revenue-generated. If the grant monies were to be withdrawn, we'd have to write another grant. Since the strategy was education-based, we were faced with several alternatives. With respect to curricula, you develop them and you go to the country and deliver on-site training programs.

Another option is audiographic teleconferencing. We've gone into that. I'll explain more about it later. There are others that are available. ISDN lines, for example, do not exist as of yet in Armenia. Satellite connection can be made and my colleague, Dr. Haik Nikogosian, will refer to that later.

In these two modes that I've contrasted up on the screen, if you deliver a classical instructional program, you send a team of instructors to Armenia. You'll be sending about $20,000 every time you go when you total the cost of the travel, the amount of time that has to be spend in-country, the labor devoted to the project, various materials. Plus, you're losing the resources of your physician/nurse/instructor team that would have been otherwise employed in another endeavor back at your medical center. After all, five days of being away does represent a loss.

You have the advantage of face-to-face interaction, which cannot be understated. When we're doing our telemedicine program, we're doing it as a supplement to, not as a replacement for, classical instruction. The initial investment for the audiographic technology that we've purchased initially was around $13,000, which increases to around $16,000 when you add in the various initial costs. Every time thereafter, though, you do not have the same costs. Your costs go down.

You can do this remotely, so we looked into this technology and it suited the situation. In Armenia, the local telephone lines are unreliable, so we leased two AT&T lines, and installed them at the hospital. They are plain old telephone lines, a POTS-based system which is cheap, ubiquitous and rapid. We were able to train personnel easily at the hospital in the use of the system and found it versatile and easy to use. Speakers from both ends, Armenia and the Boston end, were able to go live voice and annotate directly onto a tablet. I can explain a little bit more later about the actual technical system. But the benefit was that there was interactivity of the speaker with high-quality visuals.

Earlier in the program we were invited to lead a didactic session on disaster preparedness. This was the occasion of the American International Health Alliance annual

meeting in St. Petersburg. We had a group of presenters from Boston, experts in disaster preparedness, linked with a panel of ministers of health of Ukraine, Russian Federation [Moldova], and I think Armenia was there. It was an opportunity to link them together, and that led to a teleconference series on the topic of disaster preparedness. I'd like to take Event Number 2, the expert panel discussion of an airport disaster, as an indication of the model to which I referred earlier. In the training program we ran disaster simulation drills, and in 1993, the very first time we ran a disaster drill, we captured video from the drill. We did it again in 1996 under a drill organized by people who had gone through the training program.

This image here is one of the actual video images that we collected from the 1996 drill, imported into the telemedicine technology, and presented at the teleconference. This way we could provide feedback to the trained personnel and, at the same time, we had panelists representing on both sides EMS, police, fire, hospital, and government authorities for both Logan International Airport and the [Inaudible] Airport in Armenia.

A way to enhance the educational lesson is shown here on this slide. Those two stretcher bearers up at the top are about to collide with the caregivers down at the bottom. This happened in the actual drill, and we captured it on tape and presented it later. We were able to indicate the real educational lesson we learned here: Walk, don't run. That's not something I say, that's the commentary and critique the video teleconference could state with clarity.

This is chest compression being done by the rescuer during the drill. He realizes that this person is not going to survive, so he has to move onto the next victim. Although sad, this is the correct medical decision, and since it happened during the drill it could be

presented and discussed later on. We are using the teleconferencing technology as a forum for presentation and a way to panelize discussion.

So what are the media assets when using this program? If the strategy is education, you develop curricula, you deliver them on-site, teach using simulation drills, document what you're doing by video, use the telemedicine technology to close the feedback loop providing analysis and critique, and widen the impact and disseminate this by putting it onto the Worldwide Web. Both the partner hospital and ourselves have a Website These resources (including those images) and all of the disaster preparedness didactic sessions are out there on the Web.

What does all this provide? In our program, this provides a maximization of the number of learning opportunities, and we feel we can assess the effectiveness of the training program moving ever closer towards an electronic university.

Other uses to which we put the system include patient consultation. This summer we are about to embark upon a Nuclear Accident Preparedness Training Program, and that will involve an extensive use of telemedicine technology. We're about to expand the system as an electronic journal club.

Summarizing the deliverables, we've run 13 programs, 40 contact hours of actual presence, instruction or otherwise, and 53 speakers. You can see roughly a third have been didactic; another third management, leadership or organizational; and the remainder in general patient consultation. So although we can do confirmation of the diagnosis using the system, it's primarily for an educational purpose.

In conclusion, the take-home message that I'd like to share with you is that this technology, in our use, is an intrinsic component of a communications package designed to

enhance the partnership objective of education in a remote area. The technological choice was suited to the local conditions and the local need for information.

End of Side A

Beginning of Side B

The obstacles included the physical environment, the infrastructure and the cost initially, but what has been, in my view, an organizational or management issue is the limitations of the use. After you pay for it, after you start to use it, you might think it would proliferate. But in our experience, and it's a question to this audience, maybe there is an underlying reason: 13 programs, approximately one for every two months. Is that underutilized? I think it is. It could certainly be experimented with more than it is. I'm wondering, and I'd like to investigate it further, is there a leadership or perhaps a management of information flow issue here?

Certainly there is some discussion as we go into these teleconferences how formal they should be, how planned in advance? Should they be informal? There is a training issue and there is a large translation issue that comes to bear. Thank you very much.

DR. BRANDLING-BENNETT: Thank you very much. Clearly distance teaching and distance learning is an important area of telemedicine that we haven't talked about.

Finally, Dr. Haik Nikogosian will share another set of experiences from Armenia with us.

DR. HAIK NIKOGOSIAN: Let me use another approach to the same concept. Our approach is more clinical, and we are based on the Internet, not phone lines. Our approach

is: Don't use any special equipment. If you have a PC, if you have modem-Internet link, you can just go ahead.

Let me tell you that Armenian involvement in international telemedicine goes back to 1989, just after a terrible Armenian earthquake, NASA provided a space-bridge telemedicine linking the Armenian medical community to four of the vast medical centers here in America. I was the co-chairman of that space-bridge project from the Armenian side. At that time, about 200 patients, mostly earthquake victims, had been consulted. Nearly 100 physicians have been involved from both sides.

Last year, in '96, another program of NASA-sponsored telemedicine for Armenia was initiated in [Diagnostica] high-technology based Diagnostic Center in Armenia. [Inaudible] Diagnostic Center in the area of the former Soviet Union, was also chosen as the international location for this project. The project itself is to the [Inaudible] new technology which was developed here in [Inaudible] in North Carolina by [Inaudible].

Let me tell you our approach. I think that international telemedicine for the nearest years will be telemedicine between western countries and underdeveloped environments. That is our approach. Therefore, we think that cost-effectiveness and not using special technologies are critical issues because we are linking very specific environments. Meanwhile, you cannot sacrifice medical quality, realtime, or interactivity. So the combination of simplicity and not using special equipment and cost-effective technologies aids this effort. There are complex issues like interactivity in realtime, and providing acceptable medical quality is the big challenge. So our approach is to try to combine these two things.

Last year we did about 350 transatlantic sessions between Maryland and Armenia,

with some from North Carolina to Armenia. That was really about two months. We used different days of the week. We used different times of day to check if there were significant changes in the speed and timing. Also, we used different types and different levels of compression, because you cannot do medical images internationally if you are just transmitting them without compression data. Which files? And so we used both [JPIC] compression, which is very traditional, but we also went to the emerging technology, which is [VIOLET] compression; and we also compared these two compressions. We compared the compressions themselves and compared while dealing with international transmissions.

There were several goals of the project, but the main ones involved the issue of the timing of transmissions and the issue of medical quality. Let me say that while doing these connections, more than 300 connections in two months and using different days and times, we have found that indeed there is difference in dealing with different times and days. The alleged speed of the communication between here and Armenia was about, let's say, 12 kilobits/second, the error ratio. Sometimes we had 20-25, sometimes 3-4. The speed was higher in evening and weekend times here in the east coast of the United States. That corresponds with mostly the nighttime in Europe and Armenia. We had a low speed with business morning times here, which is the end of the business day and late evening in Europe and Armenia. So there is a difference.

Still, even in that case--in the morning time slot, the busy time--we had acceptable transmissions. If the file is under 1 megabyte, we had transmissions sometimes not more than 15 minutes, with and without compressions, regardless.

So if the file itself is weak or without compressions under 1 megabyte, 12 or 13 and sometimes 15 minutes is acceptable for medical transmissions internationally, which is not

ours--like without compression. We failed while transmitting files more than 1 megabyte internationally. The file broke and that's where the compression technology and the compression itself is very critical for medical images.

We used four types of medical images: city, MRI, ultrasound, and X-rays, both bone and chest. This is our timing experience. As I stated earlier, when considering the possible influence of the compression on timing and speed, we found no significant difference in the relation of the compression itself to the speed. But we also compared the medical quality while doing compressions by [JPIC], and I can say this is one of the first investigations in this field. We hope that other investigators will follow us because it's just very preliminary. We found there is no single answer to which is better.

For the [Inaudible] images like angiograms, contrasted images, bone X-ray, ultrasound, wireless seems better. But for other things like general X-rays, not bone, like chest X-ray, or general MRI, not contrasted, general city, [JPIC] compression seems better. This is very preliminary, but this is one of the first investigations in this area. We hope other groups will follow and will do more independent investigations in this field.

We also did successful realtime interactive sessions, some international, transatlantic, including more than 100 realtime sessions between Maryland and Armenia. Doctors could share the image simultaneously, and they could discuss the image using several tools. The first tool was the voice via Internet at zero cost; keyboard charting and pointing, zooming, etc. When doctors, for example, did some pointing or zooming or charting, the lab or the doctor at the other site could see that simultaneously and can refer or answer or reply.

What are we doing now? We have just created a domestic segment of this network in Armenia using the infrastructure of [Diagnostica] Corporation. It has a hub center in the

capitol of Armenia and three branches in Armenia. We have just created a network connecting that center to the hub. Now we have two segments: domestic in Armenia and International between the Hub and the United States.

We are going to show this year how even the rural Armenian patients from the branch centers can be consulted here in America, while physically in rural Armenia, not even in the capital of Armenia. This allows for the use of the Internet. We hope that this experience, this technology, and this knowledge will be useful for the international telemedicine at home for the future. Thank you.

DR. BRANDLING-BENNETT: Thank you very much, Dr. Nikogosian. I think the last example that Dr. Nikogosian provided us with is clearly the type of higher technology telemedicine that we have been talking about during the last day and the sort of thing we would like to see developed in many more countries. Obviously, there are going to be a number of challenges to accomplishing that.

We have a few minutes for questions if the audience has some. I welcome you to use the microphone to introduce yourself. While you're thinking of some questions, perhaps I could just quickly summarize. I think Pat Bittner pointed out that there are obviously a number of challenges in introducing even a very simple technology, that is, the use of the Internet. But people indeed will do things which are simple and that they find attractive and useful. Perhaps most of you are aware of a study which is near conclusion of families in Charlottesville, Virginia who were provided with Internet access to see what they would do with it. It turned out that e-mail was the most popular thing. Perhaps that means that people in the health field are no different and that if they have e-mail, that's what they will tend to

use. Of course, that can be extremely useful. But there are difficulties that have to be overcome. You have to get people used to change, you have to deal with political issues. But this can be done, and you can have a useful, and what is most important, a self-sustaining result.

Dr. Mbwambo was talking about using simple technology to meet a very serious health need in her country. Here again, we're talking about simple technology to meet major needs, and for the most part not looking at sophisticated technology. Because even if you could introduce them, you may not have the support at the end.

And then Kristin Levy talked about another area which clearly is involved in telecommunication, and that is distance teaching, distance learning. I do some teaching at three different health schools, schools of public health and medical schools. At all three sites, and at other schools, I find everyone is either into or wants to get into distance learning, distance teaching. So that is as much the mode as telemedicine. Here again, I think we have a serious problem that it is not just the use of the old classroom technology that is going to be most effective in distance teaching. We have the challenge of most effectively using the technology that is available.

DR. DANIEL CARLIN: I feel like I'm hogging the microphone. I loved your approach with low technology and I don't really have a question but a comment. I take care of some ocean sailors and one of the communication systems we use is a marine single-side band which has piggybacked onto it a proprietary modem. There are two of these company, one's called Globe Wireless, the other's called [Pinot] Digital.

When you're in a situation where you can't get a phone to work, if you've been

notified that it's coming, or you're set up to be notified when it arrives, e-mail can be turned around from almost anywhere in the world in about five minutes from when they send it to when it pings your computer.

For those of you in the disaster business, when the phone system is wiped out or it's gone for a day or two, this is a great tool. I kind of stumbled onto it and if you want to know anything more about it, please talk to me afterwards. It's really simple, low-cost technology and it's immediately available. Thanks.

DR. BRANDLING-BENNETT: Thank you very much. Any other questions or comments?

MR. SARKIS ZARTARIAN: I provided the technology for the Armenia study that Dr. Nikogosian spoke of. I thought it might be worthwhile to tell you about the technology we're doing next and the enhancements we're doing.

We found out that we would like to have multi-party instead of two-party consultations both for the diagnostics and so that you could have three persons in the call. We also are exploring distance-learning and that gets into multi-party. Instead of getting into the expenses of $100,000 or so multi-point control units, we're using the architecture of the Internet itself for multi-point with no cost of hardware. So we're going to multi-point this summer, and we hope to be doing experiments soon after that in actual situations. We're going into multi-point voice, and we're moving to realtime video. We have the capability with this hardware and software to operate through normal PCs and to go through the Internet, and we'll be doing realtime videoconferencing even down to modem speeds. We will do that between America and Armenia.

We will get reasonably smooth, not herky-jerky frames, and we will be able to do that down around 20 kilobit modem speeds with simultaneous interactive voice. We've got a way to even do that multi-point. Again, I don't see any limitations at this point to doing the fundamental functions of remote telemedicine. If we take what we did there and add the realtime voice and the multi-point, we think we have a pretty highly functional base for distance-learning and telemedicine to be developed in developing countries.

DR. BRANDLING-BENNETT: Thank you very much. I would like to invite more of you in the course of your pursuit of telemedicine and telecommunications in health to become more involved in the international field and to help us identify those things that we can do which will effectively and cost-effectively benefit so many people in the world who don't have access to even basic health services. I thank you for your attendance at this session, but foremost I'd like to thank our panelists for their presentations and their time. Thank you very much.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997
NORTH AMERICAN PERSPECTIVES

Side A

DR. JAY SANDERS: We're going to begin the session just a little bit out of order. We are going to ask Suzy Tichenor, who is the Vice President of the Council on Competitiveness, and a year ago edited and predominantly wrote a seminal report on the whole issue of market opportunities and barriers in the field of telemedicine. Suzy will begin our discussion dealing with those particular issues, potential market opportunities and barriers.

MS. SUZANNE TICHENOR: Thank you, Jay. Let me give you a quick rundown on who the Council on Competitiveness is because I think I might be the token liberal arts graduate here in the crowd from what I can determine. We're a policy organization in Washington. Our members are CEOs of companies, presidents of universities and heads of labor organizations. We're about 10 years old, and we look at policy and regulatory issues that our members feel are having or will have a bottom-line impact on their ability to be competitive.

We've done a lot of work in the past couple of years on the policy and legal issues surrounding the evolution of what in Washington is often referred to as the "National Information Infrastructure," NII, or now we talk about the GII, the "Global Information Infrastructure." At one point, we decided that we had looked at this theoretically long enough, and we really wanted to see whether this National Information Infrastructure, this convergence of advanced communications and computing capabilities was really having an impact on the economy.

Was it going to stimulate new markets, jump start existing markets? Was it really going

to create new applications, or be a tool to create new applications that would make a difference in the way we work and the way we live? So we chose one market that was of particular interest to our members, and that was the healthcare market. Why? Well, because we saw two competing pressures that we thought were really going to have an impact on our competitiveness as a country. That was the need to control costs at a time when demand for service was rising exponentially. These rising costs, we saw competing for resources from the economy, which could potentially curtail our ability to compete in the global marketplace.

We recognized that a healthy population, if you can achieve that at a reasonable cost, is the foundation for national competitiveness. We did put emphasis on "at a reasonable cost" because we felt that the financial health of the country is as important as the medical health of the country. That's what initiated our foray into this, looking again at the healthcare market as it was being effected by this evolving national information infrastructure.

We put together an advisory committee of about 35 or 40 people, many stakeholders in the healthcare community. We had business executives from hardware and software companies, telecommunications companies, medical equipment manufacturers, HMOs, and we had physicians. We are cochaired by John [Rolwagon] who was the former Head of Cray Research and Bob [Hattery] the CEO of Mayo Clinic, Rochester. At the chairmanship, we had someone who had been steeped in the development of infrastructure, high performance computing, and someone steeped in, obviously, the delivery of healthcare.

Our audience is generally the public, but we prepare our analyses and recommendations very much for the public sector, also, in recognizing that a lot of them are generalists. And yet, they are called on to make decisions, complex decisions in areas where they may not be

experts. We try to take some very complex issues, that we think are having an impact on competitiveness, and frame them up in such a way that the policymaker can understand what the impact is going to be. Then we usually offer our best thinking on recommendations for both the public and the private sector, depending on what the issue is.

So what I'd like to do today is just review with you a couple of points from the report that we did called *Highway To Health: Transforming Healthcare in the Information Age.* We actually looked at four different areas. We looked at the use of NII tools and technologies to deliver care remotely, kind of the classic telemedicine that we've been talking about. But we looked at some other areas too.

How can these tools be used to bring more and better health information to individuals to help them take more responsibility for their own health? What are the systems integration challenges that we are facing right now in the healthcare market? And also, could these tools and technologies be used to help stimulate and extend medical education and research, particularly, at a time when those activities are under cost constraints also? Each of these sections was laid out in the same way. We tried to look at what's the market today? Again, we tried to take a market perspective, what's the market potential? What are the barriers to achieving that market potential? And then some of the recommendations that we had for the public and private sector on how to overcome some of those hurdles.

What I'll do today is talk about some of the things we found that were driving the market in the telemedicine area and some of the barriers. I know that my colleagues here on the panel will be talking about some of the barriers and the market opportunities in more depth. And then recognize also that the audience for this report is not the earlier adopter such as yourself. It's for the policymaker in Washington who has to get their arms around this in

order to create the appropriate legal and regulatory environment so that you all can go out and do what you want to do.

First off, what were some of the drivers on market potential? Before we even got to the drivers, we tried to see if we could quantify the market potential. Because we are in such the early implementation stage, we really couldn't come up with any hard numbers. We found numbers that ranged anywhere from a billion to a hundred billion. The order of magnitude was so dramatic, that the numbers almost didn't make sense. But we did find a few things that were really driving market development, and I have these listed here.

One, the need for providers and payers to lower cost. That was what drove us to looking at this issue, and to see whether the NII tools and technologies could be used to help that, particularly, in a risk sharing and a capitated environment. We also saw clearly that many organizations have a need to secure their marketshare or to expand their marketshare. Rural hospitals are seeing the benefits of telemedicine because they can secure their patients right there. They can keep them and not transfer them. Academic medical centers are seeing an opportunity through telemedicine to reach into new areas and garner additional referrals, not only in this country but also internationally. And those referrals, particularly, the international ones, are bringing in additional revenue to help support the medical and research education, the real seed corn for our medical community.

We also found that the need for an advanced information infrastructure could really pace the spread of telemedicine in this country. Remember, when we were looking at this 18 months ago or a year ago, the telecommunications bill had just passed, and the FCC had not even put together its telemedicine advisory committee. The ruling that came out a couple of weeks ago, that Chairman Hunt mentioned, will do a lot to address this because the need for

advanced infrastructure is both a need for the physical infrastructure in some areas but also a need for an affordable infrastructure. The ruling that the FCC has just made will allow for an affordable infrastructure. The universal service funds will not provide for the laying of the infrastructure out there, but for those who have it and can't afford it now, they should be able to afford it with the new pricing mechanisms in universal service provisions.

Finally, the reimbursement and funding issues. They go hand in hand, and they are certainly driving the pace of development here. We found many telemedicine programs were operating on grants. They did not have a clear plan for self-sustaining activities after the grant ran out. Obviously, if a market is going to develop, it has to be able to sustain itself without a government grant. It has to be profit making. The reimbursement issue is also going to drive the development. Nobody is going to work for free. They will do it for awhile in a pilot, but, ultimately, insurance companies will have to grapple with this and also Medicare will. The good news is that since our report has come out, partly I like to think as a result of our report, OMB authorized money for HHS and HCFA to initiate a pilot project with a number of hospitals to provide for reimbursement, to see whether this would be something that Medicare could afford to do.

We found a number of barriers, and I don't think these will surprise a lot of you. But again, for our audience in Washington, crystallizing them in this way helps them to understand what we're facing. There is a need for physician and practitioner acceptance of the technology. There is still a lack of physician acceptance of the concepts of telemedicine in many areas. In some cases, there is uncertain patient reaction to the use of telemedicine. It is unclear whether all patients will want to participate in this. They are not always sure about the quality and efficacy of the care that they are getting. In some cases, they are very

comfortable with it, but in some cases they are not.

There are a number of legal and regulatory barriers. This was discussed earlier this afternoon. Interstate licensing, the reimbursement issue, is HCFA going to reimburse for Medicare patients There are cumbersome credentialing requirement. The legal liability issues are enormous in many cases. Stalling the spread of Telemedicine certainly on an interstate basis often when there is the potential that in some kind of a malpractice case, there could be venue shopping. There is also tremendous uncertainty about the malpractice exposure. Wherever you have uncertainty, the risk rises, and people become more reluctant to proceed.

There are also some very serious FDA issues regarding the use of hardware and software. It's not so much that the regulations of prohibitive, it's the fact that the regulations in some cases are not there. People don't know what the boundaries are anymore. They don't know what the boundaries will be, and in some cases, it's stalling their advancement. The FDA is struggling with this, and to give them credit, they are trying to reach out to industry. But it is going to be a long and tough haul. Regulatory issues can, if they are not sorted out properly, can have a devastating effect on market development. Then there are certainly a number of issues regarding confidentiality and patients' rights. A couple of other barriers, you all know better than the token liberal arts graduates about the need for evaluation data on cost effectiveness and medical usefulness. HCFA certainly is looking for that before they make their decisions. The cost of the telecommunications infrastructure, hopefully the recent FCC ruling will help to bring that down with the universal standard dollars that will be made available, the need for practice guidelines and quality assurance.

What's the prognosis here? We found that there really is tremendous opportunity. A

number of the testbeds that are up and operating are showing the medical efficacy. We are showing that it can be very cost effective, and, particularly, over the long term. But unless a number of these barriers are addressed, and addressed fairly quickly, the market simply won't develop as robustly as it could. Telemedicine will remain probably a regional or an intrastate activity if the interstate licensing rules cannot be sorted out. You all will continue as the early users to adopt, but there won't be the breath of integrated systems. We found very clearly that the private sector may be slow to invest. In fact, we know that a number of telecommunications companies have become very jaundiced as they've looked at the licensing and credentialing quagmire that exists. They are taking their dollars and investing them overseas. That's a concern, not because investing in international Telemedicine is bad, that's a wonderful thing because we have a wonderful service here to export, and those dollars can be reinvested back in the states, but companies were very clear that once those dollars are committed overseas, they will not be able to pull them back. For those of us who are counting on telecommunications and medical equipment manufacturers to support the spread of Telemedicine here in the United States, if these regulatory issues aren't sorted out soon, they may find that those pockets are empty.

The regionalization of the specialized markets, will be those that are developed. And the international market will continue to attract investment. Thank you.

DR. SANDERS: Thank you, Suzy. Now, it's a distinct pleasure for me to introduce Paul Cochrane, who is Assistant Deputy Health Minister of Canada.

MR. PAUL COCHRANE: Thank you, Jay. In Canada, in general, I think many of the

developments in telemedicine parallel what we've seen. But today as the Federal Health Ministry in Canada, we have a targeted audience that we deliver services to, which is the Indian Health Service. That's what I'd like to show you today in terms of a project we've undertaken, some of the findings of that program, and where we see it going.

The project is called the Merlin Project. It's a medical remote link Indian health network. The project, if you situated within our small geography in Canada, the project is in Ontario, Canada. In fact, it's located in the northern area of Ontario, in an area which we refer to as our Sioux Lookout District. This district is made up of some 32 communities, largely all of which are first nations communities served out of a zone hospital in Sioux Lookout, Ontario. The 32 communities represent an area about the size of France, with a population of about 35,000 people. Services into all of these communities are isolated northern remote communities, served by air, with the exception of Sioux Lookout, which actually has road transportation out and into a community called Thunder Bay in Ontario, and a community here in Manitoba, which is Winnipeg, Manitoba. All the rest of the communities are isolated flying communities. The budget that we spend in this community, and this doesn't cover what are our insured services in Canada, physician services, hospital services, but the extra services we provide into this group of communities about $32 million a year.

This project looked at using telemedicine. It used the base hospital in Sioux Lookout. We picked two communities, one of the larger communities, 2,000 people in this area, and a smaller community of about 400 to 500 people with satellite communication in Sioux Lookout, and for education purposes, a communication link into Ottawa, which is where our headquarters are located. The service uses a high-speed satellite and also ISDN network

transmissions. The communities are some considerable distance apart.

Indeed, Sioux Lookout zone is 1,835 kilometers. If you multiply by .6, you'll get about the number of miles that is from Sioux Lookout to Ottawa and then between the two stations and the base hospital in Sioux Lookout. The features of the project itself were multiparty video conferencing, patient-patient, patient to doctor, face-to-face, and confident sessions. The system allows for encryption, continuous medical education sessions. We use the word "medical education sessions." The deliverers of service in these communities are nurse practitioners, who receive occasional, once a week in some cases, once a month visits from physicians. The medical education refers to certainly physicians and nurse practitioners. We wanted high resolution detail for diagnostic purposes. Live interaction doctor-nurse consultation was part of the experiment. We basically focused on three devices, x-ray, ECG, and live stethoscope transition back to the base hospital. We had a number of partners in the process, and in terms of our Indian health services, the partners in the process, because we wanted to set it up as community based as possible, were Health Canada, the University of Toronto in Toronto, Ontario. University of Toronto provides the doctor services, the specialist services, and other professional services into our hospital. And the [Scabbaaske] Nation, which is the tribal grouping of bands in that area, and the Sioux Lookout Health Authority, which is in fact the aboriginal health authority, which is now taking over the delivery of services from us in this general area. Those were the four partners in the process.

The project objectives were to address the problem of access to medical care in remote areas via telemedicine. An evacuation from these communities, all of which have to be done by air, cost anywhere between $6,000 and $10,000 per evacuations. Improved service

delivery in the zone, provide the cost benefit of telemedicine versus travel, be acceptable to patients and staff, and build solutions based on standards. This was very important because we have a number of referral hospitals and specialists which we wanted to build in with standards so that they could access the network very easily and provide us with another level of consultation.

Benefits provided, patients certainly see the physician sooner without travel, shorter times to diagnostic, pre and post follow-up, electronic transfer patient's records. We can get specialist communication with the base hospital and in turn from the base hospital into the communities. Used for community health programs, this is very important. Not only is it in terms of telemedicine, but I guess in terms of teleeducation, distance learning, to provide educational opportunities for the health workers in the community. Other than the nurse practitioners, most all the health workers in the community are local people who have some training in either community health programs, mental health programs, alcohol counseling programs, et cetera. It also gave us an extended-care patient visit with families in the hospital. Somebody today spoke about telebaby bonding, well, certainly we found that to be one of the great, great features of this in terms of family bonding, visiting with family, saving people from coming into visit, and sending patients back on occasion to their communities.

Encounters, interesting what you find out. Canadian winters can be quite severe. During storms in this area, I guess you have them in Washington too, electrical storms, these communities are often isolated. We cannot get people in and out of the communities. It was possible to provide an enhanced level of service. Telephone service down in the communities, this is an interesting one, one woman's family only agreed to travel once they

saw how lonely she was. These people largely do not speak English. They speak the Cree dialect. All of the services delivered in this area are generally done through a translator. So you can imagine the cultural issues which go with that. I guess family bonding here is an issue.

Feedback, based on the pilot, feedback has been very positive. Patients are certainly willing to use it. At first, they were somewhat skeptical about it. Physicians are positive and still exploring new uses. Nurses are getting more comfortable with it in terms of receiving diagnostic information and feedback from the clinicians. Communities support it, which is very, very important if this is going to succeed. We would like to expand it into all the communities.

In terms of consultation sites, I mentioned a couple of them before that we were also able to use. In terms of timelines on this project, we actually started to design the project in 1994. At that time, telemedicine technology wasn't was it is today. It took a while to line up the right partners in the project. The pilot was conducted in '96. And we look forward now, this year, to moving it out to new partners in new communities.

Next steps in the process, we want to connect more centers, obtain funding partnerships. In terms of funding, always an issue. Our communications, the set-up costs for this project were around $180,000, and then about a $10,000 a month ongoing cost. The equipment that we needed in the two remote stations in the base hospital was about $100,000. Some of the medical peripheries that we needed were about $75,000. So it was not an inexpensive setup, but that is saving us $6,000 to $10,000 per medivac. We are still not sure it's a break-even proposal. Further acceptance, some of the issues we've identified in our health insurance plan in Canada, a physician cannot be reimbursed for telemedicine contact with a client or

with specialist consults. That's a real issue. Healthcare professionals, to take up on technology, there was some getting use to it, but it's certainly something that we still need to do more of. In terms of the communities, the whole project has to be community focused we found. It can't be a telemedicine focus. It can't be a medical practitioner focus. It's got to be a community focus, community acceptance. In terms of government, we certainly have regulation issues, which as a federal government, we don't sort it out ourselves. And certainly healthcare bodies, all professionals need to support this kind of initiative. So far, some professionals have been somewhat reluctant.

In terms of conclusions and challenges for us on this project, the technology we found works. It works very well. The imaging is excellent. The diagnosis certainly don't suffer from the lack of good imaging and good communications. Generally acceptable to all groups. However, we must target the clinical needs for the best result. We don't think that this is something that is just sort of spread out, and it will work. That's why we targeted three key areas. Definitely takes time to adjust and learn. Tracking soft returns is straight forward. The cost benefit is still not conclusive. And making it pay for itself is going to be certainly a challenge for us in the future.

In conclusion, in terms of the architecture, certainly we had partners in the architecture. Our own department, Technology Healthcare Systems of Halifax, Nova Scotia, was a key player in the equation for us. Fifth Dimensions Communications of Ottawa with the satellite setups, and our own National Research Council in Ottawa, which provided us with some equipment and helped us in the evaluation phase. That's a very quick summary of that particular project. I think it probably parallels many of the findings you have. For us, this is very important because as a federal government, I've showed you one zone with 32

communities. We actually provide services in over 350 isolated northern communities just like these communities. So for us alone is the federal government, the technology, and the investment in telecommunications versus the savings in transportation cost. Last year our transportation cost out of those 350 isolated communities was approximately $200 million to bring people out of those communities. So there's certainly an area where if cost-benefit is justifiable, we certainly think there are tremendous advantages. Thank you.

DR. SANDERS: Paul, thank you very much. It's amazing the similarities that exists from country to country in looking at the Native American population in Alaska, the population in Oklahoma, and then traveling a few miles to the aboriginal communities in the Northwestern part of Australia to see just the incredible similarities and the need for partnering in developing the types of access too care that they need. Very interesting. Our next speaker is Dr. Jeffrey Gelfand. Jeff is the Chairman of Department of Medicine at Tufts New England Medical Center and has been one of the leaders in terms of academic medicines application of telemedicine. A very interesting, in fact, exciting, both local and international program in telemedicine. Jeff.

DR. JEFFREY GELFAND: Thank you, Jay. I actually came to telemedicine via a similar route to Jay, in fact, entirely through Jay. I started off my academic career and still maintain it as a bench immunologist as Jay is. Along the way, I realized that there were some technology solutions to a growing problem. And, in fact, got my first introduction to telemedicine through Jay's kind intervention. Basically, when I became acting Chairman of Medicine three years ago at New England Medical Center, I came to realize that the Boston

scene was characterized by some unusual problems, virtually the diametric opposition. My predecessor discussion, namely, we had too many doctors and not enough people. It may shock those in the audience who come from Boston, but this is a fairly intense competitive healthcare market. Of course, the usual rules of academic gentility still obtain. We have tried to deal with this competitiveness, in fact, by some innovative solutions that would have a minimum impact on the local market.

The current situation in Boston is that there are probably a third too many specialists. And, indeed, there are too many beds. One could solve that problem simply by eliminating a third of the specialists. In the case of my institution, if I were to do that, we have 450 specialists at New England Medical Center. They also represent the faculty of our medical school, and is the primary teaching hospital at Tufts University School of Medicine. A third of my faculty departing would make for a major negative impact on the educational process. Not to mention the fact that society has painfully built a medical infrastructure in the city and in our region.

At my medical school, we currently are doing, with the hospital and school together, approximately $100 million a year in sponsored research. The infrastructure to support it, research laboratories, et cetera, I would maintain that that is a critical regional resource that rather than deconstructing, we needed novel approaches to sustain. Given that the local market, as defined by managed care, became basically a zero sum game either our hospital gained patients and someone lost them, or our hospital lost patients, and someone gained them. It seemed that a solution outside of the box was necessary. And that was provided by telemedicine.

We had an early experience with telemedicine that was established in the course of trying

to serve one of our sister institutions nearby, the Faulkner Hospital, where there was a need for real-time consultation in the coronary cath lab. That was established via telemedicine links. Some of you may recall some prior Nynex commercials demonstrating the fact that real-time consultation on coronary and geography could be generated in between institutions using the diagnostic imaging of telemedicine. That was ongoing very successfully, a technology that we were using locally. In addition, the hospital currently carries out an extensive telemedicine domestic program doing fetal ultrasonargraphy with Bay State Hospital in Springfield, about 90 miles from Boston, where our medical geneticist, pediatric cardiologist, and perinatologist carry on active perinatal diagnosis and provide a ready infusion of talent, not so readily available 90 miles away. Fetal echocardiography is conducted and so on. So the technology, from the standpoint of domestic applications, is ongoing. Of course, free of the regulatory complications that we earlier heard about. But, again, we had significant market difficulties, and we sought to address these via a technological solution. I was fortunate to have a friend, who currently resides in Buenos Aires, come to visit three years ago. My colleague is a prominent physician in Buenos Aires, and basically said, "Jeff, why don't you export your extra capacity?" a supremely logical recommendation. We have pursued that strategy fairly aggressively, and currently have active programs in international medicine. We are using telemedicine technology to basically further those ends.

Currently, in addition to our domestic telemedicine activities that I spoke about, all of them local and intrastate, we are doing some work with commercial multinational companies providing real-time medical consultation. Some of that in very underserved areas. The largest effort is in the area of international medical consultation, involving what I think is a different

format than the typical international medical consultation that most American hospitals have entertained to day, and again, this is the nucleus of this is telemedicine. We have contracted with major organizations in Argentina, in this case labor unions, using the difficult experience we have acquired in American managed care, namely, learning to organize our medical care in a cost effective way, dramatically reducing the cost of our care, learning to document our outcomes, and document patient satisfaction, and developing care protocols. We've applied these in areas with major organizations, convincing them that we could focus on three major areas so as not to compete with local physicians. We would advance our care as an opportunity for situations that were not offered abroad. Let me give you an example, cryosurgery for carcinoma of the prostate, not available at all in Argentina, now an option available to patients so desiring it. Intensity modulated radiotherapy, a very radiation sparing technique for small tumors, for example, in the brain, not offered in Argentina, now offered through our offices. Very careful to not challenge the local physicians and not deprive the local practitioners of their livelihood, but offering some new opportunities.

Again, in the context of an organization that could offer a service previously unavailable. We focused on organizations who are not satisfied with the expense of the medical care they were getting. For example, cochlear implantation at New England Medical Center's cost roughly $28,000, virtually double that by the labor union statistics in the local market. We are able to offer a cost effective alternative for the organization.

Finally, when the organization was unsatisfied with their own outcomes, for example, living related donor kidney transplantation. Again, mindful of not offering or making a promise we couldn't keep, supplying organs to foreign patients, but, in fact, using living

related donors, the rejection rate in Argentina was unacceptably high with a huge financial and social cost that was unacceptable to the organization that we were working with. We fortunately had a substantially higher graph survive or rate, 95 percent over five years, instead of 50 percent. This is something that has been rapidly accepted as an alternative to the local situation.

Now in this context, developing organizational ties, we also recognized a genuine responsibility to use this as an opportunity for professional education. In fact, while we are working with these organizations, we are also training physicians on the other end. We are interacting. It's an immensely two-way street. I've had the opportunity to see patients with [Shaga's] disease, which I would never see in Boston. I've had patients presented to me with South American [Blastimicosis], which out of the can of my local experience. This has been a very gratifying two-way street for mutual education. So in addition to telemedicine being applied to real-time interactive medical consultation, store and forward radiology, we are also doing educational conferences, both small conferences, interactive, morning report, and small rounds with groups of residents on both sides, and large conferences. The last one we conducted had 70 doctors. And on May 30th, we will have a group of 70 to 100 physicians reviewing the area of bone marrow transplantation, part of the educational process.

We have been using this technology, largely off-the-shelf, and adopting it to our market needs. We've had outstanding technical support, largely locally. We have found this to be a very powerful technique for advancing our own marketshare needs. Let me also point out that in addition to bringing patients up here, we have been able to, in fact, keep a number of patients from coming to the states needlessly. A large number of consultations have been provided, which in fact, resulted in the patient not needing to come to the states. Really

making the care less expensive and more efficient locally.

Finally, we've been able to follow-up patients who have had procedures here, send them home earlier, get them home at lower cost, and follow them up regularly via telemedicine. In summary, we have found this technology to be an extraordinary way of projecting our presence to markets we were not previously involved in. We have been trying very hard to be respectful of the local medical community, and, in fact, interacting with them on areas of professional development. It's been a very, very gratifying experience for the institution, and one that I think is built real international cooperation.

DR. SANDERS: But I just want to thank you. I think this is an example that other academic medical centers worldwide ought to take a very, very thorough look at and analyze, particularly from the standpoint of the fact that you did this without, what I choose to call "monopoly money ." The money from outside grants. It was a financial plan that was developed by the academic medical center. They use their own internal funding. I would venture to say, it is going to be that work that was done before the program was set up, which will end up being the thing that will sustain it, and make that very profitable and educational.

End of Side A, Beginning of Side B

I truly appreciate the comment about the two-way street. I often find that when we talk about professional isolation, we tend to talk about it existing only in the rural areas. I choose to underline the fact that there is really a two-sided coin to professional isolation. Those of

us who have been in academic medicine all of our life are truly professional isolated with respect to the real world. This is has just been a wonderful experiment.

Our next speaker is Dr. Margaret Cary, who is the Regional Director of the US Department of Health and Human Services in Denver.

DR. MARGARET CARY: Speaking of being isolated from the real world, I was in Alaska three days ago. There is a lot of telemedicine going on there. A gentleman nurse named Michael [Tierri] has done a lot of things with community health aids. Where there is a lot of dirt between light bulbs, there is little argument for marketshare. I sat on the State Medical Board of Colorado, one of the arguments that was often used when people would talk quality of care, I quickly learned that that was a euphemism for quantity of reimbursement. I think that that's something we need to look at here. One of the rules of the federal government is that we insure that everybody gets a little of the market, takes care of the folks in the middle and the folks with lots of money tend to take care of themselves. For all of us, this is really self-serving. You have to take care of the folks under you or you'll have a riot. A hundred years from now, some data on that.

I can look managed care as being an evolutionary step. I also think it's a great way to prove what really works. The old way used to be, the longer the incision, the deeper you went, the more you took out, the more you got paid. Those days are gone. Right now, we say to patients, be well, stay away, don't come in. I would look at telemedicine in a couple of things. I'd like to talk about clinical risk, and then about the patient side of it.

Three issues on clinical risk. We need to think about, what's the clinical process that telemedicine is enabling? Is it appropriate to apply that process? The second thing, we should

look at telemedicine as a tool to enable the transfer of clinical information. In doing so, it should reduce the clinical risks that might otherwise have been generated if we didn't have that information. The third is the technology itself isn't a panacea for our country healthcare problems? The focal point has to be the clinical process that telemedicine can change for the benefit of its users. I'd also like to ask, how many telemedicine projects in the country are self-sustaining? I would love to have some examples.

I think the action is with consumer issues. It's not only about keeping them there in their hometowns, but it's about keeping them home. If you look at what's going on the internet, about a fourth of all the information is about healthcare. There is about 10,000 Web sites. Oddly enough, patients don't want us as physician usually in their chat groups. They like to talk about it themselves and bring us in. There is a man named Howard Reingold who has talked about this extensively. He is a real virtual community.

Consumer information, when I go to those conferences, they are a lot more diverse. It is not to heavily white and male. When I go to the consumer information conferences, it really does look like America or other parts of the country. I would suggest that if you want to sell product, you might bring in the users. Get a little bit of the XX chromosome persuasion here, folks of different colors. I think it's an incredible opportunity to design a project to increase patient satisfaction, decrease their utilization of the healthcare system, and also to talk about their responsibility in their healthcare. We can use telemedicine, the internet, to talk about evidence-based choice. We talk about evidence-based outcomes from the medical end, let's talk about evidence-based choice. Thank you.

DR. SANDERS: Thank you, Margaret. Our next panelist is Judith Kurland, who is the Regional Administrator of the U.S. Department of Health and Human Service in Boston.

MS. JUDITH KURLAND: I will not speak with any authority as the Regional Director of Health and Human Service but rather as somebody whose been in this city. The city, as Jeff pointed out, has phenomenal access capacity, not just as specialists, not just of hospitals, not just of beds, but of everything. This is a city that has three medical schools, two schools of public health, twenty-four neighborhood health centers, sixteen teaching hospitals. Yet, in the early '80s, had an infant mortality rate in the African American population that was the third highest in the country.

Telemedicine doesn't always have to be at a far distance. I think one of the things we need to think about is, between whom are we teleporting this information? And what are we going to provide? It doesn't have to be from urban areas to rural areas. It doesn't have to be from north to south. It can be from south to north, it can be to underserved urban areas. It can be right around the corner in neighborhoods of this very city that have been unserved. It is what is being sent, and whose on the other end receiving it? We need to think about several things when we think about telemedicine.

One is the larger discussion we had about the information super highway. Just like the highways in this country at least, it is the governmental responsibility to build the highways, to pave the highways. We have decided as a nation that we are going to make it possible for people always to get from one place to another. If you want to go

faster and sleeker, you can take toll roads. Otherwise, we have roads that are going to get you there. If we think about the information superhighway in the same way, we might actually have an idea about the ability to get access, and the ability to get on.

A second thing we need to think about a lot is this transformation of healthcare that will occur as we develop the use of telemedicine. There are several areas of this. Two that I think we need to think about is the continuing decline, and the continuing smaller role that hospitals will play in the American medical care system and in that of all developed nations as we develop telemedicine. The modern American hospital, post-World War II became the center of our healthcare system because of federal programs like Hill Burton, because of the building of hospitals, but also because of the size and expense of technology that needed to be in one place, that patients needed to go to.

Thirdly, it was also because of the development of these professions that needed to be around the equipment and needed to be near one another. Telemedicine will change all of that. If it's those three things, the broad use of telemedicine will change all of that. Therefore, the huge resources and capital that we have sunk in big institutions, will not be used. We need to recognize that and start thinking about it and planning for it. Because if it comes precipitously, it will be more dangerous and more painful than if we think about it ahead of time before it happens.

A second thing we need to think about in the transformation of medicine in our healthcare system is this notion of community building. One of the things I liked in Paul's presentation was that he talked about the building of community. We often think of the information highway as isolating. That people don't talk to one another face to face anymore. They talk to one another through chat rooms. Yet, what we've seen, not just in examples presented today, but what we've seen in a lot of social service programs and a lot of discussions about the very elderly people, is the information highway can build community, and you can reattach people who are either geographically isolated, isolated by illness, or isolated for some other reason. You can create community. The use of telemedicine to create community by creating information, by allowing people to discuss their conditions and even to do community based research to the extent that we have not heretofore thought about. People can report on things, and you can describe what's happening in different communities. We could look at immigrant populations in those receiving nations, and look at those same populations in the countries of origin, and see what's happening with healthcare, to a degree that we have never been able to do before. So we can understand disease patterns better and the demographic and genetic relationships to diseases and see how much of this might be environmental for

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instance or dietary. We haven't even begun to think about what this may do to our research.

Additionally, in the beginning a lot of telemedicine, although it was thought about being replacement, that is to replace transportation cost, replace sending a specialist out or bringing a patient in, there was also a great fear that it would replace the personal touch. I was very encouraged by Paul's presentation and some other evidence I've seen, that once care givers and patients have an experience with telemedicine, they may actually feel that although there isn't the physical touch, there is actually more interaction with care givers because care givers are less stressed for time and less pulled. They can actually devote time face-to-face through a screen with patients.

Another thing that I think that we are seeing is that the more familiar the medium, that is, when it's a telephone or a television, those things that people have in their homes and are accustom to using and feel is not high technology, the more likely they are to use it initially, especially people that are a little technology phobic or above a certain age as, I am. The more that we use the familiar instruments or make the new instruments look like the familiar instruments, the more easily people use them.

A big issue has been raised all along and will continue to be raised about cost reimbursement. We have to honestly think about how, when you package the full cost of healthcare, whether it's an HMOs capitation, DRGs, you can

make these substitutions more easily. But then there has to be other kinds of pressure to make it happen and not just be a replacement for the sake of cost alone. In our telemedicine, not just between poor areas and richer areas in our nation, but between poor areas and richer areas in the globe, we must be careful of not doing several things and of doing some others. A lot of the services that this country and the richer countries of the world have provided in healthcare to the people of poorer countries in the world have been to an economical lead of those countries. It has had two disastrous consequences.

One is that there has been sometimes an unwillingness, therefore, to build up the infrastructure, the capacity in the healthcare system of that country for all of its citizens, because the people that had the power could always fly to the United States and get healthcare. We have to be very careful as we do telemedicine that we just don't do it in a new form. That what we're not doing is providing the highest and the latest technology, albeit, at a distance to a small elite. We must also be careful that we are not whetting the appetite for those elites for more technology, just the same way we used to when we were training people, who would then go back and demand the technology they had here at the cost, unfortunately, of basic health services.

But if we're going to do that and be careful about it, then we also have to be very careful about using this technology and all other technologies to build up the

capacity, the infrastructure, and the basic health services of those countries. We have to help them with basic public health, even though that is not our strong point in this country. We have to continue to do as much of it as we can, and to try to strengthen what we do.

Lastly, I would point out that as we do community based research, we should have a heightened sensitivity to environmental concerns and not just look at behavioral health, which has been a strong impetuous and leaning of the past several years, and an important one. We have done it sometimes at the cost of ignoring environmental factors. As we look globally, and as we look between cities and rural areas, we ought to be able to do some very nice data collection and evaluation that will allow us to see what's really happening, and allow us to use telemedicine not just to transport information for clinical care but to gather information no analysis for policy development. Thank you.

DR. SANDERS: Judith, thank you very much. Very thought provoking. Our next panelist is Dr. Mark Goldberg, who is Vice President of PAREXEL International and has recently been elected President-Elect of the American Telemedicine Association. I've asked Mark to function to kick-off the discussion and the interaction by responding to what he's heard from the other panelists.

DR. MARK GOLDBERG: Thanks, Jay. What I'd like to do, before opening up for questions, is to share a few thoughts that I see as major trends in telemedicine today. There are several important ones. Some of this you've heard from a few of the speakers, and some of it is a slightly different tangent.

First of all, what we have seen is an industry and a field which has moved from being entirely funded through grants with high-end technologies that are expensive, solutions that are essentially in search of problems, to really refinement for what the different applications are in telemedicine. At least from my perspective, some of these refinements are leading us to focus on areas like use of telemedicine in the military, it's used within prison systems, teleradiology, home care, which is really an emerging area within telemedicine, rural healthcare as has been eluded to by a couple of the speakers this afternoon, and the use within integrated healthcare delivery systems. This refinement is being driven by a couple of things. One is the enabling technologies that are becoming more and more affordable and off-the-shelf. The second thing being the information that is being collected, demonstrating the cost effectiveness of a number of the applications that I've just eluded to.

We've seen a consolidation also in terms of the industry players. I think that's consistent with the refinement that's taken place in the applications. Today there are certainly fewer, although many commercial entities

with their hats in the ring for telemedicine than there were two or three years ago when there was a lot of excitement and ballyhoo around the notion, but not a lot of science or experience on which to base that. This is all representative of an industry in a field which is appropriately maturing and learning from its experience.

Another major trend that I see is a general convergence between the imaging and networking industries and what has been a historic information technology infrastructure companies in the United States. What we're seeing is that the information technology industry is moving toward being image enabled. The databases that have historically been text-based and contain alphanumeric information are moving toward databases that are going contain multimedia information. We are seeing a transition from the paper record to a record that is text-based on computer, to what will eventually become an electronic patient record that is truly patient centered and truly multimedia in nature. I can tell you from my experience in the industry side, that massive investments are being made to move in this direction.

What that means for telemedicine is that the technologies required to enable what we do in telemedicine are going to become more and more available and closer and closer at hand, and indeed will eventually become part of the desktop of the physicians both within large hospitals-based environments as well as rural providers.

The fourth major trend is the internet. One of the most frequent questions that I would get asked when I made presentation here in the United States and elsewhere about telemedicine is, "Why not use the internet for the delivery of telemedicine services?" My response was always two thing: One, is that there is an issue of confidentiality. Second, there is an issue about how long it takes to transmit information over the internet, and how do you control that information, and how do you know it gets from point A to point B? Those are still issues today, although, I think those issues are going to continue to recede over the years to come. It is clearly the case, that bandwidth is not going to be a rate limiting step. In the Boston area, Continental Cablevision is offering a service today where you can basically get T1 rates at home for a relatively small monthly charge, not a lot more than your regular phone bill.

