QUARTERLY REPORT

RESEARCH ON NAVY-RELATED COMBAT CASUALTY CARE ISSUES, NAVY OPERATIONAL-RELATED INJURIES AND ILLNESSES AND APPROACHES TO ENHANCE NAVY/MARINE CORPS PERSONNEL COMBAT PERFORMANCE

Prepared for

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Bethesda, Maryland 20814

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GEO-CENTERS, INC.

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QUARTERLY PROGRESS REPORT
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RESEARCH ON NAVY-RELATED COMBAT CASUALTY CARE ISSUES, NAVY OPERATIONAL-RELATED INJURIES AND ILLNESSES AND APPROACHES TO ENHANCED NAVY/MARINE CORPS PERSONNEL COMBAT PERFORMANCE

I. INTRODUCTION

This report summarizes the results of GEO-CENTERS' technical activities for the first option year one of the Naval Medical Research Institute (NMRI) Contract N00014-95-D-0048, Delivery Orders 002 and 003. The delivery orders encompass a variety of scientific studies that are capable of supporting ongoing and projected programs under the cognizance of NMRI; NMRI TOX/DET-Dayton, OH; NMRI/DET-San Antonio, TX; NDRI-Great Lakes, IL; the NDRI Detachment-Bethesda, MD; the National Naval Medical Center-Bethesda, MD; and the U.S. Navy Clothing and Textile Facility-Natick, MA.

The format for these periodic technical progress reports consists of four sections each listed by the location of the research. The sections are (1) Descriptions of work to be performed, (2) Objectives planned for the current reporting period, (3) Summary of work performed during current reporting period, and (4) Objectives for the next reporting period. Accumulated scientific reports, technical reports and journal articles are being provided as part of this quarterly technical progress report. Specifically, the research conducted by GEO-CENTERS during this quarterly reporting period has been focused on the following general scientific programs:

A. Infectious disease threat assessment and enterics programs.
B. Immune cell biology, wound repair and artificial blood studies.
C. Biomedical diving programs.
D. Personnel performance enhancement programs.
E. Breast Care Center.
F. Directed Energy Effects Research
G. Dental related diseases.
H. Toxicological studies.
I. Human Performance and U.S. Navy Clothing Development

GEO-CENTERS, INC.

II. NMRI, Bethesda, MD

A. INFECTIOUS DISEASE THREAT ASSESSMENT AND ENTERICS PROGRAMS

DESCRIPTION OF WORK TO BE PERFORMED

Fernando

- Performs research on the molecular detection of orthopoxviruses, which can be a warfare as well as an epidemiological threat. The research involves the design and optimization of gene probes and tests that will identify and differentiate orthopox genomic profiles, finally proceeding to the diagnostic validation of these tests. These tests fall into three levels, namely, primary screening, secondary confirmatory and tertiary characterization.

Jendrek

- Conducts fermentations in a BL-3 suite and depending on the organism of the fermentation may also perform some or all of the downstream processing associated with the project. He also creates all associated paperwork (standard operating procedures, batch records, etc.) with the fermenter and related equipment. Scott also does HPLC work towards optimizing current protein purification methods and procedures, and develops new purification protocols for new projects as they develop. Scott also performs all of the molecular biology associated with his position.

Kerby

- Senior Scientist ; develop diagnostic systems to detect and differentiate *Orthopoxviruses.*

Pifat

- Senior Scientist II; Contractor Support for the establishment of USAMRIID's GLP capabilities

Weeks

- Serve as an associate of the principal investigator for a research program involving pathogenic, molecular, and biochemical analysis of bacteria and their virulence factors. Experimentation requires knowledge and proficiency of laboratory techniques and procedures for performing bachemical and immunological analyses. Conducts surveys of the scientific literature to develop background data on techniques and formulates approaches for the investigations, develops experimental protocols, defines the objectives and priorities of subsidiary problems and arranges the details of cooperative investigations with other organizations when necessary. Is responsible for the general administration of the laboratory reagents, solutions, enzymes, and other materials and equipment used in conducting the studies described. Is responsible for the cleanliness and orderliness of working areas, freezers, and refrigerators. Is responsible for the training and orientation of all new laboratory technicians. Organizes and accumulates repositories of bacterial strains, plasmids, enzymes and sera with sufficient documentation of the histories of each. Maintains sufficient stocks of all reagents, supplies, and equipment required for a well organized molecular biology laboratory. Performs other duties as assigned. Immunizations are required.