Security, at least studies that MIT have shown, has more to do with just protecting who has access to these system, than how many bits of encryption you have available to you when you put the information over the pipeline. This is a solvable problem also. Something like 99 percent of break-ins into systems have do with breakdowns in the way the systems are managed. That is, allowing people to get access to those systems by not appropriately password protecting, et cetera. We will move toward a world where the internet will play a critical role, where real-time video, as well as store and forward applications in the movement of large pieces of

information, will be extremely affordable compared to the solutions that we have lived with historically.

Finally, let me just touch upon the international opportunities, which really were spoken to very eloquently by Dr. Gelfand, and area where I had much of my prior experience, my coming out of Mass. General and at American Telemedicine International and World Care, and shared many of those same experiences. We are finding, with respect to the international market place as an opportunity, is that you really have to look at countries probably in three categories. There are truly third world countries in which what is needed is much more than telemedicine can offer. Places that need medicines and places that need nurses, and telemedicine doesn't really solve those problems.

Then there is a category of countries that I label developing countries. In some cases they are developed countries. Some countries in the Middle East fall into this category where they are really developed countries, but they don't have the kinds of healthcare infrastructures that their populations know are available elsewhere. These are the opportunity areas for the export of US medical knowledge, and to some degree, the importation of patients, which has been a goal of a number of US academic institutions, although certainly, I think the goal of telemedicine is to try and enable and empower the local physician and keep patients in their local care settings.

Finally, when we start to talk about what we are here at this conference to talk about, which is a transatlantic summit, what you realize very quickly is, the United States isn't likely to import a lot of immediate patients care expertise from the UK, nor is the UK likely to import a lot of patient care expertise from the United States. Both have healthcare systems that do a pretty good job but have lots of problems. In many of these countries, the focus really will be on how to take advantage of these technologies within the country and within the healthcare system in order to better deliver healthcare. This is where we can work together to leverage our different experiences so that we don't go about making the same mistakes and not learn from the histories of telemedicine in different locations, and can better serve our own populations through international cooperation.

With that, I'd like to open for questions from the floor.

DR. RENATA ENGLER: Dr. Engler, from Walter Reed. The question was raised about research using internet or electronic, in our institution the question arose: how the IRBs were going to assess this? How do you get informed consent, since you are collecting the data, in a sense, not necessarily anonymously? People frequently actually are very willing to identify themselves on the internet. It is just like a records review, either we have to migrate investigational review boards in human use to a different

perception, is it going to be enough to advertise on the internet or on electronic media? We may use your responses to collect research data, please X here if that's okay.

Frequently, the people on the human-use committees, I don't know about your institution, they include laypersons and persons with not a great deal of sophistication, and their immediate response is, "No, you can't do that." I think it's a wonderful tool, potentially, to find out what patient's perception is. The AMIA is struggling with this whole question of education on the internet, is it really useful? I am struck by the abundance of medical practice on the internet by nonmedical persons. I refer back to this $50 billion industry. If you haven't been to the health food store, medicine is practiced there every day. They don't have a worry about a lawyer. How do we harness that? There are two question there, but it's a fascinating new world.

MS. KURLAND: I think you've raised the right questions, and I don't think we have the answers accept that we have people that have done these IRBs. We have done multi-institutional IRBs. We have done this. We've never done it with the individuals without the intervention of the caregiver or the researcher, and I'm not suggesting, I actually wasn't suggesting this broad fully-participatory kind of research. It is interesting, now that you suggest it. I think we ought to think about it. There are a lot of people, Mike [Roeden], who is a pediatrician, an esthetist, and runs the IRB at

Boston City Hospital, now at Boston Medical Center, I think is one of the most thoughtful people that I've ever talked to and has done a lot of work on community-based research.

Certainly with the AIDS research, when we began doing serious community-based research, we raised some of these issues about dealing with previously untrained populations and caregivers. We have the means to resolve the problems, but I don't think we have the answers now. I think we have to be a lot clearer than we have often been to subjects if the subjects, in a sense, are going to be the reporters. We haven't had that particularly in the past, and I think we need to think about what we have to do differently, and how we make sure that the same way that we've worked hard at getting informed consent for practice and procedures, we get a kind of informed consent and an understanding of people when they know what is going to be done with their results and with their information.

It is something worth convening right away. I think it's worth doing because we are at that stage, in terms of practice of medicine on the internet, I pass or in health food stores.

DR. CARY: I'd like to say something about medicine on the internet. One of the issues that is very interesting is people will read something on the internet that is by somebody who is not a doctor, they are more apt to believe it than by many of the folks who come into see us as physicians.

I work a lot with native peoples, and it seems to me that the alternative complimentary healthcare movement, whatever you want to call it, it isn't necessarily about getting the results. It seem to be that part of the process is that as people go around and meet their [eradologist] or reflexologist, that in a sense they have formed a community. They formed a group of people who will care for them, and they are actively involved in their healthcare. The internet and the discussions that go on with that, feed into that. I'm also concerned, for instance, in Boulder, we had a lady who was treating brain tumors with garlic. We had to shut her down. We thought that probably wasn't the best way to do it. It is interesting that patients are looking at alternative ways because they offer that sense of community and a sense of caring that, unfortunately, with the time limits, we often don't have to give to patients.

DR. SARKIS ZARTARIAN: My name is Sarkis Zartarian. I would like to speak perhaps to the area of Suzanne and Mark, although, I don't disagree with them. I would like to add a perspective that might be helpful.

We have been thought of as being the early adopters, pretty much in this audience. I'd like to make a comment, that it is commonly thought that the early adopters curve continues up to the rapid adoption curve, and it doesn't. At the end of early adopters, there is a valley.

It is a valley which goes down, it doesn't go up. You don't go from early adopters to rapid acceptance. During that period, you have to cure the sicknesses which the early adopters put up with. Now, there are three sicknesses put by us dumb computer enthusiasts, I can think of them as slowly moving away. And then I see the curve rising due to a different factor. Let's talk about the three warts that exist.

One wart was the expensive equipment that was initially put out for video conferencing and mislabeled as telemedicine. It might be okay for conferences, and in some cases, distance education. But it really didn't fit the practice of medicine. Therefore, during this period, that wart has to be understood and will go away. We will largely go into things that Jay is saying, the store and forward, the medical workstation, which is not much more than an enriched PC. That has to be absorbed and understood, and that's a factor that has to leave us.

The second wart was the expectation that everybody could afford the high-end communication the way the telephone companies were tariffed. The internet shook them up. Maybe the government now is trying to equalize that. I don't appreciate the fact that they are legislating and taxing us with special fees so that they can fix the problem in the normal telephone companies. It was already fixed in the internet, which is tariff independent at a very affordable cost. That understanding has to happen, and the internet cost structure has to be valid and understood and highly utilized.

The third thing that you thought of was the reluctance of the doctors to adopt a new technology. Of course, what happens is us old folks have what we call keyboard fright. We weren't brought up with video games. We are a little bit slow to adopt this technology, however, something else is happening. I called those compelling forces. There were more

PCs sold than television sets this last year. Starting a few months ago, the major manufacturers were including, in the motherboard, the chip to enable video conferencing with PCs at affordable cost. If 17 million people are on the internet, and there are more added every day, hundreds of thousands and so forth, the children are using the video function, then it will become a commodity.

Video, as used in the homes, will be a commodity. When it is a commodity, there is a compelling force to the dad not to be a dunce. Therefore, there is an external force which will breakdown the barrier of reluctance. We will see a kicker to acceptance because he will see that the world is doing that, and his kids can do it, and they will teach him how to do it if he's reluctant. He will use, what I'll call, the change in what telemedicine will be. Telemedicine will be become something that splits into two things. The forecast you made is more involved with the growth the sophisticated telemedicine, than it is, what I'll call, the informal very low-cost commodity level of consulting with multimedia.

Consulting with multimedia image exchange, in the commodity period, will become an almost free thing that doctors will do helping each other. That's is almost the same as the telephone consulting of today. In that environment, the market will split. That doesn't have the legal implications anywhere near as severely as some of us are hearing today.

That will have a split in its forecast, and the high end will probably do what you say, as slowly as you say. But that will become a commodity. I think that forecasting has to think of it in those two ways.

MS. TICHENOR: I think you are right. I think Andy [Grosch] sure hopes you are right that PCs are going to replace television. That's what he is betting on, and he is betting the farm.

A lot of people are with him. But I think that the jury is out on that. Yes, I would agree that PC penetration in the home is up. I think personally, it's going to be a while before the cost comes down to a price that people will have multiple video PCs in their homes just as they have multiple phones and multiple televisions. Until that technology is a commodity, there are going to have to be other alternatives. I think the price sensitivity is a big issue. Look at how many people used AOL and CompuServe when they were charged by the minute. As soon as we gave you a flat rate and encouraged you to have unlimited access, the usage shot up. They found the price sensitivity point. Where can you draw more people in?

That will happen with some of these other technologies. I don't think it's quite there yet. I'm hoping that the technology moves fast enough that the price will come down quickly. I am not sure I can predict that. There is still going to be a debate in the industry as to which is going to be the monitor in your home, and how is that going to be hooked up? It is an exciting time. It is going to take a little while to shake out in the industry.

MS. LYGEIA RICCIARDI: My name is Lygeia Riccardi. I'm from the Federal Communication Commission. A little bit more than a year ago, Congress passed the Telecommunications Act of 1996. One of the things they asked us it do was to encourage the use of telehealth in rural areas by reallocating telecommunications funds to support rural healthcare providers. Some people look at it as taxes that are draining us, but Congress felt that this would be a great benefit to healthcare providers that are nonprofit and public in rural areas. As you know if you were here yesterday, and you heard the tape by Chairman Reed Hunt, the FCC recently decided to allocate up to $400 million a year to support telehealth in rural areas.

One of the points I wanted to stress is that this money is available, but it's not going to benefit telehealth if people aren't aware of it, and if rural healthcare providers don't apply for it and use it. I wanted to encourage any of you, tomorrow or whenever, to come up to me and talk to me about some of the details. You can also find additional information about this on the FCC's Web site, which I think the Chairman stated for you yesterday. I'm just going to reiterate it. It is www.fcc.gov/healthnet. Although we've issued our rules, we are still going through a lot of the detailed work of figuring out exactly how and when to implement them. So you might want to continually check into that site just to see where we are in our processes.

DR. SANDERS: Thank you. I hope this group is aware of the fact that it was basically because of the efforts of Lygeia and her colleague Elliot Maxwell that the commission was so educated about the situation, and why we got this tremendous positive result. Lygeia, I'd like to thank you again.

DR. ANDRE LACROIX: Andre Lacroix. I have a question for Dr. Gelfand. I think it was very interesting the approach that you are using. I would like to know, because academics is going through a difficult times in terms of funding, et cetera, you told us that you were facing the possibility of losing one-third of your staff, and we know that we need to keep critical mass in our environments. How much of that is now being busy with telemedicine, because one-third looks like a big chunk? How much have you been able to occupy with that?

DR. GELFAND: That's a very fair question. The one-third reduction is the kind the global statistical economist recommendation for the region. That's assuming, of course, that managed care reached its full potential for reducing the utilization of specialists. I'm happy to say, that in Boston, that hasn't happened yet. At least it is giving us some time to adjust to managed care. In fact, there has been no 30 percent reduction in the City of Boston in the number of physicians. My guess is the physician population in Boston, if anything, is probably grown slightly since those rather Malthusian predictions were made. However, the warning was clearly there.

We need to develop either a strategy to reduce our faculty size or to increase our markets somehow. Reaching out to new markets is clearly one way to reduce the need to diminish our size. I will tell you that my own faculty has been reduced approximately 10 percent through attrition and academic guidance and other mechanisms. I'm at a point now where, frankly, I don't wish to reduce any more. I've got a faculty that is able to teach every course, that's able to function extremely well and very competitively in terms of academic activities such a research. I would rather find new markets, than continue to figure out who I can eliminate.

In answer to the question of how much new business is coming in, we have developed a significant new business. It is several million dollars a year now in terms of new patient revenue. There are in the areas of most specialization, which is where we had, in essence, the most need because in fact our primary caregivers are very, very busy. Those activities don't need any new markets. They are finding their way in the current market. I have every expectation that that growth, which has been virtually exponential, will increase to a certain point. I hope it will be at the same pace as further reduction in staff are necessary. I'm not

sure that's going to be the case. Certainly, it is one survival strategy, short of self-amputation.

DR. JEAN-PIERRE THIERRY: It's maybe to rebound out the very good remarks from Mark Goldberg about potential growth for cooperation. It's also the same question with the future and strategy of tertiary care. We have this problem, and one of the barriers could be the strategy of tertiary care dealing with telemedicine and reengineering. To give you some cues and to go back to France, one of the best telemedicine programs we have in R&D is in a highly dense are of population at the regional level. It is because we are considering telemedicine in a way through the planning process run by public health specialists dealing with healthcare specialists. The example I want to give you is the infant mortality.

We were very bad compared to the other European countries and especially Sweden and Denmark. We ran into the 70s. We ran a cost benefit study. It was the only one run in France because it is to difficult. The mode is not there anymore. Then we decided to invest in the facilities. Then we achieved to be the winners at the European level and the mortality rate went down around 10 percent. Then we entered a new plateau. We convened, and we met the people in tertiary care. There was a lot of pressure to increase the size of the maternity ward. It's better if you have all the environment, the ICU. We have learned from the past.

One of the best results from the previous cost benefit analysis was to give leaves to the women. That was the best benefit ratio, to increase the leave from work. Because you have a correlation between the traffic of commuting to a job and the number of premature births. We may discuss the other implications of medical acts, but if you go into the internet and see

what is published in the US, then you question the number of Cesarean sections. You question the number of other procedures and the results.

What we are doing now is to try to consider telemedicine as a way to increase our performance. Definitively, it has something it do with the strategy of tertiary care. We think that if we don't have tertiary care, to be directly involved at the regional level for this kind of public health issues, then we won't be able to have the cost model to pay for the high bandwidth. We won't be really successful by decentralization of education, of expertise and so on. Tertiary care centers should have at least two strategies.

One is for international, because it is good to help the other. Except you don't want to get only the rich people from one country because they don't want to pay any more in their insurance for the poor. You also have the original context-based strategy that, obviously, you are facing a downsizing. That is also because managed care may be an issue because it builds the seamless model that the tertiary care will work with the secondary and the primary care. We are trying to achieve that. We certainly need your help because if you look at the US...

End of Tape 1, Beginning of Tape 2

You have been engaging in a much faster reengineering than in Europe. But we may be more cost conscious about the public health issues at the regional level. Thank you.

DR. SANDERS: I'm going to end the session at this point. Thank you very much.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

CLINICAL APPLICATIONS and MARKET OPPORTUNITIES

DR. JOSEPH KVEDAR: In an effort to create an agenda with respect to the broad topic of clinical telemedicine--and really agenda means either a research agenda or a policy agenda for how we can transAtlantically move the process of clinical telemedicine forward--and in speaking with Jim over the months, we decided to do somewhat of an experiment this morning and depart from the traditional choose a group of speakers to give presentations and ask the audience to react to that. Rather what we have chosen to do for you is facilitate a brainstorming session. The Achilles Heel in that approach may be the size of the group. So at times we ask you to bear with the fact that this is a large group for that approach. We do want everyone to contribute but it may get unwieldy. So I'll just say that at the outset and we'll see how it goes. The way this will work is we're going to have a facilitator and a question and see how at the end we can come up with an agenda to move forward. There will be a point in the discussion where we will reach a need to disseminate information after this meeting by e-mail for your reactions. So we're going to pass around a pad and I would ask each participant to put their name and e-mail simply on the pad. You will hear from us after the meeting for further reaction, and it will become apparent what you're going to react to. So with those brief comments, I'm going to turn the floor over to James McGee to explain how we arrived at the question that we're going to discuss this morning.

DR. JAMES McGEE: Good morning. Although my formal name is James my real name is Jim. To go on a little bit from what Joe has said, this session has been oversubscribed by quite a bit. We had to close the door on it if you like sometime on the first day I'm told.

So we've got rather a large number of people here and a little inference has been made as how to we're going to run the session. What I would ask you all please to do is to be concise in your comments, and concise and clear in your questions, in deference to the number of other people who may want to come in. Bear in mind also that this is a transAtlantic rim conference so that what you have to say should not only bear on your local experience but how this might extrapolate to other places. The comments or questions that you raise should be pertinent not only to your local environment but also to how they might extrapolate to the other places around the Atlantic rim and beyond. I think those are the sort of ground rules. You'll hear a few more in a moment. I'm quite looking forward to Roger's comments. And I think at this point we spent a long time deciding how we should start the session. We jointly agreed--I think the three of us--that the best way of starting is in a fairly broad way, although it's freewheeling but focused, we hope.

I think we all in this room accept that the fact that the acceptability of telemedicine in the widest sense possible is often very limited. Its acceptability--by its *lack* of acceptance by the medical and the paramedical professions. We've generated this question that's on the white board here. Namely one of the criticisms is: Why should we accept it?--because you guys haven't proven that it's as good as what we do conventionally. So that's the first question that we're going to pose and there's a number of ways that can go. But before we do, I'll hand over to Roger, who is a professional facilitator for this sort of thing. In the past 45 minutes I've learned a heck of a lot from him I have to say about how to do this type of session. Roger.

MR. ROGER EDWARDS: Thank you, Jim. I think one objective for us today is: Think about how do we measure and judge clinical utility in the telemedicine application area. If you could direct your comments to: (a) how you would examine this question and (b) whether you even need to examine this question. What we will attempt to do is go around the room in a structured brainstorming format. So you will be restricted from commenting about someone else's remarks directly--so that everyone has an opportunity to speak without commentary, without critique from other members in a dialogue format initially. Once everyone has done that, we'll try to restrict your comments to 30 seconds to a minute at most in order to provide an opportunity for everyone here to speak. We will then have an opportunity to comment, discuss and synthesize the list of topics that have been brought up.

It's perfectly reasonable to say "I have no new comments to add" if something else has already been said that you agree with. You can pass. You can move forward. In theory, we have time to go through the group twice. I'm not sure that's going to be feasible given the size of the group that's here today. Then Jim and Joe will lead us in a synthesis process. The ultimate goal will be to set priorities around those topics that are discussed and that are raised. In a small group you might set those priorities in the meeting through a multi-voting process. In this case, it might appear better to get the material transcribed, written up and sent to you via e-mail for you to each multi-vote on your own, and then bring it back to the chairs. They will then tally the votes and send it back to you for final acceptance or recommendation as a result of the panel. So that's the goal of today's discussion. I will be trying to play the heavy in terms of keeping you on track with time. It's very hard for some of us, myself included, to monitor how long we're talking when we're talking. So please be aware of that and are there any questions before we start?

MR. ERIC MENN: Roger, may I ask that you ask people to identify themselves.

QUESTION: What's multi-voting?

MR. EDWARDS: Multi-voting is a process whereby you're given 10 votes which you allocate among any number of topics that are listed. Put all 10 votes on one topic if that's your most important thing. You can put two votes on five different topics, etc. In this way you can express your values about your priorities, and then we can send them up across the group. That's the purpose of it. Any other questions? We are taperecording the entire session. So we will hand the microphone around and please direct your remarks into the microphone even though you will not hear it sound back to you via the speaker.

SPEAKER: Do we have a clear definition, a common definition of telemedicine?

DR. McGEE: Well, I could give you one. But everyone else in the room might disagree. I regard it as "the practice of medicine in any of its respects ranging from diagnosis, patient management, treatment, all the way through to education, using the tools that we've all heard about. The phone has been not replaced, and the fax machine has not been replaced; they have been supplemented by the other technologies that we've heard about." I don't know that there's a very profound disagreement on that to try to refine and hone that definition any further.

SPEAKER: It's a broad definition.

DR. McGEE: Do we want it as broad as that, Joe?

DR. KVEDAR: I would only add that maybe I could hone it in one way and say that--I said this earlier to the smaller group--in my life I deal with a number of different responsibilities that are uniformly somebody else's major responsibility, whether it's clinical care, education, technology, what-have-you. Someone else is charged with that. The only thing I can add to the equation in my environment is if we do it remotely, how does that change it? Whatever it is. So I thinking of it in that way is probably useful.

SPEAKER: Would you explain the structure of the group here: a semicircle and then the rest of the citizens.

MR. EDWARDS: We will run through the semicircle for comments and then each of you in the audience will have an opportunity to speak as well, to comment on the issues.

DR. KVEDAR: The genesis of the semicircle is very simple. As we saw the list of attendees to the meeting, not knowing this would be such a popular topic, we asked a few people to show up in case we were lightly attended.

SPEAKER: Joe is being polite.

DR. McGEE: The very large number--we didn't expect as many attendees--we exchanged faxes from his office to my home. We starred various people. I think where commonality arose, that's how names were chosen. Nothing sinister about it.

SPEAKER: Clinical utility. I'm [unclear] emergency services at MGH. My personal perspective is that reading X-rays and CTs at a distance is not research. It's being done every day. What I think we need to do is determine if that capability will either improve patient outcomes or reduce cost. I think the answer is: it will improve patient outcomes and it will reduce cost. Very briefly, the project that I'm trying to implement is to work with community facilities so that the emergency physicians there, when they have a patient who has, for example, an acute stroke, are they a candidate for acute [lysis]? Emergency physicians aren't comfortable with making that decision because there's a lot of downside risk, mostly intercranial hemorrhage, and so we would get the neurologists who are in house 24 hours a day at Mass General to make that video conference, see the patient, read the CAT scan which we will pull down from their server and then make a decision about patient outcome. If they stay there at the local facility, they're not a candidate, that's fine. If the patient is approved for this [lysis] then they can start the protocol and we'll transfer them in by ground ambulance or helicopter. I think that will improve the outcome and have a more efficient use of the high technology and personnel that we have at the MGH.

MR. KEN GREENWOOD: I'm Ken Greenwood. I'm the Director of Health Care for PictureTel Corporation. We make video conferencing systems. And I'm going to answer this very much as a vendor would. Judge and measure this. Well, obviously clinical

outcomes but as you might think of this as utilization goes up and big systems degrade or improve, that's put it that way, to desktop systems and computer based systems that are much affordable, we could measure utilization in respect to cost and outcomes. So that's what I think.

MR. JUDD PRATT: I'm Judd Pratt with System Resources. I manage the health care efforts there. I've got a little bit of an odd background because I've been in health care information systems, especially ambulatory care, for 25 years. And worked on installing the first computerized medical records system back in 1972. So my view of this is we're taking a look at data and images are data. Text is data. And what's happening is most of us are aware of integrated delivery networks being set up. So all of a sudden the communication problem is increasing. You have the probability of a physician seeing many more patients--many more doctors geographically dispersed. So how do you tie all this data together? Especially in an ambulatory way to have a coherent treatment plan for a patient. And that's my view of the problem we're trying to solve.

DR. STEVE BLACK-SCHAFFER: I'm Steve Black-Schaffer. I am the Associate Chief of Pathology at the Massachusetts General Hospital. And my view of telemedicine is largely telepathology, at least in terms of what I know something about. And I would say--we were actually discussing this earlier--that the value of telepathology, its clinical utility lies in the time value of its information. In that regard it's much less often urgent than teleradiology would be, for example. Our basic expectations of pathology processes, touching base with what our real standard, our reference standard is, is not usually instant turnaround. Except

in the situation of frozen sections. And that's a special case which has been a justification in itself for telepathology systems in a few places. In most of the United States that's not an immediate urgent need. There are enough pathologists to provide those sorts of services. There are places in the world where that's not the case. And there are a few places in the United States where that's not the case. I think that telepathology is an interesting paradigm in the following way and then I'll end. And that's the following: we have a situation where the ability to do remote pathology diagnoses in an acceptably timely fashion has for a very long time been available. Pathologists and slides. It's not like an X-ray. You can take another X-ray. You remove the lesion and it's in the paraffin block and on the slides, that's where it is. And if another place wants to see it or if you want another opinion you can, in fact, send those. So we have a reference standard of historical, nonelectronic telepathology, in a sense. Against which we are sort of automatically benchmarked any time we're being considered.

DR. GHALEB DAOUK: My name is Ghaleb Daouk. I'm a pediatric nephrologist at Mass. General and I'm also the coordinator for telemedicine for the Department of Pediatrics. I got involved in telemedicine from an interest in the theme of international medicine overall. I believe that medicine is a lot of information. It is exponentially increasing. And I see a huge gap, hiatus, worldwide between the haves and havenots of this expertise and knowledge. What my goal is, if I can be successful in [unclear] is to help bridge the gap between the two parts in a worldwide range in knowledge. Not just pure cold knowledge but intelligent knowledge. So that the human aspect to it is also included in that knowledge. That means interpretation. Whether this is a management, consulting, diagnosis and which might even

actually lead to hands on managing the patient would be a successful outcome for telemedicine.

DR. DINESH PATEL: My name is Dinesh Patel. I'm chief of arthoscopic surgery. And as you heard yesterday I was also involved in public protection issues with the State Board of Medical Licensure. I will tell you something about precedence. Way back in '74, '75, '76 when the arthoscopic surgery was not existing [unclear]. So what we did, Atlantic. We went to Europe. We went to South America. We went to India. All over the place. And did remote education. We do arthoscopic surgery in this room and hundreds of people will watch through the auditorium. So it has been a proven method of educating people through a method of educating people, a proven method of convincing people that it is possible to educate or learn about what we're going to do. So that's the precedence. And I think once you break through the barrier you'll be able to go one, two, second or fourth stage. The other interest of mine is the public protection issue. I think we've got to be absolutely sure that we should not have a big mountain in our hospital of a lot of gadgets which you people have. And then say we are doing this. Unless we have quality control. So I would urge you very strongly that whatever you do look into this aspect very, very carefully. Because we are all in this democracy. Everyone is going to come to you about public protection issues. So that's what I would look into in detail.

MR. EDWARDS: Remember we're trying to think about clinical utility and how we measure it and judge it.

DR. JOHN COLLER: I'm John Coller. I'm a colon surgeon at the Leahy Hitchcock Clinic and Director of the Ambulatory Surgical Research Center. Leahy Hitchcock is in excess of 900 physicians in a group practice environment centered mostly around specialty operations, surgical as well as medical. We face in the specialty side of medicine and surgery the same thing that's being faced by a great number of the hospital and practices across the country. That is we're being told that with managed care, there is going to be a big change in this ratio of specialists to primary care physicians. We're being told that currently there are 70% specialists, 30% primary care. Somebody somewhere along the line thinks that ratio ought to be reversed. I think many of us in this room have the feeling that might be cutting out some expertise that is there for good reason. I am personally looking at the application that permits the specialist to, even in decreasing numbers, stay in on the same [inaudible] so that when a problem comes up to the primary care individual, he is not forced to make a guess or feel the pressure of not referring the patient to a specialist, to let the specialist decide whether or not he really needs to be involved. So you keep the specialist or expert care in the hands of the individual who's been trained to do that. Simple things like a lesion on the hand can be directly forwarded as a picture to a specialist where he can spend two minutes, not half an hour, as he would in a consult in order to answer whether or not he should be involved. We can do that in all of the various specialties.

MR. TIM CALLAHAN: Good morning. I'm Tim Callahan from American Medical Development/Welch Allyn. For those of you who happen to know us, our specialty typically is diagnostic instrumentation for the primary care physician. In the telemedicine environment our focus is on moving a hospital level quality of care, equipment and instrumentation into

the primary care setting or front line physician setting. Our approach to evaluating clinical utility up to this point is for the past been through clinical trial.

MR. TIM O'MALLEY: My name is Tim O'Malley and I'm President of Viacron. Viacron is looking at the computerization and automazation of chronic disease management. My background is from IBM cardiac pacemaker and Lilly. Within that context I spent as much time in Europe as I've spent in the U.S. To address the question of how to judge and measure this, we have to first move telemedicine into the mainstream. In order to do that, the systems of Europe and the systems of the U.S. are somewhat different. How do they measure utility? How are they financed? Who are the ultimate people who are making decisions? So in order to decide how we judge clinical utility, we have to identify in each of these systems who is the decisionmaker. Then, we have to come to a fairly universal method that, irrespective of the differences between the two systems, we can all somehow judge medical, clinical, and economic value. What this group can do is to try to cut through all that timber and somehow come to some common definitions of value and common definitions of improved medical outcomes--so that all of this telemedicine can make sense. We can have it make sense through better clinical studies. The partner model is one and I hope Linda [unclear] is here. We've talked a bit about that, working on a system for chronic disease management. But the team that we put together is also important. You need an integrated team of doctors, engineers, corporate people and insurers to define these things. No one of those groups can simply do that.

MR. JOHN PATTERSON: Good morning. I'm John Patterson. I'm the chief information officer at the New England Medical Center here in Boston. I've been the architect of the telemedicine program. There are four or five fundamental principles underlying our program which now is doing about 2,000 line interactive consultations a year in eastern Massachusetts and internationally. We have three international sites as well as 30 plus sites here in eastern Massachusetts. We have an emphasis upon education, but I would say that the primary area is clinical. They're based on very carefully thought out business models. Reimbursement is a big issue. I'm sure you're all aware of that. In terms of the things that we're most focused on these days are: integrated health delivery systems, and managing the cost down and the quality up in that environment. So that ties back to some of the earlier comments about integration of all information types and electronic medical records. But more specifically, on the quality front our largest application area is in fetal medicine, where we do live interactive consultations with a complete electronic medical record. We're projecting this year over 1,000 such consultations. We have finished outcomes analysis, and there is a report on that in the process of being published. My e-mail address would probably be available for people who want to see that. I'll forward that study to them.

The last issue on the quality front is we do quite a few international consultations, and we've been keeping data on the outcomes. I've seen some very dramatic demonstrations of the efficacy of telemedicine in reducing or correcting misdiagnoses very impressively in that area. Thank you.

DR. DAVID WEINBERG: I'm David Weinberg. I'm a pathologist at Brigham and Women's Hospital, and I've been involved in the area of teletechnology for several years. I

also am the director of a clinical laboratory, the hematology laboratory at the hospital. I just want to direct a couple things specifically to this issue. I think Jay Sanders would agree with this. At the recent meeting of the American Telemedicine Association, there was a huge focus on the need for well-documented studies looking at the utility, accuracy and validity of various telemedicine practices. The need to publish these results in professional journals. There's going to be a lot of attention I think at the ATA to developing guidelines to researchers in this area so they know how to design studies and evaluate the data.

I have done such a study with a group in France, the Resontel Telepathology group. Our primary focus again was on the validation. I think that beyond having run a clinical laboratory, anybody who's run a laboratory, there's an awful lot of emphasis being placed these days on quality control, quality assurance, and being able to document all of this very carefully for various inspection groups. I think having those levels of quality and applying the same levels or standards that we use (in running clinical laboratories in terms of careful documentation and careful attention to documenting our quality and developing good quality assurance mechanisms in telepathology) are going to be crucial. So I think those two points about developing some credibility through well-published studies and then locally each place really is going to have to be responsible for its own validations and carefully documenting the validity of each of its own practices.

DR. JAY SANDERS: I'm Jay Sanders. I'm president of the American Telemedicine Association and also president of the Global Telemedicine Group. If I were smart I would just say I totally agree--and I do--but let me add this is a *deja vu* for me because in 1976 we provided the National Science Foundation a four-volume report that dealt with the whole

issue of how one measures and what the outcome is in terms of clinical utility, technological capability, psychological impact, and economic value of telemedicine. The reality is we don't need another definition of telemedicine. Telemedicine is simply an enabling technology. It is like any other technology. Whether we're here this morning talking about telemedicine or the new infrared Scotty scanning scope from *Star Trek*, the reality is it's got to be measured in the same format that we measure anything else in healthcare delivery. We need clinical outcomes. Telemedicine technology needs to fit into the same CQI program that you have in each and every hospital around the country. If it modifies in a negative way clinical outcomes that are done in an in-person fashion *versus* the technology using this at a distance, then it needs to be readdressed. We simply need to have, as was stated, clinical outcomes for everything we do, whether we're talking about telemedicine, the echocardiogram, the MRI, or the Swann Ganz catheter. We need to evaluate it in the same way and the only way to do that is to have clinical outcome data for what we do on a day to day basis.

DR. BETSY BLAKESLEE: I'm Betsy Blakeslee, the Director for the Consortium for Telehealth. I thoroughly agree with Dr. Sanders when he talks about the fact that we need universal studies of outcomes for many things beyond telemedicine. So let me address what I think will be the reality of this particular question. I believe the question is: what is the clinical utility and how do we measure this? Quite frankly, we have to move off of the "if," which is where I think we are--Should we be doing this?--to the "how." The reality of this is: if patients like this, if it makes it more convenient for them, and if payers think it's a good idea, you will basically be having to jump on board. I don't believe the doctors will

make the decision on this. This decision will be made for you. You will be in the business of the how, not the if.

End of Side A, Start of Side B

DR. RASHID BASHSHUR: I'm Rashid Bashshur and I would like to get back to a point that Jim McGee mentioned earlier that the issue that is in front of us can be addressed either from a policy perspective or a research perspective. My view is that there is no real distinction in this case. The real question is how to evaluate telemedicine, and both the policy perspective and the research perspective are involved in that question. In fact, research is then utilized as the basis for making intelligent policies. Intelligent policies has to be based on research. So in terms of how this can be done there are really two different foci: the biomedical focus, which deals with the traditional issues of efficacy, safety, and effectiveness and the health services focus that deals with the issues of cost, quality, and access.

DR. MARK GOLDBERG: Mark Goldberg, President Elect of the American Telemedicine Association and Vice President of Parexel International Corporation. I would just add to some of the things that Dave Weinberg and that Jay said. Indeed, in order to prove the clinical utility of different telemedicine applications, we do need to do studies. I think that as a field and as an industry, we have done a mediocre job of doing this so far. The initiatives that have been successful have been successful largely on an anecdotal basis. We need to do a much better job of being rigorous and scientific about compiling our results and

thinking about how we're collect information about outcomes, efficacy, about the technology requirements when we start--not once we're halfway through a project, or we've done our first 500 patients or 500 interactions. In the same way that it has become essential from the inception of projects to figure out how you're going to make economic sense and how you're going to make a project self sustaining once grant money goes away, from the outset of projects we also need to plan how we're going to evaluate them from a scientific basis and be committed to publishing those results in credible sites within the literature. So that we will be able to make a case for ourselves to the payers and to the policymakers.

DR. RONALD POROPATICH: I'm Ron Poropatich at Walter Reed Army Medical Center and Director of the Telemedicine Program. I think we need to keep in mind our focus, which is patients and providers. We need to realize that the technology has to be as easy to use as a telephone, realizing that one third of the world's population has never even used a telephone. We've got some challenges ahead of us. I think some of the measures we can look at have already been stated: performance improvements, whether it's quality assurance, quality control, whatever you want to call it these days. Names keep changing. But PI, performance improvements, are the buzzwords now people use. We need to look at how we can avoid transportation time and distance as another outcome measure to look at and access instead of waiting three to four days to see a dermatologist. We can now do that very quickly. So outcome-based metrics, such as access, is another issue that we can look at.

MR. EDWARDS: We can make an effort now to--unless you have something new that has not been said before--to ask comments from Joe and Jim.

MR. ARVIN MALKANI. Arvin Malkani, Information Systems and Networks Corporation. My background is in electrical engineering and I'm doing my Ph.D. in biochemistry. I'm new in this field so I would like to see this continue for the next 15 or 20 years. For clinical utility I'd like to just comment on the commercial market and on how systems integrators can contribute to providing clinical utility. In collaboration with I would say immature and developing IT departments and hospitals and with the medical professionals and with other economic areas, you have to allow the systems integrator to provide a baseline or requirements analysis to provide the clinical utility to the end patient or to the end customer, who is the patient.

MR. EDWARDS: Additional comments that have not been said?

DR. RONEN: Good day. I'm Dr. Ronen from MACABBI HMO in Israel. We are planning to use telemedicine, and we want to make sure that it's going to help promote the health care in our system. I would ask that we consider not only the utility and what good it can make but also the harm. And how can it harm. So that back home when we study the outcomes we can also study the harm part of it. We can really get the whole picture. Thank you.

MR. EDWARDS: Other comments.

DR. NIELS ROSSING: I'm Niels Rossing representing the European Commission. With all due respect to the chair I think the comments so far have been mostly U.S. comments. I

agree on most of what has been said. But looking at the clinical utility I think you should add what would the alternative be. One alternative could be that you have got to restaff another hospital. We heard yesterday of something [unclear] in the military. The alternative could have been to restaff another hospital. But if you go to Alaska it's not a question of restaffing. Definitely there is no alternative to telemedicine out there. If you do the same thing in Greenland, it's another matter. So the clinical utility should be rated and measured specialty by specialty. I do think that you've got to be very careful if you are looking at pathology and not necessarily evaluate the same way as when you're doing an interactive video session, guiding a nonexperienced echocardiographic doctor out there in the bush, asking him to dampen or whatever you want him to do. They are two different--very, very different settings. Thank you.

MR. KEVIN DYE: Kevin Dye, Molecules to Markets, Belfast, Northern Ireland. Quick comments regarding the how we measure. Most of the list seems to me to be addressing what we measure. The "how we measure" is "how do you provide the incentives for doing the measurement." Let me suggest three things. First, most of the countries represented here are capitalist. We measure by the market. If we want an early measure, I suggest that we set up a surrogate market where we each have a certain number of shares and vote for what we think the things with highest utility are. We can get an early detection before there are commercial companies being voted on by the stock market.

Second, I'd like to provide a benchmark for the measurement of medical utility, which is the development of a medical decision, a diagnostic decision support tool that began in the late '60s through sponsorship by the European Union. It deployed 250 physicians over

a dozen countries and applied to 17,000 patients. Every experience of which and interaction with the computer was fed back to the researchers, which made the users of the software owners and developers. I'd say that stands as one of the most outstanding benchmarks of establishing clinical efficacy of any medical infomatics tool. That particular project that reduces misdiagnosis rates by 50%. The actual conduction of this study saved 44 lives.

The third point is that in this same particular project major differences were found even though it was developed in a dozen countries--major differences where it was deployed, whether the patient tended to go to either a GP initially or to an emergency room. It differed quite a bit between the U.K. and the U.S., and it led to very different diffusion patterns. I would suggest the "how" of measuring that type of utility is the realm of comparative medical anthropology and sociology.

DR. CARL ROBBINS: My name is Carl Robbins. I'm from Canada. St. Johns, Newfoundland, Canada. I'm Director of the Telemedicine Center at Memorial University. We have some 20 years of experience in telemedicine, primarily aimed at remote communities for teleeducation and clinical applications. I guess my first comment would be that the history of technology and health care as we know--and I think we've heard a number of examples over the last couple of days--is rife with technologies that have emerged, been marketed, and been found to be essentially of very marginal utility or absolutely useless. So we need to be very careful that when we measure utility, we do it honestly. In my view and based on my own involvement at the moment, telemedicine will basically stand or fall on its ability to deliver health care services to environments where it's either impossible, very expensive, or very inconvenient to deliver. That would be a primary criterion given my own

circumstance. I think it's well that when we judge the parameters of telemedicine and success, we approach it as we would in any other quality initiative which is to ask the question: how well are the customers satisfied? The customers, in our view, are the downstream healthcare providers and the patients. So as we construct our trials, and as we construct our quality investigations, we keep that in mind and follow along the same track as we would any other quality initiative.

MR. EDWARDS: Are there any remarks that have not been made?

DR. SARKIS ZARTARIAN: My name is Sarkis Zartarian. I'm an independent researcher and developer consulting in this area. I'd separate the answer to that question into two parts. The medical judgement of clinical utility should be done by clinical trials in the normal medical way. That's been said before. But the problem seems to be that people question it. So there's a communication problem and I'd suggest that an update to those four volumes be undertaken perhaps by the American Telemedicine Association in cooperation with something like the *Telemedicine Journal* to overcome the problem of people not knowing what trials have been done. Therefore, this is a communication problem that should be solved--not something different from normal medical techniques. The second part of it is the judgement of the cost effectiveness and that should be left to market forces.

MS. KAY BERDUSIS: I guess I better have something to say. Kay Berdusis, Telemedicine Coordinator, Children's Memorial Hospital. Part of the Northwestern University Medical School and Northwestern Health Care Network in northern Illinois. I'd like to go into the

clinical utility and separate out something that hasn't been identified in terms of how to set up a clinical project. We started our research in 1993 going through the IRB at our institution and separated out the technical resolution or the diagnostic accuracy.

The second part of the IRB proposal that we completed was evaluating the remote site operator competency because that will affect your diagnostic accuracy. We then went ahead into evaluating real patients. Because our first transmissions were recordings that separated out the educational and experience of remote site stenographers from the actual diagnosis, that would have muddied the data. We have since gone on into evaluating the time to diagnosis. The cost analysis, patient outcomes, and we're now doing research in IMPEG which is a standard. So separate out not only the physician's diagnostic accuracy.

I have a question to throw out to the group here. Who's going to pay for this? Because usually the clinical research has been in the domain of academic teaching research institutions or the military, federally funded projects. I see no reason not to continue in this manner. But in an ideal world I would like to see a datqbase set up. Again, this is Jay Sanders, who brought up the point yesterday that we are currently not evaluating traditional medicine. So why should we put ourselves up to get hit in telemedicine with evaluating something which currently is a new technology, such as ultrasound was a few years back? Yes, we do have this responsibility. It's not going to go away. I would like to see in an ideal world a database set up for data collection. You don't have to write this down. This is a wish list. That every time a patient is logged in for a transmission, whether it's an interpretation in radiology, or a true consultative process that we have data collected, there would be a central way of disseminating this information. Telemedicine journalism is an excellent example. I'll give this up shortly. Just one thing. That the professional societies

are going to influence all these projects. We really can't start any clinical projects unless we have developed professional protocols, international protocols. Because those exist beyond regional borders.

MR. EDWARDS: Any comments--things that have not been said so far.
We've got time for three more.

MR. KENNETH KAPLAN: My name is Ken Kaplan. I'm from MIT. A research scientist. Just to build on a different point I want to make is: I think the concept of a clinical trial that builds on the effort and numbers of people over the years, which would raise the funds, I think has to be embedded in a business strategy. I think many of us are quite aware that there are actually pieces of [unclear] around the room. A business strategy or business plan. Current research trials that has already been done will help focus which research trials have to be done next. I think there's a need for that. The strategy and a document which would be a business plan, that would show the efficacy and would actually generate the dollars for a lot of further research trials. There are a number of people who would pay both in industry and government, whom I've talked to, that they could see that business strategy.

MR. BOB BRECHT: Quickly, those of us in the field--This is Bob Brecht from International Telemedicine Center--have pushed access as one of the reasons to be for telemedicine. Yet we've not done any good research studies on access. The literature in terms of access at four levels of access and the public health literature is there, and yet we've

not done any research on that. The second is when we measure that we need to bring the social scientist to the table because what we're talking about is overlaying technology onto an existing system without reengineering that system and taking into effect human factors. So we need the social scientists to help us measure utility.

MR. ADRIAN GROOPER: Adrian Grooper, Mass. General Hospital and Autocyt Group. One measure of clinical utility is when institutions who don't need the technology for remote access begin to use the technology within the enterprise where they have the choice of walking. That is the same technology that can also be used for remote medicine.

MR. EDWARDS: Joe and Jim, would you like to comment on the discussion so far. You raised some issues earlier on.

DR. KVEDAR: At the risk of being redundant because a lot has been said that I think reflects a lot of my thoughts. I had thought about this a great deal as we put our program forward to look in our case at the utility of telemedicine in an urban environment, or on another area of business we have, which is an international environment. We have slightly different paradigms in those two areas. But I would say that we've been struck by the evaluative component being done one of three ways. As I talk to people, people seem to have one of three favorites. I've heard variations of them. One is a scientific, rigorous, clinical trial-based way, which we've heard now from several people. So I think that should go on the table as an item for the next phase of our discussion. The advantage of that is it creates credible data that can be used at least in the physician world which is another

comment. Who are the stakeholders? So at least in the physician's world people will take comfort. I think patients take comfort when data is presented to them for what it is, which is evidence that something is providing better care for them.

The other way that I've seen people approach this topic is you people in academia can go ahead and collect data, but we're going to be out doing it. We'll establish a precedence of use, and when you're done collecting your data, you can catch up to us. I've heard plenty of that stated around the use of this technology. I think that speaks slightly to the point that Dr. Rossing made about in some environments this is what we've got, and so we're going to use it. That's a valid point. So I think that should go on the table as a way of doing this and an item for discussion. Where might we get with that? Where might we fail with that kind of approach?

The third approach I've heard of in this regard comes from the engineering side of this process, which is a large influence on the process. I think it loosely translates into a rapid modeling approach. Let's not spend a whole lot of time planning the first step. Let's throw something out and get a read on whether it works at all or not and collect a little bit of data. Get a prototyping model. Then we'll go back to the drawing board and fix it a little more and go back. By the end of that process one may have something that is workable. But one doesn't have a lot of scientific data to say about it at the end of that process, because of the nature of the rapid prototyping model.

I would just throw those out. Then the other comment is that we have different stakeholders in the process that have been alluded to. There are governmental regulators who are interested in this process. There are people who make financial decisions at institutions that are interested in the process. There are patients and caregivers. And a

variety of others. So that depending on where you look at the prism, you will I think find a different answer and you'll rely on different data. If you're market driven, you're going to be interested in market analyses. I think if you're a physician you're going to be interested in more clinical trial type data.

DR. McGEE: Reading all of the comments that have been made there are two extremes, and there is a middle road which I think Joe has expressed. One extreme is Betsy Blakeslee said, "Well, forget it. Don't even bother measuring. It's going to happen and you're going to be left behind anyway." Now come on, I'm not knocking you, Betsy. The second comment that was made, not by Jay Sanders himself, but someone else in the audience. "Why should we set ourselves up to be evaluated when the rest of medicine has given up evaluating itself? Unless it's doing something new." Well, the reality of life is--people think we are doing something new. And that's why this question was framed. So that's one extreme.

I think the other extreme is that all of this should be done in a clinical trial type format. The criticism of that I guess is: the evolution of new technology on what we've actually studied and constructed around a particular form of equipment may be redundant. In six months time when that equipment is replaced, you have to do the same study again. My answer to that is "no, that you wouldn't. Provided the systems that you're using are at least analogous."

But there's a third and very interesting--apart from the middle road--fourth route, which you may look at clinical utility, which I didn't. I think it was a very good idea which came from here. Was that this four volume piece of work that was done way back in '76--I think it was, someone said--Which was submitted again I think to the National Academy of

Sciences. If I've got that wrong, the National Science Foundation. I have to admit publicly I haven't read it, and I don't know whether that says anything about it. We may, in fact, be talking about the same thing here. But one suggestion that came from over here was to avoid all this rigorous clinical trial type approach. It might be a good idea to take on board the idea that you put forward. Namely, there's a whole lot of clinical trial type information out there. Should it not be the responsibility of someone. You said it should be the responsibility of the ATA or an analogous body, to actually pull that together and put it into telemedicine, a journal that is. So I think that's my sort of broad appreciation of what people have been--

MR. EDWARDS: I just want to add something about context and that is the issues that you're wrestling with in telemedicine in terms of how you handle the medical innovation, whether it's evaluated at clinical trial, whether it's evaluated using large databases retrospectively, whether rapid prototyping is relevant to the pharmaceutical industry--it's relevant to the rest of the medical devices industry. It's relevant to medicine in general. The context that you're working in is very much shifting sands right now. Certainly in the United States and in Europe as well. I cannot speak for the rest of the world beyond those two areas. But I think there is now an increasing demand for accountability of what kind of care we're delivering and concern about that accountability. All of these comments here speak to--we're talking as much very globally. Yet in any one specific instance I might ask you how to design a study and you might say "well, we have to look at these five parameters." Do you have diagnostic agreement from an image of one dermatologist to another? Do you have from one vascular surgeon to another as to whether a wound is

healing? When you find out that there is clinical variability in that, that the agreement among two face-to-face clinicians is only 50% or 60% how can you then begin to design a study to evaluate clinical utility in a telemedical context?

End of Tape 1, Start of Tape 2

DR. SANDERS: For instance, a study was done in pathology a number of years ago in terms of urological tumors. I think Ron Weinstein was the one in this. It clearly showed that the variability amongst pathologists--it's not [unclear] but the variability amongst these pathologists was X percent. That is the reality. That is the variability. Telemedicine shouldn't expand that variability. It should be consistent with that variability within X standard deviations. That's really what we need to do. The thing that is never asked about the--in terms of pathologists is what their eyesight is. No one ever tests the visual acuity. That really becomes your gold standard. Nobody asks the cardiologist what their hearing capability is. And nobody tests them on a year to year basis. We need to, as you said, this technology doesn't need to be looked at as anything new or different than any other technology or anything else that we're going to apply. We need to evaluate it against existing standards. The problem is we don't have a heck of a lot of existing standards.

MR. EDWARDS: How do we address the absence of existing standards?

MS. BERDUSIS: I tend to disagree. I think that in a quality assurance program at an institution, especially here in the United States, if you have the joint commission coming

through you are looking at some quality assurance standards. And they are developing rather rapidly. One clinical characteristic is intraobserver variability. And that's something we've looked at in telemedicine. You may have intraobservervariability between two physicians looking at studies in a blinded, randomized fashion. But if the physician consistently makes an accurate diagnosis or an inaccurate diagnosis very specifically to the telemedicine transmission and the original diagnostic test that you're looking at. I agree that you can't compare it and it is something that is used as a quality measure in regular medicine.

DR. McGEE: So we should be containing everything to these quality assurance standards is what you're saying. Or historic standards or both.

MS. BERDUSIS: There are existing standards and they are used in prospective studies and in retrospective data collection.

DR. BASHSHUR: Given the brain power in this group I'm really astounded at the elementary level at which this discussion is proceeding. I really mean that sincerely. Like in 1995 I had five of my doctoral students review the literature on telemedicine. And we published that in the *Telemedicine Journal*. An annotated bibliography series. And in 1995 we found over 600 journal articles in peer review scientific journals. Have you folks ever read that stuff? A lot of what we're talking about has been done and published and it's a question now what is the next step.

DR. McGEE: What do you suggest is the next step.

DR. BASHSHUR: What I thought was the focus of this meeting is the cooperation between here and Europe. And what I have heard so far are a kind of hodge podge of all kinds of ideas in terms of what projects are doing in their respective areas. What problems they're running into and so on. And very little focus on what it is we need to do together to establish this network or this link. So I'm really confused--what would we come out with after the day is over.