TECHNICAL OBJECTIVES FOR THIS REPORTING PERIOD

Fernando

- Will continue with the secondary level DNA PCR tests, re-evaluating the primer sets for 1st, 4th, 7th and 8th of the 20 kb segments and also with the mini-gel electrophoresis for RFLP DNA fragment analysis.

Jendrek

- Will develop an HIC step for the current purification scheme of Protective Antigen.
- Will write an updated protocol for the production of F1 and it's purification to increase the stocks on hand and the purity of those stocks. He will continue with his current molecular biology projects and also make a producer of F1 in which the plasmid is stable over time.
- Will also create a new protocol for the production and purification of F1 as soon as the new stable strains are created and made available to him.

Kerby

- Design and synthesize PCR primers from the published sequences of Variola virus (VAR) and Vaccinia virus (VAC), that will cross-react with Camelpox (CML), Monkeypox (MPV), and Cowpox (CPV) viruses for the amplification of : 1) DNA polymerase gene, 2) Thymidine kinase gene, 3)RNA polymerase - 147 kDa. gene, 4) RNA polymerase - 132 kDa. gene 5) Hemagglutinin gene , 6) Interferon - γ receptor homology gene ,and 7) Tumor Necrosis Factor receptor homology gene.

Pifat

- Assist in developing pertinent SOP's and other regulatory documentation
- Assist in developing Validation plans for relevant bio-assays
- Assist in converting basic research laboratories into GLP-compliant laboratories
- Assist in selecting and establishing training courses and seminars to enhance USAMRIID's general knowledge of regulatory compliance issues.

Weeks

- To finish mapping of Mud 1 mutants for possible F1 genes in the pFra plasmid of *Yersinia pestis*.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Fernando

- Re-evaluated the problematic 20 kb segments by making different combinations of the primer sets and running the PCR reactions at a range of temperatures (50° to 65°) and DNA concentrations. However, the result turned out to be the same i.e. *vaccinia* segments were amplified in all cases but not those of cowpox, monkeypox and camelpox. Concluded that these outer segments being non-conserved are exhibiting extreme hypervariability and thus requiring extensive re-evaluation with many new primer sets. This will be carried out at a later time.
- Experimented with the mini-gel system employing 10% and 4-20% gradient non-denaturing polyacrylamide concentrations. Evaluated the restriction fragments (RFLP) generated by cutting the orthopoxvirus DNA with the restriction

endonucleases, Dra I, Tha I, Xba I and BGl II, at different loading DNA concentrations and at different voltages from 5 to 80 V. After electrophoresis the DNA fragments were detected by coupling with the fluorescent dye ethidium bromide and UV light emission.

- Made digital recordings of the RFLP patterns for fingerprint analysis by using the EAGLE EYE II video camera system, and also polaroid pictures of them.
- Compared the fingerprints made by the ethidium-gel method to those made by utilizing the automated laser scanning system with which extensive studies were carried out previously. The level of resolution of restriction fragments by the ethidium-gel method turned out to be as high as that by the laser method. Although the former method was 10X less sensitive than the latter , the resolved band size range was superior with low distortion. Concluded that the ethidium-gel method was efficient, reliable and simple to use in rapid fingerprinting applications.

Jendrek

- Have been able to eliminate two HIC resins as possible candidates unless the use of organics are employed in the elution step which, at this point is undesirable since it is not a complete stoppage of the process. The new, stable, F1 producing strains have not yet been created and delivered to Scott. so he could not start this part of the objectives for the this quarter. The initiation of this work will be included in the objectives for next quarter. The molecular biology of pSJ4 has stopped. Scott performed some fermentations to create more stockpiles of Protective Antigen (PA) and performed a fermentation of the cGMP production seed stock to be sure it would perform as expected with the batch record. Scott did a final check and modification of the PA fermentation batch record he had created and it was delivered to the cGMP production facility for production.

Kerby

- Designed, synthesized, and tested about 50 sets of primers for the seven genes.
- Have complete sequences for Thymidine kinase gene, RNA polymerase - 147 kDa. gene, Hemagglutinin gene, Inteferon-γ receptor homology gene, and Tumor Necrosis Factor receptor homology gene, with partial sequences for DNA polymerase gene and RNA polymerase - 132 kDa. gene.

Pifat

- Continues to review all existing SOP's at USAMRIID and written a number of others. Newly written SOP's are currently in the Quality Assurance review process and ready to be implemented. 148 new SOPs have been finalized.
- Other documentation systems continued to be implemented such as: a receipt and qualification system for Reference Materials; a buffer preparation scheme and lot numbering system; a protocol review log; communication records; equipment maintenance and repair records.
- 5 new Study Specific Procedures were written , dealing with upcoming products, their quantitation and their qualification.
- b-Validation Protocol for one of the Anthrax ELISAs was written and finalized. This protocol was sent to the Sponsor for review and forwarded to the FDA for approval. Other validation protocols for Anthrax and Venezuelan Equine Encephalitis (VEE) virus have also been initiated.
- c-Continued to have planning meetings dealing with basic research laboratories to be converted to GLP-compliant laboratories. Renovations have been planned and equipment and reagents have been ordered.

Presentations, Publications, Abstracts, Etc.

- Participated in monthly meetings with the SAIC/NCI for the GMP production of recombinant Anthrax PA.
- Participated in organizational meetings on the development of vaccines against Botulinum toxin and the validation of related assays.
- Participated in organizational meetings on the development of vaccines against Staphylococcus Enterotoxin B (SEB) and the validation of related assays.
- Assisted in the review of an efficacy study for a new Q-fever vaccine by Dr. Paul Lepore.

Weeks

- Successfully sequenced the Trp operon by primer walking through the gene.

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Fernando

- Will continue with experiments on optimizing the mini-gel system, and if available will test new orthopox strains.

Jendrek

- Will continue to develop an HIC step for the current purification scheme of PA. He will start to write a protocol for the production of F1-V and it's purification to increase the stocks on hand and the purity of those stocks, as soon as the new stable strain of F1-V producing *E. coli* is available.

Kerby

- Finish getting the complete sequences of DNA polymerase gene and RNA polymerase - 132kDa. gene.
- Start cloning all seven genes from all five pox virus strains by TA Cloning of amplified pcr products starting with variola genes obtained from Dr. Esposito of CDC in Atlanta.
- Validate sequences and add to our database and submit to GenBank for publication.

Pifat

- Assist in developing pertinent SOP's and other regulatory documentation
- Assist in developing Validation plans for relevant bio-assays
- Assist in converting basic research laboratories into GLP-compliant laboratories
- Assist in selecting and establishing training courses and seminars to enhance USAMRIID's general knowledge of regulatory compliance issues.

Weeks

- The objectives for next quarter are to finish the mapping of possible F1 genes in pFra.