MR. EDWARDS: I think the point being raised is given this discussion about measuring clinical utility, given what's in the literature we want to raise the level of the pool. Raise the quality of the discussion both in this room and externally amongst everybody delivering health care. What is needed to help raise the standard of the discussion? Raise the standard of what does telemedicine consist of in terms of improving clinical utility. So maybe the next step would be to focus the remarks on addressing the question that was just raised on how do you facilitate better communication or existing research. Better communication while research is in progress and better communication about what constitutes good research and valuable research or useful research. Useful research. Would that be a good steppingstone? Would that make it more--would that address some of the issues you raised, particularly in the U.S.?

DR. BASHSHUR: How do we establish this link with Europe? On what grounds do we cooperate?

DR. McGEE: Can we go on to that question next. Can the audience give some thought to moving on from this part of the discussion to what we see as the links with the other side of the pond. How those links should be forged. Where they should be forged and what specialties. And anyone who has direct expertise in those areas obviously can add to the discussion. While you're thinking about those various points Betsy, could you--

DR. BLAKESLEE: I'd like to address that exact point, Jim. Here's the context I believe for the discussion. Telepathology is a wonderful example. How will this work? How will we decide that this is clinically efficacious? It will work this way. Hypothetically Dr. McGee will create the Center for Telepathology at Oxford which he, of course, already has. I will go to my doctor in Atlanta and I will say I'm aware that one of the great pathologists of the universe exists at Oxford. I want my slide to be sent to him via a network. And I want him to check it. I don't want the doctors in Atlanta checking my slide. And your doctor in Atlanta will say yes, ma'am. Because I am competing based on that expertise. Name brands, like Mayo, Johns Hopkins, Oxford, etc. will become THE standard by which we will compete. And it will be my choice to have that slide sent to Dr. McGee to be read. I believe the medical profession has the responsibility to be able to document that Dr. McGee is, in fact, the excellent pathologist that he is supposed to be. But the fact that you will determine whether or not telepathology is a great idea to begin with is not going to have an impact on whether or not telepathology actually occurs. And so the European connection with America is going to be tighter than you can possibly imagine. It won't matter where the pathologists are. It will matter who the best pathologists are anywhere in the world. And I can access them from my little remote community in Habersham, Georgia.

DR. WEINBERG: I understand what you're saying. And it indicates sort of a consumer oriented approach to medicine. But I must tell you most consumers don't even know what a pathologist is.

DR. BLAKESLEE: I want the best--

DR. WEINBERG: You're a very well educated consumer. Most consumers do not know what a pathologist is. And I think that looking at business studies of the consultative business in pathology it's really still a pathologist-to-pathologist consultative business. But this direct marketing to patients is being tried in a number of areas including consultations on cervical cytology using the automated cervical cytology equipment. Other marketing is directly to patients who will request that it be sent through their physicians. So I understand that but I don't agree entirely that it's going to be totally consumer driven. And I think that there's a danger to that. And there's a very big expense with it. If a patient requests the pathology be sent to Dr. McGee who's going to pay for that? Is the patient going to pay?

DR. BLAKESLEE: Cheaper than you can possibly imagine. It's going right over in that [inaudible] he'll have the results back to me in eight hours. Two hours.

DR. WEINBERG: I have a fundamental disagreement with that.

DR. KVEDAR: I have to interject, I'm sorry. One has to realize that at least in the United States the exact opposite of the way care is going.

DR. BLAKESLEE: Why would you say that?

DR. KVEDAR: Because managed care organizations will determine who your pathologist will be.

DR. BLAKESLEE: Exactly. And they will love this. Because it will be fast and cheap. And managed card will absolutely drive this.

MR. GROOPER: At the risk of moving to a much lower level one role for a multinational and multiinstitutional organization--in measuring clinical utility is to establish an index of standards. Because what is being published is very often not referenced to a particular set of images or a particular clinical application. And it makes it very hard to compare over time when, for instance, the use of [unclear] compression is applied and everybody applies it to a different set of situations or a different set of images. And this is clearly something that no single organization or on one or other side of the ocean can do by themselves.

DR. ROSSING: Once again back on clinical utility. Telemedicine as such is no more than an advanced telephone. One way or the other we have to think of the word clinical utility not only as a topic of research. Definitely you must have clinical outcomes measurements. But why all the research is simply control and quality control and quality control and then just back to Betsy's problem. I think it was very interesting to hear the certain defense on American pathology. Very interesting. You know what would happen--I'm not a pathologist, definitely not. But once I knew something about thyroid diseases your risk of

having a malignant [unclear] disease would decrease tenfold or something like that. Thank you.

DR. McGEE: While you're there, in your previous experience with the European Union and continuing experience as is evident here, have you any concrete or direct routes which you think we should be going down to bring the two sides of the Atlantic more closely together? Where we are actually starting collaborations, either studies or business together. I'm asking you the question specifically.

DR. ROSSING: What you can do, of course, is that you can agree upon how to make clinical utility studies under various conditions? Alaska *versus* Bethesda. And definitely on both sides of the Atlantic there is a need for collaboration. And there's a need for funding to make sure that the quality assurance is there. I do know that in Europe there are at least these ten or 12 ongoing EU cofunded--I don't like the word funded, but cofunded projects of a multinational scale. I'm absolutely sure it will be to the benefit of most of these projects and in the interest to join in either by a NATO with the military or with any [unclear] in setting up such evaluation schemes. That's for sure. And I am mandated to go back and suggest that--and I could take any suggestions back--to that part of the European Commission that is dealing with the matter. The problem, ladies and gentlemen, is that the EU at this moment has no funding mechanisms for supporting or cosponsoring the American partners. They have to find their way themselves unless NATO might help. Thank you.

DR. KVEDAR: Might make a motion at this point if we are indeed going to have the voting exercise that we talked about at the beginning either at the end of the meeting or by e-mail, one of the options that we might consider voting on is creating a set of quality and outcomes measures to use as a standard for evaluating studies. I throw that open to the group.

MR. KAPLAN: I think given the diversity of the group here today. I've been to a number of these and this is particularly unusually broad. To look at some of the mechanisms of the groups here, particularly the Department of Defense, which is a very important player both nationally in terms of its scale. In our country in terms of the size. One of the world's largest HMOs. And also its ability to integrate international efforts. And there are already historically since the Gulf War through the coalition forces a number of medical teams who were here yesterday. Some of them were here yesterday. Offering their help. And there are people who can contact internationally in the military community who would be very interested in particularly seeing some kind of even a statement, a joint statement going to the issue which I think would be a good goal today. Of some agreement on clinical trial definition internationally based on what's already been done and what would be a proposal for next time in an international set of trials. Again the specificity of those trials is another issue which I don't think you can get to today. But some definition of a strategy towards international trials, accessing the institutions that are here today including some of the academic institutions as well.

DR. KVEDAR: One of the directions I hear the group moving in is away from randomized clinical trials and towards more outcomes quality oriented measures. Again, I want to get a read on whether I'm hearing it wrong or right. I don't know how we best do that.

MR. EDWARDS: Specifically before we go to another comments, comments directly to the point that Joe just made on clinical trials, outcome studies, creating a set of outcomes. Do you want to remark directly to this comment?

MS. BERDUSIS: Directly to that. I'd like to answer that and then go back to the question in terms of how disseminating information need drive the marketplace. And if you are looking at a specific model in which we can have commonality and not reinvent the wheel we can look at emergency medicine which impacts on every other aspect of subspecialty medicine. I learned at least about three projects here that I can take back to the state of Illinois which is looking at emergency models that they might consider for reimbursement at the state level. This is something--we are taking it back to the--at Jay Sanders' recommendation to the College of Emergency Room Physicians. And developing protocols and standards and from there taking off on clinical trials. Going back to the original question: how to disseminate information. I think that there should be a central body. Again we have a worldwide American telemedicine association and I use that very loosely. But I think the way that medicine is usually driven [noises] and telemedicine is enabling. It is not a subspecialty.

DR. BLACK-SCHAFFER: I doubt if things will be driven through professional societies. But they may be. I think that things will actually be driven--it was observed we are in a capitalist system here and much of the world is. It will be driven by the market and the market is driven in general by consumers. I was for many years a member of a board of health and the chairman for some of those years. And we didn't decide who did what. We just tried to make what people did as healthy as possible. And I think that's a situation we're in here. And I think therefore realistically the issue is how do we do outcomes research? Not how do we do clinical trials. Which we can do. And also being an academic physician I'm sure that I will do. But I think that the issue--the broader and the real world issue is how do we evaluate outcomes where telemedicine helps. Where telemedicine hurts. And make sure that we have those so that when someone says I want my slide sent to Oxford instead of Atlanta that the result is what the person who asked for that thinks it is going to have been better and not worse.

MR. HARRY SIEGEL: I've been listening all morning to everybody sort of pontificate and I haven't said a word yet. By the way, I'm Harry Siegel from GTE and I'm the national account executive for health systems. We're the largest Internet provider in the world. And you keep talking about Internet, we're there. We bought BBN last week. So I'm listening to everybody talk about clinical trials. I don't think there's any doubt in the technical community or any doubt in the medical community that telemedicine is real. I don't think there's any doubt in the consumer community that if they can reach out and touch an expert without having to go travel there that's a good deal for them. The reality is as telemedicine has proliferated there's over 2,000 pack systems installed around the world today that are

showing value. And as hospitals do their own cost benefit analysis and they say it's going to cost me $14 million dollars for a pack system and over an eight year period it cost me $3 dollars per film for radiology and so much for space and so much for people and so much for going off site to retrieve the film, I reimburse myself that $14 million dollars in two years.

And then it starts making money for me. That's where the value of telemedicine is going to show itself to the world. I think if all of you get together in this room and I'm an IT professional in the health world, not a doctor in the health world, and you all look at clinical trials. Clinical trials are wonderful. But the reality is I don't think you have anything to prove anymore. I think you're wasting your time. Everybody agrees, I believe, in the IT world and even crossed over in the medical world that the value is there. So why don't you look at the successes that are there, go to the major institutions and the major facilities that have spent the dollars and done the research and let them publish and go ahead and show the value.

MR. EDWARDS: I think you're raising an important point. Earlier on Joe raised the issue of you have these two categories, if you will. You have the clinical trials, rigorous science. Then you have just go out there and do it. It's happening, anyway. The discipline of the marketplace. And then obviously there's variance from that. And the [unclear] prototyping model, the engineering approach is a third variant on that.

MR. SIEGEL: Test a little, build a little.

MR. EDWARDS: Rapid prototyping. So the question becomes then that if the users--we talk about end user satisfaction is important. And end user being both the patient and the provider. And the provider is demanding clinical trials. We've certainly heard a lot of providers in the room say that they would want clinical trials. How then do you address that provider demand, that requirement of a consumer. In this case, the consumer is the provider. Representing the patient's interests in theory.

DR. KVEDAR: Well, it's the patient, the provider and the payer. You left out the important guy with the dollars. And I think a combination of the payer who sees the value. The provider who sees the value and the patient who's getting more and more technologically advanced every day by wandering around and surfing the Net and seeing advertisements on the TV or reading it in magazines while they're flying places. Or seeing it in the news. They know almost empirically that telemedicine is here. And that there's value there.

MR. EDWARDS: You have different perceptions of value.

SPEAKER: Could I interject. I know you already have a fulltime job but I have some consulting dollars and I'd love to hire you to come and tell all the physicians in my group, that is to say the large group of partners health care that it's a done deal. I have had a lot of trouble suggesting that it's anything close to a done deal. And the IT world is different.

SPEAKER: I'll give you my card.

SPEAKER: Okay. I can tell you that the majority of docs where I am do not have that opinion.

DR. BLAKESLEE: Five years ago the majority of doctors in America would stand up and say I'll never be a part of a managed care [inaudible]. I'll never be a part of a managed care network. I'll choose not to be a participant. Well, welcome to the real world. There is no such thing as [inaudible].

DR. ROSSING: I think that of course we need technology assessment which is wider than clinical utility. There is a living gentleman called David [Banter]. He was working on the Congress OTA here, Office of Technology Assessment. He went to Europe and he lives over there now. And he taught us what technology assessment is in health care. I think this is needed for this discussion. Because it is clinical utility in terms of acuity, accuracy, etc. But it is also a matter of what does it matter if the accuracy is that high. We saw yesterday on one of your slides, Jim, what does matter. There was a slight difference in some of the figures. But beyond that what are the economic aspects? What are the consequences for society for those who are involved and those who lose their job? All that goes into technology assessment. And you do that in the specific environment. And therefore I don't believe and I don't agree that you should not have any such things as randomized trials or whatever. That you should have in pathology. But how do I judge my echocardiographic consultation with a young guy in Greenland with equipment he doesn't know? But we are working interactively. Of course we can judge afterwards on the tape. But it's a different procedure. And I think we should not set up the procedures here but we should agree on

going together and provide the means, group for group, specialty for specialty, to do it across the Atlantic. That's my suggestion.

DR. GAOUK: I keep hearing transAtlantic and the connotation is Europe and the United States. Last I looked at the map Africa was also across the Atlantic and so was the rest of the world. And I really think we're moving in a very small circle. We are assuming that we are technologically superior and we have all the money. I think the issue is not whether we send a slide to the Mayo Clinic or to Oxford but whether we read it in Seoul or Kinshasha or Beijing or at the Mayo or at Mass. General. Because I think for telemedicine to really achieve what it's meant to achieve, which is broad communication, global communication, we have to think globally. Although I know that this is a transAtlantic conference, but I think we are taking it in a very small circle. And, by the way, most of the money is no longer in the United States and in Europe. Most of the money is with governments elsewhere. For Europe and the United States who make maybe half the population of China we are really thinking in a very small scale. Computer makers started understanding this. Car manufacturers started understanding this. And I think we have to learn from these people, from AT&T, from General Motors, from everybody else who is a truly global company how to be global. And I think this is when--because we can talk about scientific studies and Western medicine. And, by the way, not all the world shares Western medicine. Some people think we do inferior medicine. So we should not be as presumptive in assuming that what we are doing is right. And the rest of the world--we are going to teach the world. Because the world may teach us and it may be that they will resent what we have to offer. And they may not want to listen to what we have to offer.

MR. VIN SPOTO: My name is Vin Spoto. I'm with Image Labs. I guess I'd like to give a little different perspective of what may be happening here. First of all, I think if we went around the room and asked if telemedicine is going to be here in five years or so everybody would say five years, three years, 10 years. But it's going to happen. I think an issue that I'd to bring up though is that when I go into other businesses, whether it be AT&T, General Motors or Deck, I see the executives there who are supposedly computer experts. And I don't see the majority of the senior level executives--maybe they're using their computer for e-mail but they're not using it for a whole heck of a lot more. And that's because their real function is to manage their business. They can do that much more efficiently by moving around, seeing their people or whatever they feel their capabilities are where they have to go. Now we're here saying that gee, why don't we just put a terminal on everybody's desk and say go to it guys. You can now get an image and do your job better. I think until we realize that this is a tool that we have to increase the efficiency of what's going on right now. I'm sure none of you have an extra 20 minutes a day or an hour a day to give to additional use or additional things to do. We have to provide a tool here that's going to make it easier to do your job. That's going to give you the time to do your job. And I think adding to the clinical utility might be what are the features of a telemedicine system that can help you do that?

DR. McGEE: Could I just interject at this moment. Because time is going on and we have to finish promptly at about a few minutes before half past 11. Because the Prime Minister of Canada is next door. Now I've asked this question once and I'm going to ask it again. And that is can anyone in this audience, the people from business, academia or wherever else,

could they in a very straightforward way say here are two or three areas in which we on both sides of the Atlantic with great deference to the second to last speaker. We are all globally committed. Otherwise we wouldn't be in this room. The globalization of health care. But we have to start somewhere. And the people in this room I think represent those two courses across the Atlantic. Now what I'm asking for is give me two or three proposals of a firm nature where we can bring together both sides of the Atlantic in a collaborative way. I've already got one in my head.

DR. BASHSHUR: I would like to respond to that and propose something concrete and specific. And that would be in the form of a registry. And so I would propose the idea that we attempt to establish a common registry. The protocols for which will have to be developed later in terms of the content and what goes in it and what measures of quality and so on that really kind of--very, very important issues but they have to be developed and it's difficult to do that in a group meeting. But the central notion is the establishment of a database, a registry that would take in not say pathology and radiology and so on by itself. Although that could be done. But kind of a common denominator, if you will, registry for researchers, for policymakers, for people who want to get information and so that we can establish a database with some common parameters. So that we can do research and we can investigate the field further and so on.

DR. McGEE: You mean a register of the people out there who are doing this?

DR. BASHSHUR: A registry of the cases in telemedicine, in the various specialties and also in the various applications. A registry has to take in the various applications of telemedicine. But would use some common parameters so that we collect data in Europe without similar data being collected in the U.S. and so on.

DR. WEINBERG: One of the primary hangups I've been hearing is the issue of funding. And it's interesting what happens when money starts being discussed. When I hear representatives of the EU say well, we really can't arrange for any kind of funding for American organizations who want to do cooperative studies with us. It puts a chill, I think, on the idea of cooperative studies. And I think people have to think about the funding mechanisms. Ken Kaplan mentioned the military organizations and there's an ideal organization that already has transAtlantic exposure. That already is involved in international telemedicine to a certain extent. And certainly has the funding to do a lot of international efforts. And if we're thinking transAtlantic military organizations throughout the world already have transAtlantic capabilities. And I think we need to think of a way of tapping into that. And perhaps working with military organizations to provide additional services or to do the kind of studies that we're interested in doing.

MR. KAPLAN: [Inaudible] other compartments that have [inaudible] a group like this could make a proposal for specific projects in emergency medicine [inaudible]

MR. EDWARDS: Other specific suggestions.

MR. HAIK NIKOGOSIAN: Haik Nikogosian. I'm professor of health care medicine from Armenia. My background is I was the coordinator of [unclear] Armenia/ U.S.A. telemedicine project in '89 after the Armenian earthquake. Now I am doing the second project, Internet and PC based in the University of Maryland, linking Armenia and the U.S.A. So my opinion is there are two very important focuses while doing transAtlantic telemedicine. First of all, I think the focus will be not inside the G7 countries or between the European Union and North America. I think the more important force is in newly market oriented countries previously industrialized countries having difficulties now. So those countries will facilitate. Because there is an urgent, important and real need for telemedicine consultations in those countries. This is not theoretical. This is a real need. So if we choose those countries as facilitators and as links who link even the most industrialized countries. European countries or G7 countries. That could be a good solution. And the second focus is, I think, that is the focus will be the diagnostic and high technology based medicine. Because in many countries and specifically in those countries those kinds of services, high technology based diagnostic medicine is improving very quickly. And there is a need, real need, day to day need of the Western expertise for those services. And we have to think, count also that the telemedicine itself is mostly diagnostic. It is diagnostic specialty. And so if we are dealing specifically with diagnostic services and high technology based diagnostic services most importantly transferring of knowledge. This could be important. So these two focuses, new countries in Europe, newly market economic countries oriented countries, and diagnostic and high technology focus will be very important in the future years for any transAtlantic telemedicine efforts. Thank you.

MR. DYE: Please write the acronym ICEIMT. It stands for the International Conference on Enterprise Integration Modeling Technology. The whole purpose of which is to get at issues of how do we measure. How do we plan frameworks. It has already coordinated a relationship between the [unclear] Somoza initiative and other [esprit] programs, as well as the Air Force ICAM project and the Army's enterprise integration technology and industrial modernization centers program. I would suggest that since the funding relationships have been forged and wrestled with for several years which was largely in the context of the international manufacturing community that there should be the formation of a telemedicine working group, subgroup, of the ICEIMT. Which takes advantage of that infrastructure.

MS. BERDUSIS: Since telemedicine rose out of servicing geographically and socially isolated regions of the world, in this country most of the telemedicine was pushed forward by the joint working group in telemedicine, an existing body that is a liaison between different governmental offices. This group also works with the FDA which is evaluating telemedicine devices. And as Professor--Dr. [Therie] yesterday indicated there is a development of an FDA body in progress. I don't know how far along that is in Europe. I would recommend that the joint working group in telemedicine be selected as a liaison with the European group, Dr. Rossing's group. Because when I noticed the G7 projects yesterday we are duplicating some of these in demonstration trials in this country. And I would again refer to the emergency telemedicine simply because in this country rural hospitals are closing down their emergency rooms because they can't man them and there is a driving need for that in this country. We have learned a lot from what is going on in the G7 projects. So I would say specifically the first start would be to look at emergency telemedicine and take it from there.

And I'm not ignoring the rest of the world. But you specifically asked for transAtlantic. I can refer to other groups, national bodies.

DR. McGEE: We've got a concrete proposal. And also a funding thing. Now there's two or three others here. We have to be conscious of the time. Betsy.

DR. BLAKESLEE: I indicated in my presentation yesterday that the center for total [inaudible] in Fort Gordon, Georgia, has been named the data manager for the Partners for Peace Network. That's the connectivity between all of the military institutions in the United States and all the militaries of the former Soviet countries. Including also Sweden and some others. So the problem we have is that the Department of Defense and the State Department are funding the connections military-to-military. What this group could do would be to work with the project manager, Jim [unclear] and how it is that we would extend that network once we're in those countries into the private sector of those countries. And we have already done that in Georgia with the commitment from U.S.AID through AIHA to extend the network that we're going to hook up between Tablisi and Fort Gordon to extend to other parts of Georgia. So I agree with your suggestion. I would be very happy to entertain coordinating that effort with the program manager, Jim McGee, for the PFP network.

MS. SUZY TICHENOR: I just have a quick comment regarding the use of the joint working group. Be aware that they are not independently funded. And if you're going to approach them with a task that should be considered. Because all the people who sit on that right now are doing so voluntarily from their agencies. They don't have an independent

budget. That's not to say that they couldn't and they do have a lot of support from the Vice President's office. But just kind of keep that in the back of your mind before you volunteer them when they're not in the room yet.

DR. POROPATICH: Last month we sent up an international lobby because of the international [inaudible] so I can tell you that there will be further discussions along those lines within the joint working group and how we can partner together. I also feel that the distance learning aspect is another application that you're looking for that we could perhaps agree to do together. The military is involved internationally, as Dr. Blakeslee has already mentioned. We are continuing to move forward. We are setting up distance learning sessions with Sweden. We do it with St. Petersburg, Russia very soon. And whether it's in the Atlantic or the Pacific we're doing all these things already right now. I think Betsy has given a nice mechanism to try to lay the groundwork to develop this action agenda. Which was my understanding of what we're trying to accomplish here. I think distance learning is one application we can look at and the topics can be a variety of things. Clinical, technical, whatever. But the joint working group is limited in terms of what it's trying to do. Just trying to get a handle on the 26 federal agencies and having us work together in the United States is a daunting task. But we are mindful of the international implications.

DR. PATEL: The health care providers are going to be providing this telemedicine consult. It would be nice to really educate us who are health care providers in what's happening in new technology in two parts of the world. So we will be able to provide that aspect. So I think it may be important to get the new developments in telemedicine.

MR. EDWARDS: We have eight suggestions. Concrete ways to collaborate. Before we begin to try to pull this together are there any more concrete suggestions that have not been raised yet? Ten seconds, 20 seconds.

MR. O'MALLEY: Is the chronic disease management area, diabetes, there's projects going on in Europe. I won't go into that. The Europeans have already unified. There's some we can do here. I would not recommend the military or grant funding mechanism. When we get mainstream there will be all the funding there we need. There are venture capitalists. When the projects are real the funding will be there. That's not an issue.

DR. DAOUK: I think since this is a market driven enterprise I think it is very effective and appropriate to foster close interactions between the telemedicine community and the private groups who are the vendors of the technology. Who have an interest in fostering.

DR. BLACK-SCHAFFER: I think we may have achieved synergy between the clinical utility question and what our next steps should be. I think that the idea that we should go to places where there is an unambiguous need for additional services, so we're not quibbling is a little better to do telemedically or the usual way. Because the usual way isn't there or doesn't work is really excellent. And I think more such [folksi] we can find the better off we'll be in terms of demonstrating real utility of telemedicine without wasting our time.

End of Side A, Start of Side B

DR. ROBBINS: Corporations who have invested heavily in the remote environments. I don't know if there's anybody from the Scandinavia or North Sea experience here but this week there is a $6 billion dollar oil platform being towed off the east coast of Canada that has a state-of-the-art telemedicine system on it. Because they came to us to insure some safety--they perceive benefit and utility for over the shoulder type monitoring of rig medic. That's present in Africa. It's Asia and certainly the North Sea as well as eastern Canada.

MS. MILT PREVONITZ: Milt Prevonitz. I do consulting. Since economics are going to drive the less risky applications my thought was in order to maintain quality standards you may want to set up a certification program for people who have demonstrated their ability to work with electronic equipment.

MR. EDWARDS: Last comment. It really has to be the last one.

DR. ROSSING: I'd just like to remind you of the presentation yesterday of the G7 concerted action called teleplans done by [unclear] from Naples. And this is a G7 project. That again bridges the Atlantic and wider. That could be a forum. G7 telemedicine project, teleplans.

MR. EDWARDS: We've heard a lot of discussion today. Turn it over to our chairs to begin to pull some of it together in terms of bringing the early discussion of what is clinical utility and what is research to these 10 or 12 suggestions that we can then get more feedback on and follow with e-mail.

DR. McGEE: You take four minutes and I'll take four minutes.

DR. KVEDAR: I'm not sure I have four minutes of additional comments. What I would hope we could do is I believe we're going to have some mechanism to transcribe this. What you see on the clip chart pages and again we'll try to synthesize that and put it out for this voting process to the group. I think it's been a useful experiment. I hope others feel the same.

MR. ERIC MENN: There has been a pad of paper floating around the room asking people for e-mail addresses. If anybody failed to put their name or e-mail address or any kind of address on that pad of paper please do so because we do want to involve everyone in the process.

DR. McGEE: I think it's very important that we end up this session by having an agenda for next time around. Which will be this time next year or sometime next year. So that we just all wasted our time sitting in this room. And I think the importance of what Eric has just said is that we will try to bring together all the comments, perhaps not all of them, but the ones which have been repeated more than once, pretending to be democratic. And get those back out to you for comment and this voting procedure which Roger knows more about than I do. I don't think there's very much more that I'd want to add in the way of summary right now.

MR. EDWARDS: I would just ask that on the people who provided some of these suggestions these will serve the basis for the voting and the comments about priorities. Maybe you have information that could amplify a paragraph on each of these things or at least would be able to put into our minutes from this discussion. Would you please give it to Eric, Joe, Jim or myself.

DR. McGEE: Or e-mail it.

MR. EDWARDS: That would be great.

SPEAKER: You could do telemedicine at MGH dot Harvard dot EDU.

SPEAKER: Aren't you sending that list out to all of us?

SPEAKER: The list will be disseminated to everyone....

DR. McGEE: At least one other thing. These various concrete proposals for transAtlantic projects or collaboration are a step forward. One or two people made allusions as to how they might be funded. We were told by another [unclear] here in the front row that we needn't bother about funding because the venture capitalists are going to come in. I really don't care who comes in to fund it provided we actually go ahead and do something about it. But those people who did mention funding opportunities and how these things might work

from a financial point of view, could they give that a little bit more thought and put two or three lines down to e-mail either to Joe or myself so we can amplify what we [unclear]

SPEAKER: I can't underscore that enough. That without warm bodies who are committed to bringing these tasks forward they simply won't happen.

DR. McGEE: Well, thank you all for coming along. Hopefully we can go forward.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

MEDICAL RECORDS/PATIENT INFORMATION/SMART CARDS

DR. CHARLES SAFRAN: I'm Charlie Safran. And I think I'm supposed to moderate today but I'm not quite sure what today is. So I think it's really up to us to decide what we want to get out of this session. I thought we might start by each just sort of going around the room saying a little bit about who we are, what we do, what our interests are. And then maybe we could try to sort of work out what our agenda, what kinds of things we might talk about and take back to the group. Which brings me to point number two which is that we need volunteers either to help scribe. We need someone to potentially scribe. And the other thing is that we need to report back to the group potentially any breakthroughs or findings that we come up with. I think our agenda today is to try to come up with some, at least if I read the little blurb here, come up with some of the issues relating to patient records, smart cards, patient information, key challenges and obstacles and recommended actions and solutions. I suppose we could come up with priorities as well

DR. SAFRAN: Well, I'll start off. I am, as I said, Charlie Safran. I hold a position as Director of Infomatics and Advanced Technology at the Beth Israel-Deaconess Hospital. After my finishing my clinical training I've been at the Beth Israel since about 1983, Largely in a research and development capacity where I built large patient databases or outcomes research, to now where we are working on building electronic patient records in our environment. More recently I've been responsible for a number of projects. One of which I think got me invited to this conference, which was telemedicine application in our neonatal intensive care unit whereby we're involved with linking our patient record systems to telemedicine project. Where we're allowing patients' families to teleconferencing to intensive care unit to see their babies and talk with the staff while at the same time the babies are being transferred home perhaps earlier and able to keep a link to the hospital environment. In our own hospital we have 5,000-6,000 terminals on desktops. We have 80,000-90,000 accesses to electronic patient records a week, about 30,000 pieces of electronic mail that are passed around our institution. We have maybe 70 clinics, about half

of which can interact in a completely electronic way. So those are the kinds of things we do. We've also worried about how to build electronic reminders and alerts and monitoring into our systems, basically intelligence and rules for supporting primary care mostly and some acute care. I've done the most of this work in the area of HIV infection. So those are the kinds of things that I bring forward. I guess the things that I'm perhaps most interested in talking about are some of the issues around security, confidentiality of the patient information. If we think some of our focus ought to be linked to care at a distance which is perhaps a broadly defined definition of telemedicine. Some of the aspects of security and confidentiality would be one thing that I would be interested in talking about.

Another would have to do with how this technology interplays with the electronic patient record. We now have the ability to capture all sorts of sites and sounds. Patients walking at home. Their heart sounds when they're in the office or remotely from home. Video conferencing, electronic mail and all sorts of things. And these are sort of nontraditional objects that aren't currently part of any kind of clinical documentation. And how that should be considered, whether we should be considering these things as part of electronic patient records would be one thing. And I suppose the other part we were talking about a little bit before was whether there's something new and different with some of the technologies that are now happening upon us. And whether electronic patient records should be thought of as an electronic capture of a paper record and hence a paper process. Or rather there's really an opportunity here to rethink what it is that we have in front of us. Whether there's a way of reengineering what it is that we're doing with respect to recording patient information and supporting clinical care.

MS. LILLIAN CLINARD: I'm Lillian Clinard and I work with Lockheed Martin Energy Systems, Inc. and that's sort of a misnomer. You'll know that as the largest defense contractor we operate a number of Department of Energy facilities, including two national laboratories. And so my interests are kind of twofold: one is the technology transfer from those entities that we operate where they may be of value to health care. And there are a broad range of those from biotechnologies. Because we've been in the nuclear business, nuclear effects, nuclear medicine for some decades. But also because we have been involved

in systems with advanced communications, advanced computing and security, which you mentioned earlier in our weapons production. Which has some applicability. The reason I was invited, however, I believe is that for the last two-and-a-half years I've been the technical director for seven projects to programs for the Department of Commerce in advanced technology. Their advanced technology programs. Specifically, on electronic medical records and telemedicine. And those range from telepathology all the way to developing a scheme by which we can secure the confidentiality of records across enterprises and across, in fact, jurisdictions like states or countries, etc. So I have a pretty good idea that's why I'm here. So that also gives you some indication of my interests. My interests and my expertise to communications technologies, computing technologies and storage as it relates to that. And we have a good bit of experience in demonstrations related to telemedicine which can be related where they have relevance to this activity.

DR. JEAN-LOUIS RENAUD-SALIS: Good morning. I am Jean-Louis Renaud Salis. I'm basically a surgeon. I am working at the regional cancer center of Bordeaux, France. I'm responsible for the Department of Medical Information in this institution and in charge for the French Federation of the Cancer Center of Projects and Distributed Patient Records for more or less a regional cancer care network as well. I'm also involved in European Commission programs on the electronic patient records. I must say that just to give an European prospect, we have since the beginning followed the Institute of Medicine report in specifying the functionalities of the patient records. That is not only patient data entry presentations and retrieval and so on, but as well decision support. Simple functions and communication functions. I must say that we have now, as I presented this yesterday, at the level of the Commission we now have a model and conceptual model and architecture which is a standout for the Commission on electronic patient record architecture and on the information system architecture more broadly. And now the main development at the level of Commission progress on [unclear] middle ware architecture for local, regional or even national patient record systems. So technology is more or less here. The main problem for us is one of security and confidentiality and two the problems of terminology and languages. We are working on the UMLS as a solution for the multilingual patient record we need in

Europe. Because we have 15 languages at least. So my main areas of interest today are security, confidentiality and terminology.

DR. JO HAUSER: Do you use the same standards in Europe for your electronic records as is used in North America?

DR. RENAUD-SALIS: It depends on what you mean.

DR. HAUSER: You talked about this CNTC.

DR. RENAUD-SALIS: CNTC251.

DR. HAUSER: Is that used here?

DR. RENAUD-SALIS: No, this is European.

DR. HAUSER: Is that a problem?

DR. RENAUD-SALIS: No, not at all.

DR. HAUSER: It's not a problem in interfacing the two electronic records in North America and those in [Europe].

MS. CLINARD: You're making the assumption that the ones in North America adhere to some standard, which they do not.

DR. SAFRAN: I believe that the European standards for laboratory data are probably the closest to merging with North American. The new set of LONC codes would be sort of the area where is the greatest overlap. But you have to wonder why you would merge data. In other words, what's the international travel *versus* intracity or regional or state? Where is

the merger, not the merger but the confluence of data really greatest. Actually, the Europeans I think are probably a great deal of ahead of us in terms of their standards efforts in many ways. They've been able to go through the EC at their own country levels and organize and put forward standards much more effectively than we have.

MS. CLINARD: A comment in regards to why you would merge. I think you would merge not for single patient activities very often but for research outcome studies, those that are broader than particular entries. So I think there is a rationale.

DR. MARGARET HOUSTON: Look what happened to driving on which side of the road. People said well, we're not going to drive anywhere else. And that's lasted for how many years. I can't even take a hair dryer over to Europe and plug it in without having an adapter. It would be nice if we could do something fresh and new and realize that maybe we do want to talk to each other in different parts of the world.

DR. RENAUD-SALIS: Intercommunicational. Between different patient records on both sides of the Atlantic, I think the main problem is today the problem of use of this side of HL7 standard and on the other side of the [EDIFACT] standard, that hopefully this is coming to converge now. From what I've heard. Because once some format with which you can exchange data using [EDIFACT] there's no more program for exchanging data. Not for terminology. This is probably something of which we could work on both sides.

DR. SAFRAN: There are also two levels, probably more but at least two levels of terminology or exchange. One is that we're looking at the representation of certain kinds of facts like a serum potassium level that comes off an autoanalyzer or a date of birth or patient name or something like that. Something that's closer to a fact. The standards for those kinds of information are probably easier for all of us to agree on. You then get to concepts. So he wants to report that the abdomen was soft. And this is important for running decision support because you have a soft abdomen that might mean something very different for outcomes research or for decision support than someone that had a rigid abdomen. How that

data exchange happens or how that concept exchange happens. How we are able to record comparable patient descriptions from one place to another. Much less one country to another represents another level of complexity that we haven't quite gotten to.

MS. KATHY MILHOLLAND: Hi. I'm Kathy Milholland, senior policy fellow at the American Nurses Association where I cover anything having to do with health care information. That's a pretty broad spectrum. It includes both the electronic patient record or the computer based patient record, national and regional databases that are used for making health policy decisions, and for examining health practice, etcetera including telecommunications applications for the delivery of health care services. Of course this meeting seems like a small group, very oriented to the electronic patient record. And I am very interested in that. Especially from policy perspectives, both for the Association and at the national level and at state levels. So that we can ensure the full range of patient information is included in those records and included in those databases that are used for research. We're very interested in nomenclatures and the standardization of nomenclatures or the ability to at least do the last kind of approach which is I think is what we have to do for awhile until people can let go of their uniqueness. Interested in practice issues surrounding any application and that includes both professional standards of practice. How does this affect the professional? How does it affect the nurse/patient relationship? How do you make a therapeutic nurse/patient relationship? Things like that. And also standards of care. When do you decide that a telecommunications visit is okay? Or when you decide that it's time for an in person visit. Those are things that need to be worked out in this area. Security and confidentiality, ethical issues which are beginning to arise especially we're hearing among telephone triage centers the need to practice the way you believe should be practiced *versus* a commercial entities decision that you will practice in this way. Regulation. We've heard some of that about cross state practice. Labor and workplace issues which goes back to how does this technology affect the individual? What kind of workplace do they end up having to deal with? How the patient record connects to telecommunications, international issues, global marketplace, global competition both for American nurses and for nurses from other areas and other health care practitioners. Do we

have to lower our standards because of agreements like NAFTA? Or do we raise everybody's standards, things like that. General informatic standards, ASTM, health level seven, [unclear] work, national databases and their use in research.

DR. SAFRAN: Could you clarify how you think NAFTA could conceivably cause us to lower standards?

MS. MILHOLLAND: Well, actually I was talking to one of my colleagues who actually does a lot of this work and it's the issue of apparently NAFTA, the statements in NAFTA that we cannot treat professional or health workers any different than we treat those who are already working here. I'm trying to remember exactly how she told me. But she said the issue comes down to the licensure issues and the fact that, for example, Mexico has no standards. And their educational programs have no professional standards of practice. So they're at zero. Canada and the U.S. have fairly equivalent standards of practice so it's not as much of an issue. But if NAFTA prohibits us from restricting Mexican nurses coming into the United States we can't set up barriers to that. Does that everyone has to lower their standards to the lowest common denominator? So that everybody has equal access.

DR. HAUSER: Check appendix two. You can object to that.

MS. MILHOLLAND: Well, I know that. She's much more expert than I am. It's just that I became more informed about it. That there are those kinds of issues that have to be dealt with whether you have restrictions. You place restrictions like Canada has put in a reservation that it wants to not allow commercial U.S. health care systems into Canada. Because it wants to protect its public health care system. And we don't have those kinds of reservations because we don't have a public health care system. And so there's some issues about licensure of professionals crossing the border. That is one of those questions that the country has to grapple with, not just the ANA but medicine. All the health professions may have to grapple with this. And I'm not an expert on it. I just brought it up as another area of interest.

MR. PIERRE TOUMA: My name is Pierre Touma and I am not a clinical person. My interest is in telemedicine and the electronic patient records from an engineering and technology perspective, whether it's through my work with the NASA telemedicine program or work that I do with medical equipment companies that are trying to refocus on telemedicine. So I'm not really involved in standards since I cannot have an input. But I take the electronic patient record as a black box after it's being worked on by the clinicians, the legislative body and all of the other people. And I try to use it as a nucleus of any patient centered care process. Be it inside of the hospital, inside of a regional health care system or even on a global level using telemedicine. So I'm not involved in its architecture. But through some of the dealings with the government and private entities. I came out with kind of a synthesis of what should be in there. We don't know where it's going to be. We don't know how it's going to be structured. We don't know a lot of things about the transmission protocols. Whether it's going to be HL7 or other things. Or whether the radiology standards are going to be [dicom] or something else. But if we look at it as a black box we know it's going to be there. And optimally it should be used let's say for patient care, for administrative purposes and also basically for epidemiology and outcome studies. So basically the way I ended up looking at the patient medical record is as just the nucleus of anything that's going to be information intensive in the care process. And I try to apply engineering principles, organizational techniques and information technology to optimize the flow of this information, including when it's carried by the patient either in the form of a smart card or something else. And reduce the cost. The holy grail if at all possible would be to have a remote village in Sri Lanka linked to MGH or the New England Medical Center in real time. And by real time I am not looking at video conferencing. I mean just having the multimedia patient record with whatever information is there in a compressed manner still good enough to be medically relevant with the adequate security and confidentiality mechanism sent in real time either for primary diagnosis or for second opinion. At the lowest cost possible. So we're looking either at the Internet or satellite based connection to the Internet or other mechanisms, or the phone lines, for example. Even though we're dealing with high tech it doesn't have to be a very expensive technology. But the core thing is that the patient medical record is a nucleus, is the most important part of

any of this information manipulation and it should be protected and structured in a way that the communication is basically made easy. That's where I come from and that's how I look at it.

End of Side A, Start of Side B

DR. SAFRAN: We all found out who we are. We're only kidding. We're only half way around the room.

MR. CARL HENDERSON: My name is Carl Henderson. And I'm with Science Applications International Corporation, SAIC. I am here to meet with some of my other counterparts who are participating in the conference. And I have previously worked on developing solutions for video conferencing and telemedicine between the Atlantic coast of the United States and the Abu Dhabi in the United Arab Emirates. And the main focus of that particular initiative is to provide a means by which patients can be assessed and consulted. Physicians can have a physician-to-physician consultation with experts and specialists here in the United States from abroad using technology. And we've yet to begin implementing the solution though we have designed it using satellite technology. Another option is also LAN line technology. And piggybacking on some of his comments about it uses the latest in technology it doesn't have to be expensive. LAN line technology is, in fact, available for use for long distance communications for both video and data. That's about it for me. I'd like to entertain any questions you have when that time comes. But for right now I think that's about it.

MS. EVA HEDBLOM: My name is Eva Hedblom and I'm working for AxTrade Inc. It's a Swedish company. And I'm here today representing some hospitals in Sweden that have telemedicine installations. We have one in Bosnia together with the U.S. Army and another one in St. Petersburg, that together with the U.S. Army with Walter Reed Hospital and Fort Dietrick. So I'm here today to learn more about what's going on and observe a little bit.

MS. BARBARA BECKERMAN: My name is Barbara Beckerman and I'm with Lockheed Martin Energy Systems. I work for Lil. And I'm a project manager in telemedicine and health care projects. Lil's already given you a brief introduction about some of the types of health care projects that we're working on in medical records. Some of the other work we're dealing with includes emergency medical types of activities. We're involved in a project with the U.S. Army developing a hospital in a box called ASSTC, Advanced Surgical Suite for Trauma Care. There are a number of other activities that are going on that deal with advanced technologies and implementation of these technologies for the use in health care. And so I'm interested in the infomatics aspect and the information security and the telecommunications components.

MR. LARRY BOLAND: I'm Larry Boland. I just joined the GTE which is about a $40 billion dollar telecommunications company. I'm on my third week of employment with them. I was told by some of our folks who have been in communications since the conference started that we have at GTE a product called Cyber Trust which is one of the premiere patient information and security systems in the world. So we in GTE would be happy to speak with anybody who's interested in using that product and whatnot. It's apparently quite famous although I had never heard of it, quite frankly. In my previous life I was and still am an active duty captain in the U.S. Navy. I'll be retiring on August 1st. My last tour of duty was with the Assistant Secretary of Defense for Health Affairs in Washington, Dr. Martin. And as such I was the business area manager for theater operations for the seven commanders-in-chief of the various theaters around the world. European, Southern, Special Operations, Transportation, Pacific and Atlantic. As the business area manager for theater we're responsible for tracking and implementing the use of personal or portable information carriers of which there are a wide variety. And that's one of the reasons I was very attracted to this session was because it seemed we were going to be discussing smart cards which is something which I believe has to be an essential element of providing that sort of continuity of patient information. From the point of injury all the way back to tertiary care level and even into our Veterans Administration in the United States where similar facilities worldwide. And also with the smart card the Reed Wright

technology that's available, the various Reed Wright devices that are being developed at Fort Dietrick and some other places. Captain Zimnik now Major Zimnik was on the panel yesterday. He's a good friend and a colleague and he's done an awful lot to advance that technology, make it available to the Department of Defense. And he controls the funding now for the telemedicine research laboratory so he's a key player in all of this. As you work with the Department of Defense. My affiliation with GTE is with the Government Systems Corporation so that's why I'm particularly interested in that. The other side of the coin is I was the project manager for the development of an electronic theater medical record at Fort Gordon, Georgia. Dr. Blakeslee, who was one of the speakers yesterday and I were colleagues on a project to develop a clinically relevant database, identify what that was, provide the technology that would enable us to move that clinically relevant database anywhere it was needed, any time it was needed. And then keep track of that all the way back through the various echelons of care back through the VA. So I've got kind of an interesting background. I was a helicopter pilot for the first 14 years of my service in the Navy. So I have firsthand experience about what you do when you're at the tip of the sword operating in contingency operations. I was in the Iranian hostage crisis in the Arabian Sea and whatnot. And then I was the chief operating officer at the Marine Corps Base U.S. Naval Hospital Camp Pendleton, California. Which is a teaching hospital which is at a Marine Corps base which was the primary receiving hospital for Desert Storm. If we had had this massive flow of casualties which we expected to get Camp Pendleton would have been in the center of that. So I was involved in the planning for that. So I'd be more than happy to assist. From a technical perspective I'm not a software engineer or anything like that. But as a theater business area manager I was very deeply involved in the functional applications. So what you're talking about, Pierre, as far as treating it as a black box sort of what functions will be provided in that black box, we were mainly interested in identifying what those functions are that were going to be necessary to be engineers. So I would love to talk with you later about this or maybe even during this session. Sorry to take so much time.

MS. CLINARD: Particularly now as we have returning military folks that don't know what they were exposed to and/or what things they received when they were there.

MR. BOLAND: As a matter of fact we also did a study through Wilford Hall down in San Antonio with the civilian EMS folks in San Antonio. They assisted us greatly in identifying what were the elements of that clinical relevant database. Because there's, quite frankly, not much difference between the trauma indications that are necessary to be tracked and whatnot from an automobile accident out on Interstate 10 and that which was necessary in Bosnia. So we were surprised at that. And there are several companies that are involved in developing that database and I believe there was something yesterday that Colonel Engler Renata brought up about immunizations and predeployment type information which is absolutely crucial for the Department of Defense. But not only the Department of Defense. In the televillage concept it's important to track the ability of the general population in this televillage that was in the article to, if you will, immunize, protect, provide protection in an ongoing way for the ability of the community to respond and be protected for any disease vectors that may be identified. So that part is really very necessary to be added to the clinically developed database and I think Dr. Engler brought that up fairly nicely.

MS. JUDY BOTTOMLEY: I'm Judy Bottomley and I work with Science Applications International Corp., just like Carl. I have been for the last four years heading up a software development team up in Billercia, Massachusetts in association with Wang Laboratories. And we've been developing a frontend system, a thin client approach with a Web browser capability for number one, connecting to military medical systems. In particular CHCS and the ambulatory data system. We've been working with health affairs and tricare under Dr. Martin and we have a product now that is deployed at Scott Air Force Base and it has been there for three years. And it probably, to my knowledge, the largest storage of computerized patient record right now in the military. We have dealt with some issues and I'm interested in this session to find out about how the data is collected. We talked about scanning and information. We talked about fact fingering data in or uploading ASCII information into a database. Somehow mapping the data into a database. And also we've prototyped

capabilities like voice recognition so the provider doesn't have to type or in any way have to interact with the computer keyboard or mouse or tablet. And we've used all those medias as well in our product. We have also dealt with in the military the master patient index which is what we've called the virtual patient record. In the commercial it would be similar to having a record available across locations or regions. We've run into a unique situation here where each of the sites that we've been dealing with has their own unique setup. Although it's the same system they all administer and operate their systems uniquely. So I might be patient number one at Hanscom Air Force Base and patient number 33 at Langley. And likewise drug number one might be aspirin at Langley and Percadin at another Air Force base. So we have a large data standards problem there. Even in a homogeneous system.

DR. SAFRAN: Every person in the military actually either uses their Social Security number or had a unique identifier. Is that not true?

MS. BOTTOMLEY: That's true but it's complicated by the fact that family members are also under the primary Social Security number. And they tag on just one, two or three, depending on which family member it is. So there's some complications relative to that. So it's not quite the unique identifier that you might think it would be.

MR. BOLAND: That's SSAN in someone's and SSN in another one.

DR. SAFRAN: What's an SSAN?

MR. BOLAND: SSAN. Social Security Account Number and the other one is Social Security Number, SSN. It may sound like a little difference but when a computer is looking for SSN it doesn't find SSAN. There's a huge effort within DOD right now run by a gentleman named Marco Johnson for Dr. Martin who is trying to wrestle with this. They have a tiger team. And they did 12,000 items like that. It's a huge problem within the Department of Defense. But they've identified it and they've got a solution going. You

were talking about the architecture and definitions and terms within those architectures. It's not unique. Everyone is suffering.

MS. MILHOLLAND: And we also know the Social Security number itself is not unique.

DR. SAFRAN: We know that's not unique in the civilian population.

MS. CLINARD: You were hoping.

DR. SAFRAN: Right. I thought you had a pair of dog tags that had a number on them and put a little chip on the dog tags and that was it.

MS. MILHOLLAND: My [unclear] the United States is considering through its Congressional activities and the Kasenbaum implementation to adopt the Social Security number as our medical ID number.

MS. CLINARD: That's not finalized.

MS. MILHOLLAND: It's certainly not. But they're considering it.

DR. SAFRAN: It doesn't work for city hospitals. Because we have an immigrant population that doesn't have Social Security numbers. We have an illegal immigrant population for which we provide care regardless of anybody thinks. And we have babies that are born who by definition don't have a number.

MS. CLINARD: Their response to that is it's easier to fix those problems than to start from scratch. Cost wise.

MS. BOTTOMLEY: And related to the standardized data I have worked with Marco Johnson. And we've been trying to define and scope out the clinically relevant database.

The project that I've been under was started by General Doctor Peter Hoffman in [Almendorf]. And he is now working as a medical consultant for Wang Technologies. And we use Wang's imaging product to bring in images. We have a capability to bring in historical data and this is a complicating factor. As you bring in historical data how do you get that in? You can scan it in. But then it's just a picture. It's not retrievable data. You have to know that it's there. So there's some issues around that. What is useful information for the users and how do you want to see it? We are using HL7 interface right now where my team is in the process of developing an HL7 module that we can plug in to any Windows 95 or NT based Windows application to allow the HL7 protocol to be utilized where the messages are available. Where messages aren't available we still go back to [unclear] sessions and terminal emulation to actually use the original Legacy system protocol to communicate with the database. I am also very interested in privacy act and security. As our product has evolved we've gone from heavy client Windows based with all the rules and graphical user interface tied heavily to the rule base on the PC to a thin client and access via a browser. So you could have a really cheap solution with just having NetScape on a terminal and dial in through a browser application. But that brings up reams of privacy act security and what do we want to allow on the network of patient information. I can talk for hours about this so anybody who wants to corner me I'd be glad to talk to you.

MR. HENRY BERGE: Thanks. I'm also Henry Berge from SAIC. Science Applications International. I won't talk anymore about that. I'll just mention three things that I think are germane. One is there's been an implementation in the Pacific rim of something called [Pac Med Net] which is a telemedicine implementation. Again it was driven by the Department of Defense in coordination with some other hospitals I believe for delivery of medical care in that region. Somebody else might be a lot more knowledgeable about exactly what hospitals are involved, etc. But essentially it is a full implementation of a couple of different technologies in terms of trying to deliver remote medical care, if I can use that terminology. I'm also involved in a couple of different nations. It's kind of an interesting scenario is the oil companies in Saudi Arabia, Venezuela and Indonesia in particular. There is no other infrastructure when you go into those countries. And yet in all of those countries those oil

companies establish hospitals and education facilities, etc. And essentially those oil companies are responsible for creating that infrastructure, wiring up that infrastructure, delivering medicine, delivering teachers and all of those kinds of things. And in Saudi Arabia in particular there's been a pretty big implementation of sort of remote health care that probably bears some interest to a lot of folks at some point in time. The last one I'll mention is Kaiser Permanente who has taken sort of the browser kind of approach in terms of getting people access to medical information, including audio, video and fixed images like X-ray. But there's also doctor annotation, if you will, etc. that's all been implemented by Kaiser and probably is worth looking at. The last one I'll mention is a problem in terms of the National Institutes of Health. The National Institutes of Health obviously has got some profound interest in looking into cancer and cancer research. And with each of the clinics sort of conducting independent clinical trials. There's been some very keen interest in the National Institutes of Health to use sort of search engine technology, if you want to think about it that way. To be able to go out and search those various clinical databases and thereby bring together a lot more robust studies than any one of the individual clinics can do by their own. So if you look at the population size then all of a sudden that would be brought together. It's a very, very dramatic difference in terms of each one of them operating on their own. And so there's a study at the supercomputing center down in Bethesda to do some of that kind of stuff. So those are the ones I'll mention. Thank you.

DR. HAUSER: My name is Jo Hauser. I'm from Ottawa in Canada and I was formerly the G7 coordinator for Canada. Subsequently retired. I do a number of things now. One of the things I do is I work for a company called Synapse Publishing which is an electronic publishing company that develops guidelines in association with Cochran Collaboration. Has developed a product called the stroke guidance system. And my interest is looking at how guidelines that have been developed can be integrated into existing electronic medical record systems to provide decision support and help change physician behavior. I have an interest in doing that in North America because there's a potential for the company to sell a product. But also have an interest in conceptually how do we change physician behavior in other countries? Certainly in the former USSR have very antiquated medical practices and I'm

very interested in looking at how a process of developing guidelines can change physician behavior. Also I have an interest in multimedia electronic record not for real time interaction but for store and forward. I think that's going to be the major use whereby the information is collected and another physician can look at it at his leisure when he's ready. Look at the information and make some decisions. And I do think that we need to look at how that record can be sent over distance using simple e-mail technology. And one final comment I would make and that is the vision that you mentioned of using the transfer of medical information over distances to solve problems in Sri Lanka. That is you take a medical record and send it to Massachusetts General Hospital for a diagnosis in the expectation that would improve health in Sri Lanka. The evidence is that doesn't improve their health. Health care has very little impact on improvement of health in underdeveloped nations and the issue that we really need to export to them is the knowhow so that they can improve their own health. Rather than expecting us to use our high tech medical knowhow to solve problems that are endemic to their countries. So I think I'd just like to suggest that we look at how we can export the technology they can use, rather than exporting our medical knowhow.

MR. TOUMA: Sometime from a cost-effectiveness point of view, it's better to have some specific cases that say some type of logical disorder sent to a specialist in this area and that can really answer the question very rapidly. Than spend 15 years and so many thousand dollars for them to have one or two or more specialists that are going to be underworked. It depends on their priorities, their strategic goals and also the money they can afford. You can send this medical record at 50 cents from Sri Lanka to MGH and you can have good care while this pool of doctors that you have in this area that's one of the biggest and underworked but there are a lot of doctors here and the training is pretty good. So it could help.

DR. JO HAUSER: This is a big debate. But the evidence is it doesn't help. It's been tried many, many times.

DR. SAFRAN: I don't know that we're going to settle this. You're talking about two different issues. You're talking about the fact that world health is best achieved by making the water supply clean. That's the world health problem, schistosomiasis and malaria, which has nothing to do with rear consultations. So I don't know that we're going to quite settle that here. But I think both of you have valid points. But the technology that he's talking about applies equally well in the inner city to Mass. General as it does from Sri Lanka. And so where we use the technology is up to the smarts of our societies to use it.

DR. BJORN BERGH: Good morning. My name is Bjorn Bergh. I'm from the Virchow-Klinikum, which belongs to the University of Berlin in Germany and it is the largest hospital in Berlin, the University Hospital in Berlin. And I'm from the education point of view. I'm a radiologist and I have an education in mathematics. And I'm leading a group which is located within the department of radiology, which is responsible for all digital imaging and infrastructure and also image distribution to the hospital. And we set up Web technology based patient records which right now does interface our digital image archive and the information systems, laboratory systems and the pathology system. And we are trying to advance it and today it offers all those information within the hospital. So a LAN based Intranet and that's also of a certain amount of information to doctors referring to our hospital. And I'm very interested to see what the American aspects are in this field and to exchange and share the problems we've found. Because I think there are many fields where we need a standard. Which we do not have today, especially concerning the integration of systems as you said already, HL7.

End of Tape 1, Start of Tape 2

From our point of view there is not very much sense in having proprietary clients at each ward and each place, which you have to install, which you have to support and so on. Which gives you a lot of problems which somebody has to solve. We as a department of radiology don't want to do that because we don't want to be the servants of the whole hospital in this field. Which is very possible a proprietary problem I think, but it is a

problem. And those problems do not occur, at least not that intense if you use Web technology. And the other thing is that from my point of view people using patient records today on the wards, in the emergency rooms do change very often. So they do not systems all day and 24 hours. So they perhaps only use it 10 or 15 minutes a day or less and I think the easiness of Web technology facilitates the ability to overcome the fear for computers that can be easily achieved by using Web technology. That's our point of view.

MS. CLINARD: Bjorn, could I ask you a question in terms of you handle access or security in that multimedia system?

DR. BERGH: From inside the hospital we have a rule based access. If you log in as ward X you only see patient X and that is where I think the main problem of the infrastructure. We have an interface via communications over to our hospital information system. And this is the only way you can do it because you have to have the ADT messages telling you that the patient hasn't been moved to another ward. And I think there's one problem because if the patient moves very often, you have to allow also the old wards whereas before to access records. If you move through 10 wards then you have gathering wards and finally you end up having the whole hospital being allowed to access his record. We see this problem, of course, and what we just do is that we have additional accounts for doctors. So if it's gathering more than four wards we shut the other wards down. But the doctors from the other wards are still allowed to see the patient's file. It's not the best solution but it's one solution we had to do.

MS. CLINARD: What about access from outside?

DR. BERGH: All the access is done by ISTAN so we do not allow access by open Internet or modem. So it's just ISTAN. There's three levels of identify checks. The first level is the ISTAN number which is dialed in which cannot be falsified or it's very difficult after breaking the central [unclear] in telecom computer to change it, this number. And then it's the same again. [Unclear] passwords and then this is very strict. So a doctor who does only

see what he is allowed to do. He sees the patients which are related or come from his office or his hospital. Wherever this patient goes within the hospital.

DR. HOUSTON: I'm Margaret Houston. I'm in the trenches as a practicing family medicine clinician at the Mayo Clinic in Rochester, Minnesota. And although the trenches there are lined with marble they are still trenches. My view of this is from the clinician's standpoint and I will leave the technological solutions to somebody else because I'm not really that interested in it. I think that there's an overall need to look at an electronic medical record as something different than the ordinary patient record. And Mayo is one of the only place, if not one of the very few, that has an integrated patient record now on paper. We have all the inpatient records, all the outpatient records from birth to death. And anybody who's ever been at the Mayo Clinic I can access that and that's in my hands when I see that patient, all his labs, everything. And we are trying to convert that to electronic and I think that you need to look at it as different from the record. The patient paper record that we have now. We need information. We don't need verbiage. We need information and data points. And I think that that sometimes doesn't come across enough. The conceptual issue of what is the EMR. I think people focus on the technological. How do we build this database? And those kinds of things. But right at the moment we don't have data information available to us. All we have is a replication of our paper record and it's not working very well. The second comment that I have to make is that I think that we need to regard patients as electronic patient and real patient. The real patient is sitting across from me. The electronic patient is on my desktop and my desktop has everything about that patient available to me right now. You could use that for all purposes.

DR. MARCELLO BRACALE: My name is Marcello Bracale, University of Naples in biomedical engineering group. Recently, I have been appointed responsible within the project, G-7, in the subproject number four, telemedicine for emergency. I am participating in this meeting because I am strongly interested in and strongly preoccupied about what it means exactly, medical records. [Unclear] confidentiality. In emergency organization to know exactly some minimum data set for the patient is extremely important. And I agree

with the comments which I heard just a few minutes ago that electronic data set is compatible with manual data set. And at the moment in Italy, since May first of this year, there's a new law about the confidentiality of the data in a general sense, not only for the medical environment, but with the only exception of the criminals and the finance disorder. Is in line without the laws in Europe but this may be a big problem because obviously we have condlicts between the bureaucracy, the medical environment and the application. Concerning the standards which I heard before in my opinion I think that we must divide what means an electronic standard, technical standard instead with a minimum data set from a medical point of view. Yesterday also Dr. Sanders explained this aspect. It is not completely true that the medical doctors are aligned in a common fort for giving this definition about what exactly is a necessity. In my opinion this may be an important approach of this group as an interdisciplinary group. Not only giving the guideline from the standardization from a technical point of view because probably this aspect may be solved within another environment. More in line the international sense. We can use these guidelines. But the true problem is to define from a medical point of view what means minimum data set. From a graphical point of view, from medical point of view. What it means, for instance, in an emergency approach the risk factors. Please if there are some doctors here try to converge the definition about the risk factors. I know that there is a dispersion of consideration. And probably this is the main goal of this group. Also about the use of the electronic card. Now in Naples we have this experience with this electronic card in telematics support for the control of the patient. This may be a good example. Every laboratory in Italy or not in Italy, in Naples has its own protocol for defining this kind of control. What does it mean? That we try to align all the laboratories about the protocol is unbelievable. There are a lot of unsuccessful results about this matter. In oncology you have a lot of protocols for therapy, for measuring but there are filters of a school, as I mentioned, which evolved to be aligned with a real result. So probably as a technical person we can study the opportunity to use this card like a key for entering in the different databases. Using also the Internet network. In other words, we try to save the autonomy of the schools, the autonomy of the professions, the autonomy of organization. But the problem remains which may be the minimum data set from a different point of view, medical point of view, bureaucratic point of view, legal point

of view. Another aspect, if we are speaking, is international environment, not only European. But also in Europe we have this problem which may be the code for organizing the patient. In Italy, for instance, we use the finance as a code. Which is possible to create when one is born. Because it is a kind of [acronomus] of first name, family name, sex, date of birth and place of birth. But in Europe we have not the same code. This may be another consideration to take in account. If we are considering the transportability, the interEurope, integration of our system.

From a professional point of view at the university at the moment we are involved with some telemedicine projects for teleconsultation. Radiological and cardiological video consultation with a video conference system. The project about [peacemakers] and finally support of telemedicine, telematics for the [handicapped]. In Naples we are using the [audiomatized] system for reading the papers for blind person, in an automatic way.

So in conclusion my comments. Like with my responsibility, Italian responsible for the south project, telemedicine for emergency, I ask for individuating a patient in an emergency situation which are exactly the data to be used successfully.

MR. MICHAEL ACKERMAN: My name is Michael Ackerman. I'm the assistant director for high performance computing and communications at the National Library of Medicine. We define that at the National Library of Medicine as the library's interest in imaging and in telemedicine. Both imaging and telemedicine being that we're a library from the informational point of view. We approach these things from the information side. I also serve as the NIH representative to the federal joint working group on telemedicine. And something that has not been mentioned here and as the committee that's dealing with the possible medical applications for the future next generation Internet. The National Library of Medicine has been the sponsor for the recent IOM reports on the evaluation, how one would evaluate telemedicine. And it's also the sponsor of the [Cart] report on best practices for security and confidentiality in medical practice and electronic medical records. As others have said, we are the sponsor and the originator of the unified medical language system, the UMLS. In my office I have in my portfolio 19 telemedicine projects around the country which deal with the evaluation of telemedicine. Optimally to evaluate the optimum amount

of information that would make a difference in medical outcomes. Information as distance and it's information at a distance that we consider to be telemedicine. We believe that the electronic patient record is central to that process. Everything hangs off that electronic patient record. And as soon as you get to the electronic patient records as other people have said you're right into the issue of security and confidentiality. We believe that if there's any application that's going to kill telemedicine it's the issue of security and confidentiality. At least in the United States. And so that issue has to be broached before there's going to be any widespread of telemedicine. Either that or the medical community has got to do what the business community did and convince the public that they should not worry about the security and confidentiality record. But that the benefit is better than the risk. Which essentially is what's happened with your credit cards and so on. Nobody worries about the security issues. You just do it because they've convinced you the risk is worth it. We either have to do that or we have to do something off the record.

DR. SAFRAN: They absorb the risk, right?

MR. ACKERMAN: No. It turns out that that's a social issue because the risk in the United States of misuse of the credit card is $50 dollars which my insurance company magnanimously will pick up.

DR. SAFRAN: The business will take the hundreds and thousands of dollars.

MR. ACKERMAN: That's right. So the analogous risk is that we have to have uniform and guaranteed health insurance and most of us won't care about whether or not our medical records are looked at. But that's a legislative thing and it's probably going to be easier to solve a security problem than that legislative problem.

DR. SAFRAN: I just want to point out that your family can have a religious belief, a known fact, that would not allow you to have an abortion but you don't necessarily have to share that. And what if, that information gets out? Your rights as an individual have been

violated and there's no amount of health insurance that to deal with the context of the family and the issues around something like abortion. So it may be fine, the fact that you're known to have congestive heart failure. They can't fire you from work because you have insurance. That's a separate issue from these other highly charged issues which people consider personal.

MR. ACKERMAN: But so does the clear and personal bankruptcy is not covered under the $50 dollars. So for each one there's an opposite. And it's just a question of how much PR you want to do to smooth it over. The business community has been masterful at it. We also realize that there is a patient record. It's called an insurance record in this country and there's no security of that record. So the cat's out of the bag, anyway. But that's only a topic for discussion. We became very much interested in smart cards through G-7. The National Library of Medicine is the U.S. rep to G-7 for health. And we think the Europeans are well ahead of us in the potential of what smart cards can do. The smart card needs to be explored in the United States as one of the potential solutions to the security and confidentiality issue which then relates back to the medical records and the whole thing in telemedicine. So the three topics of this particular group just seem like they went together and fit right in at this point.

MR. HERVE MARTIN: My name is Herve Martin. I come from France, from France Telecom which is a telecommunications operator. In France physicians must be electronically connected in the next year. And we look after this new situation to offer to the physician electronic mail with security and confidentiality.

MS. CHERYL WILSON: My name is Cheryl Wilson. I'm a senior telepathy engineer for a tertiary care facility in Tulsa, Oklahoma. We have an active telemedicine program that we've been supporting for the last six months. And the issue of smart cards, patient confidentiality, medical records obviously is very important to us. So the discussion next door was covering topics that I already heard. I thought I'd come over here and see what you guys were doing.

DR. SAFRAN: We're about an hour and 15 minutes into a two hour session and I wrote down about 13 or 14 topics here which I'll just try to briefly summarize. And the question I'd have for the group is whether we want to pick a couple of these and drill down further. We've really covered most of what many of us have spent our professional lives dealing with over the last 20 years. So I have no hope in covering them all in the next 45 minutes. But let me just recount the list and it was sort of in an order of how I heard them. There seemed to be a common theme of issues around security and confidentiality that a number of us were interested in and had approaches to. There, of course, was an underlying theme of electronic patient records and multimedia. The people asked what was new and different about electronic patient records. Whether there was an opportunity to shift from a paper paradigm to yet a new and different paradigm that had a concept of virtual patient that one of us put forward.

There was another thread of discussion that had to do with how does telemedicine and patient records intertwine? What are the commonalities of the two? How should we think about them as a whole? The issue of storage was brought up. A number of folks brought up the issues of terminology standards and nomenclatures. The issues of health policy and regulations were brought up. Another set of themes were outcomes, research, minimal data sets that were brought up again. We talked about the various practice issues and patient relationships as these new technologies evolve. And related to that had to do with some of the standards of care, new concepts in health care about when might certain televisits be appropriate *versus* an actual visit. There were some ideas about what were the underlying international issues that need to be addressed. We also talked about the patient centered nucleus of the electronic patient record and how it perhaps relates to optimized flow of work. And I lumped under this the issues of transmission of information as well. I'm not quite sure whether smart cards relate to storage or they relate to transmission. Or they relate to minimal data sets. Or access. Another theme that was brought up were what were the functions that were needed, whether we could elucidate any of those. Someone else brought up the idea of how data is acquired into this. Whether we were going to deal with voice technology, scan technology, mouse keyboard, whatever, fingerprinting. Master member index or patient identification seemed to be an area that was important across both

international boundaries and local boundaries. The issue of transition to this new technology was of concern having to do with how one moves from paper and historical data to an electronic world. The issue of decision support, guidelines and then I'll reterm your physician behavior as to how this technology is used as change agents in health care. I'll generalize that a little bit. And then finally there were some comments about generalized technology issues. Whether we could say anything about emerging platforms and we could just all agree that thin client technology was interesting. The underlying technology issues were brought forward. Some of the notes I brought here and I think any one of these we could clearly occupy the next 40 minutes talking about. We could talk about two or three in greater detail and just report back to the group that there were lots of other interesting issues. We could focus on one of them. And I'll just sort of get your sense. Before we do that I just have to make one plug. Which is I'm chair of a conference in Korea in 1998, August 18 through the 22nd. It's a World Health Congress on infomatics whose topic is global health networking. And as I've sat here listening to all of you talk I think I've got to get all these people to Korea. Anybody that's interested, papers needs to be submitted by July 14th, Bastille Day. My cohost is Patrice [Degulay] in [Brosay] Hospital in Paris. And that's why we picked Bastille Day. In any event, for my part of picking a date I got to pick Halloween. As close as I could come to an American holiday. In any event, any of you that are interested I'd be happy to send you more information about the conference. That should be a great conference. It's in 1998. It's going to be held in Seoul, Korea as a large international and Asian contingent in telemedicine and all the topics we're talking about are completely relevant. So that plug out of the way and the question is should we pick off a couple topics here and drill down on them? Should we talk about security, confidentiality more? There was a national report that came out on that at least in the United States. It's obviously of common concern. Are there other things? Should we drill down on. Smart cards, if I heard one of our funding agencies say. They're interested in smart cards. Maybe we ought to talk more about that. There's an opportunity here from the United States point of view and interest. I don't know very much about smart cards myself. But should we talk about the uniqueness of multimedia telemedicine as it relates to the patient record?

MR. BOLAND: Is it possible for us to somehow identify electronic mail addresses or something like that? So we could continue the dialogue with folks who have kind of demonstrated an interest in these various topics. I thought you did a masterful job of collecting all this stuff that we talked about as we went through. Would it be useful to write down on a piece of paper, circulate a piece of paper, with electronic mail addresses so that we could establish some kind of a mail [group]? If somebody has that. I'm sure somebody in here has the capability to establish a mailing group where we could continue to dialogue with it. Does anyone have any objections?

DR. SAFRAN: I'm just sort of wondering do you want to create a list? And see if we can't xerox the list internally. Would it be easier to exchange business cards? Do a massive card exchange.

SPEAKER: I think just a piece of paper.

DR. SAFRAN: I'll start a list. Shall we just put e-mail down or do you want names?

SPEAKER: Name, organization and e-mail address.

DR. BRACALE: In capital letters.

SPEAKER: Rather than photocopying what one person could do is they could just type it all into their one e-mail. And send it off to everybody.

DR. SAFRAN: The problem with e-mail. I'd be happy to create a mailing list and then do one e-mail out which would give everybody. I don't want to create a mailing reflector. So I could e-mail out once to everybody all their e-mail addresses and then everybody would have that. You'd build your own. So it wouldn't exist on a machine but I'd do that.

MS. MILHOLLAND: I would guess in the limited time we have we should pick one topic. I'm not sure what we determined our purpose was in meeting. [Unclear] grand ideas for the group. Are we going to deal with those? I, in fact, would not suggest doing security and confidentiality. Because I think there's so much out there now that I don't know that we can offer anything all that new. Debates go on in all professional organizations and our standards that have come out. There's stuff out there about it. And lots more to talk about. But I would say smart cards because I think in the U.S. it's an idea that's very low level. If the European or other countries have more experience that would be something I'd be interested in learning about. And then some in this country have a little more knowledge of where it is would be very helpful. It's going to come to the U.S. and we need to know about it for practice and policy issues.

DR. BERGH: Smart cards is not necessarily [inaudible] a universal application which can be used for other things. [Unclear] have internal structure. The first step is from a European point of view would be interesting in the way of identification. Because I think it's a very important topic. We have not a model [for Europe]. If we're ever going to try to exchange data via the Atlantic [inaudible] how do I get the information into my record which is then related to the third point, which is the concept [unclear] which you store everything in or kind of a [unclear] system where you just have hyperlinks or links to a departmental system. And then the interfacing is very much important. So I'd like to know what kind of systems are established in the States. I would think it's more logical to have a [bata] system which you have already determined systems in hospitals. And to see the interfaces in this field could get to agreement. At least an approach. I think the last point is retrieval which isn't necessarily linked to security. From my point of view I would be interested in the three points very much to at least try and approach what could be preparation fields in Europe and in the U.S.

DR. SAFRAN: Any other comments or reactions? We have two proposals. One is we talk a little bit more smart cards and another is we talk about the three topics. I might just have

one comment about the identification which is my rough take other than sending back to the plenary meeting later that this is a hard problem. I don't know what else to tell them.

MS. BECKERMAN: May I ask a question? What are we referring to as identification? Patient identification. Or the physician trying to access the information.

DR. BERGH: For certain standards like [unclear] there is unique IDs. But there is not an overall concept. Has to be solved at a very high level. I think it's very difficult. It's new for me. [unclear] in Sweden.

MS. CLINARD: There is another effort underway in the United States which is a master patient index approach. And it's a conceptual approach. It is not a number. It's an approach to human characteristics about which you can identify them over time and that might be a link to that organization in regards to how that's being accomplished. That's been underway for about a year and a half.

DR. BERGH: In Germany some people are trying to solve this by using the social realm about the health insurance ID. Everybody in Germany right now has a card, a ID. This doesn't only exist in Germany. In France, too. Both are already compatible. Would that be a way in the States to do this health insurance card?

MS. CLINARD: Squeamish about any one language [attached to us]. I think it has something to do with big brother but I'm not sure.

DR. HOUSTON: Could we hear some more about smart cards? I think that's something that we don't understand and I don't know how that interfaces with the medical record. And what minimum data is on there and what data is on there at all.

FEMALE SPEAKER: It's up to your choosing.

DR. SAFRAN: Lillian told me something earlier today that changed my view of smart cards instantaneously. She said they have cards now in her laboratory that you can put a terrabyte data on a single card. So I asked her how she did that. Did they manipulate the molecules themselves? And the reason that changed my thinking about smart cards sort of instantaneously and she said she thought the cost of this might be $60 dollars when it comes out.

MS. CLINARD: Which is too expensive from our view.

DR. SAFRAN: Well, no, because the security dynamic cards that were now physical tokens, that were now vying for remote access for our physicians and nurses cost $60 dollars apiece. So that's a cost you might entertain.

MR. ACKERMAN: If that's true it will come down.

DR. SAFRAN: You heard the discussion earlier about a minimal data set and thinking about a minimal data set in part has to do with the fact that storage is limited. And that you're only going to be able to put so much storage. So I have a million patient records spinning at my hospital in 20 gigabytes of data. It doesn't include images. It doesn't include EKG wave forms. But full patient records going back five and 10 years. And we're in 20 gigabytes. So if you all of a sudden tell me I have a terrabyte of storage that's more images than my whole hospital takes in a year basically. So I forget minimal data set. I just take all my data.

DR. SAFRAN: But part of the thinking of smart cards is premised on the fact that it's so limited what you could have there. Why bother? Why not just centrally store it someplace and have Web access to it. So you have a data form someplace.

MR. ACKERMAN: One of the things we talk about smart cards is the concept is very much like going to your safety deposit box. You can't carry all that stuff around. You carry around a key. And so the smart card has minimal information on it so that in an emergency

situation they know what your allergies are and stuff like that. But in the more likely situation you put your card in and now that's a physical presence which gains access to a medical record. Maybe it has to be backed up by you actually typing something in and maybe it also has to be backed up just like in a bank vault by a second card which is the physician. Your entire record is not available but only your release of the medical record which is appropriate to whatever is on the second card. That is the level of physician that's with you. So there's more of a personal dog tag ID card than actually carrying information.

DR. SAFRAN: Why would you put a terrabyte on it?

MR. ACKERMAN: In the current mode and when I'm thinking terrabyte. What you're thinking about is kilobyte. Because the cards today are one and four K. That's it. AK now? And so what we're thinking about is minimal information for emergencies and then pointer information. The other thing that the smart card can do is the smart card can contain your unique encoding key. So all the data that passes up and back passes, in fact, through the card through a unique encoding key. So everything remains coded from the time it enters the system. The disk, the communications link and back. It remains totally coded and coded according to your unique key which even you don't know it's on the card.

MS. CLINARD: And it can change.

MR. ACKERMAN: And it can be changed dynamically. So it becomes more of a lock and key thing than it becomes the actual carrier of information. At least that's the current concept.

End of Side A, Start of Side B

MR. TOUMA: But the information will stay on line, dynamically stored? Or would be archived on a physical CD-ROM?

MR. ACKERMAN: Our information, at least in the United States, does not want to be in one place because we Americans get very upset when anything is in one place. It would be distributed throughout where the distribution pointers again are coded based on the key that's in the smart card.

MR. TOUMA: But if there is a card that can hold like a terrabyte...

MR. ACKERMAN: That becomes another problem. Because you give it to the patient and the patient loses it and now what do you do? Keeping it all in one place is another problem.

MR. TOUMA: Duplicated and archived on CD-ROMs. So then the patient has their own in their pocket. They would feel very empowered. The hospital would have it archived. And what I mean by archived they wouldn't have to use any rate systems or any online storage systems which would tremendously increase the cost.

MR. ACKERMAN: Which hospital? What hospital?

MR. TOUMA: Each hospital would have part of the patient's record that they are working on. And the patient would have everything consolidated on that card.

DR. HOUSTON: But then he'd lose it.

FEMALE SPEAKER: So then you never have a totally consolidated thing. You need to have a backup.

MR. TOUMA: But then we go back to the central concept where all the data is centralized. And even with this central concept it's better to have it archived on CD-ROMs and the price of CD-ROMs is going tremendously down. Than have it in real time online on rate systems which are in the tens or hundreds of thousands of dollars.

MR. BOLAND: There's some experience on that. Dr. Zimnik was giving a presentation yesterday and Dr. Bakalar, Rich Bakalar. They are developing at the National Navy and Medical Information Management Center in Bethesda a four terrabyte permanent archive note called PAN. And so there will be extensive experience with the use of a centralized huge storage facility. Although now that I hear that cards will have one terrabyte. We just did a study in the Department of Defense and all of the cards that were available and we didn't come anywhere near anything saying terrabyte.

SPEAKER: And a dog tag is just 20 megabytes.

MR. THEBERGE: On the dog tag scenario, it's a combination of the two. The combination is like you were describing. The minimal stuff is very important because the scenario that we have with the dog tags is when you're someplace. And I travel a lot and when I need emergency care there's an immediate record that gives you some finite detail of exactly what I've had and what the situation is. At least somewhat a perspective. But then the second part is the encryption key or your access key, if you will. And with all the stuff that's going on today that access key can be a remote dial up and everything else. Essentially with full encryption to where that stuff is done. So whether it's done with the troops in Bosnia or in places that are forward like that, what there is is a laptop. The smart card goes into the laptop and then there's immediate understanding of what's going on. And then the access codes for additional information.

MS. MILHOLLAND: Who decides what goes on these cards? Who has the right of refusal to have specific information put on it? If we're talking in the military situation they don't have any rights. But if we're talking in a civilian situation there are many people who would not want specific information on that card. They consider it nobody's business and has no relevance to their current state or future state of health. Who's going to make that decision?

MR. ACKERMAN: I suspect that decision is going to be made by your health care provider who's going to tell you if you want to be in our plan this is what we do. If you don't like it,

don't be in our plan. This is exactly what they're telling you today. You either sign off and let your medical records go to the insurance company or you don't pay.

MS. MILHOLLAND: I know that.

SPEAKER: It's exactly the same thing.

MS. MILHOLLAND: I'm not sure. There could be alterations.

MR. ACKERMAN: Unless there's legislation. If there's intervening legislation. That's right. But if it goes the way it currently is the market will tell what you want to do.

DR. SAFRAN: We had that experience with our electronic records where patients were asking for certain information not to be put on the records. And we basically said we didn't know how to do that. And that was the way we provided care. We kept our information electronically. We have complete audit of who looks at what. And security measures and the like. So we kindly tell patients we'll help them find another suitable provider.

DR. HOUSTON: That's been true in the paper record all the time. I'm very careful about not writing depression or this or that. I write something that makes sense to me and makes sense to the patient. But if somebody else were reading were know what I really meant but I try not to put it on my master list. If it's going to adversely affect the patient some time in the future.

DR. SAFRAN: But, for instance, something like HIV status. Our hospital said that practitioners had to record that in the chart. It wasn't an option. You couldn't use an alternative word. If someone was HIV positive it was recorded in their patient record. And so patients who object to their providers recording that we help them find care elsewhere.

MS. BECKERMAN: I wanted to get back to the question that you asked earlier about the access and being able to store things on a CD. Some of these things that we're doing in the

States are in community health information networks. Where hospitals and other health care providers are joining together to share certain types of information. The projects that Lil mentioned earlier, the ones that we're dealing with in terms of the security and the integration of telepathology and teleradiology of these systems. We're test [unclear] the entire system and every hospital in the state of Connecticut is linked to one community health care information network. And we're using hospitals in Connecticut, Florida, Tennessee and in Alabama. But in Connecticut we use that as an example because while they're not dealing with smart card technology they're able to record all the pharmaceuticals, all their morbidities and mortalities statistics and other information about the patients now that they're able to gather electronically. And this electronic patient record all going through central servers. So any hospital can access the information they need. They put in the protection [unclear] so only the right people can see it. But you are able to have it centrally located as well as distributed. So if a patient anywhere in that state goes to any hospital that information is available from any hospital in the state. And so if that patient has a smart card, the smart card got lost, a doctor in one hospital who had never seen this patient before could still treat the patient. With all the information at hand and being able to access it. But if you're dependent on a CD-ROM or other things those things become outdated as soon as they're printed. So you have a record. Now you can't change it.

MR. TOUMA: You can update it on the CD-ROM.

MS. BECKERMAN: Right. But that means you have to go locate the CD-ROM.

MR. TOUMA: It's on a jukebox. You have a huge jukebox. The reason I'm talking about the CD-ROM is not just for cost effectiveness purposes. But I mean personally and I know what some hackers and some technologists could do, if the information is online I can find you five around the world that could get on it no matter how encrypted it is. No matter what security levels you are. Then we would get to the question who are we afraid of? If there's legislation or there's a rule that we should give our medical history to the payor or to the insurance company so who are we afraid of? Is it the public at large? Is it our next door

neighbor? So it's also a question of who are we securing this information from? Because if it's flowing online, even if it is encrypted it could be tapped. Now the reason that it might be an option to have it on a secure smart card and on a CD-ROM because of the physical security. It's not just an electronic security. You have a smart card in your pocket. If you lose it you cannot sue anybody else. It's your problem.

DR. BERGH: As long as you carry it in your bag. But the moment you plug it in to any point.

MR. TOUMA: It would only be there temporarily. It's there while you are in the care process. Once you're out it's not dynamic anymore. It's stored and locked physically.

DR. BERGH: Let me come back to this point. I think there's one terrabyte stuff. My logic is that not anything like this is available. So it's a code, it's a key. It's not in a storage, it's a key.

DR. BRACALE: A key for entering.

DR. SAFRAN: So how is that any better than the secure ID card? Which just simply has a number that generates itself every 60 seconds that is particular to the card that you carry around. Security dynamics as a card. Creates a number. Or a key ring creates a number every 60 seconds. So that plus your password authenticates you. How is that any different?

MR. ACKERMAN: If it's just a key, just a password kind of thing. The information content is not any better than your typical credit card. That's not an issue. It's not any better than the telephone cards we use in this country. Would have no information on them at all. You have to punch in the number that's physically listed on this card. But the smart card has additional information so you have in a situation where you don't have a network connection you have the minimal emergency situation. Which is you don't have the capacity of a normal credit card. And it also has the ability to do coding and decoding. The personal

key in the card. So that everything is coded at the point of sale, if you will, not after it goes from the wire to the computer that's doing the coding, which is what you have in the other. It brings the encoding encrypting out to the point of contact unique to the card. If you think of it in that scenario eight kilobytes or 16 kilobytes or something is enough and once you go to the megabyte card then you begin to ask the question well, couldn't I put more of a record on there. Have to carry it around. Then I won't need [the central office]. That's another issue. More technology, more problems.

MR. TOUMA: Dr. Safran, going back to your audit trail at the hospital. What's a priority for doctors or whomever is concerned about security? Is it the issue of tightening the security as much as possible and making [unclear] hermetic? Or having all these audit trails and these followup mechanisms that would allow you to trace the breach of security.

DR. SAFRAN: We took the view, unlike you did in Berlin, that we'd never be smart enough to know who needed to look at what record. So that patients move around. Practitioners move around. That we were never going to know what floor. The patient comes from the emergency room to the ICU to the surgical floor or the medical floor. We were never going to know the logistics of who needed to look at what. The second thing is that the greatest problem we have is that people who are authorized, who would normally be authorized, actually inappropriately use patient data. So when famous people come to a hospital people who should know better who are trained professionals, who are bought by local newspapers or tabloids or whatever look at data when they shouldn't. So the risk in our framework isn't that there are unauthorized people, at least five people in the world who can look at any data. The risk is as much from within as from without. Increasingly as we expand the integrated delivery system that is our health care environment our employees are also patients. So the distinction between who is a patient and who is employed, who's a worker and who's not, is they are all one and the same. And so the curiosity of a worker to look at other worker's record is there. A supervisor might want to know if someone who wasn't there really was at a hospital appointment. Misuse of the information system. Nevertheless that's the kind of thing that we're able to understand happens. So we

authenticate. We certainly restrict access to the extent that we can. But in fact we ultimately need to increase the level of accountability for who's looked at what. So we track at the level of basically a keystroke. But the individual data items that are displayed. So in the case of Web based access which we're now using for some emergency room access we actually record at the site the HL7 message. So what data was finally transmitted to the stream before it was put in HTML format. So if someone looked at some potassium from a given terminal at a certain time that's the level of the audit. The storage requirements of that are really not as great as people believed. The vendors continually say when they build systems that it's too expensive to do that. It turns out it's really not a current storage technology cost. And we keep that data for at least six months and then for every employee in the hospital. Then a patient has the right to request that information. But every employee who also has a computer key can actually look online who's looked at, so there's sort of a self policing or self awareness of that.

DR. HOUSTON: Is there an automatic identification of people who are probably looking inappropriately? We have that built into our system.

DR. SAFRAN: We tried to do that. And, in fact, the volume of lookups is so great that both on a statistical basis and then also in the past, so we've been doing this for about 20 years. The system started in about 1978 roughly. I got there in '83 and when the reports were printed, our attempts to try to find high lookups. Eventually there's too much data for people to look at. So we have a security officer who theoretically worries about this. We know when VIPs are in the hospital. We've tried to statistically look at who's looked at what to see if we can't find out why. It's really hard. And we think it's more effective to teach by allowing people to see that they have the ability to look at who's looked at their record and hence people should understand that everything that they do is also discoverable by others. In fact, people call. If someone looks at my record I call them and say why were you looking at this? Well, we just needed your home telephone number. And I say that's not an appropriate use of the information system. Whatever they think is innocent.

MR. ACKERMAN: There's been a lot of talk that one of the ways to secure a system is to allow patients to see who's accessed their records. When staff and other people realize that every patient knows who's accessed their records and be given the phone number and name of the person who accessed their record they stop accessing records. The patients do their own policing. Do you know if that's effective?

DR. SAFRAN: We do that. And let me tell you what happened to us when we did that. The average patient during a six day stay in a tertiary hospital has about 150 people who might look at the record. They then put out this list for me and they say before we give this to the patient who are all these people? And I look at the list. I've got no clue. There are 9,000 employees. So we actually had to institute a sort of second level check. So we now ask every employee when they look at a patient record if they're not known to us, not known to us in the sense that the primary care physician or primary care nurse are known by other mechanisms. We know who they are. But say another physician looks at a record or ward clerk or whatever. We actually ask them why are they looking at the record. So in addition to their computer key we ask them for a reason. Are you involved in patient care? Is this research? Are you a hospital administrator doing quality audit? There are all sorts of reasons people have legitimate reasons to look. So now when we print out the list it actually tells you who the people are, what their role is, what they said they were doing and then their telephone numbers. But the problem is that in a big hospital you just have no clue the number of people. And when you actually call them they've got legitimate business. We were doing a quality audit of why patients fall in the hospital. Well, you need to have that activity but the patient would be offended so we make that available. And it causes a lot of conversation. Administrators keep trying to not have us give these lists to patients for that reason. Because it literally takes a quality assurance person. There's a hospital administrator who has to then deal with.

DR. HOUSTON: Are there very many of those phone calls?

DR. SAFRAN: No. It's on our patient bill of rights. So every patient knows they have the right to do this. Not many patients actually request it. I don't know. Five a month of printouts. You can't just give the list to the patient, you need someone. You have to sit down with them for a period of time.

MS. MILHOLLAND: That's a minor price to pay.

DR. SAFRAN: Oh, yes.

MS. MILHOLLAND: Hospital administrators. I just don't have any sympathy for them.

DR. SAFRAN: We actually prefer to give it to the primary care physician or nurse sometimes. But not every patient has a primary care physician.

DR. HOUSTON: Oh, good. Another burden for the family doctor. Thank you.

MR. TOUMA: [Unclear] practical to allow the patient, himself or herself, to screen who's looking at the story. Which would happen if everything is on the smart card.

DR. SAFRAN: To me that's the obvious way to do it. Just let the patient have access to their record in its entirety. As well as who looked at it.

DR. HOUSTON: What do you do about patients? There's the issue of patients not wanting diagnoses and stuff there. But there's also the issue of when you're describing behavior. I am thinking particularly in terms of psychiatry or when someone is belligerent. There are situations when you have to write honestly something that occurred. That the patient doesn't like. And then what happens with that?

DR. SAFRAN: The reality is that they have a right in Massachusetts I believe to comment on the chart. They don't have any legal standing to censor what you've written. But they

have a right to both confront you with what you've written. To read what you've written. To confront you and to actually put an opposing view. I wasn't belligerent. I'm not depressed. That's Massachusetts. But this is hospital policy. It has nothing to do with the electronic record. This is medical records policy and it's governed mostly by state law as to what patients can and can't do with it. Patients don't own their own data. In fact, the other interesting thing is you lose all your rights to your privacy once you die. You're no longer a person.

MR. TOUMA: So who owns the medical record?

DR. SAFRAN: The hospital.

MR. ACKERMAN: It's not true in every state.

DR. BERGH: It's different in Europe. The patient owns everything [unclear] in the hospital.

MS. MILHOLLAND: You can't force the hospital to give up the original record.

DR. BERGH: In Germany they won't let them get the original stuff and the hospital keeps a copy. For a certain period. It may not take forever. As long as it takes them to work with it.

MS. MILHOLLAND: Here I think the patient can get a copy made. They can't take the original. They can get a copy of their record. They have to jump through several hoops, depending on where you are.

MS. BECKERMAN: That's an interesting question for telemedicine. Because when you start doing outreach programs then you have physicians at both ends then you have the question of who owns the record. But the physician who's attending the patient on the spot

or whether it's the special care facility or the health care provider, wherever it may be. So that's where having a smart card or some other kind of capability where you can at least record the information and it can go to all those different places and everybody has the same stuff would be very valuable.

DR. BERGH: That's perhaps the European approach. The problem in telemedicine is one of the main objections is that somebody else is located in another place where the patient lives later or right now, whatever, if he moves. Has the same stuff. Does he then own? Does the doctor at the other site then own the complete old stuff? That's a question. We said the patient owns and the smart card is his key, proof that he owns it. And doctors may just add to the pile. That's an approach which is quite logical from my point of view.

MS. BECKERMAN: It's a question that hasn't been resolved. And the thing in this country is we're a very mobile society. People tend to pick up and move not only within the state but across state borders, frequently. And so a medical record can be anywhere. It can be bits and pieces in every state in the country. If you're trying to gather a whole picture of that particular individual you don't have it.

DR. BERGH: That's why I think one of the only ways to [inaudible].

MS. BECKERMAN: If the patient loses it that's the same problem we had before.

DR. BERGH: Owns in terms of he's the owner of all and of course there has to be a couple of keys. I don't know where.

DR. SAFRAN: Well, it's 11:30. I'd like to thank you all for coming here. Do you know what you're going to say?

MS. MILHOLLAND: My sense is that we don't have any solutions we are just identifying the issues and concerns and it is something that continues to need more and more dialogue on

all of these issues. It is too short a time to come up with any recommendation other than continued dialogue and continued identification of the key issues and the subissues under that and promote the international exchange, what is different and what is common.

MR. BOLAND: There was some discussion yesterday, or the day before, where they said that about two years ago there was the first meeting, a development of an action plan, it would be useful for us to have access to that original action plan to see how this event is going to reform that action plan and refocus it towards how things have changed since they change at the speed of heat anyway. So for us not to have access to that seems to hinder.

MS. MILHOLLAND: Because we are apparently supposed to contribute to this action plan, but not knowing what it was.

MS. BECKERMAN: Well, I think what they are asking us to contribute to this action plan are these four things which are on top of the agenda.

MR. ACKERMAN: We are contributing it to whom? There is no official body sitting anywhere around.

MR. BOLAND: So maybe we could ask for access to the plan and we could have it electronically mailed to our little village that we've created here. Maybe we could then come up with some suggestions to someplace. Somebody would have to coordinate all that, put it together, and I'm not sure that any one individual but I would be willing to assist with that. Since we work in the same location maybe we could work together, sort of a team agreement between SSIC and GTE to be the center of that kind of action. But we'd need access to the plan. If we could get access to the plan then we could put it together and send it out to all of you, let you respond. What's happened in two years? Where has it gone? If it hasn't gone anywhere then that's extremely useful information.

MR. ACKERMAN: I'd kind of like to know who [they're going to], for what reason, what status do they have.

FEMALE SPEAKER: We need more information.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

DISTANCE LEARNING/CME/LICENSING AND CERTIFICATION

Side A

DR. DENNIS WENTZ: I'm a gastroenterologist who got lost and went to the American Medical Association to head up Continuing Medical Education. And I am one of the co-chairs of this conference. Cynthia Trutanic on my right. I'm going to ask her to say a brief word about herself.

MS. CYNTHIA TRUTANIC: I'm a telecommunications lawyer who fell into telemedicine working for Mrs. Gore in 1992. And through the back door of telepsychiatry and have been involved in several of the policy activities of the federal government in and around telehealth and have also been a handson telecommunications operator as well. So I now will turn the mike over to all of you to tell us a little bit about yourself.

DR. WENTZ: Before we do that I am going to remind us that we've got a lot of distance to cover. There's a lot on our plate. We see sort of three areas, at least two of them merge a bit. Distance learning, continuing medical education, continuing health education and the issue of licensure certification. And I think rather we should talk about credentialing as well. And if there are other issues that you want to see addressed there will be time to bring them up. What we thought we would do is have some--after we all get introduced which we'll do in just a moment, as Cynthia said. Have some brief opening comments on some issues to set the stage to raise your awareness, pique your curiosity and then move into the general

discussion. As we do that--let's stop there. We've had enough rules for the day and go around a bit. I'm going to ask you to practice by handing this microphone around. Catherine is actually going to be our first presenter but please introduce yourself at this point. Catherine.

DR. CATHERINE CRAWFORD: I'm Catherine Crawford. I am currently an Associate with the National Health Information Center. I've been an academic for quite some time. My background is in building computer simulation models, information systems and decisionmaking theory and applications.

DR. ANDRE MORIN: I am Andre Morin from Protagonists, Paris, France. I spent about 25 years in the health care industry as a medical practitioner, as a scientist and then a business developer in the pharmaceutical industry. And today I'm involved in the development of new information and communication systems and application to the health care sectors. Plus an activity of teaching the physicians, the private practitioners. As you may know, in France there is an obligation for each private practitioner to get computerized at the end of 1998. [Unclear] of explanation and explain what is at stake and what are the modalities and what can be done with this new technology.

DR. WENTZ: Thank you.

DR. CATHERINE ***: Dr. Catherine [Yasbecare]. I am in charge of the telemedicine program for the Assistance Publique of the [unclear] Paris in France. Which is the

University Hospital Institution. So now we are very interested also by continued medical education with these tools.

DR. WENTZ: Thank you.

MS. LYGEIA RICCIARDI: My name is Lygeia Ricciardi. I work at the Federal Communications Commission. Where I've been involved in implementing the Telecommunications Act of 1996. Specifically those portions of it that call for subsidies for rural health care providers. The act was passed about a year and a quarter ago and just a couple of weeks ago the FCC released its rules and its final order which will give up to $400 million dollars a year to eligible nonprofit or public rural health care providers.

MS. RENEE EBERT: I'm Renee Ebert and I'm associated with [UCLA's] project, a special project for continuing medical education to physicians and other health care providers in developing countries through telecommunications.

MS. CHERYL PETERSON: I'm Cheryl Peterson with the American Nurses Association. I'm Associate Director for federal government relations and my area of expertise has to do with trade. And I'm looking at the licensure aspects of telemedicine.

MR. TONY SCHWARTZ: I'm Tony Schwartz. I'm academic dean of Tufts University School of Veterinary Medicine in Boston. And I'm interested in continuing medical education because I'm directing that for the Veterinary School and also the utilization of

telemedicine and distance learning and to impact international veterinary medicine efforts in Africa. Which is a big program at our school.

MR. MAKATO HANDA: My name is Makato Handa. I'm working for Nippon Telephone Corporation. One of the world's biggest telephone [unclear] companies in Japan. As you can see, I am the telecom people so very different from most of you. But our company also provides the services for areas of hospitals in Japan and we also have distance learning system to be integrated to those hospitals. I hope there will be some useful views. How new technology can be used to improve the present situation between the hospitals and continuing medical education.

MS. AIKO MORIMOTO: My name is Aiko Morimoto of Energy Corporation, Tokyo, Japan. We are a manufacturer of telecommunication equipment including computers.

MR. BRIAN PENNY: Brian Penny from [Tarin] Halifax, Nova Scotia. We're involved in developments of services and applications on communication networks. This is one of the areas we would like to look at.

DR. MICHAEL ALLEN: Michael Allen. I'm in charge of the Community Hospital Program at Dalhousie University in Continuing Medical Education at Halifax, Nova Scotia. The Community Hospital Program is what you would probably call an outreach program where we deliver CME to physicians in rural communities.

DR. ERIC ALLELY: I'm Dr. Eric Allely. I'm Director for the Center for Medical Education Technologies at the Henry M. Jackson Foundation for Advancement of Military Medicine. I have academic appointments at the Uniform Services University of Health Sciences which is the military medical school. Those appointments are in surgery and psychiatry. And I'll give you a dollar if you can figure out how those two things mix. We do both research and development. We do research in the process of training human computer interface issues, computer vision work and are interested in the whole idea of reengineering both the training and the way medicine works. Our development side we focus on training issues, distance learning, just in time training, cross training kinds of things that the military would be specifically interested in that we think widely applies, not only to the civilian communities but the international civilian communities as well. And the other hat that I wear, if it's not enough, is I'm a division surgeon for a light infantry division in the National Guard. So my bottom line is that you stand up from the experience better than you sat down. And I'll say more on that a little bit later.

DR. RANDALL FALK: Good morning. I'm Randy Falk. I'm an active duty Air Force and International Guard flight surgeon. Currently at the Harvard School of Public Health en route to the Air Force's School of Aerospace Medicine in San Antonio, Texas. My major interest is in leveraging the civil military concept of leveraging defense resources for enhancing military operational readiness. At the same time improving continuing education both on the civilian and military sides. Specifically, in trauma but in other aspects of medicine as well. And I look forward to working with the telemedicine community in trying to emphasize the medicine aspect of telemedicine and particularly the interactive integrated

training capabilities and continuing education capabilities. Can be piggy backed onto the telemedicine portion.

DR. JIM FRYER: My name is Jim Fryer. I'm an endocrinologist. I spent 10 years as the chair of the Department of Anatomy at the University of Ottawa Faculty of Medicine. I recently have been appointed the Assistant Dean for Research of the Faculty. And I'm responsible for research activities like computing, electronic communications and that would include telemedicine. So I'm here to see what the future of telemedicine is all about.

DR. ALAN LAW: I'm Alan Law from the faculty of science at Memorial University in Newfoundland. We in our faculty are fairly heavily in high performance computing, high performance networking visualization. And I'm quite interested, as our university, of course, has been active in telemedicine for quite a number of years. And the new technology and where we're going is what I'm here to learn about.