II. NMRI, Bethesda, MD

B. IMMUNE CELL BIOLOGY, WOUND REPAIR RESEARCH AND ARTIFICIAL BLOOD PROGRAM

DESCRIPTION OF WORK TO BE PERFORMED

Chavez

- Principal Investigator
- Performs basic research on the physical properties of hemoglobin and erythrocytes. Hemoglobin is the protein within the erythrocyte (red blood cell) responsible for oxygen uptake and transport. Blood is a valuable resource to the U.S. Army; currently, the use of this precious resource is time consuming and thus inefficient due to remote locales, storage requirements, transportation, etc. In short, a thorough understanding of red cell membrane function is necessary to impede or prevent cell degration, rigidity, and fragmentation, thus preserving cell viability, integrity, and function. The projects listed below are being initiated to study the red cell aging problem in hopes of extending the shelf life of blood, a primary mission goal. Hemoglobin oxidation, heme stability within hemoglobin, and nitric oxide interaction with the red cell membrane are the major focus areas at this time.

Christian, Wohlrabe

- Provide assistance to the adenovirus surveillance project within the Preventive medicine Division of Naval Hospital, Great lakes, IL.
- Assist in the development and implementation of "Operation Stop Cough", a programmatic approach to reducing respiratory illness among Navy recruits.

Thomas

- Serves as the Computer Aided Design Drafter(CADD) Manager, representing GEO-Centers, Inc., in support of biomedical research and development activities located at the Walter Reed Army Institute of Research(WRAIR)-Health Facility Planning Agency(HFPA) Office. He is responsible for organizing a CADD department, manage all aspects of computer-aided design and systems management for all CADD workstations. Mr. Thomas is also responsible for implementing procedures for

manipulation of drawing files and developing user(working) drawings from existing documentation of new health facility.

TECHNICAL OBJECTIVES FOR THIS REPORTING PERIOD

Chavez

- Continuation of nitric oxide - hemoglobin binding experiments
- Preparation for the 1997 Biophysical Society Meeting

Christian, Wohlrabe

- Continue culture surveillance for adenoviral illness among recruits.
- Collect metrics on hygiene and handwashing as a part of the needs analysis of Operation Stop Cough.
- Assist with developing the presentation of our data for other health care professionals.
- Continue to liaison between investigators, providers, laboratory staff, and patients to provide adenovirus surveillance information.

Thomas

- Provide training to HFPO staff on MicroStation Review.
- Develop user drawings of first, second, third and penthouse floors of new health facility.
- Provide assistance to Corp. Of Engineers(COE) investigating all existing drawing documentation for current modifications.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Chavez

- Submitted the manuscript "An Improved Process for the Production of Sterile Modified Hemoglobin Solutions" to the journal Biologicals. This journal was chosen because it emphasized biotechnology papers and it can be found on Medline. The initial review of the manuscript was extremely favorable with recommended changes totaling three words.
- Submitted the manuscript "Liposome Encapsulation Attenuates Hemoglobin-Induced Vasoconstriction in Rabbit Arterial Segment" to the Journal of Applied Physiology. We have made minor corrections and resubmission has already taken place. We have passed the second review process and this article is currently in press.
- Our study is focusing on the interaction of nitric oxide with red blood cells. Preliminary results went as expected, with the nitric oxide interaction being much slower with intracellular hemoglobin (red blood cells) versus extracellular hemoglobin. Additional titration experiments have shown that the nitric oxide does not react on a molar basis with intracellular hemoglobin, in contrary to earlier work done in our laboratory on extracellular hemoglobin. This finding indicates that nitric oxide has some interaction with the red cell membrane which could have significant physiological effects.
- The abstract "Enthalpy Changes of the Step-wise Ligation of Hemoglobin" has been submitted for the 1997 Biophysical Society Meeting. Data is being collected and processed for presentation.

Presentations, Publications, Abstracts, etc.