DR. ROBERT VANDRE: I'm Bob Vandre. I'm the Deputy Director of the Army's Telemedicine Research Laboratory. And I'm a dentist, graduated from UCLA. And I'm in charge of the Army's teledentistry program. I'm also for a short period longer in charge of the Army's deployment in Bosnia for telemedicine in Bosnia. And I'm interested in becoming a dental school teacher so I'm interested in education and that's why I'm here.

MS. ADRIANA MEAD: Good morning. My name is Adriana Mead. I work with Partners Health Care System, Inc. And I'm charged with assisting in the development and

implementation of staff and patient education programs through video and video conferencing.

MS. DIANE JORDAN: Diane Jordan. I'm corporate team leader for the Partners Health Care System. I'm based at Brigham and Women's Hospital and I'm specifically involved with the joint residency/fellowship training programs amongst the five merged and the two affiliates and also with distance video conferencing.

MS. KIMBERLY GALBRAITH: Good morning. My name is Kim Galbraith and I'm the corporate manager at Partners Health Care. It's my job to deploy telecommunications technology to further integrate our network and to impact telemedicine applications through urban telemedicine.

MS. SHAKE KETEFIAN: My name is Shake Ketefian. I'm a member of the faculty of the School of Nursing, University of Michigan. I've been in graduate education for 25 years and I've recently been appointed as Director of International Programs at the School of Nursing. And I am here to learn more about telehealth, specifically ways in which it can help us with our international partnerships. Especially in some of the developing countries that we're just launching.

MR. PAUL COCHRANE: Good morning. I'm Paul Cochrane. I'm the Assistant Deputy Minister of Health Canada in Ottawa. I'm here to learn about telemedicine in general. But two specific applications: distance learning as it applies to our first nation's communities and

also telemedicine application for first nation's communities to assist us with program delivery and professional upgrading.

MS. LARENE TONDRO: I'm Larene Tondro. And I'm with TSD Communication Services, Inc. And our company provides communication solutions and we've worked quite a bit with distance learning. In particular our applications are with satellite delivery but not limited to. One of the groups that we're working with right now is the Academic Care Health Association in Washington, D.C. and we help them to put together a distance learning to academic health centers throughout the United States. We're established in 50 centers. And they do a broadcast analog, primarily they broadcast analog twice a month through a title of Center Net. Some of you may have heard of it or been involved with it. And we continue to do the network management on it.

MR. MICHAEL CAPUTO: I'm Mike Caputo. And I got my start in telemedicine approximately 10 years ago when I was working for the Johnson Space Center down in Houston. And joined a team down there developing the instrumentation and protocols for doing inflight health care in telemedicine to our astronauts who are on the shuttle. I left Houston three years ago to work on a contract for C. Everett Koop at the Koop Institute at Dartmouth. Working on the establishment and really the coordination of the infrastructure for telehealth and telemedicine in New England. I'm now involved with several other academic institutions and industry helping them to integrate distance learning and telemedicine into their operational component.

MS. CAROLYN HUTCHINSON: I'm Carolyn Hutchinson with the National Council of State Boards of Nursing. And obviously very interested in the licensure issue. Particularly as the delivery systems become larger and larger and deal with moving professionals across national and international boundaries. And looking at how we make that more a solid process and not a barrier.

MR. MANABU NAGAKAWA: I'm Manabu Nagakawa, Professor of [unclear] University in Tokyo. That is a social science national university. And I'm teaching macro engineering as a contemporary economy. Macro engineering was established by Dr. Frank Davidson and the research group's home ground of research group is MIT. And this time I came here to learn about the distance learning and training because I am preparing the establishment of an institute for peace engineering in Okinawa Prefecture, Japan.

DR. RENATA ENGLER: I'm Dr. Renata Engler. I'm the Chief of Allergy Immunology at Walter Reed and Director of a training program in allergy and immunology and Director also of an immunization education program for more than 15 years for nurses and physicians. And I'm very interested in migrating our efforts and expanding them in terms of outreach education at all levels from the patient or the active duty service member needing to be ready to deploy to the physicians. And I'm here to learn about distance learning and migrate into that arena.

MS. JOSLYN PICOT: I'm Joslyn Picot. I'm the Director of Industry Canada in the regional office in Montreal. I'm also an Adjunct Professor at McGill University in the

graduate program in communications. I'm completing a study for Industry Canada on the telehealth industry in Canada and the telehealth industry includes telemedicine, distance learning in medicine and health and health networks. And immediately after completing this study we will move into an action plan for this industry which will help the industry situate itself or round itself out. Because currently it's a very small industry and somewhat fragmented. I'm here because I expect that part of the conclusions I'll come to is that there is hope in continuing medical or continuing health education for this industry. More hope than in developing other kinds of products and services.

MR. ANTHONY SPIKES: My name is Anthony Spikes and I'm legal counsel with a company called Space [unclear] Inc. based in Houston. My relevance for being here today is that we're currently developing a telemedicine program to be a first response system for inflight medical emergencies aboard commercial airlines. Very much what we're doing is augmenting what Mr. Caputo did with the space program. And that is transferring some of that information and some of the knowledge that we've acquired in the space program to utilize it in a more commercial sense. As you well know, a lot of the issues in such a program will be concerning the delivery of medical care across jurisdictional medical care. And so that's the reason for me being here today.

DR. WENTZ: Thank you very much. I think that was worthwhile. We have a tremendous amount of intellectual capacity and ideas assembled in this room. And we hope we can find some chance to hear from you about those ideas. We've also got a voice print of your voice so in case you forget to mention your name we'll be able to go back and figure out who it

was. Cynthia is going to be the recorder and her job is to make some sense of our discussion and to present it at the luncheon this afternoon. I do not envy her. But she's going to be taking notes diligently and for that reason I wanted us to be as clear as we can--as you noticed in the introductory material we're supposed to identify needs and priorities for the stakeholders and those clinical priorities. We're supposed to identify some of the key challenges and obstacles in each of these areas. And we're to recommend actions and solutions. So be thinking of those three things that are listed at the beginning of the Thursday session. As you make your comments. As I said, we're going to get started with some brief overview comments and to start with on distance learning I'm going to ask Catherine Crawford to take us through in four to five minutes.

DR. CYNTHIA CRAWFORD: I thought I was told 45 seconds. Actually, originally it was supposed to be 10 minutes. Yesterday it really was 45 seconds and now it may be two or three minutes. So I'll do my best. And I do understand that it's up to you folks to do the work of today. Jim [Baron] and others had asked me to talk to you today, just sort of suggest a broader framework within which you may or may not choose to place the discussion of long distance education. And I was actually more than happy for the opportunity to do so. So as I whip through this little presentation I would just like you to think about ways in which this information and this way of thinking could perhaps help this group to overcome some of the issues that you have consistently needed to address over the past few years regarding distance education. And perhaps ways in which you can either overcome those barriers or perhaps even get around them in other kinds of ways. I have been not surprised but I am continuously perplexed at the ongoing discussions in many

meetings of what is telemedicine. Telemedicine has been around, as I'm sure everybody knows, for 30 or 40 years. It began in psychiatry, as we know. The armed forces has played a lead role in developing technologies. And in addition even yesterday I learned for the first time that telemedicine is now being used on cruise ships, on airliners. So I believe the definition of telemedicine hasn't changed. But the applications, the opportunity to provide applications has become much broader. And this is a very simple definition of telemedicine. But I would like to underline three words. Telecommunications, clinical care and distance.

And the combination of those three things describe telemedicine. On the other hand, I've heard actually today and elsewhere in the conference and in this room the use of the word telehealth. And I would like to provide a definition for you that came about as a result of my working on the committee, a subcommittee, as did Cindy, on the Vice President's Task Force for the National Information Infrastructure. And I was asked to head up the writing of a white paper on managed care and the NII. And this was to be the first white paper from this group that crossed the public and private sector boundaries. I was to include both private sector participants and public. We ended up with about 60 or 65 participants and I was the principal author of the paper. We had four sections: information systems, network consumer health and information, telemedicine and privacy and confidentiality issues. In thinking about that I thought there has to be a phrase that defines this very complex and evolving arena whereby we see the interaction of telecommunications and health.

I thought I created the word but later found out that it was being used as a synonym for telemedicine in some arenas. And that word was telehealth. Very briefly and simply I define and the group defined who wrote this white paper, telehealth is activities that link telecommunications and health in order to improve the health and well being of individuals and communities. That can be by improved access, improved health care services, disease prevention and health promotion. And so I would ask you to think about that distinction because telemedicine then, the definition hasn't changed. The applications are arising, new ones every day. And actually telemedicine is a piece of telehealth.

I have divided up somewhat artificially some of the ways in which we can think about activities included under telehealth. I put one is individual community based and the other is clinically based, a second category. And as you can see, I've listed many kinds of activities under each. The problem is you can actually take decision support software and place it under this category as well. So this really is an artificial separation. But I would like to hope that this suggests to you and by the way, telemedicine I've listed under the clinically based activities. I suggest to you that telehealth includes an extraordinary broad of activities which, in fact, are increasing in numbers even as we speak. The creativity involved in these activities is tremendous. You're thinking okay, we're talking about semantics. So what? Telehealth, telemedicine. And I would like to suggest to you that the differences are indeed very important. We currently have but are moving away from a health care system. I just gave three very broadly defined characteristics. Organized around functional divisions of care. There are important distinctions among various communities in the medical care system. And individuals and communities are really passive recipients of care. If you think

of public health, the public health system goes into communities. If you think of individuals we as patients enter into a physician's office and actually that's changing a bit. Physicians may or may not like it. But actually individuals are becoming less passive in the medical care system.

Many of us believe that telehealth is going to have a major impact and is already doing so on a new health care system in this country and in other countries as well. We are beginning to recognize a need for following individuals' and communities' health and health care over a lifetime. Therefore, longitudinal data are needed. We need continuous, well coordinated care and services available to communities and individuals. And lastly, individuals and communities as a result of all of these activities will become and are becoming active participants in their shared decisionmaking about health care and also in participating and acquiring information. Now I started thinking after I got this far now how do I talk about long distance learning within this context? I know that this is very much an international community in this room. But I would like to ask you to raise your hands if some of you, at least from the United States and perhaps elsewhere, have ever heard of, watched or have children who watched or parents who watched *Romper Room*. I'm amazed.

End of Side A, Beginning of Side B

You have parents or grandparents who talk about the 20 miles they walked through the snow and how many of you have at least heard of that story? I would suggest to you that each of those is an example of long distance education. The first three, in fact, are EDE, electronic

distance education. The last one is just plain old--I had to travel to get to where I needed to be taught. And so in thinking about that I didn't create the definition. I just put the definition of electronic distance learning on here. And it's essentially the same definition as telemedicine except I've replaced provider support health education at a distance. And if we begin to think about continuing medical education or any of the other categories under long distance and if we broaden our perception and understanding of what we mean by long distance learning already I am suggesting we begin to think about other ways and opportunities in which we can provide or use long distance education. And very briefly I would just like to go back to my description of activities of telehealth and in that description begin to just talk through and think about how we can by using a telehealth framework begin to think about long distance education or EDL in a different way. I've placed EDL under each. Individual and clinically based categories. Because indeed, for example, continuing medical education is essentially clinically based. However, under individual and community based distance education there are 800 numbers. The mentally ill call up for support. That's long distance education. If they're asking questions and receiving information. The Worldwide Web. All of the self help sites are long distance education. And I could go on and on. I'm out of time. But let me just summarize perhaps the implications of thinking about long distance education. Not as necessarily a piece of telemedicine although it can be. But within a broader framework because what does this bring to the discussion.

Number one, I think it encourages the development of partnerships across the entire health care system. And, in fact, we've heard about this during the conference. And it would very much be a viable way of thinking about long distance education as well.

Partnering with other folks in all of these communities, including consumers/patients. Another benefit could be that by virtue of partnering we become more entrepreneurial and creative in our activities regarding long distance learning. Wouldn't it be wonderful if at some point the current virtual reality applications that we are seeing being developed at Georgia Tech and elsewhere will actually be used to not only create a long distance learning environment but indeed be extraordinarily effective long distance learning environment. And so the creativity would be important. Also the entrepreneurial activity would improve economic development which is something that we all would like to see in each of our countries and around the world. And finally, the last goal would be that essentially by virtue of doing all of this we actually could by virtue of thinking about long distance education within a broader telehealth framework, we can actually achieve what I think is the ultimate goal for everybody here and at the conference which is to improve the health and well being of individuals and communities in our regions of the world and in our countries. Thank you.

DR. WENTZ: That is a reminder also for me to distribute this editorial that came from *JAMA* that I thought we ought to be thinking about as assessing, controlling and assuring the quality of medical information on the Internet. I think there is so much available on the Internet and elsewhere that consumers have a legitimate right to ask what's the quality of that information? The other point that I wanted to make is I think and I appreciate the nuances that came out of your talk, Catherine, because it allows the patient to really become the center. And there are new ways for patients to relay information to doctors. There are new ways in which doctors will function because they will not do their traditional role--doctors, nurses and other health providers, I should say--but they will have the ability to make those

assessments and then reach out and gather more information and synthesize it quickly. If we're about this in a smart way. I think I'm going to vary what we were going to do. It seems to me the time is right to discuss some of these issues. Do you think we could do that? And then we'll keep an eye on the clock and then we'll make some switches along the way. Cynthia reminded me, are there other issues that you want to put on the table other than these distance learning, CME, licensing?

MR. ULF BAUMANN: I should have introduced myself. My name is Ulf Baumann. I'm with a company called OSII. We're providing network services. One of the areas in which we're very active is small band telemedicine. We call that medicine for people in isolated sites. So that you have the constraint of not being able to set up video teleconferencing or any kind of broadband transmissions. You have to make do with the very little piece of information you can transmit and you have to pack all the medical information into it and the recommendations for treatment and so on. What we would like to see discussed is the issue of data integrity and authentication of people who use and receive e-mail messages who are the senders and how can the receiver make sure that the sender is indeed who he pretends to be. And that nobody has tampered with the contents of the message.

DR. WENTZ: So assuring the validity of that information.

MR. BAUMANN: We believe that's very important. Since all the means that you have mentioned are basically anonymous tools. So on a Web site, for example, anybody can post something if you cannot make sure that the information posted is indeed from the person you

think it is from then you use that information in a professional way.

DR. WENTZ: Does anybody want to respond to some of those issues? Cynthia.

MS. TRUTANIC: Can I just say one thing? We do have to come up with some very practical recommendations for action. And one of the things having participated and been a member of the task force and member of the infrastructure subcommittee on this Telecommunications Act, at least domestically one of the obstacles and perceived barriers to the implementation of telemedicine has been the infrastructure and the lack of infrastructure in rural communities and remote and frontier communities. That will be eliminated at least domestically pretty shortly. Not completely but it's time now for those who have continuing medical education programs and undergraduate programs and other forms of distance learning in mind to really get down to work. And prepare for this rollout in the infrastructure and also to think about ways that those programs can be deployed internationally in a way that's useful to people outside of the United States. And I think we need to kind of remember that is our objective here and hopefully we'll come up with something wise to say.

MS. EBERT: The issue about credentialing or integrity of the content. I would think a lot of that has to do with the responsibility for that is frequently with the institutions providing the information. And so a lot of those questions get answered by virtue of who's presenting the material. For instance, the project that I'm working on that's public health education to developing countries, it is the responsibility of the University of California Regents to assure

that the program that's coming out is curriculum that's approved by the university.

DR. WENTZ: Well, that's fine but do we need to educate consumers to look for those imprimaturs that comes from an academic setting?

MS. EBERT: What I was suggesting is that's one way that's addressed.

DR. WENTZ: Does everybody agree with Catherine's list of telehealth?

MS. PICOT: She defined telehealth by including as the main technology telecommunications. And I would argue that the definition of telehealth includes other networking technologies. Such as cable. Such as WANs and LANs and even wireless. We don't necessarily fall into the telecommunications category and it may sound simplistic but in your distance learning CME action definition you've got to talk about mediated distance learning for CME. Because 60% or 70% of distance learning, at least in Canada, is paper based. And we have a very long tradition of long distance learning in Canada. So you have to make sure that you're talking about mediated distance learning if you want to make it telehealth or telemedicine. Our definition of tele--

DR. WENTZ: I want to be sure I understand what you mean by mediated distance.

MS. PICOT: Some involvement of communications technology I believe is what I mean by it. But there may be other definitions.

DR. CRAWFORD: I would agree with that. I guess my definition and it's probably not appropriate is anything electronic. I would put under telecommunications. That may not be an appropriate way to define it but I think you're right. We need to be careful to include all of the venues by which information can be transferred electronically.

MS. RICCIARDI: I'm from the FCC as I mentioned. And I think that use of telecommunications is very appropriate. I do think it's important though to highlight the fact that we are talking about other technologies beyond just regular telephone lines. And that these other technologies are very important and often are a better way to communicate information. So that's an important point that you raise although the term was being used appropriately.

DR. WENTZ: Other comments on basically the thoughts raised by Catherine.

DR. ENGLER: I guess one of the things that we struggle with in the military system and I think it's no different in the civilian sector is how do we really disseminate in an entertaining, user friendly fashion key elements of information that impact on utilization of health care? We talk about access but access actually is irrelevant if people don't choose to access it. And to me the greatest hurdle--it's probably the same for doctors or nurses as it is for patients--is how to get people to access it. Doctors get busy running businesses and there may be resources to learn by but they don't access it. Because it's not easy enough to reach and I find myself very excited and I guess I would like one of the initiatives of a group like this to move towards really thinking about--in a country that we live in here. And I think in

the world the pace of life is such that it almost prohibits people from learning sometimes. How do we make it truly easy? We've talked about kiosks of learning in bus stations and railways and schools and senior citizen centers. And now there's working going on I know for outreach using the television, $350 dollars cruise the Net at home. And of course the AMIA which I think is an organization that I would think this organization should partner with because there's overlapping concerns. Take all that ability and start to create things that are truly easy, user friendly, rapid. Whether it's for patient or doctor or nurse. It's really the same problem. And that to me should be the prime goal of exploring all the ways to reach out and touch and motivate people. Because again we all know dry learning. People go to sleep. How do we make it fun?

DR. WENTZ: So you have identified really some of those obstacles.

DR. ENGLER: It's a major challenge.

DR. WENTZ: I'm going to start asking is there any ideas for actions, solutions?

DR. ALLELY: A couple of things. I'm not going to disagree with the definitions. Because we're not going to be semantic. I have another way of looking at the same set of things and I don't think it's important. But the whole licensing and validation, verification, accreditation process I think has to be a major part of what we come out of here. I mean it's an issue. Part of it is educating the user to look for the brand name. That's part of the--but also looking for the developers to be sensitive to these issues whether it's security, all those

kinds of issues. Corruption. Let me take a step back even further from what you just talked about in terms of user friendliness. Because at least from my perspective it's a measurement of effectiveness. We're sort of doing all of this for now. If we make it accessible and make it friendly but don't impact health care. I think something that is in almost every science and particularly in this science where technology is sexy and let's see if we can get faster bandwidth and T1 connections and whatever. That there's a very critical part that is not--it's addressed partly but not addressed in my opinion enough. And that is are we really doing what we think we're doing? And that isn't just getting physicians to access it and nurses to access it and patients to access it. But is there really a change? Because if it's not we're spending a lot of money that should be spent somewhere else, in my opinion.

DR. WENTZ: I see another hand and then Catherine.

DR. ALLEN: I think that's true for any educational intervention, not just for distance education. The holy grail of education is changing behavior. I think we can get lost in that morass.

DR. ALLELY: I don't mean to spend a time on [inaudible]

DR. CRAWFORD: Let me just respond to all three points which are very relevant and really talk about access and impact. I think essentially we could look at access as three levels of access. One in which perhaps the military has not yet been concerned about although Dr. [Bushco] certainly has raised that question today. Is access to the technology.

The federal government is very concerned that those populations which currently don't have access to health care may get a double whammy in terms of not having access to the technology. And so access to technology is one issue. However, as you have suggested, another level of access is use of technology. And actually it's been shown that having the--what is it? Starts with a k. Kiosks in supermarkets, etc. are not necessarily effective. People tend not to use them. And finally, the third level of access is accessing what we need at that moment to be effective. And I think the positive things that I'd like to reemphasize in terms of learning and outcomes is that we do know that multisensory environments--we do know that people learn differently. And the more you can approach them with information from a multisensory or multimedia approach actually the better they're learning and the more they're reacting. Studies are beginning to show that. There's a person by the name of Dr. Chris [Didi] who heads up a new virtual environment program at the National Science Foundation. He's actually been creating virtual environments to teach physics and has shown that students learn much better within a virtual environment when they're learning about something like physics. So I think there's very positive aspects to what we're talking about. But also there's a lot of potential negative aspects as well.

DR. ALLEN: Just before I came here we were given a talk. I'm sorry, I forget the fellow's name but he developed a software program for physicians in Scotland. And part of the program was to track the effects of educational interventions. And so if you combine distance education and telecommunications with some method of doing that then we can achieve what we want to achieve. Of course there are financial incentives involved, too. So I think what we're talking about can probably enhance what we want to do.

DR. WENTZ: This may be a good time to ask Eric--or do you want to wait a little bit? To tell about the exciting system that you have on display over there. It's more in the arena of continuing medical and continuing professional education perhaps than consumer health education. I think this is a good time.

DR. ALLELY: At your direction. And this is not going to be an advertisement. It's going to be a philosophy.

DR. WENTZ: Would you stand? Because I think we can hear you better.

DR. ALLELY: All right. Again, Dr. Eric Allely. The stuff that we're working on addresses--first of all, we try to drive things from a perspective of what's needed. So there's a research and analysis component. What's going out where. Where are we failing to do things. How can we make people better at what they're doing now. And also we are very interested in engineering as I said before. I'm not quite so sure that the way we have tasks and skills broken down today in medicine works for the future. I don't think it works for today necessarily. That certainly the lay people need to know more about the bodies that they own. They need a better owner's manual. Patients need better education. Medics need to be more like nurses and PAs and PAs need to be more like doctors and doctors need to lose a job. Or learn something more. The point is that that's what drives what we're doing and not so much a single technology. Now I like BTC. I like synchronous connections. I like asynchronous connections and store forward. I like CD-ROMs and sneaker nets. I own a printing press at home. So I'm sort of a throwback kind of a guy. I like to look at the

whole toolbox and say what is the need that we have? What do we have to approach? So that's been the starting point. That we're trying to do something that when the student stands up they're better than they were when they sat down. If I can't do that then I'm wasting my time. So everything that we do has measurements of effectiveness out the back end. And we have built a set of tools that work just as well on floppy disks and CD-ROM distribution as they do integrated with printed correspondence courses. As they do on VTC. What we've tried to make is an interface, a desktop publishing interface, as you were, that allows you to do building questions and quizzes. That allow you to distribute these questions and quizzes as training mechanisms. Not just to test people to see if they're doing well, but so that they can test themselves to see where they stand and direct their own learning.

Through scenario development. Being able to lay out a case that you have to work through, a problem that you have to work through. We've all seen the applications out the back side of these kinds of things. But what we've been focusing on is building the tools that allow others to build these things. Because we think what's going to make it happen is a watershed. As a user if I walk up and I have to buy a system and it teaches me three things then forget it. I'm not going to buy this system. It's not worth my time. It's not until we see thousands. It's not until I can sit down at my NetScape Web browser and say you know, I'd like a quick little course on and then you do a little search and gosh, Stanford's got a great course on whatever it is I'm looking for. And download it. Maybe it charges me a nickel or whatever off of my Master card so we can support that development. But that's what has to happen. And we have to be able to have that, in my opinion, have that accessible at all levels so that if the lay person wants to learn something why do we have a

barrier there? Why can't the lay person or the medic or the nurse or the doctor--why can't the doctor dial up--I don't want an MBA degree. By God, I'd like to have part of that. There's a part of the business of administering a hospital that I think I should know because I think I could make it more efficient by knowing it. Even though I stay in clinical. So we have these artificial barriers in my mind that are degree based and diploma based that we have an opportunity to break down if we address the problem appropriately. So that the stuff that we have developed or are developing, that's basically the philosophy. That is put something down as a teaching point, develop a set of interactive not entirely computer based but a set of materials that allow you to come in at your leisure and do just in time training. Do cross training. And then hopefully have a better trained staff, a better trained set of patients and consumers. And let them determine which way they're going to go and how they're going to get there. Because I think it's a little bit presumptuous of us to try to build this entire architecture and decree from on high this is probably how it's going to work.

DR. WENTZ: How many of you have seen his demo? Is it going to be up yet over the lunch hour?

DR. ALLELY: Yes, it will be. I can attend it over the lunch hour and answer questions.

DR. WENTZ: There's some interesting twists in there that I had not seen before until this morning. And I think they're wonderful. You can use the one in the front right here.

MR. MORIN: Thank you. Andre Morin. Can you hear me? We all assuming that

everybody is computer literate to use Internet. I was interested to read that in Susan [Tichner] report, the think tank, there is only 3.7% of equipped people in this country which are using for medical education. And apparently there is less than 30% of the total medical population which is equipped with a computer. So it's relatively advanced here and other countries. In my country the situation is worse. We have controversial figures. But about 20% of the medical population is currently equipped. Fifty percent of them being equipped with an obsolete material. Too old. And they don't have the technical equipment, the modern equipment.

End of Tape 1, Beginning of Tape 2

Who have access to Internet. In France it's around 3% total and the medical community we are talking about less than 1%. So the point I guess is before looking at what should be the content of a book I think there is a basic need to teach people how to read. And to teach how to access. There is a real illiterate population. And it should not be forgotten. Of course we are preparing the future. So it's important to discuss the early adopters and what will be the showcase. But if we are talking about mass education today the situation in the following many patients, many internal navigators are much more educated on the point than the physician. Because the physician doesn't have even access to Internet. So it's paradoxical that the patient will bring the information to the physician. So I think basically there is a mass campaign to help the medical community learn how to read. Then we can address--probably it will start with a child's book and then it will become more sophisticated reading. But this is a point which should be not forgotten in a practical recommendation.

There is a vast campaign of [unclear] among the medical community. Although it's not as worst here in this country as it may be elsewhere.

DR. WENTZ: So you're making a recommendation for a massive educational program.

MR. MORIN: In the medical community.

DR. WENTZ: The medical community and I would extend that to the nursing community. I don't know if anyone from nursing wants to communicate or talk about that issue.

MR. MORIN: And even think of incentives for doing so.

DR. WENTZ: So broaden that to health care providers.

DR. ALLELY: May I make a comment on that. Let me put my light infantry hat on. When I'm deployed--last year when we were deployed to Ecuador I made decisions about how many MREs to take. We did not take our technology with us and I'm fully aware that a lot of our students aren't going to have technology, as much education as we might want to give them. One of the things that we try to do with our process is the output doesn't even have to be electronic. I mean we output our student materials directly from the computer into printed materials. Our center is for the medical education technologies. Using all the media that we can. So I agree that we have the future target and a way to get there and accelerate that is through the education process. But even with all of those efforts and all the

money that we might devote to it there's still going to be a large percentage of the people in this country and even larger percentage of people outside of this country who still will not have access. So I think that we have to do a two pronged approach. One is we have to push for that as much as we can. The education process, to use what you have. But I think we cannot ignore the 85% of people or more who will not have technology for a long time. Whatever we do with our technologies we should be smart enough to apply them to bring them into the fold. Make the tent big enough, whatever the analogy you want to make.

MR. SCHWARTZ: I would argue that the most efficient way of doing this is by developing some means of using computers in education. Every one of the health profession schools and having every student who graduates be required to have a working relationship with a computer before they do graduate. That's already happening to a great extent in most of the schools. I think the--this is Tony Schwartz, by the way. The battle to educate those outside of educational institutions who are making a living is going to be a lot greater than that. And I'm not sure that it would be cost effective to even do that.

DR. VANDRE: I agree wholeheartedly. I know that a lot of universities require their freshmen class as part of their tuition to buy a computer. I think that's someplace where we've been lacking in medical and dental education is to do that. I also feel that trying to think how can you get content to people. Obviously the Internet is the cheapest way I can think of to get content to someone. I can't think of another way to get medical information to someone as cheaply as that. I know that you're saying that in Europe very few doctors have access to the Internet. Although I'll bet most of the doctors could afford it. They have

the money to be able to do that. Just not maybe the reason right now to do that. I also feel that if we were to put--if there were enough alluring types of educational opportunities out there and I know that as a dentist I'm required to get 50 hours a year of continuing dental education and that forces me to get that education one way or another. And if that was possible to get that at home at night when I'm just relaxing and I can just pull it up onto my computer, if there is enough content out there and they were on subjects I found interesting that would be an allure to me to buy a computer and to want to implement that type of technology. So I'm thinking if you build it they will come, like in the movie. If there's enough good content out there with good lectures and I think people will show their friends and by word of mouth that we can get people to start using it.

DR. WENTZ: Certainly. We've heard this in this conference. One of the factors is that as people are exposed to it, as their kids go out and bring back desires that they get dragged in kicking and screaming, I put on the board three initials. PAI. Has anybody heard of it? Probably not in this audience. On May 15, 1996 this was the subject of an editorial again in *JAMA*. It's called physicians accessing the Internet project. It was a call to arms from us. The American Medical Association is an umbrella organization. We have 93 specialty societies within it and so forth. And this call was for every one of them, every academic institution to launch a campaign to educate doctors on not only the Internet but perhaps basic computing if they need that. And acknowledging that it fits the definition of continuing medical education or whatever you need to. But to say we all have to get into this. Entrepreneurs jump in. Universities jump in. Specialty societies because a lot of physicians look to their specialty societies for their education. And as a result of that a lot is

happening. Our reports are being coordinated by Dr. [Bonnie Chilom] who's at Loma Linda University. But these efforts are I think beginning to make a difference. So I think the percentages will change and my own experience has been to see older doctors who have never touched a computer, who thought the mouse was the on/off switch suddenly just light up and overnight become converted. It's a conversion experience. And once they see what it's about--we have just entered into another agreement with [Marshal Ruffin] who heads the [Infomatics] Institute which was started with the American College of Physician Executives. Marshal is a guru in terms of educating physicians to know how to handle information. But the earlier parts, letting them experience the joys of it. So that's what we're doing in medicine. I was wondering if anybody else has launched a similar effort in nursing or in other health professions. Or for consumers.

MS. KEFEFIAN: I'm Shake Kefefian, the University of Michigan. I think that unless we take steps to achieve this pretty soon those of us who are in education will be unable to talk to our students. Because that generation is changing. And their level of competence, not just competence but their orientation and attitudes are being molded through a series of exposures to different kinds of technologies. And those of us who are in our middle years will be unable to have conversations with these people. So I think we better get on with it. And in our school we don't require but we urge very strongly that our graduate students, if they don't already have a computer by the time they come to us, they do so. And those of them who don't start out doing this pretty soon discover that they can't function as effective students unless they have this equipment. The last point I want to make is I think it's important for us to consider the needs of other parts of the world and other populations

beyond our borders. We tend to be very not isolationist but there's a tendency for us to think about the interests of, needs of our own population. And I think that's good. But there should be a wider responsibility so that we are thinking globally. And considering the needs of others who don't have the things that we do have.

DR. WENTZ: Does anybody want to comment on that? Andre. I saw you hand up.

MR. MORIN: I would like to make a comment on the use of computers also. That's true that it may create a gap between the teacher and the students. And soon the teacher would lag behind. Would lag behind from the technical and technology standpoint. But what a teacher brings to a student is a sharing of experience. So that cannot be overcome by just technology. So I think there is still ample room for the teacher to transmit the experience he may have gathered along his career and his life. And this is a precise comment of the use of this tool as an [unclear] technology as we have been discussing. And certainly if the medical education can get improved from the Internet, the use of computers at large and Internet specifically should be only part of it. And that's why I guess it's the same thing here. But in France there are 50 points which will be mandatory. There is a reform which is making mandatory to get 50 points every year for continuing medical education. And this obligation can be fulfilled or will be fulfilled not only with one [mean]. There will be a mixture and an obligation to use a mixture of means. And that also should be taken in perspective, that it is one tool. The computer is one tool but it is not the only one. And certainly for all of us who have been teaching the interactivity and the sharing of experience and the interpersonal relationship will never be replaced by the funny aspect of a game or even if it is interesting.

You have to digest the information to make it, to render it, to extract the essence of it. And when you are a beginner or even if you have a certain degree of education, self education, it's so much easier to have someone holding your hand in the jungle or in a new field. So I think it should keep a reasonable balance between this traditional aspect of the teaching and this enabling technology.

MS. TRUTANIC: I'd just like to say I think that's a good point. I also think what you're addressing is the whole mentoring process in learning and the facilitation through that mentoring relationship. But I think we have to remember that it's not possible to deliver that type of learning to a lot of people, especially globally. And there's a lot of training that the medical and the health communities are trying to do in areas where there are emerging democracies that need health care support. And the only way to get that type of support to them may be through the use of telehealth or training measures that are evolved through some of the newer technologies. I mentioned specifically trauma training and for example, one thing that's been learned through the war time years and why the military transfer technology programs have been helpful is that those experiences gotten on the battlefield are sort of waning. Because they're not trauma--the trauma physicians are now in our ER rooms. I think Eric can speak a little better to that than I. But that knowledge we don't want to lose and we want to be able to get it to people who need it in parts of the world for example, where there are land mines and civilians are stepping on them. So I just say there still is a need for that even though there's a need for that dialogue. There's also a need to expand the reach of this.

MS. EBERT: One quick addition to what was said regarding the outreach to the developing countries. And then also with regard to the computer literacy and use of it in the health care environment. At UCLA School of Public Health where I spent two long years in a master's program the majority of the average age was between 35 and 40 for students, so you had quite a number of people who were much older. Of that group of people the majority of those people were also health care providers, physicians and nurses specifically. And they were doing research kinds of things using computers to gather their data. They were therefore older using that technology and because they were applying it in an area that some certainly were familiar with, the health care end of it, they were able to learn both the use of and the efficacy of a computer generated type of learning. So that I think that there's an awful lot of intermeshing of technologies with health care now that are going to make it easier for those of us who weren't born into it so to speak. But then we have this whole generation coming behind us who are already computer literate by the time they get to medical school. So I think there's going to be that combination.

DR. WENTZ: We have a comment from the back. Pass the microphone. But are there other folks who want to comment on these I think very relevant issues? And we've segued into continuing education of health professionals. But I think it has to be seen together.

MS. PICOT: I want to go back to the definition of telehealth because in the study of the telehealth industry that we're doing we have five categories of applications. And in each one of those categories there is an opportunity to educate, train or learn. The first category is all of telemedicine applications that you're familiar with. Telepathology, teleradiology,

telepsychiatry and so on. You can't tell me there isn't an opportunity in each one of those for some education. The second category are what we call interinstitutional networks. The grey area between that and the third category which is the community health information networks, the regional health information networks, the [unclear] and so on. There's a strong role for training and education in those networks. The fourth category is the one we're dealing with which is teleeducation, continuing distance learning and so on. And the fifth category are all of the telemedicine and telehealth applications where you reach out to the homes of people, whether they're things that are sold direct to consumers or via a health provider or care provider. Telemonitoring. Home visits by video and so on. There's a very strong patient education component in that application as well. And in the health population networks which I didn't mention, which this lady just spoke of in public health, there is an extremely strong public health education component. Because if population health networks which are roughly covered between the second and the third category I mentioned, many centres are using the Internet for public health information. And there's a strong component of public education involved there as well. So I think that could be one of the recommendations that through all the categories of applications one should consider the aspect of learning and education. Not put that aside. It is there. And it can be emphasized in whatever application you have in tele [unclear]. I'm really broadening your definition.

DR. [illegible]: Do you have any of that in a format which we could submit? It's recorded, so we'll have it.

DR. CRAWFORD: I have a question for those of you who are engaged in medical

education and health education. I'm sure some of you share the same awareness that telecommunications companies in this country are putting up satellites as quickly as they can. Expending a lot of resources. And I'm aware of at least one of them which would like to develop a purely health channel. And when you think about barriers to technology if we moved our awareness not just to include the Internet but cable and cable television certainly in terms of accessing more populations we could do so by using television and satellite and cable. So is it realistic to think about implementing on a channel or a one hour basis time programming, continuing medical education in that kind of environment? And especially since we do know that television is becoming multimedia as well.

DR. WENTZ: Can anybody comment on the merging of television, the cable community with the computer community?

DR. ENGLER: I just was very impressed with the program at Stanford that I think Dr. [Shotlift] is involved in. Where they're going to use this in home television technology that allows you, the remote basically to cruise the Net or potentially interact remotely. And they're developing a system where diabetics will be managed in home so the diabetic when he or she measures sugar it gets entered on the TV. It's immediately electronically added to their record and graph. You can actually ask a question of your doctor through your television and get a response. So you're basically e-mail by TV. Which I think if you talk about acceptability that that will take off like crazy. Because everybody is addicted to the TV. And it becomes suddenly even the computer phobic little old lady or gentleman or whomever uses a TV. And if the remotes are made with big buttons so you can see. I

would think that considering how much people take to that is probably one of the most powerful outreach to the individual. And the question is: is the doctor or the nurse going to learn if they have their feet up in front of the TV, watching their continuing education or answering their question online. When you talk about learning, getting up from the seat, I think that this is probably very powerful. I was very impressed and I think it will make diabetic management potentially much more powerful. And home care tool. Also if there's a nurse who goes to the home she can use this at the same time as the patient uses it. So instead of having to carry it with her and have extra technology it's already in the home.

DR. WENTZ: Thank you. I was glad we got into this whole area because I think the area of home health care services delivery is a major advance that we should comment on somewhere. In the American Telemedicine Association meeting last April there were many papers actually on applications in home health situations. And new ways of partnerships between the Visiting Nurses Association and so on. A diabetic is home and there's a wound perhaps that's healing slowly. A digital camera can record that and transmit that picture to the surgeon who isn't going to be happy unless he had seen the patient in person. But now the patient doesn't have to be transported because one picture being worth 1,000 words. You have that picture there transmitted from home with the help of a nurse and a partnership is established that's really good. The home health care provider whoever that may be and then the consultant physician perhaps in the home site.

MR. MORIN: One quick question. To the person who described the system. Is this paid for by the insurance company? Who is paying for that? Because we do have the online

telephone answer, the so called 800 number in France, for instance. Or I guess it exists everywhere. But there is no fee and we heard yesterday legal aspects of it. Responsibility as soon as you would lift up your phone you would be committed to--we heard an interesting story from the lawyers yesterday. So that's another aspect. But from the economical standpoint who is paying for that?

DR. WENTZ: Other than [unclear] do we have any lawyers in the room?

DR. CRAWFORD: Actually I'm aware of a program in Kansas. Telemedicine or telehealth. Bring home health care into the home. And they've done evaluation studies of the cost effectiveness. And it's far cheaper to have a provider connected to a chronically ill patient five times a day via electronics than it is to send a home health nurse in there once a day or whatever. You can vary the frequencies but it's definitely cheaper and managed care corporations and others are very interested, of course, in pursuing this. And so the answer is yes. Because if it will save money they love it. In addition it also though has really good health outcomes. Or, in fact, some of them are showing no change in health outcomes but positive improvement in psychological aspects which of course many of us believe have a long-term effect on health outcomes.

DR. WENTZ: Pass the mike over there.

MS. EBERT: There's health innovations in Kansas which is a home health monitoring. Is that the one you're talking about? I've spoken to some of the people there when I was

working with Hughes on consulting for global health care markets. And monitoring is done at a distance. And it completely obviates the necessity of a patient having to travel and that sort of thing.

SPEAKER: The reason it's inexpensive is all they do is add a little box on top of the television in the home. That's all it takes.

DR. WENTZ: Mike had his hand up there first. Did you want to just respond to that comment first?

MR. MORIN: Yes. The question is noted that it should be economically more interesting but are they already paying right now? Because here we have someone who made an interesting experiment on avoiding transportation for neurosurgical and the system is there. It costs some money. But nobody is willing to take up from the industry the standpoint at this stage. So it's there. The demonstration is there but possibly it's too early to bring the payors, the people who have the money. But noted that the demonstration is there but is the culture there to--

DR. CRAWFORD: [Inaudible]

MS. TRUTANIC: And also the state of California is reimbursing for home health care by legislative mandate right now.

DR. CAPUTO: I wanted to get in on this because we're getting more into the telemedicine and less away from the education. But I am aware of a project that just received substantial funding from Robert Wood Johnson. This is a five town region in rural Maine called the Healthy Futures Project. And they're combining everything that we're talking about and they're doing the analysis to show that it is cost effective and it does save money. And the payers are supporting a portion of this as a study. They'll be sending into the home nurse practitioners who also have special training in patient education. And they'll be working--each nurse practitioner which I believe their title will be health advocate. Will be responsible for 125 homes in that community. And will go in and act as a liaison between social services, health care, education, developmental screening, all those different areas. And they're going to use laptop computers, CD-ROM and databasing and Worldwide Web connections to be able to bring the information into the home and to educate these patients and these families on everything from such diverse topics as how to manage your diabetes, how to take care of prenatal care for your unborn children and one of their largest issues that they're facing in these communities are domestic violence issues. So they're going in there to monitor and to educate for those conditions as well.

DR. WENTZ: Thank you. That's exciting to hear about. The quality incentive now is to keep people out of the hospital and so managed care plans, health systems even if they aren't managed care plans have free 800 numbers and whatever manned by trained usually nurses, backed up by physicians and so on to provide that sort of information to the company or the health care consortium. It's in their economic best interest to do it that way and patient satisfaction is quite good. So that's one way of funding that sort of system but it's a very

elemental level. It's answering a response, do I need to come to the hospital now? It doesn't go much beyond that.

MS. TONDRO: I just wanted to make a comment further about, as we were talking about the wireless distribution and bringing it directly into the home. The element that we need to add to this, the acronym is DBSDTH. Direct broadcast satellites direct to the home. And it's not just the U.S. that it's taken off. Really Japan was the forerunner of the DTH market. DBS satellite launch here in the United States has really taken off. But you find DTH nearly in every country now. And this gives the opportunity through specific satellite launches and through the small antenna systems that can now go to a home, to an apartment complex, multiple dwelling situations, and the funding or the development of this programming is either entrepreneurial or it's an accumulation or aggregation of associations that are putting on a product and being able to purchase time and getting it on the satellite. And then it is bringing the black box and it may be at this particular point of simply bringing the information into the home and then the response back to the physician or the health care community via telephone lines. So it is a quickly evolving thing that is combining the Internet, the satellite and bringing it to the television. But it comes back to the point that we're all making. It's thought to be user friendly. And the most user friendly thing is not necessarily the computer but it's the on/off easy push buttons on the television set.

DR. WENTZ: A potential solution if we can figure out how to work with it. And I think how to partner with those companies.

DR. VANDRE: The problem with direct broadcast though is it's only at certain times of the day that you can get it. You can't get it when you want to hear it. And you'd almost have to have a medical TV station to do that. Something like only 20% of the people in the United States know how to program their VCR.

MS. TRUTANIC: Can I just say one thing here. We haven't really talked about and I don't know how progressed any of your CME or distance learning programs are in your institutions or if the plans you have for them have evolved to that point. But the technology is not going to be the impediment here. The question that I'd like to pose is it the economics? And how are people proposing to get these programs up and running in their institutions so that they can be directed to the people who need them or at the need that's stated. And then if the economics is an obstacle how might there be opportunities or what solutions may there be to overcome those particular obstacles? I do know that the cable companies--there are many cable companies who are right now looking into health CME programs that have already been in the career training, the corporate career training business. But they have not yet gotten into them because they haven't figured out the economics. Who's going to pay for them and where the dough is going to come to keep them up and running. I think we might want to address that before we have to close this session today in about 30 minutes.

DR. ALLELY: From our point of view, at least where I sit there are two main sources of funding. One is I think has to be the market and the mandatory CME that the colonel referred to before is a primary source for that. And the great thing about that is that if you

don't do it right then you don't survive. So that it really presses you hopefully in an open market to make good material and it's validated and accredited and all the rest of the stuff. And that you're serving a community. That you're not necessarily serving a company or a university but you're serving the people who are the end users. And that's one major piece of it, the whole CME accreditation, knock off the requirements block. The doctors pay for that. The nurses pay for that. Or their companies do. Like Kaiser would pay for you to go to your 50 hours of CME. So they're consuming the education and so that what it does is the good stuff gets used and then it gets paid for, for redoing it and keeping it up to date and stuff you don't do very well falls by the wayside like it should. It should die on the vine if it's not good stuff. Now that only covers in my mind--let me back up a little bit on philosophy. Something I call missing software. We've got a lot of games because kids will buy them and my mom plays solitaire so she buys them, too. And then we've got a lot of business applications because they help businesses. And then there's this what I would consider a moral imperative stuff in the middle, the missing software, the stuff that should be done, that can help people out but it's not necessarily got a community that can either afford it or pay for it or access it. That's where we go to nonprofit foundations and to the government to say look, this is your broader responsibility. But I think we need to segregate those two things. I don't think we should be going to government and saying please make for free all of our CME stuff. I think the CME stuff should stand on its own. I think that's a healthy commitment to make for it. Because if it's a requirement and it's consumed then it will be naturally supported and nourished. The other stuff, the patient education materials that maybe the patients can't afford to buy, the stuff that needs to get into inner cities and prisons and wherever else, then there's a social responsibility and then we turn to these

sources of money that are typical funders of social responsible kinds of things. The government and nonprofit organizations, etc. That would be my simplistic division of two. But I think it's important we try to divide the two and not ask the government to fund the CME part or ask the nonprofits to fund the commercially viable software.

DR. CRAWFORD: The private sector is very aware of the fact that two years ago in this country we spent more than $15 billion dollars outside of the medical system for alternative care, for information, etc. As a result of that awareness a lot of the software that you're suggesting has been or is being developed. A lot of entrepreneurial activity is happening in the private sector to provide information and within a software framework and otherwise to consumers. And whether or not that's going to become a viable industry a lot of people have bet a lot of dollars on that. Whether or not the demand will be there when consumers currently can get information free off the Web, etc. and in libraries that's a whole other question. But it is happening. And there may be, as you suggest, other ways in which the federal government can assist to fill the holes that aren't being filled by the private sector.

DR. ALLELY: I'll just have to end this philosophy I guess. The one thing that bothers me a little bit about waiting and seeing what the holes are and then filling them is that you somehow--you pay to learn. You pay to be informed. Now in some settings that makes sense. If it's professional applications. But there's a part of me, maybe it's the academic part of me that the hairs on the back of my head or neck--I don't like that very much. Because I think that closes some of the information. It puts a barrier that isn't necessarily there to some of that information, particularly in third world and inner cities and rural

communities.

DR. CRAWFORD: Well, to be fair to the federal government they just rolled out four weeks ago at a major conference in Washington a Web site called Healthfinder dot gov. And that Web site will provide all government generated medical and health information and also connects to other major Web sites currently around the country and eventually around the world. So I did not mean to suggest that the government isn't looking at all of these issues and Cindy and I others here who are working either directly or indirectly with the government are very aware of those gaps. But I also personally think that the government tends to move rather slowly in these areas. So it will just be interesting to see what happens. Yes. Healthfinder is one word dot gov. And it comes out of the National Health Information Center.

MS. EBERT: There is one other aspect that might be addressed and that is that managed care which has taken over quite a lot of the country, especially out West where we're from, has changed the face of education. Is vertically integrated as the HMO might be. Also is the education. Because they're educating their physicians, they're providing the CME. Sometimes they're actually the producers of the CME as in Kaiser. And this is for their nurses, doctors and other health care people that administer to patients. There's also an initiative within a lot of HMOs to provide the education to patients as well because an educated patient is one who isn't coming in and taking up an awful lot of doctor time or nurse time, for that matter, for care that they could otherwise administer to themselves. So that trend across the country and as it moves East more and more managed care format is

used in other indemnity insurance and other providers of health care coverage. They're implementing this technique, this approach because they see the education being the singular most important aspect of health care.

DR. WENTZ: Unfortunately I've had a perspective that if you've seen one managed care provider you've seen a managed care provider and they're all different. When you look at the old line, say the not for profits like Kaiser they invested heavily in continuing medical, continuing nursing education, consumer health education. When you looked at some of the newer companies who were the for profits largely they said education is not our business. And often we're not even allowed in the contracts they had with their physicians. But they're changing, thank goodness.

SPEAKER: They're finding that at least the research has shown that they're finding that education is a cost effective approach. And so if it affects their bottom line and it's cheaper to provide more education to their people they have to provide less care.

DR. WENTZ: But they had to go through a progressive process to get there. We're supposed to have a subject expert on CME, Bob Leach, he's not here. I just want to make a couple of comments. That's my area at the American Medical Association for full disclosure. And I know it best. So I don't mean to in any way not talk about nursing education and so on. But we do have a standard of quality I think in continuing medical education.

End of Side A, Beginning of Side B

This is AMA PRA category one credit. And that to doctors is a signal that this has got quality experience, comes from a provider who voluntarily submitted themselves to review and is used. And it's that category one credit that is mandatory in the 30 of the 50 states that require it. Usually at some level 20 to 25 hours per year. A more important part is it's mandatory in hospitals in order to get your privileges renewed as a physician. You have to document that you were doing relevant continuing education in your specialty to some amount determined by that local entity. So that system is in place and it has a validation system and I think now the PRA award which we started in 1968--it's almost 30 years old--has probably stood the test of time. This category one is sort of the currency of CME. There's different credit if you're a family physician. They translate their equivalent. The long range goal I would like to see is that we think some day worldwide continuing education so that credits achieved in the United States will also meet the French physicians' need to satisfy the system Andre told us about. That we have reciprocity established on the basis of quality. And this could extend not only through medicine but to nursing and to other members of the health professions. I can say a lot more about the CME system but I think we ought to continue this discussion and then spend in about five minutes we're going turn to licensing. It's available on the AMA's home page. A number of things exist on that home page including you can search for courses on the CME locator. The physicians recognition award is a voluntary award. You get it by documenting that you have done CME. There is a part that's formal learning which is category one credit. There's a part that's self directed learning, informal learning and a third part is you read journals regularly two hours a week.

Which we can't validate but we feel that if the physician documents the journals they read and so on. It's a signature. It's an honesty thing. In the category one there's an accredited provider who has a record that you were there. And if it was a procedural course that you learned objectives of the procedure. If you want to get it in depth either e-mail me at the AMA or look at our AMA home page. You'd find the physicians recognition award up there on it.

MS. PETERSON: Just to say that nursing has a similar accreditation system also for continuing nursing education. And also has in many states a requirement for continuing licensure. That we also have an accreditation process.

DR. WENTZ: Pass the microphone back.

MR. COCHRANE: Certainly in Canada we have a number of distance challenges which not only in the business I'm in in terms of Indian health business. But certainly I'm sure in many areas of rural and outpost Newfoundland or Labrador, Nova Scotia. And our biggest challenge is not to educate the medical practitioner *per se* or not to educate the nurse practitioner *per se* although they are great challenges. It's how do we continually educate the community based health worker. So that the person that's in the community 24 hours a day, seven days a week, 30 days a month, 365 days a year who's providing community assistance whether it be mental health programming, alcohol counseling, family abuse counseling, etc. How do we first of all educate because how do we get those people educated? It's a very expensive proposition to get those people out of

communities whether it be rural communities or isolated communities initially. Most of the training is not accredited although some of it is now becoming accredited. It is generally not university or college based training. It's done in other modalities by recognized institutions. But if you get that person with a two, three month course at the start of their work that's a major leap forward. But then in terms of trying to keep them updated in terms of trying to keep them professionally stimulated and trying to get them to work with the other workers in the community, that's the huge challenge for us. And I think in terms of telehealth distance education, for us that's what will make the real difference in our health care delivery system in terms of the change of lifestyle that's required. And I mean as we move away from deinstitutionalization of services because of cost factors we certainly haven't come up with too many brilliant ideas about how to equip the communities better now that people will spend less time in institutions and more time in other settings. So I think that that's a very, very important aspect of where we to change the face of the health care system in Canada in terms of distance education and continuing medical or health education.

DR. WENTZ: Wasn't it in your talk you mentioned the $200 million dollars a year in transportation costs. Are these folks definable by category or are they different community to community?

MR. COCHRANE: They're definable by category.

DR. WENTZ: Are they all advanced practice nurses or are they all anything?

MR. COCHRANE: Well, certainly in those communities we would either have nurse practitioners or nurses with an enhanced community health background. And they would be, if you will, the hub of the system in the community. But the people that actually have the majority of interface with community members are locally based people who would have training courses, as I say, in counseling, family violence. A lot of the problems revolve around mental health issues. The issues I don't have to describe. Disintegration of the family based on noneconomically viable situations. Low education levels, etc. So the nurse practitioner or the enhanced community health nurse would be the hub. But certainly just a hub of a group of local practitioners.

MS. TRUTANIC: Excuse me. Can you just tell me how you would frame that as a recommendation. Because that's what we need to do.

MR. COCHRANE: Well, I would suggest we need to target some of our expenditures, if you will, or some of our programming towards first of all the education and secondly the continuing education of the community based practitioner. Because they are the backbone of the system. Supported by nurse practitioners and certainly by clinicians all the way up the system. But the change is only going to occur with those folks. So we need to target them. Whereas we tend to target the higher end of the system all the time now. If that's--this is not meant to be a derogatory comment, a lower because they are certainly not a lower end practitioner. But we tend to target the easier, reachable practitioner and not the more difficult reachable practitioner.

MS. KETEFIAN: Yesterday the panel of lawyers who talked about licensing and credentialing, I think a major point was left out. And I want to make sure that our discussion takes that into account. Nobody mentioned the fact that one of the major impetus behind the notion of licensure was to protect the public. And this point was missed. And in terms of how does that translate to recommendations I would say that in setting up programs it is important to set standards along the lines that will ensure that the public health is not jeopardized. There may be other things to add to this but I think that notion should be uppermost in our minds.

DR. WENTZ: Thank you. Maybe that's a good segue into discussion on the licensure issue as we get near the end of our time. I sometimes feel that deciphering this current debate about licensure is sort of looking at a Rorschach test. Remember ink blots and everybody is seeing it from a different perspective. Whether they be a physician or a patient or an insurer or a vendor or a government agency. And so a lot of this also--we've got to get over that and we've got to get over a lot of the debate I think really reflects, in the U.S. at least, the changes in our health care system. It's upheaval time on this. Telecommunications has helped to contribute to that upheaval time. But basically some of the questions are, as you said, is it the state's attempt to basically protect the health, safety and welfare of the public, of their citizens? Or you can say is it a restriction on commerce and trade? Is it a regulatory barrier? Or is it a basic safeguard for [inaudible] against people who shouldn't be licensed, etc. Somewhere were the federal government should approach it or is it a case the federal government would overreach if they did? These are really basic issues that we don't have much time to get into. But they're worthwhile. If you will remember [unclear] offered

an amendment in 1995 to the Communications Act of 1995 that said no state shall directly or indirectly restrict interstate commerce by prohibiting any licensed physician from conducting a consultation with a licensed provider in another state using any advanced telecommunications services provided by common carrier. It was withdrawn. But I think it had three consequences.

The first consequence it started a study that came out of the telemedicine report to the Congress. How many of you have seen that? It came out in January. Secondly it created momentum for the Federation of State Licensing Boards to develop a system to have a limited license. If you wanted to practice telemedicine. And a full license in one state, a limited license in another. That hasn't gone very far as we heard yesterday. And paradoxically I think one consequence was some states sort of tightened up and they added full licensure requirements where they didn't have them before. And that did happen, too. So this debate is very open. Well, let me stop there and I'm going to get some comments.

MS. PETERSON: I think from nursing's perspective what we find ourselves in is that the issue of telehealth is what's driving much of the discussion around multistate or regional licensure or national licensure. And from the American Nurses Association's perspective is the issue is much larger than that. Because while you may be having the issue of telehealth driving this it's application and implication is for any trade agreement or any other just the general mobility of health care providers not only using technology as an application for providing health. What has happened under the NAFTA agreement which was very well explained yesterday during the panel discussion was the reservation that was taken by our

Canadian counterparts. And as a result of that 60% of the market for jobs and I'm talking jobs for registered nurses in Canada, for U.S. nurses to move in have been blocked or closed to our being able to access those jobs. Whereas there's no similar barrier here in the U.S. So it is really an issue of reciprocity. It is an issue of say if we're going to open our market and we're going to create a national or regional licensure that we have to be assured that similar types of systems are going to be opened in other countries. And that we're going to have access to those markets because at this point we have now seen a precedent set with our Canadian counterparts that can be replicated as we look to adding Chile to NAFTA or we look to the free trade areas of the Americas to be created. And these are not issues related to consumer health and the protection of the consumers. They were clearly a protection of the system. And it is an issue. And it's bigger than telehealth and the unfortunate part of it is going to be that organizations like ANA, we are going to have to look at wanting to be able to facilitate the use of technology for the application of health. But making sure that we see that there are much bigger, broader implications from a licensure standpoint in particular. Whereas we would like to open it. We have to be assured that there's some reciprocity and we're not sure that there's going to be. That will make us be cautious in our approach.

DR. VANDRE: As a dentist we have never had national licensure in the United States. Pretty much most of the dentists in the United States that I know of feel that the use of licensure in states is used to keep other dentists from coming in and competing. Especially those of us who are in the military have always felt that. And it was only until two or three years ago the American Dental Association came out in favor of supporting national licensure. At least a reciprocity. Just because they knew that each of their state constituents

was against that. I really feel it's probably going to take something like some wording in a communications act from the federal government, at least on the dental side, to get them to allow dentists from one state to treat dentists in another with telecommunications means. I do think that there is a danger in that. We find in dentistry and I keep saying dentistry because I'm not an expert in medicine but in dentistry we find people that lose their license in one state and so they realize I cannot practice here and they go to another state. I know that there's now this national registry of things and I think that's the one fear I have about using telecommunications across state lines is that people that have been found to be incompetent and have lost their credentials in one state might somehow be able to practice across state lines.

DR. WENTZ: You may want to call Chicago and talk to the AMA because at the AMA one of the functions we do is when we have a licensure action--we have a file on every physician in the United States. And an action is taken in one state.

DR. VANDRE: We have that now in dentistry, too.

DR. WENTZ: To notify the other states in which the physician has a license. And we notify them faster than the Federation of State Boards does. And it goes on their LCA and we will--

DR. ENGLER: I think the Washington, D.C. area is an ideal example because for a physician to practice in the three states, if you will, Washington, D.C., Maryland and

Virginia. A lot of expenditure of dollars and paperwork has to be exerted. And it really doesn't make a great deal of sense. And I think the perception of many physicians and I think nurses or other professionals is that bureaucracies and licensing organizations, continuing education, etc. has a life of its own and it becomes a business. That employs people and I won't play the cynic role, frequently health care professionals who don't want to be in the trenches anymore to see patients. And I think it's time to be honest about some of that. That the bureaucracy and the dollars expended administratively are prohibitive. Physicians who like want to go to underserved areas or who want to work at a lower income and I think this is true for nurses as well. Midwives are being penalized. It's the expenses that are dumped on them become quite prohibitive. And I think that the move to make education cheaper because it is more efficient and to also address this licensure issue and streamline it and make it sensible. It's hard to get a license in California and Florida because they don't want people to come and practice parttime. It is economic. And I think some honesty about that. Again I would go back to the alternative medicine arena. They don't have any problems. No licensing, no nothing and they practice medicine every day. And I think we need to simplify.

DR. WENTZ: I want to extend the discussion. Licensing, you must remember, is the most [unclear]. It is a minimal criteria after you finish school and perhaps a year or two of residency in medicine. Important I think is the issue of credentialing and--

DR, ENGLER: Correct.

DR. WENTZ: Not call a consultant just because he's licensed somewhere. I would call them because I knew they were a national authority, could contribute to my knowledge, etc. Which means they have a series of other credentials.

DR. ENGLER: But I think we could learn from the teachers, the schoolteachers have moved to a single national exam, single standards. And I think that's something we need to move towards as well.

DR. WENTZ: We've got that. There is a single national exam now.

DR. ENGLER: Right. But it doesn't impinge on the licensing disaster.

MR. CAPUTO: I'll be brief on my comments about licensure. And I've heard both sides of the issue. I've talked with folks. Curtis [Rooney]. For the AMA. I've talked with the folks from the Federation and I actually was part of a meeting of the state medical boards of five of the six New England states who were willing to sit down and talk about it. And basically we all arrived at the same conclusion. There is no data out there to explain the fears and the concerns that many people have about what's going to happen if you do start allowing physicians to practice across state lines. There's a lot of theory as to what will happen. That there will be litigation. That people won't have the ability to enforce restrictions against that physician because the physician's in a different state than where the patient was. And in New England they have agreed that it is probably worth their while to look at reciprocity of medical license and clinical license across state lines between states that

are in the same geographic location because the physicians do know each other even though they're in other geographic areas. And typically do call for the curbside consult or for the referral across state lines. And what was suggested was that perhaps there should be some sort of a pilot study in one focused area and no one could seem to argue with the fact that maybe we would do this for centers that deal with pediatric complications. Not many people can say bad things about trying to provide better health care for kids who are in trouble. And so that is a move that's going on in New England and I think that we ought to look at this perhaps in a group of states that are ready to go. If it doesn't happen in New England, somewhere else because although it will happen that you'll have Mayo Clinic conferring to folks in parts of New Hampshire and Maine, for the most part I think what you're going to see is it's going to be in the same geographic area but not limited just by the political boundaries of the state.

DR. WENTZ: [Inaudible] I will mention that in California the state board of licensure is working on a system where you can register with them without having a California license. And they're just implementing that at this time. So that might be the sort of pilot project Michael, that might be worth looking at. I believe Utah has an exemption provision that might be worthwhile looking at also in medicine. I'm sorry, in nursing--

MS. PETERSON: The state board of nursing--I think they're looking at a license that's similar to a driver's license type of concept is where they're heading. And actually I think that we would not have a problem with cross state communication and cross state licensure. It really is the international aspects that are of concern to ANA.

MR. BAUMANN: I'd like to introduce a different perspective to this licensing issue. We are service providers. So we don't mind about the person's qualification. We have to make sure that the person who has a certain qualification expressed by license, for example, is actually the person who is providing the medical act over our network. So in addition to licensing an individual you have to make sure that there is an issue of--well, that you have tools that make sure that that person who provides [unclear] is indeed the person who has the qualifications and the legal responsibility. That is directly attached to licensing issues.

DR. WENTZ: There are ways in which electronic medical [inaudible]

MR. BAUMANN: But there's no standard or any obligation.

DR. WENTZ: So that's another perhaps challenge and an opportunity.

MR. BAUMANN: It also ties in to information distributed over the Internet. It's true it's very easy to access information on the Web although there is much too much information nowadays already. You have to make sure that the data integrity is assured because an article in which you are going to make a medical decision afterwards based on if that article is not authentic then you run into trouble.

DR. WENTZ: The problem is people tend to believe what comes on the Internet. And you would not believe the types of stuff that you can see up there from "authorities" that are nameless.

MR. BAUMANN: And it's very easy to use somebody else's name. Very easy.

DR. WENTZ: Oh, that's right.

MS. PETERSON: Well, that's an issue for telemedicine. That's an issue for delivery of health care regardless. Whoever is wearing that pin or is putting themselves out to be anybody. You can do that when you walk into a patient's room. It's a problem regardless of--that's a problem broader than beyond even just telehealth.

DR. WENTZ: Well, I think there's many more points that we could [unclear]. Hit some hot buttons in this licensing issue. But we must end because we've got some work to do. Cynthia has to get this ready for a report. We'll all hear what we thought soon. I want to thank you all for contributing so many good ideas to the discussion and we hope that you all felt you've heard something from each other. Thank you very much.

End of Recording

ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

DISEASE MONITORING AND MANAGEMENT

DR. JOHN WOODALL: Hi, my name is Jack Woodall, and I'm the director of ProMED-Mail, a non-profit system for reporting outbreaks around the world. We will introduce people as we go around. I welcome you all to our panel this morning on disease monitoring and control management.

For the first session, from 9:30 to 11:30, we'll be talking about disease monitoring. Then after the coffee break, this session will turn over to Dr. Hirsch and Dr. Holloway, who will carry on with their demonstration of disease management.

I have with me this morning Dr. Johan Giesecke, who is the State Epidemiologist from Sweden, who is going to tell us about Eurosurveillance and the type of disease monitoring that goes on in Europe. Mike Sharpe from WHO Geneva in charge of Global Information Access Strategy will tell us about using the Internet and electronic connections for disease monitoring. Next we have John Mullaney, who is executive director of SatelLife, which has innovative satellite strategy and other connections for the Internet. Without SatelLife, ProMED-Mail would not exist. Over there is Steve Corber from the Pan American Health Organization. He is the director of Communicable Diseases. He will tell us about their system for monitoring diseases in his hemisphere.

Now let's go around and introduce ourselves.

MR. LOUIS GRANT: I'm Louis Grant from Washington, DC. I'm working with Jim Barron.

DR. HARRY HOLLOWAY: Hi, I'm Harry Holloway. I'm a Professor of Psychiatry and Neurosciences at the Uniform Services University.

MS. BARBARA ROSENBERG: I'm Barbara Rosenberg from the Federation of American Scientists and part of the Pro-MED project.

MS. MARY ANN BOWER: Mary Ann Bower and I'm a telecommunications and software consultant from Colorado.

DR. ERWIN HIRSCH: Erwin Hirsch, I'm the director of Trauma Services at Boston University. I'm here to work with Dr. Holloway.

MR. ALEX FRASER: Alex Fraser from SatelLife.

MS. HEATHER TOWNSEND: Heather Townsend from SatelLife.

MR. DREW TAYLOR: Drew Taylor. I'm a consultant invited by SatelLife.

MR. SAKUICHI OHFSUKA: I'm Sakuichi Ohfsuka from [Inaudible] in Japan.

MR. TADASHI NAKANISHI: I'm Tadashi Nakanishi from Stanford University. I'm interested in information retrieval for the multimedia systems.

MR. KAZUHIRO MORITA: I'm Kazuhiro Morita.

DR. MICHAL BAER: Jean Pasteyer and Michal Baer. We are managing the Emergency Medical Services in Paris, France [Inaudible].

DR. WOODALL: Thank you very much. I'd like Mike Sharpe to start us off.

DR. MICHAEL SHARPE: If you scroll down the home page of the WHO you'll see "Outbreak." That's what the world is watching all the time for the latest and greatest on anything happening.

We have an ongoing situation in Sierra Leone. There are public health control measures going on between the WHO authorities and the country officials there. There is also the issue of lead poisoning that people are afraid of. This makes it difficult to do public health control measures at times. It spikes as we go through the year.

Good morning, ladies and gentlemen. I am speaking today on behalf of Dr. David [Heymann], the director of the Division of Emerging and other Communicable Diseases, Surveillance, and Control, commonly known as EMC. This division is in the World Health Organization. He wishes to thank the organizers for inviting EMC to participate today. EMC was formed in October, 1995, upon recognition by the World Health Assembly that infectious diseases have become a serious public health threat.

While communicable diseases continue to be a major cause of illnesses and deaths in developing countries, industrialized countries have become increasingly aware that they too,

are at risk. Few public health concerns today carry the sense of urgency and importance as that of emerging and reemerging communicable diseases.

Many factors contribute to this problem. Population growth, migration, urbanization and poverty are key. Other factors include changes in human behavior, land use, agricultural practices, climate and environmental conditions. New concerns have risen about the ability of infectious agents to cross the species barrier from animal-to-man, anti-microbial resistance and pesticide resistance. Finally, increases in world travel and trade have made humans a principal and rapid vector of infectious diseases. Yes, the picture has changed.

In the past 20 years, some 30 new disease-causing organisms have been identified. Old ones are reemerging, sometimes more virulently. We could say it is possibly because of more attention to the electronic global surveillance. But it's not just that. It is happening with greater frequency.

In total, the frequency of occurrence of unusual disease threats of international importance is increasing. When there is slow detection response and or irrational international or local response, there will be significant economic impact. We have the 1994 plague epidemic in India. A total of $1.6 billion was lost in India. That was a phenomenal impact on the country of India because of an outbreak in one specific location.

We also have the 1991 cholera outbreak in Peru. Both are very clear examples of the economic impact of outbreaks. This does not include the cost to industrialized countries, who instituted domestic quarantine measures for disease outbreaks that occurred thousands of miles away.

That is the problem in a nutshell, and I'll talk about the response that WHO/EMC is putting together. A worldwide partnership of countries, non-governmental organizations,

international organizations and individuals are required to respond to this growing threat of emerging and reemerging communicable and zoonotic diseases. As one of the partners in this global effort, EMC's strategy is to work with these partners within a global framework to reshape and strengthen the network for infectious disease surveillance, preparedness and response. Laboratory-based surveillance, international communication networks, national surveillance systems and a strong public health infrastructure form the basis for this strategy.

There are four areas of concentration by EMC. They are global, monetary and alert systems to bring together laboratories and disease surveillance systems from all countries to share information internationally through electronic and printed media. Secondly, global information systems to ensure that information collected through global, monetary and alert systems can be rapidly and widely disseminated to those who need to know around the world. Thirdly, there are national and regional preparedness to ensure strong, local disease surveillance and control. This is done through the regional offices because the entire national and regional infrastructures in various parts of the world are uneven in strengths. This is not a "top-down" approach. This is a "working with all of the partners" approach. The fourth is international preparedness to provide strong, coordinated and engaged response at the international level while countries and regions are improving their capacity.

Global information access is the project that has been in development stages for the last nine months. It's about to get launched this summer. Underlying this global framework is a fundamental need to fully exploit the state-of-the-art information technology such as the Internet and the World-Wide Web. To do this, five global, monetary and alert systems will be strengthened by EMC and will serve as examples of how such technology is being used.

The first area is International Health Regulation. It is the only international public health legislation which requires mandatory reporting of infectious diseases. To transcend the regulations into a working global alert system, WHO is revising them to broaden their scope through electronic links with quarantine officers and veterinary officers in the 191 WHO member countries. The system will become proactive in providing immediate reports of disease and syndrome outbreaks of international importance, permitting timely provision of recommendations on what measures should and should not be taken in response.

WHO/EMC Collaborative Centers comprise about 200 sites, mainly human and veterinary microbiological laboratories. These laboratories are centers of excellence which provide reference services for verification of the diagnosis of bacterial, viral and zoonotic diseases and/or ensure training for epidemiological services for WHO member states. Linking all centers electronically will ensure regular exchange of information on infectious diseases and permit timely identification of problems and needs so that necessary training, supplies and/or reagents may be provided. Information from this system is regularly used to update the EMC Disease Outbreak News that we put on the World-Wide Web.

Antimicrobial resistance monitoring networks are an expanding network of medical and veterinary laboratory centers which perform antibiotic sensitivity testing. The national data are used for antimicrobial policy formulation and are electronically fed into the WHO regional and global networks for monitoring of drug resistance. The information will be displayed in the future in geographical presentations on the World-Wide Web.

The EMC Rumor Disease Outbreak List contains unconfirmed rumors of communicable and zoonotic disease outbreaks worldwide. Rumors are received from various sources. This list is distributed electronically only to key public health policymakers in each

country, UN agencies, and NGO collaborators for policy consideration prior to actual confirmed reporting of those diseases. Once confirmation is received it is published in the EMC Disease Outbreak News.

Other active global surveillance mechanisms include the influenza network which collects information from over 130 participating laboratories worldwide which is used each year for decisions on influenza vaccine composition for the following year. As well, the HIV/AIDS surveillance network which provides information from over 90 central sites. This is used to make HIV estimates each year. The influenza network is the first of these active systems to go online. It has direct electronic data entry by participants and it has global access via the World-Wide Web to query the database and generate comparative charts and maps. It is on this prototype that EMC will be building other global disease databases.

The participants of the aforementioned monitoring and alert systems have been targeted as a priority for electronic linkage under the EMC Global Information Access Project. That in a nutshell is the summary of our five targets that we are doing for the Global Information Access Project.

I've got just a few slides here about the Ebola-Tai Forest Project in Cote d'Ivoire. This is a good example of a recent remote project that we have. This is in the Tai Forest, Cote d'Ivoire. They are doing the research for the reservoir for the Ebola virus. This is the laboratory. It's occupied right here in this camp. The facilities are quite primitive. Communication is a very critical issue. My job is to get communications in there so that while the camp is occupied, they can communicate with the outside world. This is also important, not just for reporting results or emergency situations, but to bring in teams of media, CNN, ABC, Global One in Britain, etc.

This is a walkway platform of 150 feet high in the jungle, a canopy to attach the wildlife at that altitude. It was a little tiring to keep going up and down trees, so they built platforms between trees throughout the jungle canopy. It's an interesting communications problem for them. EMC's mission for the twenty-first century has been to include rapid information exchange among global networks of partners.

The telecommunications technology that we need may only be basic, but it will have the greatest impact for all of humanity. Thank you very much.

DR. WOODALL: Thank you very much, Mike. There is time for some questions now. Please state your name and then ask your question.

MR. JOHN MULLANEY: On the slides that you have shown, there was one section about sporadic recording. Latin America was highlighted in green. I would just like you to explain a little bit because I didn't understand exactly what that was about.

DR. MICHAEL SHARPE: Was that the utilizing network one? Okay, that would have to do with the influenza reporting. We have 130 national sites plus some subnational sites. But there are some gaps in the world, both in actual collaborative and also sometimes just in the frequency of reporting. That's where those gaps come up. They are very much a priority being addressed. It's a combination of communication access and just the reporting itself. Before it became electronic it was more of a manual system.

MS. BARBARA ROSENBERG: Barbara Rosenberg, I have two questions. First about international health regulations, is there any controversy involved in switching to syndrome reporting and when do you expect the new regulations to be enforced?

Secondly, about the Rumor list. How do you maintain confidentiality on that if it's going to individuals in many different countries?

DR. MICHAEL SHARPE: Okay, the first one, the international health regulations. There will be a pilot project for 1998. It is expected to be implemented or passed by the World Health Assembly in 1999. Yes, this is an interesting issue because it is moving from disease-specific reporting to syndromic reporting in order to be more broad, and to try and encourage more reporting by countries.

For example, on the issue of cholera, some countries are rather hesitant to report these specific disease outbreaks of cholera because they are afraid of their impact on their trade and tourism. They try to do it as a syndromic reporting. We hope to encourage them to report more willingly. EMC has been criticized for not being more aggressive given the new state of the situation in the world today. We are taking steps to get more direct reporting, not necessarily relying on ministries of health, if that is the case. We have legal interpretation that our WHO Collaborative Centers are perfectly capable of reporting directly to us and we can take those as confirmed reports.

The second question is in the area of the Rumor list. The sensitivity of that information is actually time sensitivity. That is the most critical thing. It is sent to on average, only three primary contacts per country. We have that kind of control. We know who it's going to per country. It's not widespread outside of the developed world yet. It

started through the G-7 initiative and has been taken on by EMC, so it hasn't spread widely yet. But it is spreading widely into the UN agencies and NGO checklists, the NGOs who are our partners. We are not sending them to a common address in the NGOs. We are sending them to specific individuals who have a need to know.

DR. WOODALL: There will be time at the end for more questions, thank you. Now I would like to pass the microphone to Steve Corber.

DR. STEVEN CORBER: Thank you, Jack. I was happy to hear Michael's talk this morning about increasing risk of emerging and reemerging diseases putting this in a public health sphere because yesterday's talks were primarily concerned with diagnosis of patients and patient management. So I think that's our focus today, and specifically we will be looking at surveillance.

Just to briefly introduce, I'm not sure how many people are familiar with PAHO. It began in the early 1900s as a partnership amongst the countries in the western hemisphere to prevent the spread of communicable diseases. With the establishment of the World Health Organization approximately 45 years later and its regional offices, they chose in the western hemisphere to use the existing Pan American Sanitary Bureau, as it was called at that time, to become the regional office of WHO.

We have PAHO as part of the inter-American system and we also have it as an office of WHO, though I'm not going to go into much more detail in that except to show you that there are offices in virtually all of the countries in the region where we have some professional staff generally working through the ministries of health. I say not every country

because in the Caribbean there are a lot of small countries. But certainly all of the countries in Central and South America and there are about four or five representatives of the countries of the Caribbean that cover the entire region.

Looking at surveillance, what we're trying to do is the establishment of a global surveillance system so that we can detect whatever is unusual. Generally we look at surveillance as a regular monitoring of disease patterns and a regular reporting of information. But with the increasing importance of emerging and reemerging disease and the increasing importance of travel and interconnectedness of people around the world, the idea of presenting things which are unusual seems to be coming more and more to the forefront. So the idea has come up in a number of plans. WHO plans for emerging and reemerging diseases, PAHO plans for emerging and reemerging diseases, the United States, the Presidential Director, the G-7, all of these plans for emerging and reemerging diseases are focused on global surveillance as the first thing mentioned in virtually every one of those plans.

The idea is to see what is unusual and report it to those people who ought to know. The objective would be to get standardized reports by E-mail weekly and have the data analyzed and available on the Internet. That is what we hope to do.

End of Side A, Beginning of Side B

DR. CORBER: I want to put the communications in perspective with regard to the whole surveillance picture. There are a lot of problems related to the sharing of information. The first is, countries report late. We get reports of cholera, on Michael's example, from some

countries. The latest report we have is April 1996. Even in Latin America where we are having outbreaks.

There is irregular reporting that comes from different sites at different times. Some areas within a country report quickly, other areas report much later. Some physicians and labs are much

quicker than others. There is also incomplete data. We don't get the whole picture. They leave out cases or names or areas or whatever. There can be nonstandardized data sets, and Michael's already referred to that, which is the idea of moving to syndromes. But to put another aspect on that, when you have tens of thousands of cases of cholera and they are occurring in remote areas, areas that don't have hospitals, etc. Some countries are reporting by people who have diarrhea and look like the same as other cases.

Some cases have physicians reporting based on clinical diagnosis, other areas are waiting until they get confirmed lab reports before they report. We count them all as cholera, but they are not all the same. There is a lack of computing resources, and there is also an unwillingness to provide data, which has also been referred to because of the possible economic impact and image of the country.

We're going to concentrate today on the sharing of information, but I just wanted to put it into some kind of perspective. What we're sharing is also very important.

All of this still is on the lower end of the scales as I listened to yesterday's presentation. We go from people telling somebody personally about a disease through mail, telephone, fax, E-mail, and the Internet. Even the Internet from yesterday's presentation was referred to as the low end of technology, but in the countries we are working in, that is quite high end.

Jack asked me to present some idea of how to get information to PAHO and I've broken it down into three areas. Two areas of how we get it and one that we produced which we have already seen a bit of. I'm going to talk about the vaccine-preventable diseases such as polio and measles, generalities about disease prevention and control which cover diarrheal diseases, respiratory infections, dengue, malaria, tuberculosis and leprosy, sexually transmitted diseases, HIV and AIDS, and we will talk very briefly about core data.

First of all, I think I have already alluded to how these diseases in the real world actually come up. The disease is found in a locality; somebody reports it. By regular mechanism, they are supposed to report to their municipality, the municipalities report to some sort of region or province or state. The states report on a regular basis to the national center, usually the Center of Epidemiology. These national centers report to PAHO and we may report to other agencies: WHO, the World [Inaudible], etc. Each of these have different levels of sophistication.

With regard to vaccine-preventable diseases, there are many reporting sites. The usual way both with polio and measles is that the local people report by telegraph or in some cases by E-mail in some of the localities in some of the countries to the province or the state. As you move up to the national, they picture changes when you go from national to PAHO. There is relatively more countries, and I'm not going to go through the list of each one, reporting to PAHO by E-mail or modem and some by fax. Very few are reporting by telephone, but for vaccine-preventable diseases it follows this kind of a pattern. We have this for many diseases.

We have central laboratories in measles which confirm the diagnosis and all of those laboratories are hooked up with the local offices in the countries, the PAHO offices, so they

send their information to the PAHO offices usually by E-mail. We have an E-mail connection so that all these come to the central office. Once it gets to the laboratory reference centers in the countries, they are passed to the PAHO centers and then very quickly by E-mail to the region in Washington. That is a similar pattern that takes place for polio.

Looking at the other communicable diseases, each of these diseases has their own separate reporting system so people who are seeing malaria and reporting them may be different from the people who are recognizing data at the local level. They are different from the people who may be reporting leprosy. Often the physician is treating several different types of these diseases. When you get to the provincial or state level frequently there are different epidemiologists handling each disease. At the national level there are certainly different experts in different diseases, and then PAHO would get them by disease category. Looking at the local level, for most of these diseases, virtually all of them, the diseases are reported by mail. From the local to the province by mail, from the province to national, a few countries such as Brazil and Mexico use fax. Most of them are still reporting by mail, and then from national to PAHO it is usually by mail, a few of them -- Nicaragua sends it by E-mail, Mexico by E-mail, most of the others will send it by mail. So it's not a rapid system. In the case of an outbreak or rumors, representatives will report back to us by telephone.

These diseases: malaria, leprosy, cholera and tuberculosis get much more detailed and sophisticated reports presented on an annual basis. But that is not a rapid communications issue. There is nothing reported from the countries to us on the Internet.

AIDS and STDs. AIDS is usually reported as a separate disease. It is usually seen by different treating people and is reported differently. From the municipality to the province, most of the time it's by mail. Sometimes it's by persons. People who are actually going from their city to the state or provincial level will take the paper with them or tell them about it. From the provincial again, even from the state to the national level, in most countries AIDS is reported on a mail or personal level. From national to PAHO it is by fax on a regular basis, and then from PAHO we present paper documents. Every three months we send out documents. It is also on the Web similar to what you saw here.

There are studies that take place in certain sites that we've organized. So people can report but not rapidly. They take over periods of weeks or months. Looking at specific syndromes, list serves, etc. such as prostitutes, pregnant women, drug users. So we have produced at PAHO a manual to help people on how to report and how to diagnose. We've also established some sites in countries. We're having trouble with these because of funding. They are not really operating that well at this point.

Regarding sexually transmitted diseases, there is really no system in place at present for reporting STDs. There used to be separate systems, particularly for syphilis and gonorrhea, but with the dismantling of the vertical systems for healthcare now, countries are moving towards integrated systems and providing primary care at the local level. These special kinds of disease-specific personnel are not there and they are not concentrating on specific diseases as they used to. So we get reports, but they are much more general and not as clear. All the difficulties that we have with the information that I presented at the beginning: standardized data, regular reporting, on-time reporting, etc., are much less in place than previously.

Some comments about general epidemiology: we are having a meeting next week in the Central American countries to share information and the focal points. The National Director of Epidemiology and the communications people will be meeting by teleconference on how to share their information amongst each other by E-mail. They are going to be working on agreeing on case definitions so that they agree on what a case of malaria is, cholera, or leprosy. They will be talking about the basic indicators that they are going to use to report. They are going to help each other define laboratory procedures they are going to use so they will be in agreement on what they are reporting is the same thing. The first meeting will be taking place next week.

The other thing that is happening on the Internet is the fact that PAHO is collecting information on the different countries and providing it on the Internet. You saw an example of human development, health problems, disease control. They tell you about the various diseases and the numbers of cases of polio, measles, leprosy, etc. It also shows the number of places with good water supply and the type of waste disposal system that is present in the country and health services. We got a glimpse of that with Peru. The number of health professionals that are there, mainly doctors and nurses that are being trained will also be shown.

What are the needs? There is increased interest in all the countries to participate in communications and the use of computers. There is a large number of people in Latin America who are really highly skilled or in working with computers. But it doesn't get down to the local level. There is increasing interest in governments who collaborate with each other, usually for economic reasons and trade so they are starting to work with each

other more. Also the product level can be more user-friendly, so they are not quite as complex and difficult for people to use.

Unfortunately we still have some major problems. The cost of the equipment is great, the training and complexity of the training can be quite difficult, and the willingness of people to share information remains a problem.

What are the needs in our area? Well, obviously we have to develop the Internet, both in terms of human resources and equipment. We have to develop partnerships. As I alluded, in Central America they are starting to work together and we as people with some expertise must help them. We have to work communications, not only the physical ability to do it, but also attitude is important, the willingness to share. So, equipment training and the will to work together are important. Thanks.

DR. WOODALL: Thank you very much, Steve. We've got time for a couple of questions.

DR. BAER: How long does it take for the information from the very beginning to get to you, you check it, you trust it, and get it on the Web; the average time?

DR. CORBER: I think it depends on the situation. In outbreak situations such as the situation with leptospirosis in Nicaragua or yellow fever in Bolivia this year and leptospirosis last year, I think we get the information very quickly. They are usually here within a couple of days from our representative in the field.

We usually work very quickly to confirm the diagnosis and that is usually done within days or certainly a week. Leptospirosis took a little bit longer because of the confusing

picture of the disease. Assistance mobilized very quickly and there were rumors just last week of meninges toxemia in the Dominican Republic and we knew about it relatively quickly.

For the other diseases which are more regular and ongoing: tuberculosis, leprosy, malaria, cholera, those are not emergency situations and the reporting is supposed to be weekly. Sometimes it's monthly. It's very irregular. We keep reminding countries.

I think the best example would probably be AIDS. AIDS, where countries reproduce a report every three months. Countries are supposed to report by the end of April all cases up to the end of March. They usually do it. By the end of June we will have the reports for up to the end of March on the World-Wide Web.

There are different needs for different diseases. But in urgent situations, we can be pretty quick.

MR. ALEX FRASER: If I'm a local physician who is recording into this network, how would I then get the information that I or my colleagues have recorded?

DR. CORBER: That's a real problem. That's really up to each country to assist its physicians whether in Canada or the United States, Mexico, Brazil, or Nicaragua. It's always different. The primary use of that information is within the country itself.

If you report cases of cholera you would want the other physicians in that immediate area to know more than anybody else. When you report it right at the local level, at the municipal level, they should be sending out information to the other physicians in the region that this is reported. They are not just supposed to take the information and send it to the

next level and the next level. Each level has some degree of responsibility on how they are going to handle the information. So it should be right there, the other physicians should know.

It doesn't always work that way, but certainly at the state level they should be producing, if not weekly, they should be producing monthly reports of diseases reported in that area over the past month. It doesn't work that way and especially in the developing countries. But certainly in Canada and the United States you get reports every month; and in many of these countries, you do, too, at the local level.

MR. GRANT: Where does what you do start, and where does it stop?

DR. CORBER: At PAHO? Our job essentially is to help provide technical cooperation to the countries so that they can improve their own capacity to monitor disease and look after their health system. We use the information as a means for helping them to improve their situation. We get the information, we encourage the countries to report it to us, and record it.

We are not responsible for the collection of the information. We are only responsible taking the information and transmitting it. When we get that information and the form we get it in, we can see the deficiencies in the country, and then we make recommendations to them about the training that they need in order to improve it. We assist them with what they need to report and help them with their legislation and in practices that would reduce the spread of disease such as testing blood in blood banks to prevent the spread of blood-borne

diseases. We might also recommend improving the lab requirements so we can help them improve their lab capabilities.

We use the information to help them better the kind of information they are getting and the control measure that they have in the country.

MR. GRANT: I have a follow-up question if I may. A conference like this, it seems to me, what I'm getting so far is where each institution or individual is expressing what they do. It seems there is a great need for integration. The total need is being met rather than just the pieces being performed. A further discussion to how we integrate that so that where you start and stop and where it goes from there is really one of the biggest needs there is.

DR. CORBER: I agree with that and perhaps Jack will be saying that is what our next task is.

DR. HOLLOWAY: Would you make some comments on the media's interest in your system? You're in a relationship with the media and the relationship between PAHO and the media and the individual participants in the information system. How are those interfaces managed? Are there any emerging lessons to be learned there?

DR. CORBER: There are several lessons to be learned. I think there is increasing interest by the media in communicable diseases in general. All news is local news, I've learned. So in particular in the aspect of how it affects people from their countries who are visiting or the risk of the disease being reported into the country of the news area.

I've only been at PAHO for a year-and-a-half. I understand that we tended to be very guarded about sharing this information as many of the scientists are in terms of what their knowledge is. They know how to interpret it and confirm it. That is true in many places, not just PAHO.

Over the last year though, there has been a real effort in the organization to share information and to be open with the media in the hopes of educating and working together. The reality, of course, is that the media are frequently getting the reports of the diseases as quickly as we are. Their surveillance system is in many ways better than ours. They have a real interest in sharing the information. Whereas many of the people in our countries have no interest in sharing the information.

The way I see things moving in the future is to use them as part of our surveillance system, as the Rumor list, when the media reports something we shouldn't run away and say, "No, we are not going to discuss it. We have no evidence of that," and hang up the phone. I think at that point we have to take it as they are on our side, they are providing some information to us, we should investigate it and tell them we'll get back to them. By establishing that trust, I think they will believe us more.

One brief anecdote, in the case in Nicaragua a year-and-a-half ago there was an outbreak of leptospirosis with several thousand people coming down with similar symptoms, that was ultimately diagnosed by CDC experts that we helped arrange to go down there. We work very closely with CDC in these kinds of outbreaks. One week after it was diagnosed as leptospirosis, I got a phone call from CNN that there was a physician from Honduras who said that it was not leptospirosis, but some other disease. The physician went on national television and said that. CNN wanted me to confirm that. I said, "I have no evidence to

that effect. From all I know, it's leptospirosis. I'll check and get back to you, but could you also please check who that physician was and where he said it?"

So I checked and CDC said, "No, it's still leptospirosis." He checked and told me it was the Head of Internal Medicine at a hospital in Honduras who was providing that information, and by him giving us that information, we were able to go back to the country and tell them, "Look, this is the situation as far as we know it. Would you please, unless you have specific evidence that is different that we would like to check, we have to say at this point that it's leptospirosis and that's the line."

They actually helped us in that way to quell a Rumor.

DR. WOODALL: Thank you very much, Steve. Let's move on. Next I'd like to call on Dr. Johan Giesecke from Sweden to tell us about Eurosurveillance and we are just bringing up the Website now.

DR. JOHAN GIESECKE: It has outbreak reports. This was here because there were people from Europe involved in this one. This is one thing that's being pushed quite hard to have Pan European review articles and other outbreak reports in this publication.
This is the electronic version of a monthly capability meeting. It points to one particular European program. The editorial office is in Paris and in London. It's not in one place, it's in two places. As you can see it is printed in both languages.

I'll talk a bit about electronic surveillance and communication in the European Union. I'm a State Epidemiologist for Sweden for about a year but I guess that's not why I'm here.

It's because I'm European that I'm here, so I'll talk more from that perspective. I'm involved in several other projects I'll be mentioning. That's the reason I'm here, I guess.

The border between the 15-member states of the European Union are rapidly vanishing in many respects and it's getting easier and easier for people and for goods to go between countries without any problems at all. This has led to the realization that better communication is needed on outbreaks and on communicable diseases between the member countries. The things that need to be communicated between the member states are these. For example: outbreaks, untoward events of other kinds, rare diseases, new syndromes, routine surveillance, and the most sensitive, suspected sources, which Jack Woodall and I have been talking about. I'll get back to that one.

One particular European problem is that not all countries have a surveillance institute like the CDC. Of the 15 countries, 10 have something similar. Specialized infectious disease surveillance institutes. Belgium, Denmark, Finland, Prague, Germany is a bit special because it's a very federal state government; much more federal than this country. National reporting to Berlin is not working all that well. Italy, Netherlands, Spain, Sweden and UK has four surveillance institutes, one from England, one from Wales, one from Scotland, and one from Northern Ireland. Five of the countries do not have any surveillance institute at all, but surveillance is still at the Department of Health [Inaudible], Ireland, Luxembourg and Portugal.

What's the problem with this? Well, I would say that there is a clear inclination among institutes that regard communication of outbreaks and untoward events as a scientific thing, but there is much more concern with political consequences and political correctness when you get into the ministries.

Another particular European problem is that the autonomy of these ten different institutes towards their ministries varies very much from country to country. This affects communication. The main central European Union initiative concerning communication has been mentioned at this conference. It is called EDA, Interchange of Data between Administrations. It is sponsored by -- I'll just make it brief for those of you who do not know the Euro bureaucracy. There are 24 DGs [director general] in the European Union right now. I usually try to look at them as ministries. That's not really what they are, but it's the simplest way to see them. DG-1 is the State of Foreign Affairs. The ones that I have the most connection with are DG-12, which is Medical Research. DG-13, we saw here on the screen an hour ago which is Research in Telematics and DG-5 is Public Health. That may move to DG-24 but is still DG-5 Public Health. That is an important player in this world.

EDA has not been funded by any one of these, but by DG-3 which is promoting European Telematics. So it is, and my French colleagues may share, the initiative is driven to some extent by the industry. I think without knowing anything about it, I think it has some similarities to the G-7 Initiative. The demand does not only come from the floor, but also from the industry side.

So EDA is this interchange of data between administrations, and its plan is to provide hardware and software for various kinds of communications. Not only in the health sector, but many other administrations as well.

End of Tape 1, Beginning of Tape 2

PROFESSOR GIESECKE: You were showing from the Peru data about the country's life expectancy and prenatal mortality, often not very urgent communication. There is one project called "pharmacovigilance." That is adverse effects of drugs. There is one subproject for infectious disease surveillance, which is the one that I have been involved in.

The system will start operating this year. It has changed its impetus quite a lot over time. It was planned originally to have one central server for all the infectious disease surveillance data. It was never really decided where that server should be put. That is always a problem with the European Union. It has changed. So now each of the 15 member states, each institute like mine, will have its own server and be responsible for the data on that server. There would be a protocol for urgent messages along the lines drawn by the G-7, about six months or maybe a little bit more ago, which would be closed to only the 15 surveillance institutes, at least initially. All communication would be in ordinary www lines encrypted. There will be a central server and ISDN lines that were only for this purpose. The communication would be much more open than once originally planned. Most information would be stored on this local server where the project will supply the templates for the information. The project will also provide direct access to various databases that are existing already and that are being brought into the project.

There are three being opened up now at present: the Summit, the EuroAIDS and the EWGLI. I will just mention those three so you know what they are.

The Summit comes up CDSC, Communicable Disease Surveillance Center in London, where all the member states and some countries outside the European Union. Canada not very long ago reported an outbreak of salmonella going up. It reported all phage-type salmonella strains that are found. So it is not just outbreaks but all the ordinary phage-typing

that goes on is being reported to London. Questions are still routed through CDSC. There is no really good communication. I can not directly access the database in London. I have to fax or call someone there to ask if I want to know an answer to a question. This network has discovered several international outbreaks and is one of the prime examples of the benefit of international collaboration in outbreak surveillance. It aims to include USA. It has included Canada, Japan, South Africa, Australia and a few other places.

The second one is EuroAIDS, which is a European database for AIDS which is also not very electronic. We send diskettes every quarter with our AIDS cases in Sweden to this center. They produce quarterly reports about the AIDS situation in the European region. But this database will then also be opened to access from the outside.

The third and last one is EWGLI, European Working Group on Legionaires Infection. This one is also not very advanced or high tech. We send out cases by diskette monthly to London. It has discovered several outbreaks involving tourists from different countries. With the European situation where tourists from many different countries often go to Mediterranean hotels, and there will be tourists from five, six different European countries in one hotel. An outbreak may not be noticed in each individual country. This has always been quite successful, but it is not very high tech yet.

These three databases will now be searchable directly. I am not quite sure how open this will be. It has not been decided whether only members will be able to search or will others also be able to search these databases. For some it is only going to be members, at least initially.

Other initiatives in the area. There is one, prioritization. Which diseases really need electronic communication? That is something we are working on. There is a group of all

the heads of surveillance in European countries which meets regularly. In that group there is a discussion which obviously we should concentrate on. There is an inventory going on that is part of the EU-US cooperation called the "EUUS task force," which will do a proper inventory of all the resources for infectious disease surveillance and control. This will be opened and out on the Web. It is quite a big project. There is an electronic weekly bulletin, but is the paper version. There will be within a few months a weekly, purely electronic version for Euro surveillance. I am not sure what the Web address of the electronic version will be. It is not up yet.

On the larger scale, there is also an initiative which was taken this spring to set up the network between all the European countries of reporting communicable diseases to each other. Exactly how using the system will work, hasn't been decided yet. It seems to me that it is unlikely that there will be a European CDC in the near future. There is too much national feelings involved in that. The problem might be one center in Europe that has all the collection, but they would rather have distributed systems. The topic of this conference could play a major role here. We could have a virtual CDC in 15 different places in Europe. It would not be possible using modern communication.

A few institutes actually update their Web page from the Internet automatically which is quite nice. Finland does that. This is the Web address. You can get directly from their [Inaudible] and it goes directly into their Web page. So you can see the number of salmonella cases in [Slavolac] last year, if you want to or last week. The Netherlands are doing that in a trial fashion. They also move the data directly from internal surveillance databases out on the Web. It is searchable either the next day or maybe in the same day. A

few other countries are doing that as well. You have to understand Finnish or Dutch to read them. Most diseases have similar names.

So what will the communication be between the member states? Outbreaks, yes, there will be some system within the next year or two for communicating outbreaks between member states. Rare diseases, maybe new symptoms, or maybe routine surveillance, that are slowly building up now. The problems are not technical to my mind. It is more about case definitions, the diseases that should or should not be included, what kind of data should be provided for each disease. These are not technical issues. They are surveillance issues, and they will take a long time to solve for 15 different countries. The most sensitive bit is unsuspected sources, which is always economic and political implications, when you name sources, restaurants, food chains, hotels and things like that. There I don't see that that will be open like the ProMED system in the near future. I think it will probably be a restricted communications network between the 15 member states just like I guess you have here in America between the 50 states of this country. Thank you.

DR. ERWIN HIRSCH: I am sort of the frog from another world here. I don't belong to the club of viruses or bugs. Can somebody tell me why we can't do all this with a fax machine, western union or some very primitive thing? I understand political concerns, I don't understand if we are here to explore telemedicine, what we have heard here that cannot be done by much more primitive things and go to a telegraph office? Issues of Latin America, so what? If Brazil has ten more AIDS cases I can pick up on the Web or I can use UPI. The WHO spends an enormous amount of the country's dollars either to duplicate what the European countries are doing or perhaps the European countries are doing something much

more intensive, the WHO only live next door to [Inaudible]. They can drive from one to the other in 15 minutes. I am a little bit lost here as to, is this an impossible dream because of political correctness or incorrectness, or what is the common denominator that this electronic technology can bring and move this in the next five years or three years?

PROF. GIESECKE: Two things, one is speed where you will not be able to beat electronic communication with any other means or telephone. The other, which I tried to show here regarding some of the databases, is the ability of the participants to search the database themselves, not just rely on information that is being produced somewhere. But I could actually go in and look at the salmonella cases in Europe because I want to see something. That would be very difficult in a nonelectronic environment.

DR. CORBER: I think getting the information to a common source can be done by fax, telephone, or any other way. But I think it is good to have a repository such as a Web site, where anybody can get immediate access. It is like an instant library system. I agree with you. It is not the same as needing the video transmission of a person's tympanic membrane to help somebody make a diagnosis. It is not that level of sophistication in telemedicine. But I do think using electronic capacity for speed and access is important. Technologically, it might be relatively simple as I said in my speech. I do think it adds something.

DR. HIRSCH: I am looking for that extra level of technology, for example, if somebody would have, in different parts of the world, weekly changes of sensitivities [Inaudible] antibiotics for a particular organism, that has relevance. That has both industrial relevance,

it has cost containment relevance, and it has direct patient care relevance. But really to know that Brazil is supporting 20 more or 20 less cases of AIDS is absolutely no relevance other than for people to make pronouncements as to how good or bad they are doing things. To me, as a clinician or administrator of health care systems, I am looking at this, and I am saying, where is the meat in this? There are some issues here, for example, sensitivities or lack of antibiotic are issues of that sort. Political concerns, open, closed databases, who can get access to what, and the best of all perhaps is only Finnish can speak to understand, certainly I can't. I am a little bit mystified that the technology is probably far advanced to what we can decide among ourselves as to what to put or what to do with it.

DR. WOODALL: I think we might see in the next couple of presentation how all these things come together, and how the patient is served.