- "An Improved Process for the Production of Sterile Modified Hemoglobin Solutions" F.A. Highsmith[2], C.M. Driscoll[2], B.C. Chung[2], M.D. Chavez[1], V.W. Macdonald[1], J.M. Manning[3], L.E. Lippert[2], R.L. Berger[2], and J.R. Hess[2], Biologicals, in press. [1]Blood Research Detachment, Walter Reed Army Institute of Research; [2]Bionetics Corporation, Rockville, MD; [3] The Rockefeller University, New York, NY.
- "Liposome Encapsulation attunuates hemoglobin-Induced Vasoconstriction in Rabbit Arterial Segment" A.S. Rudolph[1], A. Sulpizio[2], P. Hieble[2], V.M. Macdonald[3], M.D. Chavez[3], and G. Feuerstein[2], J. Appl. Physiol., in press. [1] Center for Bio/MOlecular Science and engineering, Code 6910, Naval Research Laboratory, Washington, D.C. 20375-5348; [2] Dept. Of Cardiovascular Pharmacology, SmithKline Beecham, King of

Prussia, PA 19406;[3] Blood Research Detachment, Walter Reed Army Institute of Research, Washington, D.C. 20307-5100.

- "Enthalpy changes of the Step-wise Ligation of Hemoglobin" J.A. Foltz, K. Franklin, H.S. Zahwa, M.D. Chavez, and R. L. Berger, submitted for the 1997 Biophysical Society Meeting.

Christian, Wohlrabe

- Created a poster on Operation Stop cough for the Navy's Occupational Health and Preventive Medicine Workshop in Virginia.
- Continued to distribute, collect, an arrange mail-out of culture materials for adenovirus surveillance.
- Provided assistance, including data feedback, to medical professionals in obtaining adenovirus cultures.
- Reviewed records and provided quality control for case reports of respiratory illness.
- Inspected handwashing facilities for recruits, as a quality metric for Operation Stop Cough.
- Continued to work on occupational health evaluations and annual training requirements.

Thomas

- Attended MicroStation 95 training to provide further efficiency for production of working drawings.
- Assisted COE in investigating all existing drawing documentation for current modifications.
- Developed procedures for easy identification and access for all WRAIR staff to review existing drawings and future user(working) drawings.
- Provided training on MicroStation Review to HFPO staff.
- Generated user drawings of first, second, third and penthouse floors of new health facility.
- Established Customer Support Program for MicroStation 95.
- Aided in implementing a new database, Construction Management System(CMS), for equipment tracking and information.

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Chavez

- Nitric oxide interactions with erythocytes - Nitric oxide is known to cause vasodilation. Nitrosothiols, formed between nitric oxide and thiol groups, are also potent vasodilators. Our experiments will show whether nitric oxide reactivity is preserved through the formation of nitrosothiols on the erythrocyte membrane.
- In vitro endpoint for red cell storage - Currently, there is no single reliable in vitro endpoint to test for red cell integrity. In vivo isotope labeling experiments are both costly and time consuming. Although the labeling technique yields adequate survival results, one gets no direct insight into the mechanisms controlling the integrity of the red cell. My proposal is to repeat selected labeling experiments in vitro and test the physical properties (glutathione, ATP, glucose levels, oxidation, pH, etc.) of the stored erythrocytes simultaneously. In this way, possible correlations can be found and an in vitro endpoint can be developed.

Christian, Wohlrabe

- Continue work on the adenovirus surveillance project, modifying procedures as the protocol changes.
- Continue to provide data on hygiene and handwashing, as metrics for Operation Stop Cough.
- Begin development of video aids to encourage hygiene and handwashing among recruits.
- Collect and analyze division-specific data to help assess the relationship between hygiene behaviors and lost-time for respiratory illness.
- Complete occupational health evaluations and annual training requirements for health care workers.

Thomas

- Continue producing working drawings which can be effectively used for space utilization in the new health facility.
- Continue to maintain all CAD workstations.
- Continue to provide support of new CMS database.
- Investigate potential of linking CMS database with MicroStation drawings, and determine any training required.

- Stay abreast of any new CAD features, processes or training which may assist in the design of the working drawings and arrange for any further training as necessary.