DR. MULLANEY: I am John Mullaney, executive director of SatelLife. I always feel funny coming to these events because in some sense they are kind of a trade show, and we are a non-profit organization of about 12 people located here in Boston. I like to think of SatelLife as a very non-commercial enterprise because we serve a constituency where there is no market. We are providing very affordable communication technology and information to a constituency for which there is no market. So often times Motorola and the big companies will just kind of pass us by because they don't see any kind of [luger]. We feel as though we do respond to a very critical need. Foremost of which, I think, is the issue related to emerging diseases.

As I was thinking about talking this morning, probably one of the best indicators of where there is a great disconnect between scientists and researchers in the developing world and their understanding of technology and the realities in the developing world is highlighted by the very new malaria page. It has just been announced. About three weeks ago we saw their announcement on the Web. First presupposition, that if it is on the Web, it is there for the whole world. We are going to see that that is not the case. Secondly, very sophisticated, very high-powered group of malaria researchers have said, this is going to be the site for collaboration on malaria research worldwide. Now, we realize that most of our colleagues in the developing world don't have access to the World-Wide Web. They will have in about five or six years, if they believe what Bill Gates is saying with [teledesic] and all the rest, so in the mean time, we will just wait for you. You can wait, and we are going to start this Web site, and eventually, you may have access. SatelLife has been operating for about 10 years mainly under the thinking that we can't wait. We cannot afford to have this tremendous information gap continue between the developed and developing world. As a result, the organization took some rather audacious measures about ten years ago to correct that by launching a satellite, hence the name SatelLife. It was a low earth-orbiting satellite, and it is still functioning. It functions in remote sites. The organization has moved far beyond that. It continues to keep present with technology developments taking whatever is developing in the industrialized world, tweaking it, making it available to people in the developing countries in a means that is going to be affordable for them and cost effective.

This is the mission of SatelLife, which really is to improve the health in developing countries and in remote areas of the world using telecommunications, whatever measure that is, to link health workers with each other and with information resources. Again, we operate

on the theme that we can't afford to wait. I like the question that came up earlier about the coordination of who is going to do all of this. I think the governments and big bureaucracies tend to be astounded by the fact that they are big and they bureaucratic. As a small NGO, we have the advantage of being able to move quickly.

We have a system called "Healthnet." It is the network. SatelLife is the administrative offices, but Healthnet is the network that we run. We have a technical office of which Alex Frasier is the director. We have very young, bright people who are continuingly working and listening to what the field is saying, developing very cost effective and appropriate technologies to meet the needs of people in the developing world.

I'm going to give you just a very quick run through here of the technology and try and explain it. It almost has a chronological move. Ten years ago, Dr. Bernard Lown, the chairman, had just received the Noble Prize for International Physicians for the prevention of nuclear war while he was attending a conference in Moscow. At the same time, Ronald Reagan had announced Star Wars. He was very upset by all of this and announced to a group of medical students that we were going to use space for health. It was ridiculous that it would be used for escalation. I am going to launch a satellite, and it will be used for peaceful purposes. Much to the horror of the students that were behind him because they realized they were the ones that were going to have to find a low earth orbit satellite to do this. When they found that satellite technologies in London was actually constructing these, the satellite is one of a series of them called "EuroSats" about the size of a small refrigerator that you might see in a student's dormitory room. It orbits the earth at about 550 miles above the earth. That is very different from a geostationary satellite which is 23,000 miles above the earth. So you are talking about a tremendous difference in power. Therefore, the

machinery that you use on the ground is very different. 550 miles above the earth, you can use a very standardized off the shelf transmitter/transceiver with an antenna that is probably a little bit larger than what you would find on the top of a building for your television set.

All of this technology has been developed such that the person in the field could use a computer to type messages, and it would go in through a modem. Then when the satellite came over head in an orbit, that message would be thrown up to the satellite, stored on the satellite, and then the satellite would come over Boston, the radio signals would click, the messages would go down to Boston, and those electronic messages are taken out to the Internet. At the same time, it is a two-way street, so that this person in Sudan, for example, has a standardized Internet address that we have developed, the person's named at SUD.HEALTH.ORG, so that message is going through our bi-directional. So that message that is destined for that person would come up through here. As telephone communication improved in the capital cities of developing countries, we took the idea of store and forward technology, that was used on the satellite, and applied is to dial-up networks. Why, because international calls continued to be very expensive. This would allow users to dial in having to pay the cost of only a local telephone call.

How does it work? You have a rural site in Kenya right now, and the person has his or her computer that they sit at, and they type their message in. There might be 10 or 12 people around this particular point, which we call a computer. They type their messages in, and it is stored into the modem. When they are ready, they initiate the phone call, and that phone call takes all of those electronic messages and dumps them into what we call the "node," which is a central post office. Now, six times a day, we call Kenya and pick up those electronic messages for them, and then bring them out to the Internet. Again, it is a

bi-directional communication, so anybody who had mail coming to them, is sent to them in that same communication.

Lastly, developed systems where you can use surface radio, HF radio in the same principle applies. Messages are sent, they are stored, and when it is ready to be sent, you can initiate the communication, and it can be sent here through radio waves to a central node or post office. Those messages are picked up by our telephone calls, and we bring them out to the Internet. We do that because Internet access in most developing countries has been expensive. It is coming down. We are making changes now in the node software so that they will be able to negotiate with local internet providers and dump their messages in locally, preventing us from having to make the telephone calls. For those of you who have the interest in the technology, we can talk about that later.

I think that SatelLife, for good or bad, has been recognized for providing last mile technological solutions. SatelLife is much more than the technology, and probably its best success is its information. I would like to say that SatelLife has three areas where we focus: technology, information, and lastly, and probably most importantly, people. Because unless you are working with the people and training the people to use the information and use the technology, it is not going to work. We have learned from experiences, but that is good.

Healthnet services that we provide include first and foremost, e-mail. In the very early years, SatelLife and Healthnet were the only e-mail service providers. In some countries this continues to be. That is changing as e-mail and Internet services continue to increase. For many people in developing countries, we continue to be the main e-mail and most affordable e-mail service provider, most reliable by the way too. What we focus on is

the network of people. We try to get people to talk with one another and train people to use it. So we have set up what we call "conferences."

That has really been based on the experiences that we have had. Even at organized meetings like this, probably the best conversation happens in the hallway, over a piece of cake and coffee, not necessarily what happens in here. If you can begin to structure organized places, virtual places or forums where people can talk, that is probably the best contribution we can make to this whole global network. It really started with FAS as a brain child of SatelLife with the Federation of American Scientists, starting with the idea of getting the people to talk about emerging diseases which is a critical problem, as we all know. The reason why FAS and SatelLife worked well is FAS realized that they wanted to get to about 85% of the world's population that doesn't have access to the World-Wide Web. How can we do it? How can we bring them in? We provided the technological solutions, by the basic e-mail store and forward systems using either telephone dial-up networks, satellites, or radio, and we are able to provide a platform where people in the industrialized world could actually talk with people from the developing worlds in a simple e-mail based system.

So ProMED was launched. It took a while for it to crank up. We had about 80 users for a while. Ebola broke out, and it went up to 3000 users, and I think we are now up to 6000. That also happened because Jack Woodall, Barbara Rosenberg, do some pretty heavy marketing, and actually have to work with people to get them to know that this is a very user-friendly system and can be very useful for their work.

We have now moved to other areas, very specific discussion groups. Essential drugs is a conference that works on the rational use of drugs in the developing world. This is very useful for pharmacologists and people more at the district levels. Procare is a program for

the collaborations of AIDS and related epidemics. It was funded by AT&T originally, and their foundations officers through $150,000. They said, but you can not call it the HIV sexually transmitted disease because we don't like the words "sexually transmitted diseases." So STDs are now related epidemics. Procore is a project that is on cardiovascular disease, [Afranet] is a policy discussion on responding to the need of decentralization in these countries. What is happening is that World Bank said, decentralize, without taking into consideration the fact that the infrastructure doesn't exist to support it. We have in Uganda, six district sites, three of which have absolutely no telephone communication at all. And that poor district officer is now left with the responsibility of reporting not only emerging diseases but things like basic administrative issues. [Afranet] can begin to discuss policy issues related around issues like decentralization.

[Indices] is another conference that is working on central drug use and really a first step toward distance education on training people on the use of drugs in developing worlds. What we see here is almost a progression of information and its use. ProMED is really a bulletin board system. People can come in and they can report. Procare, procore, and even [Afranet], kind of build on publications.

SatelLife, when it first began, went to all of the major peer-review medical journal publishers, explained what we wanted to do, and they were very upset over the idea of electronic communication to developing countries. What about a subscriber base? We explained that we were probably serving a constituency who would never be able to see the current issue of the New England Journal of Medicine, therefore, would you please let us have at least the abstracts. They have gone beyond that, and have given us abstracts and occasional full text articles which are condensed into a daily publication called Healthnet

News. What we did then is take the permission that we had from these journal articles, and we started to put them into the conferences, so that we have for example, Procare the bulletin board system, that is stratified into different areas of research. We have moderators from the Mass General who work to actually post a current article from the New England Journal. That goes on the site, and there is discussion that happens around that particular article. You see the emergence of what is effectively like a journal club for developing countries. You have a feedback group then, which is very interesting and critical for what we want to do.

In addition to Healthnet News, which I described as a kind of companion or synthesis of the peer-review journals, we have several others. There are 23 publications that allow us to distribute in Healthnet News. We have a chief medical advisor at the Mass General and several other physicians that work with him that go through these journals once a week. What you find is that there is probably about an average, about 20% of that literature that is really relevant to what is going on in the developing world. So rather than just sending all the journals out, and this deluge of information, we try and sift information that is going to be relevant. Now there are some criticism that can come back. Who makes the decisions of what is relevant or not? We work with what we have, and do the best we can. In addition to the Healthnet News, we have the WHO Digest for Africa, the [Indices], the AIDS Bulletin, Child Health Dialogue from [ARTAG] which is a primary health care and issues of diarrhea publication. It is very helpful in the local levels. Practical pointers for primary care is done by a physician in South Carolina who takes journals and summarizes them each week. We have a project called [Bitness] in collaboration with the National Library of Medicine. Clearly the lack of information, current information, in medical libraries is

critical. National Library of [Inaudible] developed as kind of an experiment system called [Bitness] which was an e-mail store and forward mechanism to enable a researcher or a medical student to access the National Library of Medicine on what they call [meshterm]. How [Bitness] works is a medical student at the [Macur] University in Uganda walks in, there is a point set up, and he or she can begin a search. Malaria, well, it will come back and say, no, malaria, you are going to get 300,000 hits, give me something more specific so that it is malaria-children under 13, malaria with [Inaudible]. Then it will do the search for that person and come back with the 20 or so articles that might be relevant to what he or she is doing.

There is a program called Getweb which we have as well. Basically this is an e-mail system that can grab text off of the Web and bring it to people. This is critical for people in developing countries that do not have access to the Web. We make it possible now for any Web based information to arrive to them. We are developing a global database of health professionals which is an electronic directory. If you don't know who else is out there, who might be in your field, how can you talk? So we are developing a directory stratified by areas of specialties so that people will know who each other are. Thank you.

DR. WOODALL: This is a message from a clinician at the [All Indian] Institute in New Delhi last year. It was sent to ProMED-Mail saying, "We are facing this near epidemic of dengue hemorrhagic fever, and so many of our patients are dying." Within a few hours of this appearing on the list serve which means it went out to 7000 members, WHO's regional office in New Delhi, the staff there read it, phoned them up and said, don't worry we are on our way. They got in a car and drove over with all the literature, information and advice

that they needed. They were in the same city. But some people don't know where to turn for advice. Instead of making a lot of telephone calls and playing telephone tag, all he had to do was send one message out to the Internet and get the information he wanted.

There were some queries about ticks in Madagascar in relation to disease. We got another message about antimicrobial resistance to transfer from animals to humans. I have to say that we also report diseases of animals and diseases of crop plants because we know that human health is powerfully impacted by what goes on in livestock, in wildlife now in connection with man and affecting our nutrition. Salmonella infections in reptiles are a big problem in this country and others where people like to keep Iguanas and turtles as pets. Kids put them in their mouths and things like that. Cholera is a problem in Hong Kong. We have an update today, and of course, there is a continuing discussion about [Inaudible] disease and a bovine spongy form of cephalitis.

This is from a correspondent in Australia who sends us stuff from the media. We get information from local news. We have a Chinese speaker in Canada who reads the Chinese language newspapers on the net. Of course, we get them because the sun comes up in China before it comes up here. We get today's news yesterday. This is a very useful source of outbreak information. ProMED-Mail is the program for monitoring emerging diseases. It started as an initiative by the Federation of American Scientists who had a joint meeting with WHO in 1993. The electronic communication part of it developed from that. We developed in this manner over the last 30 months from the number of subscribers which is now over 8000 and the number of posts. But we have had now almost 4000 posts, not all of our outbreaks because it sparks discussion about outbreaks and control. Some people only wanted to know about outbreaks and updates, figures, number of occasions and the number

of deaths. It didn't have time to participate in the discussion, so we created an EDR list, Emerging Disease Reports list which has a much lower volume of posts. Then we also started a year ago ProMED AHEAD, Animal Health and Emerging Animal Diseases, which is very popular with veterinarians, although it is nice to see how many veterinarians also subscribe to the whole list. They are interested in the whole spectrum of human disease and crop diseases.

We feel that it is important to evaluate what an Internet list does in terms of various things, for example, coverage by a number of countries, information sources, and so on. What we know is we have greater coverage by a number of countries because we have a 136 countries with subscribers, whereas, for example, WHO only has 100 country offices or less and doesn't get reports from every country. We have a very good big coverage of information sources, our speed is very good, and our reliability is at least as good as official sources. Our transparency is greater because we don't have to hold back reporting because we are a non-governmental system. We don't have to hold back reporting because the government doesn't want it out. We are for public health, and we think the important thing is for the public to know and be able to make a choice about not traveling to a certain country because there is an outbreak. Even if the outbreak is being suppressed in that country.

The feedback we get, of course, is every report that goes out, goes to everybody. Simultaneously, the WHO tells the countries involved around the world, the health authorities, the hospitals, everybody who is logged on, including the interested general public, all get the report at exactly the same time. You don't have to wait for it to go up the chain through the government and come back down again. We have good public confidence.

The cost is practically zero, apart from what it costs SatelLife to operate us, just bear in mind, we have over 8000 computers with 8000 Internet connection working for us there that didn't cost us anything. We don't pay any salaries to the people who report. The people who are logged on are self-selected because they are interested in emerging diseases. Even though we are only one in a hundred, we will report these diseases. That is enough for us to get plenty of reports from local TV, local newspapers, and local health organizations. And we get reports from the horse's mouth, from the GPs who see the patients. We think this is very effective. We are not trying to compete with WHO or anybody else. We are trying to complement them. We, of course, publish all the WHO reports we have got.

This is to show the gaps in the coverage. The problem with french west Africa we know [Alstorm] is out there with a network, but it is a very expensive one, and one that people can't use very easily. Then we have all the [Stans]. I need to talk to the army people about getting e-mail connections with the [Stans]. Just look at some figures very briefly. The number of countries that have e-mail access at the moment are 170. We reach 136 at last count. If you add on to the 8000 people who have e-mail addresses, there are 25 of those which are Healthnet addresses. Which means that they push the information out to the 5000 healthnet subscribers. So we are actually up about 12,000 people now who see the reports every day, and then secondary distribution is much higher than 1500. There is one group that sends out to 1000 of their subscribers. Secondary distribution is very high and Web site is very high. That doesn't really help the people in developing countries.

I want to mention, for example, these are our subscribers. WHO at the moment, their bulletin goes out to 2000 people. Then it also goes out through Healthnet and SatelLife by ProMED-Mail to our 12,000. It still increases the distribution of WHO outbreak news

very considerably. There are a lot of people from CDC that subscribe. All these people keep in touch. They know what's going on, and they wouldn't subscribe and clutter up their e-mail with this information if they didn't find it was useful. If you want to look at the source of our reports, 43% came from public health agencies, 33% from the media, 17% directly from health workers, doctors, and some from other sources. We get from many sources, official and unofficial.

If you look at just the US subscribers, there are a lot of them from educational institutions, academics, students, professors. They have 25% commercial and then government organizations and military. That is the sort of breakdown. We don't have an easy way of finding what the breakdown is of our overseas subscribers. But it is probably similar. Let me give you an example of speed of reporting.

The 28th of May last year, a subscriber said he was watching local TV news and hears the number of cases of cholera and deaths according to the local TV. People must use their brains to say this is a non-official report. This is a press report and it may be exaggerated. When it comes out through WHO two weeks later, they have got an official report, it is 214 cases and four deaths. The official number was a bit low, but it was in the same order of magnitude. So we get the confirmation. We have speed and reliability here.

On the 20th of June, a clinician from the University of Switzerland says, "I just diagnosed a patient that died from yellow fever." We asked him for information, and he said he will present the case at the Grand Rounds and then let us know. He didn't seem to understand the importance of reporting cases of yellow fever right away to WHO which is in the same country. But he did finally come up with the explanation that this was a tourist from Brazil. But then WHO Geneva in the same town has to wait the whole month before

Switzerland reports. The Swiss reported it in their bulletin before Geneva is allowed to report it a month later. Think of the number of tourists who could have not got vaccinated and gone to Brazil during that month due to inefficiency in national reporting systems. Think of the advantage of getting a direct report from the hospital physician and being able to go out to this went out to WHO, they just couldn't report it until they got clearance, and it went out all around the world, and hopefully it saved some peoples lives.

I want to emphasize that this kind of reporting of ProMed-Mail, it complements....

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DR. WOODALL: As you have seen from our list of subscribers, they look at what we put out and decide whether they can use it or not. For example, Health Canada has a meeting every Friday morning at which they discuss among other things what was on ProMED-Mail the previous week and whether they should take any action on any of this. Our charge here is to discuss and present to the final [Inaudible] meeting what obstacles we have in the way of improving electronic reporting of emerging diseases, and how this is going to help the patients in developing countries that don't have web access, probably just e-mail access. We also need from the people who are here, and what we need from the people who are not at this conference, and where we want to be a year from now.

DR. CORBER: I wanted to add a comment to the last thing you presented on yellow fever. When we got that report as well, we contacted the Brazilian authorities to find out whether there was yellow fever in the region, and they did a more intensive investigation and made

sure that immunization of yellow fever was in place for that surrounding area. So it didn't only prevent cases in people visiting from Switzerland, but it had an immediate impact in the country itself. It prevented cases right there.

DR. HOLLOWAY: This is a comment that really takes us into the next discussion we will be having about the use of this in disasters. I am one of your users, a very pleased one I might add and also one of the people who secondarily distributes this to our disaster team because it was one of our primary ongoing questions long before deployment is, what are endemic and epidemic diseases where disasters occur? This has always been a very hard proposition. One might think that intelligent services in the various governments that we do have some access to would be helpful. But those in fact, are generally outdated by six months to sometimes two years in terms of their general sources and requirements. Frequently they are utterly irrelevant to the actual place at the time of the disaster. This kind of information is very valuable. With regard to WHO, I would add a further comment that when we were first called in to look at the management of refugees for the former Yugoslavia, that the overall availability of better information on endemic infectious diseases would have been very helpful to the people who had to set up the receiving areas for what, of course, became eventually in excess of two and a half to three million refugees. All those utilizations of this system and the reason the near or real-time data is so important.

DR. MULLANEY: As the discussion ensued today, I think that probably some of the slides where you articulated some of the obstacles was probably most resonant with the experiences that we have had. There are many organizations trying to address to overcome the

technological problems of getting a global surveillance project in place. I think that there are answers to that. Certainly we have a low tech answer, and there are people that are fascinated by the higher tech answers to it, and I think the question of coordinating all of that will ultimately shake out. But any organization that is doing planning for a global surveillance program must factor in the training of people to use it. The issue that you had about the lack of the standardization of the reporting mechanism is a critical issue. Unless you have some people that know how to report and to fill out these people, you are not going to have a very satisfactory result. Training oftentimes is unpopular when you are trying to present a budget to the budgetary office. Unless that is included, we made decisions back at SatelLife that unless there is an element by which we can continue training people to use these systems, we don't even want to bother with the project anymore because we know it is destined to fail. So that is my only comment, that in the planning of any kind of global surveillance program, a budget item and a very good program for the training of people to use these technologies is absolutely critical.

DR. WOODALL: Thank you, very much.

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ATLANTIC RIM NETWORK
TRANSATLANTIC TELEMEDICINE SUMMIT
MAY 20-22, 1997

DISEASE MONITORING AND MANAGEMENT
ADDITIONAL PRESENTATION BY DR. HARRY HOLLOWAY

DR. ERWIN HIRSH: Dr. Holloway is a professional psychiatrist in neurosciences at the Uniform Service University Health Sciences in Washington, D.C. He has been associated with NASA for many years and has had an active participation for the last ten years in a number of disasters in which telemedicine played a role. I have asked him to come and not so much tell us what piece of equipment he used, but the lessons learned in each one of these different events.

DR. HARRY HOLLOWAY: I need to first own up to the fact that although I am here speaking entirely for myself, I am representing the knowledge and experience of others in doing so. I had some co-authors in putting this together: Arnold Nicgossian, who is the acting Associate Administrator for Life Microgravity Sciences for NASA, and Craig Relon, who is the Chair of the Department of Military Medicine and Emergency Medicine at USC. Nothing I say here should be taken as anything the government will stand behind. These are entirely my personal views.

I want to start off with the definition of *disaster medicine* to make sure that we are clear about what we are talking about when we talk about telemedicine. This definition comes from Gunn and his publication, and the only part I have eliminated is the relatively arbitrary list of the specialties involved, because when we fundamentally think of a medical specialty, at one time or another, given the right disaster, it's involved. The question is picking the right specialty.

It is in the following context that I am going to be talking here today about disasters: to study and collaborate the applications of various health disciplines--prevention, immediate response, and rehabilitation of the health problems associated with the disaster. This is all in cooperation with other disciplines: politicians, lawyers, engineers, folks that are from public health, and all kinds of other things that are involved in any disaster, involved in a comprehensive disaster management.

I am using a very simple classification here of disasters themselves. That is, the things that occur before the disaster happens, that happen just immediately after the disaster when you are dealing with the acute problems created by the disaster, and the rehabilitation for the people who are injured. A good example of that would be Oklahoma City right now. If you follow the EPA's Web site, you will discover that they are now running into big problems because the initial money that is taking care of managing a disaster has run out, but the broken bones, the rehabilitation of the amputees and the people who are coming forward with various kinds of psychological injuries are not going away. They are faced with that kind of problem. The same thing is happening down in Florida following the crash of the aircraft in the swamp. They are having the same problems at this time, as we get beyond the acute phase. The rehab phase, I mention principally because that's the area of big medical problems, but sometimes it is the area of least funding for various disaster relief efforts.

This is a classification of disasters. The real point I want to make here is that it is as complicated as the devil, and the real issue is that every natural disaster is in high risk of becoming a man-made disaster. Human beings, if they do it just right, can really screw up the rescue and make things a lot worse. If you study disasters, one of the most common

findings is that rescuers do harm, not good. Therefore, in approaching disaster, whether using telemedicine or not, in evaluating the overall outcomes, you have to look at it.

This comes from a large earthquake disaster that occurred in Peru in 1968. 1967 was the actual earthquake in which people from the United States came in to carry out a mountain rescue. They were refused trucks to transport them. They were well-equipped: they seized the trucks and they rescued some 18 people. Only afterwards did they discover they had seized the only trucks that carried food to the overall devastated valleys below, and over several thousand people died as a result of a lack of trucks. You can do a lot of harm because when you arrive, you are the person who has some power, and the people who are there, don't.

Now, I am going to talk specifically about some disasters in which we have utilized telemedicine. One is the Armenian earthquake, in which there was telemedicine intervention. It began in May of '89. It created a circumstance in which there was a break in the large gas pipeline running from Russia to Europe, causing the UFA fire and the train fire. When the pipeline pressure dropped, they turned up the flow rate. The effect was to fill a large valley in the Vascur Republic of Russia with gas. Then, two trains passed in that valley. A spark occurred between the two trains, causing an explosion to occur at .7, the force of the Hiroshima bomb. Seven hundred people were immediately incinerated. Six hundred and some people went to a town called UFA in the Vascur Republic, and there their burns were cared for. Finally, we provided support during the crisis in Moscow, during which time there was a military seizure of the Parliament.

One of the questions about any of these applications (I am sorry to go aside from telemedicine, but these are things you have to think about if you are going to do disaster

relief), is, What are the circumstances under which you are doing the intervention? As we go into Armenia on December 7, 1988, the earthquake has occurred, it is almost 19 months after Chernobyl, the country has lost billions of dollars, secondary to the Chernobyl disaster. The Afghan war has ended disasterously. They are broke for that reason. The USSR is broke. Armenia and Azerbaijan are at war. Therefore, many of the people who are actually casualties in Armenia are war refugees for Azerbaijan. Armenia is under marshal law, which helped, because much of the immediate rescue was done by the Russian Army, who was soundly hated for their having done so. An offer of help that we originally made in that circumstance was rejected by the Russian government.

The leader of the whole medical establishment of Russia happened to be attending a space conference in California with another group that was also attending. Thus, the space bridge was built because everyone happened to be in California. So, what we had were satellite links that we could utilize in which we had to bring all satellite links in through the USSR, but not going directly into Armenia. That was totally a political decision on the part of the Russian Soviets. They wanted control of every link. Here you have a country that is starting to withdraw, so they wanted to control the link. No reason not to go through Moscow; it had to go through Moscow. Then it went back up the satellite; then it went back down to the folks in Armenia. In this country, we had a number of collaborating groups to provide consultation and help to them. Those people were from the University of Texas, LDS Hospital in Utah, the Emergency Services of the State of Maryland, the Uniform Services, University of Health Sciences and the Texas Medical Center, which is a conglomerate of folks down in Houston.

I make that point because the question is, What did the satellites do for us in this circumstance? One of the things they did for us was that we provided consultation at the distance, unlike the usual situation where if *I* give you a consultation, is that what Harry Holloway thinks? All of my consultations were done on par and reviewed by my colleagues from at least at two other institutions, who then immediately and directly commented on them. By the way, as a reward to me, that was one of the most fun aspects of the entire business because it was sort of like going to college again with really super examiners, and you learned a lot.

All data was encrypted. I figured this was probably not the important issue when taking care of people in disaster. It turned out to be the most essentially rated feature from the point of view of the patients that we had. They felt the encryption of the data demonstrated that the Soviet Union wasn't doing things the way they had always done them; totally independent group encrypts the data and nothing is known about the exchanges. This was what we established: that we were concerned about the patient, not about the politics in between. It turned out to be one of the most absolutely critical messages. For the development of this area, a message that is carried on there is, that unless the U.S. government steps away from its restrictions on use of encryption, we have real limitations, I think, on how well we can utilize telemedicine techniques through the internet and other places.

Ground stations received clearances from regulations almost immediately in the Soviet Union in ways that we could have never done in this country. If you tried to do the same kind of disaster rescue here, between states, and go through the electronic regulation of the electromagnetic spectrum inside of the United States, you could have never deployed, even

within the two month period. It would require the United States probably a year to deploy a similar system if you didn't have it already deployed. Central control helped us there. Audio/visual fax link was what we had.

The hardest part of that technically to maintain throughout, the hardest thing to get a signal from across 9,000 miles, is voice, good voice. Even in this room, you will notice there are problems. Anywhere you go, voice has room and other interactions, and it becomes the biggest problem to get good clear voice throughout the entire operation. Video, in fact, what we thought would be the big problem, not a problem at all. No problem.

In fact, we had some fairly fancy technology. This was done by COMSAT, as a public operation, and we even had some self-correcting signals. No echo problems at all because as we sent a signal, if there was any kind of echo, it re-regulated the primary signal and regulated the echo out of existence. Echo cancellation within a room was not so manageable. Minimal use of computer technology because at that time, we are still talking about the Soviet Union, and we have got all kinds of limitations on that because the technology could be used for military purposes.

That was a terrible, terrible lack. It meant, that in terms of quantitating the actual nature of the disaster, particularly when we got to UFA, we did not have good tools for that at all. The lack of computer technology was a critical issue. One of the things that was clear was that you have to establish that in order to do disaster work, you must begin working in the pre-disaster phase with usable, understandable, mutually appreciated protocols for communications. It does not happen naturally. It turned out that establishing, for instance, whole sets of operational definitions for the various clinical terms was critical, and, of course, once you decide to operate across the international lines, you better make sure that

their clinical data is going to be reported in the same kinds of units your patients will understand. If it is milligrams per deciliter, then you ought to get that tied down and not in some other kind of unit. If you overlook that, that's a disaster in communications.

You must have trained and prepared for that ahead of time. We had some leg up on that because our reason for having NASA's support in this was simply, what NASA wanted to end up with was a group of trained individuals who clearly understood how to use telemedicine techniques in the United States for a space disaster. We wanted to know in real-time whether we could do it or not. So work had gone into training and preparation, not for this event but for this kind of event, ahead of time. That turned out to be absolutely critical. We needed knowledgeable leadership: technical, clinical, cross-cultural and political.

One of the things that we had in all places was that there wasn't a single time that I was listening to a patient. The Russians were responsible for translations and they did an excellent job. But I had more Armenian speakers sitting with me than they had sitting with them. They also had more English speakers sitting with them than I had with me. So we all could speak each others' language. Language was never a prolem. It had been something of a problem onsite because many of the Armenian doctors did not speak Armenian. They were brought up in the Soviet systems. They had been trained only in Russian.

We needed a medical record that was appropriate. This meant, again, considering the overall kinds of inventions you were going to do and how you were going to record the data, so that everyone played off the same piece of music. In order to achieve this, in the first example, one of the reasons for the delay in getting to Armenia was that we actually brought Armenian doctors to the United States. I did an onsite survey; we developed an independent

record to do that. Then when the explosion occurred in Vascur Republic and UFA, we were immediately prepared, and within a week were there and running. That was about a 7000 mile shift.

The ongoing quality and quantitative goals have to be set ahead of time. If you have to set, What is a good outcome? Where do we want to end up? That has to be defined ahead of time. This is not something that is inherently good. The entire usefulness of telemedicine has to do with what the purposes are. In this case for Armenia, our primary purpose was to transfer information to the Armenian practitioners; that is what we wanted, to improve their overall treatment. So they brought us modal cases. We taught them approaches to doing that as it would exist in the United States. They learned in that process. We saw about 200 modal cases. The overall damage of the Armenian earthquake, officially, is that 25,000 people were killed. That is an official governmental figure. The true estimate is that 92,000 were killed. One hundred and twenty thousand people were severely injured. We are helping them take care of those patients in that context and transmitting techniques.

Immediately people from the Burn Unit in San Antonio had gone over to help out. One of the principle things that we did in intervening in UFA was to provide an opportunity for the burn surgeons to follow carefully their patients as they recovered over time. We brought totally new techniques for treating burns. They had never been seen before in Russia. The burn surgeons asked to see only patients who were, by the Russia's definition, dead. Within a week, all of those patients were doing well, while almost half of the Russian patients had died. This result shows a huge difference in technology.

The really critical need was the work in informatics, and that was something that we, in fact, addressed among ourselves throughout all of this. We had agreed upon task; we had

strong institutional support. One of the ways that happened was after Gorbachev initially turned down this whole operation. The critical time was in the first week in January, when the then Foreign Minister Chevernatzy himself said, "That was the old way of doing business." "That was the old way of doing business" became the theme for strong institutions abroad in Russia. We had negotiators committed at all times to work and negotiate all items. We committed workers, and we had adequate resources to the task, as we defined it.

One of the real leaders of this in Armenia, Hitnik Nicgossian, is at this conference. Arnold Nicgossian was the leader in NASA. Dr. Gazenko is a certifiable genius and the leader, and the reason the Russians put the first person in space. Dr. Kiselev ran the information system. Dr. Secasian was an expert in medical diagnosis and a leader in Armenia. These are the people who could really make the thing happen and provided the leadership and structure.

These are the numbers of people that we have that were involved that must be brought to bear: 127 positions. That gives you an idea of the complexity, but of the 209 patients seen, 183 were modal cases of disaster victims and 54 diagnoses changed. There were 70 that had to be completely restudied, and 47 had new diagnostic processes, and the whole treatment plan was over. Another 47, in terms of new information. Those primarily occurred in three specialties.

Three specialties accounted for a majority of the changes: most in psychiatry, second, in surgery, third, in infectious disease. The largest number that occurred was in infectious disease, and there we had to have thorough knowledge ourselves of the endemic diseases on the other side, was the overall discovery that most of the cases being called prush injury

hepatitis, were, in fact, alcoholic cirrhosis. Alcoholism is a far larger epidemic, it turns out, than beta hepatitis was within the overall setting.

Obviously, you have to have a very good working relationship. In the next set, the intervention was within a week. We were prepared. We had the ongoing protocol occur with the attack on the so-called White House in Russia. There we could provide immediate consultation with [Inaudible] in the Soviet Union. Consultation focused largely on postsurgical trauma care. This occurred in the context of an ongoing set of consultations that we were carrying out with regard to radiation exposure following Chernobyl and others. This allowed an immediate response. This was sufficiently well-organized, that at one point to demonstrate this, we actually bought this telemedicine exchange and the doctors directly into the Congress and did this out of the capital building. By then, we felt we could make it work and make it run. We had people who were pretty experienced and fairly well-trained.

These are the functional requirements: training and education, integrated planning through all specialties, situation of continuous development of protocols, modification of the protocols on all sides so that everybody knew what everybody else was doing, creation of what we might call "electronic table tops" in which we could work at large distances from each other (that was another use of the telemedicine), and continuously updated technology. Some of the most valuable work with patients was done offline from the patients, with the doctors and the care people working together, preparing how they were going to do, work and plan things out.

I want to go over some of the other operations because they illustrate the problems that can be associated with it. We progressed a fair distance by the time the Gulf War came along. Telemedicine should have worked just fine in the Gulf War, but to quote Sir Conan

Doyle, "The dog did not bark." And the reason the dog did not bark tells us a lot about how telemedicine can work and not work in a strained disasterous situation. The reason was, that the country would not allow us to use our already-purchased, already-owned satellite uplink, because they were afraid that if somebody used that--even for emergency purposes--without being paid, that the very large amount of money being earned from the World News Organizations for uplinks would be lost. Because of commercial competitive considerations, the agreement between the two countries could not be arrived at or put down. That is an absolutely typical exchange. What we did in Armenia by going in and continuing to work, that is atypical. Usually that sort of thing does not go that well. That illustrates the one thing that you also need to do in a pre-disaster area. Negotiate the agreements, preposition the agreements, or you are not going to get there in any reasonable period of time following the disasters.

Shipboard: that is continuing as an obvious application. The Air Force has created area nets around these major medical centers, which now presents an opportunity in those areas to utilize those networks for disaster interventions. Somalia, I will return to. A very important example was done by Ed Gomez, a surgeon who put together a really fancy program that teaches us a lot.

I want to say one thing about a lesson learned in Macedonia. Macedonia was the first time in telemedicine where we really sent out some fancy teleoperators with people who wouldn't normally use them like corpsmen, so they could do various kinds of very sophisticated, invasive, as well as some surgical, operations at those areas. It did not work at all. It did not work because the actual person intervening with a real human being who was really sick, faced with doing harm, wouldn't do it.

In order to carry out the teleoperation portion of it, it is clear that--we did a teleoperation in Armenia in which a person did a fiber optics surgery on a cartilage from LDS Hospital and did the actual procedure in Armenia. But the difference was that the person had already done that as a part of intermountain west, and knew they what was doing. If you are going to play in a disaster, you have to have done it. Training means doing it, in order to do it when you want to play in the circumstance. You are not going to pick it up on the side. In Bosnia, telemedicine is ongoing, and I will say very little about that.

I will talk about a potential, at this point, that there is a satellite called the ACT Satellite. That is the Advanced Communications Technology Satellite owned by NASA that is being used by GW, AFIP, a couple of other universities and Tripler Hospital, which extends its foot all the way through the American host territories and provides medical and acute medical coverage for transfer of data in the Pacific Ocean. This provides an opportunity of the growing number of things in place, satellite technology from which you could do this sort of itervention.

But the one that is most commonly used right now is the Somalia example, and that is INMARSAT. INMARSAT is a satellite that is really there for disasterous events that occur on shipboard. It provides data screen voice and fax, no online television. Ed Gomez and his gang over at Walter Reed put together a system utilizing a digital camera and an ordinary Mac notebook. The total investment, when you put together everything that went into it, was $100,000--both sites, by the way, that is $50,000 in Somalia, $50,000 in the United States--and with that and a microscope and other things, we were able to transmit things that we could not transmit from Armenia. For instance, from Armenia, we couldn't send a high grade CAT scan because we were using television, and television won't give us the right

resolution. Here, they created rate of transmission against precision of imaging, and they could give an absolutely precise image. Not only that, but because they had a microscope, they could send actual pictures of parasites, bacteriological [Inaudible] smears, diagnostic smears, and other things.

This was a much more sophisticated telemedical application than what happened in Armenia. In this one, actually people created virtual surgical environments. "Tomorrow I am going to do a piece of surgery. I haven't done it for two years, can you guys help me out?" And the person receives a three-dimensional laid out image of how such an operation is done and gets to review it in the three-dimensional space transmitted through that chain. On the other hand, once he has finished the procedure over there in the trauma case, he then transmits a three-dimensional reconstruction of his trauma case to the receiving surgeon on the other end, who is immediately then prepared for dealing with it on that end. This is another sophisticated extension of the capacity to operate under a field and extreme conditions applications for disaster. It provides a critical link for patient management onsite and then reception elsewhere.

Just to emphasize the point, microscopic diagnostic images, virtual crude simulations, cost of the technology is low, and let me tell you that now in NASA what we are planning is to move towards Internet and Intranet technology. We think that the television technology has seen its day and consumes too much bandwidth. In terms of lowering price, which is critical for this whole business, there is not an offer of that particular option.

Disasters are predictable. That is the big message. The point is that earthquakes don't occur where there aren't plates. Boston is probably not going to have a volcano next week. On the other hand, if you are going to have a plane crash in the city, just look where

your airport is, and you are going to see that there is a statistical odds that sometime or other that is going to happen. Therefore, disasters are predictable.

I can begin deploying my overall technology ahead of time. It is perfectly reasonable to talk about doing this in the pre-disaster phase. Local resources are critical. What will save your life, if you get a crush injury, or if you receive another kind of injury, is a good person working in the golden hour, in the period immediately afterwards, not the guy who shows up from another country three days later. The system must be robust enough and inexpensive enough to allow prepositioning. If it costs a billion dollars, you can't afford to preposition a whole bunch of them. If it costs less, you can.

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...so that you can use it when you have actually got the disaster at hand. So most of the work with telemedicine, in my view, needs to be done in the pre-disaster phase. Including cleaning across national boundaries, working on the access, studying things like the Suma Project which was done by Claude de Ville down in the Caribbean.

Let me tell you how brilliant this was. He came to us at NASA, one of our grants to him was for $50,000, a very small grant, for all of Central America to establish the telemedicine plan. The reason for the telemedicine plan was, as he said, "I want the NASA name because it has a good reputation down there, and 2) I just simply want every disaster manager to meet every other disaster manager. So when they plan this system, they will have to sit down and meet each other." And then he developed a system that says where all the repositioned resources are in all of Central America for responding. It is a lot better if

you are in Nicaragua to have someone in Costa Rica who can have something there within hours, rather than to have your friend in the United States, who will have it there two days *after* you've dealt with one of these disasters. This is an example of a very sophisticated utilization of what you can do ahead of time.

Finally, you can use other kinds of space technology, satellite technology, drone aircraft, and other things to operate in that setting. Damages assessments and needs carried out by satellite technology in the acute phases are going to be critical. What has been destroyed? When something like the Loma Preed earthquake occurs, they say, "Well, we are hearing calls from X,Y and Z, that is where the damage is occurring." I will tell you that as a disaster relief worker, the damage is occurring where you are not hearing from. That is where the big-time damage occurs. Because that is where the infrastructure has been knocked out. That is where the people are dead. That is where their legs are broken, et cetera. You modify and utilize your teleobservational capacities with your telemedical position to reach those areas. Use external consultants to help reorganize things outside, because in the confusions onsite, you can seek consultation during that period. But it is the folks who are right there and doing it that make the difference.

Assessment and surveillance are important, so that you can modify the risk operation. If you are talking about a Bangladesh, you have 110,000 people in a flood, what bridges are intact? What roads are intact? Where can you haul things? How many helicopters do you require? Now, you don't have what you had in Armenia, by the way, on the third day of the earthquake when the two aircraft ran into each other. My friend at that time, who had been taking care of children, and who had actually done evaluations on 890 children in the day before, now has to take care of the additional 38 casualties created by the rescuers.

Training means doing it. You have got to have the experience, and it ought to be occurring under supervision. In the future is the following: we are actually working on systems where we are talking about teleoperators. The most sophisticated of the those teleoperators are in fact nanotechnology, small machines preposition, not at some site that is unusual to you, but in your body, that will sense the overall operation of a given organ, and it will correct it. That puts my friend over here, the surgeon, out of business, and leaves my internist out of business as well. It really changes the way we practice medicine. I can put something in that will sense the disease, and then I can operate. I am talking about machines that are at the molecular level or even at the atomic level of construction. These ideas were first conceived by Finneman in 1950. This area of nanotechnology is already finding some applications in the kinds of surgery that are being done on fetuses at the University of San Francisco. There, implanted sensory systems are being used for post-op management of the fetus while still in the womb and in the development of neuro [Inaudible] technologies for various sensory effects.

We are very near to the point of telediagnostics, where we can actually preposition things so that many of the questions we have diagnostically can be done on the other site and transmitted back. Another advancement is echo surveillance for preparation and understanding of what problems we are likely to have. From space, we can predict the overall occurrence of Lyme disease here in New England with relatively high accuracy now. We can predict where malaria is going to occur, or where valley fever is going to occur in the world, by looking at the ecology in the plant situation. That can be very helpful to us in terms of observing what will likely be the imminent problems in disaster, and increasingly utilize telecommunications to establish standardization of care.

A number of people supporting programs in this particular area: NASA, ARPA, the NIH. One of the things that we have to stay alert to is, that if we develop these systems, and we become dependent upon them, they then become the source for the next disaster, when *they* malfunction and when *they* don't work. Even as we are developing them, we must look at what the sour side of the lemon is, as well as the lemonade, in understanding what may be of value here.

I think you can see this is a very exciting area. When I am talking about the nanotechnology at the end, you may think I'm blowing smoke, but I am not. This is dead serious stuff. Our friends over here at MIT and elsewhere are building these very, very tiny machines. There are engineers who are thinking, How do I attach that to the amino system so that it carries it to exactly the right organ? What are the receptor sites by which it will go to a given place, and then how can I activate it with external power sources? You understand that that is likely to be part of what we think about in this rapidly changing era that we are working in. Thank you.

DR. HIRSH: We have discussed this before. Where does CNN fit in all of this?

DR. HOLLOWAY: If you are going to deal with the press and make them into a pet, realize that you have got a pet wolverine. When your hand gets bitten off, you do just as well not to complain to the wolverine. On the other hand, you have to work with the press. They are critical to this overall proposition. They can undercut the whole credibility of the procedure that you have going. In general, a place like CNN is not a bad bunch to work with because they actually put the same reporter to this task over and over again. So if you

put some training in, you get at least knowledgeability out. Not a friend, knowledgeability. Their business is different than your business.

On the other hand, that is not true in the other organizations. I think we have to do a lot of work to bring in the other organizations, to realize the importances and bad consequences. Actually the story that I want to work on seeing written for some of the crash sites and others, are circumstances where one news organizations writes about another news organization. So that where there has been malpractice, it starts to be revealed. Then I think we may see some changing behavior in this area. But this is absolutely critical. It is a part of managing any disaster. If it is not managed well, everything can come to nought. Managing the communications that are going to be reaching the public is critical. All of you can see why. How does the public know where to go? How do they know whether the people who are there have some kind of honest structure?

I also want to say one other thing about that, which is something that's not usually talked about, but if you are in a foreign country, realize that the country is likely to have many of the same kinds of prejudices and racism that are carried from your own culture. So those may be reflected in the care system that you are buying into; attend to them very carefully. Look for the people who you are not seeing that are a part of that demography. Because those are the people who caregiver may not even realize they aren't taking care of, but also the press in that country is likely to be ignoring that population as well. That is another aspect of this, knowing that it's just a part of it, but that also says that you have to familiarize yourself with the culture ahead of time, prepare yourself if you are going to be doing it.

DR. HIRSH: I think that is very important because everyone should mentally accept that although in country X things are not done like in Boston, that does not mean that we do it better. That is their way to do it. If you try to bring Boston or New York or San Francisco into country X, the best intentions will fall apart. All the efforts will go to waste. Most times I can think of, the ugly American is not somebody who is doing something bad, it is somebody who is trying to put his own or her own philosophy in a place in which the philosophy is different. When you do that, you lose 100% of the time.

DR. HOLLWAY: The Armenian situation worked because we learned from each other. Dr. Secasian used imaging techniques in terms of sonography in ways that we would not have conceived of ever in this country, that have since been published here. It is a two-way street.

When I first started out, I was off doing a research study of cerebral malaria. They had a very large death rate in Viet Nam of people with cerebral malaria when we first began to see them. I was working with the Thai doctors who were treating cerebral malaria; they were my colleagues. They didn't treat any of their patients right. They didn't keep them in fluid balance; they just dehydrated them. We kept talking to them about that, and then gradually we had been noticing one thing. Their patients were surviving, and ours were dying. When falcipral malaria gets really bad, what do you call it? You call it black water fever because your kidneys aren't working any more, and there is nothing but the black coming out. So we said we better check that Glamaer filtration rate. Maybe it starts earlier than that. And it did, and indeed the critical step to keeping the patients alive was exactly

the practice that we were saying that these guys don't know how to do it. Better really to know what your picture is because they may have some big messages for you.

AUDIENCE: Do you think that the internet is going to become a powerful vehicle to exchange this information, such as the one you sited with about malaria in the Armenian?

DR. HOLLOWAY: The Internet is already a good one on this ProMed business. I use it all the time for that. And I think it is moving in the right direction. But the fact is, that the Internet is getting ready to collapse. We have to think about post-Internet, I think, really. I think that is the reason I use the phrase *intranet*. I think there will be devoted segments of the 'net that will have to be devoted to some of these topics in order to protect the communications, rather than getting swamped in its overall commercial competition. With that amendment, I think that if he looks on this as an evolving system, yes. This is a critical area where we can start getting information out; generally make it available on a worldwide basis.

We were talking before, and I agree with the idea, that in doing that, the NGOs, the nongovernmental organizations, will have huge advantages over the governmental organizations because in a sense, being able to communicate well means also being able to communicate with the ability to be wrong. The government is so preoccupied with never being wrong that it will also not quite get it right. I think that that is an area where there is also a big contribution to be made in that way.

DR. HIRSH: I can not emphasize sufficiently the need to develop communication skills before something happens. My experience, very limited, is one to establish a more sophisticated communication system. However, there are societies in this world today, in which communication, open communication, is still a threat to control. People will not allow open access to a telephone or a terminal as we see it here. There is not this openness. The more these things can be open ahead of time, the greater likelihood that if something happens, this occurs. Otherwise there is going to be--people protect their jobs. If the world sees that you are doing something wrong, the next logical consequence, you lose your job. Nobody is willing to do that.

DR. HOLLOWAY: I think that is right. I also will comment on the other side of it. UFA, as I have indicated, is not exactly on the main pathway. UFA we did with very low technology. Actually, the visual technology out of UFA was slow scan because we put it over about 1500 miles of Russian telephone line for part of its exit from the country. That is very tough. Russian telephone line is not good.

The thing that was interesting about that, was that eventually, we finished our consultation there, and we got ready to leave. And our contractor, John Scott, went back to pick up our equipment, including the slow scan machine that was sitting in the hospital director's office. This was the office we used. The hospital director said, "No. I am not going to give it to you." That is still sitting there today. And he said, "I am not going to give it to you because the day will come when we are hooked to the world again, and we are a part of things again." So when you go into these areas, you really are opening up this communication stew in a way which is desperately desired by those folks. In fact, I

eliminated one of my overheads which has written on it, "Did we create a cargo cult?" Because as we are reaching out, we will also identify these areas of need, and there is some real follow-up to be done about that, too. Every post-disaster piece of work is pre-disaster. So that when you start doing your post-disaster stuff, you ought to be thinking about the kind of pre-disaster things that you are going to be doing.

DR. HIRSH: Thank you.

End of Recording

Session Summaries and
"Next Step" Recommendations

DR. JAY SANDERS: This is really the most important part of the conference. This is the time when we really need to identify the critical issues, identify recommendations, and, most importantly, to come up with the next steps. What Jean-Pierre and I would like to do is first start with a report from each of the Action Panels. We're going to start with Panel A, the two chairs being Joe Kvedar and Dr. James McGee.

DR. JOSEPH KVEDAR: The agenda for Action Panel A was to come up with next steps regarding harnessing the clinical opportunities in telemedicine across the Atlantic. In organizing the session, Jim and myself utilized the brain storming technique as opposed to a series of speakers. We recognized in doing that that if the audience got large, there would be potential peril in trying to incorporate everyone's ideas. But I think despite that potential sidetrack it actually went quite well. We posed the question to the group: how do we measure the clinical utility of telemedicine? During much of our discussion, we posed the question: How should we measure the clinical utility of telemedicine? We had an interesting discussion around that. Much of the discussion focused on the measurement of outcomes from both the clinical and economic perspectives with consideration of the potential benefits and potential bad outcomes that patients might suffer from the use of the technology. We talked about different measurement styles. One particular style that was mentioned was a specific scientific-oriented clinical trial based on a way of measuring results that would generate data which physicians would find credible and comforting. Another approach which was discussed was more of a establish a precedent of use that actually bringing the technology into environments where it is needed and using it will teach us lessons and that we'll be able to measure utility on that basis. That would certainly fit into areas where there isn't face to face medicine with which this would compete. A third perhaps intermediate approach comes from the engineering world, which is that of rapid prototyping. Put something in place, see how it works for a little while, change it a little bit, go back to the test bed, if you will, and work with it some more. So those were the three areas that we talked about measurement in.

We also discussed evaluation of telemedicine in context of existing medical standards which are variable. I might say at this

point that what I forgot perhaps to mention at the beginning is that the actual agenda from this group will be forthcoming. We're planning to hone this summary a little bit more and then disseminate it to the group for e-mail discussion regarding where we come up with next steps and have a voting process by which the group can hone in on various approaches. I would say that in summary for this part of the presentation then I'm going to hand the floor over to Jim McGee. I would say that by far and away the most common approach of the audience to looking at the utility of clinical telemedicine was in the outcomes and quality assurance realm. There were a minority of people who felt that the randomized clinical trial was critical to the process, and there were a minority of people who felt like there was no need for evaluation whatsoever. But I say that the vast majority were in the realm of driving it through quality assurance and outcomes aspects. With that I'm going to turn the floor over to Jim McGee. Jim's going to tell you about another question that was raised in our session which had to do with forming some specific possible collaborative efforts between both sides of Atlantic to further this notion.

DR. JAMES McGEE: Well, we put it to the audience: Can you come up with some specific proposals which will encourage immediately, in the short term at least, interchange across the Atlantic ocean, taking that in its broadest context. But if it's not in it's context I suppose it would be North America and Europe, which in fact not strictly as we all know what Transatlantic means. There are about eight projects that I've got summarized in front of me here, which on the face of it I think are viable and would lead to collaborative activities. I'm not going to do through all of them in detail. The first one was to produce a register of what was going on in terms of telemedicine activities on both sides of the Atlantic in the form of a database. Emergency medicine came in there as another one. The Armenian gentleman who just spoke talked again about fairly complete things that might happen, if I might use this term, in the former USSR. One other point that we did discuss, but not at any great length because of the time element and the fact I don't think there was a forum for making such decisions anyway, flagged up the problem of funding these collaborative giant efforts. Several bodies were identified. The European Union was one funding source outside of the Atlantic efforts, but making it very clear the European Union does not fund anything on this side of the Atlantic. One can put up giant proposals, the European Union will look at the other side of the Atlantic's proposal and whatever government agency on this side will look at

that. The second proposal, about funding was that we should in fact go via the military and use the military's best offices both on this side and on the other side of the Atlantic because they have access and influence in government circles. The third and I think final comment that was made on that is that just get these projects up and running in fact the man who made this statement wanted a project on chronic disease. That was welcomed. He said there wouldn't be any difficulty funding it because the venture capitalists would step in. My business card is available for any venture capitalist here in the audience. They can feel free to contact me about any of these. So in summary then I think at the end we did come up with some concrete projects that might work across the ocean. We've identified potentially at least some funding agencies. I think that's a fairly good first step. Just one final comment, what we have derived from this particular action session, as Joe said, from their comments, voting on, and prioritizing, will be e-mailed out to all the people in the audience.

DR. SANDERS: What I thought we would do is to have all the panels provide their recommendations and then to have open discussion with the movement towards specific recommendations and, in fact, hopefully, identification of projects that we would do. However, if you would like to discuss these after each panel, that's also fine. I just have a feeling that I don't want to end up with the last panel having the least amount of time. So unless you feel otherwise, let's move on to the second panel, and we'll hold the discussion and the recommendation until after all are summarized.

DR. JEAN-PIERRE THIERRY: Thank you, Jay. It's my pleasure to ask for Mr. Charles Safran from Beth Israel to report for our Action Panel B on medical records, patient information, and smart cards. You're representing him? Okay.

MR. PIERRE TOUMA: My name is Pierre Touma. My background is mainly technical but I really enjoyed the discussion about the ramifications of the deployment of electronic patient's records in health care systems as well as the issues related to security confidentiality and the use of smart cards. The panel was able to basically outline fourteen areas of concern or issues. We focused on one of them, mainly security and confidentiality of the medical data and how smart card technology would be used to enhance this security in the health care process. I'm going to go through all of the fourteen subject areas in case anyone in the audience has any

particular question. Any one of us that was in the panel would be able to answer them I guess. The first one was security and confidentiality, the reason being that this would be one of the major issues that could topple the entire telemedicine effort. I mean if there is any concern from the public at large that the information that's going to be sent over wires or satellite or imbedded in a electronic patient record is not safe from whomever has no right to look at it. It's going to topple all of the telemedicine efforts. It's going to be more crucial than the reimbursement issue, which is being worked out either on a state level or the federal level and probably more relevant to the medical community and the patients alike than the cross-border licensing and other clinical issues. The other subject area was: Should we look at the electronic patient record as a mere duplication of the paper record? Should we look at another object-oriented approach which would end up developing a multimedia record that could imbed every and all information that clinicians would need? We then switched to the relationship between telemedicine and the patient record--the electronic patient record. I think there was an agreement among all members that this should be the nucleus of all and the center of any telemedicine effort, viz-a-viz, for example, real-time video conferencing that some people are basically advocating as the way to do telemedicine. Most clinicians feel that dispatching a multimedia record is a good enough telemedicine practice to base any system upon. Then there's the issue of storage. How should this data with stored? Is it going to be a central data base, a clinical repository, or is it going to be distributed environment? By distributing the information, how far? It's going to be on a provider's level or on a patient level? That's where the issue of using smart cards, not just as a security mechanism as an access tool but also as a electronic storage media was discussed. Some people were for the idea of using the new next generation of smart cards that are supposed to have a very high memory capacity to store the entire patient record. Another alternative would be to use the card as an index card or just as an electronic key. So these areas were addressed.

Then there's the issue of terminology standards and nomenclatures, how do we address this? How do we make a standardized electronic patient record on a local level and on a global level that allows the transfer of electronic patient information across all borders. Then we went on talking about health policies and regulation as it relates to the patient record and telemedicine in general, how we could use the data that's imbedded in the electronic

patient's record for outcome studies, epidemicology research. There was a discussion about the minimal data set that would be needed by clinician in the day-to-day operation. Then there were practice issues that were a subject of discussion and the relationship between clinicians and patients around the electronic patient record, which led us to talk about the standards of care. When do we need an actual physical visit viz-a-viz a televisit over a communications link? Some international issues were also discussed such as cost effectiveness of using telemedicine, what is appropriate, what is not. Again we went back to the smart card subject which led us to talk about patient centered information and how this would be used to optimize the flow in and out of the point of care. And what's the functionality that would be needed in the electronic patience record, in the smart card, and in the different interfaces to communicate with them? Then there was a question about the data acquisition. How would the data be entered? Is it scanning, is it typed, or should clinicians use the latest in voice recognition technologies? Then after going through all of the points that were raised, the discussion centered around the security and confidentiality of data, optimal mechanisms to make data more secure, and also the way to trace and figure out who were the persons who had the last look at a patient record within the hospital and within a larger framework of an HMO. So audit trails were discussed. How they would be combined with security mechanisms and eventually the smart card to insure that if there are breaches in security, the person who's responsible is going to be accountable. This was mainly the topic of the discussion we went through. If there are any questions, I guess myself or any other member of the panel would be able to answer them.

DR. ERIC ALLELY: Dr. Eric Allely with the Jackson Foundation. Related to the security issue and the patient confidentiality, did the committee address the issue of ownership? Who owns this data? It would be interesting to hear a little bit about what you had to say.

DR. THIERRY: Excuse me, Mr. Touma, maybe we have to move for the next session and trying to keep all the questions and discussion after the presentation. Thank you.

DR. SANDERS: Our next panel, Panel C was chaired by Dennis Wentz, who is the Director of Continuing Medical Education for the American Medical Association; Cynthia Tutanic, who is a member of the FCC Advisory Committee on Healthcare and Telecommunications; and

Catherine Crawford, who is an Associate for the National Health Information Center in Washington.

MS. CYNTHIA TRUTANIC: Dennis has asked me to give this report for him. I'm hoping he will fill in everything and anything that I forget. We had a very nice group of very patient people who gave a lot of input. We started talking about distance learning and then went on to certification and licensing issues and then CME. We tried to get very practical to come up with an identification of what the obstacles are and what recommendations we may have and tried to be very task-oriented. But we really ended up talking about was that one of the major obstacles for the distance learning discussion was really a definitional one. So we broadened the definition of telemedicine to not only include clinical applications, but we incorporated telemedicine as a subset of a broader category of mental health, to cover the education of all health professionals who are not engaged in clinical applications, and also to include consumers and users of health services and to include the public health arena. So defining the definition was a problem.

We did use the category of "telehealth" that's actually come out of the Commerce Department report that you all have been given. We said that telehealth are activities that link telecommunications and health in order to improve the health and well being of individuals and communities. This includes better access, improved healthcare and services, and better disease prevention and health promotion. In discussing that we talked about this broader definition actually in counseling partnerships of all players in the health system, including patients and other consumers. It encourages creative development of applications, for example, using the virtual reality technologies as a learning tool. It encouraged economic development as a result of new applications and technologies. Many of the barriers to implementation may be eliminated. Ultimately, the goal of distance learning, certification, licensing and all of this is to achieve the health and well-being of individuals and communities.Another obstacle we identified to implementation of distance learning was access. Access we defined as access to technology, which is differing in many areas of the world. In United States the infrastructure, the work of the task force on the FCC, and the new Telecommunications Act will be eliminating some parts of the infrastructure barriers. Therefore, the question is: Who is going to be ready and with what types of programs to be prepared to take advantage of the roll out that may be occurring

domestically for distance learning and for health? Internationally, we talked about the fact that access to technology is really mixed. We also talked about how to validate information that's being disseminated as an issue of access, and how ready is the access to that information? How fast you can get it? How do you validate the quality of the information or the provider of the information? We recommended that access to and education about technology be provided to providers in health education and training programs. That we try to eliminate computer fear and that we also provide patient education and learning systems within a multimedia environment, allowing for many levels of training. The point was made that if you provide a mixed media and a multi-tasked form of learning, it can be used a variety of ways, and therefore be more efficient and more useful to the general society at large. Then we talked about developing filters that would help people digest the amount of information that's available today about health on the net. The other obstacle to distance learning and the implementation of these programs was economic. That's obviously the infrastructure cost, the cost of equipment, the sustainability of the programs. As infrastructure development varies widely all around the world, we didn't really get into that, but we did recommend that the lowest, simplest and most prevalent technologies be used first, such as telephones and e-mail, whatever can be used to achieve the educational goals. In defining your educational goals that you clearly identify the needs of the end user whoever they are, and then use your equipment and technology to meet those needs. So you really have your definition done from the outset.

We acknowledge that in many cases the market forces will determine the economic sustainability of a program. If a program is needed, it's geared towards the need, and if it's of good quality, then the market may support it. In those instances where the market does recognize the need for example, payers who have incentives to provide education programs for not only their patients but also their healthcare providers, that where those incentives do not exist and where the public health and public good are involved that those training programs and those education programs be supplemented by public funds. Then we talked about licensure and credentialing and noted that state-by- state licensure, as currently constituted, does present economic and practical programs, and that the cost of licensure and the complexity of a process were mentioned. We also noted that national licensure issues may prohibit professional international collaboration. There was a recommendation that (as in

maybe one state in this country) a regional pilot project be developed that facilitates interstate collaboration of health professionals. Dennis may want to add something to this. We also urged international bodies to discuss licensure issues at high levels such as NAFTA, WHO, WAMA, the economic union and the G-7. The last thing we talked about was credentialing and authentication. We said that credentialing could service as an authentication tool to insure the quality of the information being provided and the identity of the provider. And credentialing of the health profession goes beyond licensure in an effort to insure quality.
DR. THIERRY: Now, we have Action Panel D. And this is monitoring and management. And I'm glad to call John Woodall who is the Director of ProMED-Mail.

DR. JOHN WOODALL: Section D discussed the following, the way in which the PanAmerican Health Organization collects information from around this hemisphere on disease outbreaks and diseases, and how on the other side of the Atlantic the European Union and the USA collects data from 15 countries, 15 core countries and some others on disease outbreaks and diseases that are occurring in Europe. And then we heard from the World Health Organization, Michael Sharpe, if fact how when the World Health Organization puts all this together for not only both sides of the Atlantic but the rest of the world and how they do their reporting through the Internet and the with the use of all means of electronic communication including for out military friends the fact that they have agreement from 45 mostly Nato military labs and medical sections around the world to report diseases as they see them also. It's a significant addition to the sentinel places looking out for disease outbreaks. How these systems are complemented by ProMED-Mail, which is an NGO operated system of e-mail open to the public, and it covers the whole world which re-reports, re-posts WHO outbreak reports, PanAmerican Health Organization outbreak before its European one and so on, to everybody who's interested to sign on. This means that such reports are seen simultaneous by WHO, by national health departments and by local health departments. So that any outbreak report is immediately seen by everybody who has a need to know.

Now, the way the program now is facilitated is by satellite, which you may have seen. It's all out there in the exhibit area. That's another NGO that's based right here in Boston that provides free Internet access through low earth orbit satellite. This is terribly important for developing countries, particularly our southern

neighbors because the country may not first of all have an Internet provider. Secondly, if they do it's too expensive for anybody except commercial companies to use. Therefore, the health sector can't use it, therefore the diseases don't get reported. Now satellite has [olio and polo] orbit and does p about this service. So when we came to talking about needs and recommendations, our first need as we saw it was. Well, there are 284 people subscribed to ProMED-Mail with an .MIL address, a military address. They wouldn't waste their time reading outbreak reports unless it was some use to them. We know it was a use to them because we got an e-mail from the Armed Forces Institute of Pathology in Bethesda just yesterday asking for information about pulmonary [hemasidrosis]. Although the military have their own network for getting things, they also find that public access, e-mail network very low tech, very widely available--useful. They got their reply of course. So our recommendation would be that our military friends could cooperate with us even further, that they have spare bandwidth anywhere, that they could make it available for making these sorts of disease reports available to a wider public and especially to developing countries and our friends in the south.

Our second point out of three was that there's a need, there's a definite commercial interest. They are 1223 subscribers to ProMED-Mail with a .com address. Of course oil companies, mining companies, travel experts, and export/import companies want to know what epidemics are breaking out where. It effects their business. It effects their bottom line. They will go anywhere they can to get to know what's happening in the way of diseases around the world. Look at the plaque outbreak in India that cost $1.6 billion three years ago. So there is a need to be met with the recommendation that these companies put some money into operations like SatelLife, or low cost operations, in order to reach the world of the people who are reporting outbreaks in remote countries. SatelLife and ProMED-Mail reach 136 countries right now, which is more than the WHO, but there's still another 40 countries with e-mail and a need to get into those.

The last point is that the low earth orbit satellite has ground stations that will fit in a suitcase but right now costs $10,000 each to make because they are handmade with off the shelf components. There's no patent involved here, easily made. If they could be produced in bulk, the price could come down to the same cost as a [Comsat] satellite telephone set. But it would have to be different. You can't plug a [Comsat] suitcase telephone into a low earth orbit

satellite. So the recommendation is if somebody is interested in commercializing this patent free system, it could be parachuted all over the world and you could get no-cost access to the Internet through this system. It would make a tremendous difference to disease reporting and to the doctor in the field who has a question and doesn't need to transmit the x-ray on anything. He just needs to ask somebody: What do I do with this case? Thank you.

DR. SANDERS: We've now heard a summary of the four panels, and we have heard some recommendations. I'd like to open it up to a much broader discussion in terms of recommendations and next steps. In order to corral the discussion a bit in terms of focus, let's begin relative to specific recommendations with regard to Panel A, Clinical Applications and Market Opportunities.

DR. RASHID BASHSHUR: I would like to make two comments of different nature. The first regarding this meeting and what happens with the proceedings of this meeting. The second comment is about the future. With regards to this meeting, I would like to offer the facilities of the Telemedicine Journal for publishing proceedings. This is not a blind or a blanket offer. What I have in mind specifically is a set of recommendations coming up from the groups that will have to be edited and agreed upon, and that will go through a process of consensus development among the participants. To my mind, this will be a concrete outcome of this meeting since it has taken place. We met here a number of days and I think it will be quite appropriate to come out with a product. The product that I'm proposing on behalf of the Telemedicine Journal is to publish the proceedings. The second has to do with the future of this group. I must say that I was quite a bit confused in terms of the focus and the trend in the development of Transatlantic Rim cooperation. I could think of two models, and perhaps a hybrid of the two, that I would like to have some clarification on if the idea's already clear in the organizer's mind or some discussion about it if the concept is not well-developed at this point. One approach to mutual cooperation in the Atlantic Rim would be a meeting of this sort where projects, activities, plans, policies, research that is undertaken separately in the various countries participating will be presented. I call that a forum. We come here, we present ideas, we discuss, we share information. I find that a useful forum. I must say, however, that when I came to this meeting, I excepted something else. It could be my own imagination. It could be my own fabrication. I thought that

there was an interest in establishing a network of some sort. The network would imply some kind of a joint activities, things that done by partners on both sides of the Atlantic. In order to do that then you pursue the idea of this group in a very different way. Please I'm not favoring one or the other, I'm just asking for clarification, so I would know in the future what to make of this kind of activity if it should go further. Thank you.

DR. SANDERS: Rashid, thank you very much. Thank you specifically for, number one, the offer to consider the proceedings for publication in the Telemedicine Journal. I applaud that and as one of the conference co-chairs, I would certainly recommend that as long as we can get it into a format that is appropriate. Second, I don't think your anticipation of what this Summit was to be is any different than certainly I thought the Summit was to be and what I fully intend the action recommendation to be directed at. That is the development of Transatlantic cooperative initiatives in which many of the things which the panels themselves addressed would, hopefully, be able to be answered or at least an approach towards an attempt at answering would occur. So for an instance, a clinical initiative that might involve France and the United States would be one in which we could look at the four issues that were addressed by the Action Panels. I would be very disappointed if we were not able to develop a Transatlantic network both from a latitude and longitudinal standpoint Transatlanticly in terms of the outcome of this Summit. So I certainly would like to encourage, and I would hope that we will be able to identify certainly if not this afternoon by the post-Summit group that will be getting together. To come up with a specific action plan or plans that would involve cooperative applications of telemedicine, clinical applications, market opportunities, and in which developing those applications we would be able to look at issues of licensure and credentialing.

For example, just as a footnote, wouldn't it be of interest if we had a clinical application with the European Union and the Western Governors Association group of states in which we agreed on a proof of concept period, a study period of two to three years, where during that period there would be reciprocity with respect to licensure and credentialing. So that in fact there would be an international license that would exist between our western states that made up the Western Governors Association and the European Union where there is cross-national licensure at the present time. During that process we could look at the whole issue of continuing medical education.

We could look at some of the issues with respect to disease monitoring management. After the last panel report, I was just amazed by the fact that we don't have a common acquisition assessment and reporting of process for disease management. Why does the CDC have something different than the World Health Organization and what the European group does? We may not all be affected by the same diseases from a frequency standpoint because as Jeff Gelfand said yesterday, he has learned a lot from his telemedicine system into Argentina in terms of seeing a [Shoger's] disease and South American [Blastermycosis]. But the reality we are a very small world. We all travel and we do see malaria, for instance, in the United States. We have had plaque in the United States. So the reality is that the reporting mechanisms could all be made the same. So that's a long response to your short suggestions, but I hope that we don't leave here without having exactly what you had anticipated in coming to the conference and your recommendation to have transnational initiatives.

DR. THIERRY: I just want to add that this is of course a starting point. I think many of us have recognized opportunities as an output. So I take it in this way. Of course, all the opportunities that have been recognized, that will be followed by recommendations should be understood and looked at. But we have to start somewhere. Also maybe to look to add something because I think we have first to hit the panel discussion before moving to the general recommendation that we have first to establish a framework. This is exactly what the difference between a Summit, a Forum, and a Conference with the big technical exhibits for example. Something has to be established really definitely in the future. But this is starting point. It deals mainly from technical to diplomatic issues. So it was rather complex, maybe confusing for many of us because of the definite world of specialization. So I think one of the most interesting parts in the Summit in discussing strategy issues is multi-disciplinarity. We have also to deal with a lot of different opportunities recognized and actions proposed. We still have to--I think because it's an international matter--to stick and have a framework well-defined first. That's all I have to say to this point, and we may have that framework that Jay began to draw.

DR. STEVE CORBER: Steve Corber from the PanAmerican Health Organization. I was interested when you were talking, when the first panel presented ideas about how to evaluate it, the idea came up with regard to outcomes and quality assurance. Speaking from an

international health point of view, where policies are made for the general public with limited resources--and increasingly that's the case with HMOs now being involved increasingly in the United States--I was interested that there wasn't much talk about prioritization based on cost benefit, outcomes over cost, or basically the health needs of the population as being one of the driving forces in the development of telemedicine. I just heard a presentation at Tahoe last week on the technology assessment unit being presented by the University of Ottawa in Canada. They were taking about a rather sophisticated models being available to measure the burden of disease using various measures and developing models not only for consumer choice but also for policy-maker choices with regard to possible benefits and matching those two. So I want to put on the table for that first panel the question of: Had they considered cost benefit from a population point of view, of choosing priorities for areas of development of telemedicine or where that might fit?

DR. McGEE: We had considered specific remarks from the floor cost benefit. What we didn't go into was technically how that might be done. Because it is almost self-evident that cost benefit is part of clinical utility, Because diagnostic accuracy can be 100 percent. But if it costs 100 times as much, no matter what technology you're using, it is almost irrelevant. So that will actually be built into our summary and recommendations. But what will be omitted are the techniques to achieve that.

DR. SANDERS: Could I turn the question around. I'm not a psychiatrist. Do you know of any cost benefit analysis that has been done for the traditional system?

DR. CORBER: Well, there are a number of cost benefits, analyses that are done in public health. You can use [dallies] per dollar invested in terms of what the outcome might be. There's cost benefit analyses which are done for immunization programs and the values of different types of interventions. There are many preventive measures--whether you should stop smoking and how much, measure blood pressure or have a low fat diet, wear seat belts, have Pap smears or mammography. They often have for a policy decision as to what people should invest in, what the burden of that disease is, and what the likely benefit is going to be if we do such and such. So there's sometimes it can be just dollars over cost. Sometimes it can be cost per year of life gained or various measures like that. But in choosing which of the areas to try to develop in terms of diagnosis

and intervention for a particular application, I was wondering if you were looking at or had thought of looking at the consumer needs not from an individual patient or from a diagnostic accuracy point of view, but from the point of view of what are the health problems in Armenia and should we develop interventions along that particular line in telemedicine? [end of edit, for early access by Jim Barron]

DR. McGEE: Your question is now a little broader. Namely taking the very last couple of sentences that you uttered. Did we dwell in Armenia? The answer is that we did to a slight extent because it was an Armenia representative there. But what we didn't consider in general was the -- I think what your interest is the public health needs of Armenia.

DR. CORBER: I just use that as an example but more I was interested in choosing the telemedicine, were you looking at cost benefit of different types of applications as a measure of developing new technologies or trying to sell market in particular areas?

DR. McGEE: We weren't trying to sell market. I mean that wasn't the object of the exercise, and I'm only to repeat what I said earlier perhaps in different words, that in measuring clinical utility you have to measure cost effectiveness, cost benefit. We recognized that and that will be part of our report. What we didn't do was to enumerate the techniques we would use to do that.

DR. SANDERS: I think your point it critical. I would recommend and I would suggest if we identify the clinical application or applications that we wanted to focus in on, is that we use a platform that was recently developed by the Institute of Medicine National Academy of Science in its report on evaluation of the evaluation of telemedicine. They went into a very complex and comprehensive review of how to evaluate telemedicine and clearly cost benefit economic issues were part of that study so that needs to be done. However, I want to make sure that we are all aware of the reality of the existing healthcare delivery system certainly in the United States. That is as you know if either one of us had to have a [prosthetectomy] done in Oregon, and have the same [prosthetectomy] done in New York by the same skilled surgeons, it would cost us vastly different amounts even though it's the same surgical technique and the sam it would process, it would cost us a vastly different amount. Then how do we measure the cost benefit analysis we do. Do we do it for the state of Oregon or do we do it for the state of New York. We have a basic

problem. We have this knee jerk reaction that in fact telemedicine is something new and different that needs to be tested, when in reality everything that we do today needs to be tested. We haven't done the same scrutiny other than the existing healthcare delivery system that we are asking telemedicine to go through in terms of its evaluative hoops. I don't say that to suggest that telemedicine should not go through evaluative hoops. It definitely should. I'm just saying that we don't have a platform upon which to compare it yet. That really needs to be developed. However, using some of the suggested evaluation frameworks such as the one that the Institute of Medicine has, such as the Office the Rural Health Policy has, such as the one that the Armed Forces has, and I'm just here can only speak to the ones here in the United States. There are -- there will be for lack of available frameworks to utilize in terms of evaluation and clearly the economic benefit issue is one that has to be addressed. But what do we do when we get into the situation as clearly we have gotten into in terms of public health in which there are certainly very rare diseases that can be treated very adequately with specific drugs, but it's of not cost benefit for the pharmaceutical industry for make those drug because there are so few people who have those rare diseases. Where do we as a society make a determination. Unfortunately yet we haven't made a determination with respect to that. You know we deal with that on a day-to-day basis today.

DR. THIERRY: Jay, if I may comment, I think it's a -- that suggested that we maybe some investment goes abroad because the opportunities are abroad. We invest a lot more in Europe. So maybe we are to cautious and to royalcratic, but the demonstration of cost utility of telemedicine is a very important issue because our resources are more scarce. One of the objective, one of the opportunity, but I can't give names because of -- I can, but it's, companies are involved and this is management entering the cost utility demonstration to telemedicine. I think this is an opportunity. It could be seen as a set. Because it goes with the managed care area, but I think if the pharmaceutical industry is willing to demonstrate the cost utility of telemedics and telemedicine through managed care or business management program, it could be a great help because they have a lot of skilled people, and they have the money to put maybe into the assessment and the demonstration. Besides on a public health matter, the immunization proms are well established base of cost benefit in light of this. It doesn't fit very well with technology, and I agree with Jay that we haven't for the time

really demonstrated that the methodology was applied to medical technology. But it's already applied for pharmaceutical as I said before.

DR. NIELS ROSSING: Thank you very much. I really appreciate them and I also appreciate the comments about cost effectiveness and the part technology assessment in general. That's very needed. But I don't think at this time, at this hour we should devote all our time to discuss the technical aspects of how do we evaluate and what are our criteria et cetera. I think now is a time and I was very happy that the answer to this -- the owner of general telemedicine thank you for your gift. There came really a question, what is this about and Jay answered, and I was very happy that you're going to have a postfestem meeting on the issue that I think that we also who are still here at this working lunch should act not only as nitty gritty researchers but as the strategists we are suppose to be when being here. One of the issues that we must deal with right now is can we use this wonderful platform which is the Atlantic Rim Network to work on for the future, who does what, what is to be done, as far as I'm concern, people have been very kind and addressed me and also addressed the EU, the European Union and the commission as some entity which it is. Of course until somebody that the EU will not fund participants from this side of the Atlantic in a collaborative effort, but even half the funding for the Europeans might be supported and pooling from the other side might be worthwhile as well. But in our panel we did not discuss very much the issue that was also there, the industrial opportunities. There is some there because really thinking in terms of funding from G-7, from Nato, from EU and wherever. But where is industry in this matter. This is actually I think a strategic issue. So I think that we should deal with the aspect of having this framework, doing what, being a forum or being a leading force. There are many people who have been discussing over the last couple of hours very interesting issues, but who are the doers, when do they do it, and where do they meet next? Thank you.

DR. THIERRY: It was our intention that Niels came here. So because you have so many things to tell us, please com now. As a representative officially of the European Commission and also as a professional in telemedicine for so many years with great skills.

DR. SANDERS: I do want to mention one thing about the postmortem process, the post-Summit activities. They will in effect consist of the following. We are going to ask and there probably will be a few

groans, we are going to ask the co-chairs of each of the panels to provide us their written recommendations as well as prioritization of actions. We will then, and we will, I'm pretty sure we have collected everyone's e-mail and or fax address. We will then send these recommendations and priorities out to each of the registrants, each of the participants here at the conference for your response. They will then come back to the co-chairs for finalization, and then we will hopefully be able to have the bullseyes that we want in focus for Action Panelss. I think there will be some critical problems after that, in fact our biggest problem will be once we identify three or four initiatives as to how do get them funded. But what I would suggest, and I certainly will suggest, I can make that commitment now

[End of Tape One]

for telemedicine, I will suggest to the United States that we embrace those initiatives as part of our G-7 obligation. Make that part of our G-7 projects.

DR. THIERRY: If we take this recommendation, maybe we could move to the discussion of the framework that or do we have to maybe leave the floor for discussions of panel issues. We don't want to be frustrating for anybody here. What do you think, Jay?

DR. SANDERS: Well, I think we -- as we said before, we need to make sure we are embracing everybody's view with respect to discussion on the panels, so there didn't seem to be a lot of discussion about panel A. Maybe what we can do now is move on to panel B with regard to medical records, patient information, and smart cards. Or let me open it up totally, if that's all right. Let's go through all the panels. We have a scribe, and we will be noting all of the discussion.

MS. SHAKE KETEFIAN: Shake Ketefian, the University of Michigan. Unfortunately I have to leave just as this is getting interesting. But one suggestion I have is for us to use the people who attended this Summit as the core group to get an international society for telehealth or telemedicine established. One of the things I will find very useful personally is to receive a list of the people who attended along with their addresses. All the conferences in my career have this information in the packet when I come to the conference. I miss that a lot and I would like to still get it because it's a wonderful

opportunity for continuing the networking that has been begun. Thank you.

DR. SANDERS: Thank you. In fact with respect to your first point, there is a meeting in Kobe, Japan next week, and one of the issues that will be abroad at that conference, this is the third international conference on telemedicine, is the formation of an international organization to deal with some of the things that you just mentioned and most of the topic that we have discussed at this Transatlantic Summit. The nature of that international organization really hasn't been decided yet, whether we will be a separate organization or whether it in fact will be sort of an international council or international federation made up of each national association, hasn't been decided on yet. I can just tell you from the American telemedicine Association's standpoint we would much prefer it can a federation that represented all of our individual national associations and interest rather than a separate body. But yes, you're suggestion will be acted on. Jim, what about the suggestion concerning providing a list with all the registrants.

MR. JIM BARRON: We will put together all of concluding materials.

MR. HAIK NIKOGOSIAN: My suggestion is that the -- I'm Haik Nikogosian from Armenia, MD and Healthcare Management. My suggestion is that we have to congratulate Jim Barron, Jay Sanders, and Jean-Pierre Thierry and for all of us with the Summit to consider this as a major international telemedicine event. Consider that if you are reviewing all the organizations and events in the telemedicine field you can find out the ratio between international and domestic events and organizations I'd like through 1999. So this organization and this event and this umbrella could be a very good environment for improving, increasing international portion of telemedicine. My suggestion is that this event and this organization should be more focused on the specifically on not just the telemedicine theoretically and technical medical just on the international issues of telemedicine. That will be the special mission, the special vision of this organization. My suggestion is that we consider this event not just like Transatlantic Telemedicine Summit, but the first Transatlantic Summit and the second event should follow. That is my strong suggestion. The second suggestion is that we have to think to create a least three professional groups and ask them to work on any basis before the next event, maybe next year, maybe by e-mailing or I don't know or corresponding another way to prepare some materials

in the technical field in the medical and policy and management fields. That could be like a continuation of the efforts before the next event. The third and final suggestion is that I think that we can recommend this organization and the future events that couple of or three or four projects could be chosen as demonstration models under the umbrella of this organization to demonstrate that real information efforts and really functioning international models could be created and could be effective for healthcare and public health. So my suggestion is that if you are going to do such work the focus could be at least for two, three future years newly market economy countries were there is a real need for the western connections for telemedicine. So G-7 and the European Union nations could select two, three countries among other countries in the Europe or in America and as a focus of the real international network bridging not only physicians but also their countries. Thank you.

DR. THIERRY: I like this intervention and also I think that the Summit does not duplicate the meeting of the newly formed medical associations as the ATA or the newly formed French telemedicine Association. There will be a German telemedicine Association soon. So that's exactly what we're trying to do what you stress, is to address maybe some different kind of problem on the international issues, and of course we have a lot of [Inaudible] to wait from the international medical aspects of telemedicine because in [Inaudible] I think it's medical aspects in telemedicine. Here this is not a medical meeting again. I went to the ATA organized by Jay, and we have a lot of input from the medical side. This is not to say that international aspects couldn't be treated. In the French telemedicine Association meeting or the German telemedicine Association meeting. But my impression is that we can't be very good doing everything. I agree maybe the Atlantic Rim has a lot to do with framework. Maybe some diplomatic contacts, strategy issues, and then of course we will work directly with the telemedicine associations, but even more efficiency to the European Union, to the different federal agencies here, to your country and to other countries as well. So it's slightly different I would say. I completely agree with you about the future organization of the Atlantic Rim initiative.

MR. KEVIN DYE: Kevin Dye, Molecules to Market, Belfast, Northern Ireland, I have kind of a simple request which is actually on the invitation to the Summit which was looking to sponsorship for a set of Website, but I'll take it to mean some kind of electronic collaboration facilities or an infrastructure to continue meetings in an

asynchronous fashion anyway which is a step up from e-mail. We have some excess capacity on our system and I think that if I have three or four other people in the room that are interested in pulling together some of the technology we're promoting to use for ourselves to step up from e-mail which hasn't advanced a whole lot since the late '70s, that would be very helpful to me and I trust in the spirit of the Transatlantic collaboration. So I'll be over here with business cards ready to trade.

DR. THIERRY: If we're going ahead I would just like to propose to establish a framework, but it's a fast reaction I would say. It has to be elaborate more, and it's inspired more than a little bit but what was going on in Europe telematics, it also relates to the different projects we had. It goes from what could be the international corporation in RTD. This is the first level we may address. It's apparently the more simple, apparently because of course RTD works is very difficult to achieve and we have to put a lot of money, a lot of development to achieve the proper telemedicine platforms of virtual reality. But I think it's maybe more simple because it's already exists. A lot of even small companies are already international when they deal with innovation. So maybe it's their commitment to find for venture capital, this is already a free market everywhere. It has been increased lately to Armenia and to other countries. So I think that's the first layer. Maybe we can do something, if Niels Rossing could come out on that because we have a lot of RTD projects, and of course we have a lot of subjects to treat. But the second layer maybe concerns more directly the Atlantic Rim framework, it's the application. Exactly staying with the technology we have, how should it work, and we are not completely clear on that one. We have to deal with technical requirements on the healthcare professional side, but also we have to deal with -- we've been discussing the telecom infrastructure. We're not completely clear what telemedicine requirements. A lot of people say it's low tech, we need for example, your rural area on the other side we have a very good recruiting effect if we bring rather high bandwidth to some remote area and to the poor people, users because we seen from other imagine on access at least in Europe because we are [Inaudible] doctors because if you increase the speed of a network there, you increase the number of users and maybe you increase the number of not too favor users doing that. So that's why also your initiative here is very important with rural areas. So applications. Then we have integration. That's a very important word at the European level now. It says we have the technology, we have the applications defined, not

so well, that we have to define that even more, and then we have to integrate them. How are we going to use them. Then that's one of the topic we have here is something to do with the priorities and to segmentation. We may separate developed countries, rural, we may also segment by specialties, we may also think about military as a segment application , et cetera, et cetera. But also just my comment on that is, and it goes with the cost effectiveness approach is that we considering integration of different sector applications. That maybe one of the major found here also is that cost effectiveness of telemedicine or telemedics won't be seen only thinking that the telehealth will have its own pipe. We need to think of applications integrating transportation applications, education applications on the same networks. That's why it's important to have an even more broad approach of other sectors of applications of telemedics not just telemedicine or telehealth. The other is validation and verification where it goes utilization review, quality assurance, legal aspects, how do we extend telemedicine, how do we do with cost effectiveness methodology and so on. How do we define the proper methodology for outcomes. My concern is look at social effects of what we're doing. We have a long tradition through planning systems. We don't have the same kind of side effects that you have in the U.S. in a way. We have a side effects of very well planned technocratic strategy. We want to treat all these people -- with a lot of invention is from state. This even if the design is proper brings a lot of side effects. I mean people don't use the technology the way you want them to use it. Everybody has to deal with that. So the social implications of telehealth should be also treated in the verification layer we have to address here. Input from other specialties not only health specialties as well. The last and maybe one of the most important layer could be the regulation issues in a big sense. I'm not at 80,000 feet here. I think we've seen in the U.S. that you have a very strong regulation policy that will bring a tremendous amount of good to telemedicine with the $400 million a year that we've just heard. I mean all the effort that has been through regulation process, and we know Jay that you are one of those who made this happen through the different committees you have in the U.S. But regulation at the international level should have a lot to do with diplomacy with dealing with what we call may be too easily bureaucracy have there because they are important people, and we have to convince them. We certainly have to go to them and other bodies to deal with confidentiality and security. If we don't do that, we may have one of the big social affect even with Internet may not be willing to face now because everybody agrees that the

Internet development has a lot of good things do bring, but if we don't deal with a lot of concern for many countries on confidentiality, then we may have very big social affects that may impeach us to use properly what the Internet could bring. We have also maybe to set up a universal world access as we are doing in Europe, you are doing in the U.S. now. Of course this has a lot to do with talking with governments, talking with agencies, and do this at the international level is really, really difficult. Everybody knows that, but it's not because it's difficult and it may be frustrating that we don't have to try to do this. I think in a way Jim could add something on that, on this small, but not so small now, but on the subject of telemedicine it has to go back -- it has to go from the people. The people initiative that the people that work. You're working in this field for years. A lot of people here have a lot of experiences. So it's up to us now to bring many information to the policy makers to the regulators the way is has to be organized in the future. We have to do this, will fortunately for me at the European level with the help of people like Niels Rossing that maybe want to comment on my 80,000 feet remarks on the future.

DR. ROSSING: You want me to comment. Thank you very much. I don't know if you really came through your questioning session with all the panels, but we did okay. The reason why I'm asking for the strategy to follow for this group here is because for the paradoxical reason that I'm a little bit uncertain. I do know that I'm not myself working in the commission any more. I am here to report back to the commission what was the outcome, what is going to happen next et cetera, et cetera. I already foresee the questions that will be put to me and that I should answer in my reporting to the commission. There I want to know the commission just being one small player in the game. They will want to know what really is the feeling of the group, and how are we going to use this wonderful tool that the Atlantic Rim is. Having said that I'm uncertain, I'm certain of one thing and that is that I cannot really commit the commission's, the European commission, not the European Union but the European commission which is a civil servant's organization. I cannot commit them beyond what's already there. There is a telematics program including, as you mentioned, twelve domains or applications fields has only been one. There are other areas that deal with the Atlantic and Transatlantic issues, but there is not very much funding for that. On the other hand, I know that the commission services realize that there is a world, goes to the east and to the west of the European Union. We can not build fortress Europe anymore. We shouldn't do

that. Therefore, we should use all the opportunities and all the bridges that we can get, hold that whenever there is a possibility and to think that Jim explained the Atlantic Rim network to me this morning in a wonderful way saying it's a kind of back-door diplomacy. Bringing the various players together and I'm looking can we use that or think that the proposal that came there is certainly a very interesting proposal, and I want to how the organizers of this event themselves want to plan the future. All I'm asking for is that we feel fulfilled that we don't go to the nitty gritties of where to use this technique or that technique because research is not the subject of this meeting. It's something different is how do we steer including the research but research as such is not the subject of this meeting. I think, therefore, I'd like to join in on you, Jean-Pierre, saying that maybe in the Atlantic Rim network one has to look at other applications not just healthcare. Therefore the European approach of integration of distance learning, teleadministrations, tele whatever and telehealth is something useful. I'd just like to know if everybody's is content with that. I for one would like to say I have been so happy being with you, and I do believe that the Atlantic Rim network has proven to be a wonderful platform. I wish you all the luck for the future on that. Thank you very much.

DR. SANDERS: Is there any other discussion on the panel recommendations? Any other suggestions as to specific actions?

DR. McGEE: I think the actions, Jay, are going to emanate very largely, if any. I hope there will be many from the reports of the committees themselves. I think all of these layers that we are trying to build are obfuscating. They are necessary, but they are not mandatory at this point in time. I think at this point in time we need recommendations for action because on that we are going to be judged as to whether in fact there should be a subsequent meeting.

DR. SANDERS: I agree. Jim. I think then what we will do is this is going to be as it has been from the beginning a participatory process. We are going to really canvass the entire group that participated in the Summit with respect to the recommendations that came out of all of the panels so even if you were at and I'm sure most of you were only at one panel, you will have an opportunity to participate in all the panels based upon the material that will be sent to you and requests from us to respond to that material with respect to

prioritization and any other actions that you feel would be appropriate. Carolyn.

MS. CAROLYN HUTCHERSON: I feel terribly uncomfortable just asking the question, but since I don't know the answer maybe I'm not the only one. In going back to the start of the meeting the things that stuck in my head so clearly -- I'm Carolyn Hutcherson, I'm with National Council of State Boards of Nursing -- the comment that stuck in my head so clearly is that this is about healthcare, it's about globalization or internationalization of healthcare. There are people who have very differing interest in terms of whether the technology of telemedicine is their primary interest or the healthcare is their primary interest, so my question is is there sort of a master plan or is there a group or a process, is there a big picture of globalization of healthcare or will it unveil randomly because it seems if there's somebody doing thinking about what will happen either in the business world or the healthcare world, then the various different aspects and emphasis will be able to contribute what they uniquely do best and have to offer into something that is comprehensive and cohesive and effective. So that's simply a question that I don't know the answer to.

DR. SANDERS: I can only give you an individual response. I mean I got involved in telemedicine for a simple reason not the intrigue of the technology but the reality of the plight of the healthcare delivery system. My objective in being here is as idealistic or corny as it my sound is to do something about the problems that we have with access to care and quality of care and the continued education of our healthcare providers. As I have said before in this conference, I view telemedicine simply as an enabling technology to meet that objective. Let me share with you something that is a specific project that I am working on right now that may be of interest to the group relative to what we have discussed. It is a project for which I'll be totally candid up front in terms of conflict of interest. I have none. I have no economic concern with it. I get no funds for it. But it's something that I thought could be some sort of back-door diplomacy similar to what the Transatlantic Rim intent is. I was looking the something that address the development of an international global healthcare delivery system. I focused down on a initially a specific population of the individuals. Not that anyone of us in this room would identify this population of patients as needy. They are certainly not what we saw in Ottawa in terms of Indian healthcare delivery system or as we see in rural parts of the United States, rural

parts of the rest of the world. So this group would not be the first group to identify in terms of needs. But there is a practical need that they do have. That is our diplomats. Specifically our embassy personnel. As many of you know if embassy personnel get sick. Let's use the U.S. an example and the embassy is in China, one of three things happens if that ambassador or any of his staff become ill. If it's an acute illness, the individual is brought to a certified credentialed physician in country because it's an acute problem. But the majority of times the problem is not acute. What happens to the individual. Their [air vacced] back to the United States. Or we [air vacc] a state department physician to that particular embassy and that country. Well, why not use the technology that we have. These people are in effect geographically isolated at least from what they know as their healthcare delivery system. Why not use telemedicine to provide them access to care? That became an no brainer after we came up with the idea, and then we said you know there are other people, there are other citizens of our country in these nations, and who are they. They are not embassy personnel, but they are ex-patriots who work for many of our corporations who have multinational corporations, and how are they cared for? Well, it turns out when you look at how they are cared for, they are cared for the same way embassy personnel are cared for. They are [air vacced] back to the United States. Well that is a totally inappropriate system. It's incredibly costly. It leads to delay in care. It's poor quality by definition. Why not use a system similar to what we would presumably put into the U.S. embassies to take care of multinational ex-patriots. The third motive in doing this, is wouldn't it be interesting in the system worked. If it worked, why not provide it as an example to the health minister of the host country as to what he or she could use both within country and to use for their ex-patriot who maybe for instance in the United States to provide for healthcare. We have gotten to the point whereby we have gotten in effect an okay from the State Department, and I've also brought in the Department of Defense in the United States. The reason I did is that in half of the time that an evacuation occurs, military personnel are involved with that evacuation process. So the DoD has basically signed off on this, as has the State Department, and we will be initiating an embassy telemedicine project which will probably go at the beginning to only three or four embassies around the world. Three or four embassies that have been identified based upon need and the absence of effective medical personnel in the area or long distance evacuation. We will initiate that type of program. What I would fully intend to do is to put the evaluation issues that we have

brought up from an economic standpoint, bring the continuing medical education issues to bear, bring the security and confidentiality issues to bear in the basic framework of that type of system. As I said before, these would not be population that you would initially identify as needy, but it's a reality of the marketplace. It's very possible that the multinational companies, not a possibility, a probability, that the multinational companies based upon what they know pay for air evacuation, would in fact underwrite this type of system. We would do all of the things that we're talking about. In many respects it represents a Transatlantic program. This is one of the things that I'm doing at the present time, and I'm just wondering whether or not the group that has any feeling pros or cons about that type of system?

DR. McGEE: I think it's really an excellent initiative, and it's a tangible step towards globalization of healthcare, all be it within the confines of an embassy owned by the U.S.A. abroad. I'd like to be associated with that.

DR. DANIEL CARLIN: My name is Dr. Daniel Carlin. I'm practicing telemedicine now. Jay your thoughts are ones that I've had in my own head. Actually with overseas personnel in isolated station sometimes at sea, but a lot of them are on land. I'm also an ex-ex-patriot, and spent a fair amount of time in the rural areas of Pakistan. I think you're point is extremely valid. For the State Department personnel where I was, and there were a great deal, there was no medical care at all. There was a state department general medical officer in [Islamabad] which was more than two hours away for us. We almost, the physicians actually members of the French medical teams of MSF and myself, we served as the defacto physicians for many of the American personnel that were involved in the NGOs and the press and stuff like that. So it's -- the point I want to bring to bear is that that is a very high profile position. If you make yourself out to be that medical resource in an isolated place, I think you're going to do very well in similar to your colleague, I would like to be a part of that as a volunteer even. Thank you.

DR. THIERRY: Just a point about -- there is a least to a certain degree of convergence. It's -- I'm not sure we should use the term globalization of healthcare yet. Because the differences are smashing. The results, even in Europe where we have long tradition of difference, it's very difficult to see what could explain the slight

difference in mortality. Why, because in Crete we have the best life expectancy in the world for men in Crete without the level of healthcare consumption may be let's say one tenth of what is going to happen in Massachusetts, by the way they are smoking too much, but they have the Mediterranean diet. At the same time in Crete, they are already establishing their icepick backbone, and there seems to be very good risk to their health and their participating in many project. At the same time, it's truly the embassy close to the military model is a very important one. But I think the most important in term of public health would be the tourism one. In Greece in July and August, you have a lot of American citizens in Crete. We have a lot of French citizens in Crete. In fact we have a lot of citizens from everywhere in the world because it's beautiful and the Mediterranean diet, it works and it's good. The sea is warm, and there is the sense of -- I think we also have to go from this model, that's what I say, if the model says we have the good technology. If the applications with the embassy says that's how it should work, then we have an integration strategy to deal with for tourism, and then through Atlantic Rim we may use the other activity of Atlantic Rim with the tourism with many cities in Europe and the U.S., and you may know that Boston is a twin City of [Tasborg] for example. That we may be very easy through Atlantic Rim and the twin cities to speak with the people who are establishing the ATM and [Inaudible] for integration of sector applications and as with other friends under a project of EU. So that's exactly the same starting from the -- I would say the telemedicine in the embassy still a national project because your embassy abroad part of the national U.S. territory. Then you have maybe a model for tourism, and then we may integrate it, and then after we have to validate it. That's the kind of framework we could make a recommendation for starting from Jay's proposal and Jay's project. Maybe, I don't know, we could get fundings from the commission.

DR. SANDERS: In fact I wouldn't use the term globalization of healthcare. I would use the term globalization of access to healthcare. Number two, I think based upon what you just said, there is no question in my mind that next year's meeting should be in Crete. Third, I have already spoken to American Express who seems to have some interest about the traveller access to healthcare using the system. I think we had better wrap up at this point with this part of the program. Jim, you have some comments?

MR. BARRON: I wanted first of all to thank everybody here for your time and your contribution to making this a greater success than we ever imagined when we first started planning this over a year ago. You clearly are the vanguard for helping to address a host of these issues. We look forward to working with you. For those of you who don't already know, we do have a Website that we have structured that is www.Atlantic-Rim.com. We can use that as a vehicle for exchange of information in getting material out in a broad way to the participants here and to others that we seek to involve in our activities going forward. A couple of other things, briefly, one for those who are able to stay, there will be a presentation and discussion following this meeting led by the delegation from Japan especially by the people from PEC dealing with Asian perspectives in telemedicine particularly looking at the case of Okinawa. You're all invited to that discussion. It will be here. Finally, there are many people to be thanked for all of this, more than I can name here this afternoon and want in different ways to recognize everybody who has helped to make this a success, but there are two players that we want to single out at this time. The first is Sam [Dissie] representing SRC, who has generously given the support of the organization and the team that has helped make this event logistically and otherwise a success. Mr. [Dissie] cannot be here today, but I wanted to give a little certificate to Judd Pratt who has been the point person for SRC.

MR. JUDD PRATT: On behalf of Sam, I think that he apologizes he is not here. I will say we at SRC had a tremendous learning experience both before and during the show. My congratulations to you all.

MR. BARRON: Finally, I want to thank John Evans, who as many of you know was the driving force when we first had the Atlantic Rim Congress several years ago where John and Judith Kurland put together the first session. It was John who single handedly sustained and pushed us to make healthcare in telemedicine a priority activity of the Atlantic Rim network. To a great extent, our success here today is a function of John's vision, energy and drive. If John's here, I'd like to give a certificate to John. Rick do you want to accept this for John?

On behalf of John, I give this to Rick Brooks. Thank you very much.

MR. RICK BROOKS: My only comment to that is I've worked with John for several years, and Jim's visionary capabilities to put together something like this succeeded only by John's ability to cover many

different topics across many disciplines of telemedicine. He thanks you very much for your participation.

MR. BARRON: With that, thanks to our two distinguished chairmen and the chairs of all of the other sessions. We conclude this first Transatlantic Telemedicine Summit. Thank you.

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