II. NMRI, Bethesda, MD

C. BIOMEDICAL DIVING RESEARCH

DESCRIPTION OF WORK TO BE PERFORMED

Cortes

- To conduct surgeries for neurodegenerative disorders projects.
- To perform other surgeries such as cannulations and probe implants.
- To collect and analyze data from animal models.
- To assist in experiments using a hyperbaric oxygen chamber.
- To care and maintain laboratory animals in excellent condition for experiments.

Lee

- Responsible for implementing and carrying out aspects of the Navy Blood Storage Project being conducted at the University of New Mexico (UNM), under Dr. Tatsuro Yoshida and Dr. Mark Bitensky, both of Boston University, whom serve as investigators of the project.

Shea

Alzheimer Project:
- To perform microdialysis experiments in the CNS of rats which have previously been lesioned at the nucleus basalis Mynert (NBM) via the drug NMDA.
- Analyze the neurotransmitters acetylcholine (ACh), norepinephrine (NE), and serotonin (5-HT), in microdialysis perfusate obtained from the above experiments.

Oxygen toxicity Project:
- Run microdialysis experiments in the newly designed hyperbaric chambers prepared for 100% oxygen environment under deep dive conditions.

Dityrosine Project:
- This is a new and collaborative project with the dept. of neurology at the Uniform Services University. It involves measurements of a compound which reflects oxidative stress in biological systems.

Obowa

- Provide technical assistance in the Diving Medicine research laboratory investigating exposure to hyperbaric oxygen (HBO) and its effects on the CNS. Prepare brain and spinal cord tissues for histopathology, histochemistry and immunohistochemistry staining procedures. Responsible for small animal care and welfare. Perform surgical procedures on rats. Insure laboratory is maintained and adequately stocked.

TECHNICAL OBJECTIVES FOR THIS REPORTING PERIOD

Cortes

- To finish acquiring data for the neuroscience posters.
- To start working on the manuscript for neuroscience posters.
- To finish the microdialysis study on the effect of NMDA in the formation of free radicals in the brain.
- To train civilian staff in surgical procedures and sterile techniques.
- To start on new project involving the C-FOS protein analysis.

Lee

- Complete the second half of the in vivo study to store blood in the new blood additive solution, but in an aerobic environment.
- Study, by in vitro methods, ways to improve 24 hour survival rates for future in vivo human studies (e.g.- effects of lactate accumulation on cell size).
- Analyze the data from the in vivo studies, make any necessary changes to the blood storage protocol, and submit these amendments to the FDA and the UNM Human Research Review Committee (HRRC) for approval.

Shea

<u>Alzheimer project:</u>

- To continue the experiments in the NMDA lesioned rats by increasing the number of observations at various time points post lesion.

Oxygen toxicity project:

- A number of rats implanted with microdialysis probes will be run in the new hyperbaric chamber in order to monitor the effects of 100% oxygen at 3atm on the brain levels of various neurotransmitters including an amino acid profile.

Dityrosine Project:

- The primary objective is to establish a specific and reliable assay for dityrosine. The system will utilize HPLC with electrochemical detection. We will also set up a number of animal and human studies to see if various stressors increase the levels of this compound in different fluid compartments.

Obowa

- Development of a rodent model of spinal cord decompression sickness (DCS). This model will be utilized to evaluate pharmacological interventions for prevention and treatment of DCS in US Navy divers.
- Investigate what role vascular intracellular adhesion molecules may play in central nervous system ischemia/reperfusion injury.
- Study immuno-modulation in pathophysiology of DCS.
- Optimize immunohistochemical staining procedures to apply in DCS models.
- Refine procedure for NADPH diaphorase staining of spinal cord and brain tissues.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Cortes

- Coordinated and supervise the use of the stereotaxic apparatus as well as surgical procedures and protocols.
- Performed cannulations, probe implants as well as other surgical procedures.
- Gathered extra data for neuroscience posters to be presented at the society for neuroscience national meeting.
- Injected animals and perfused them for the analysis of C-FOS.
- Trained civilian staff in surgical procedures such as probe implants, cannulations and cerebro-spinal fluid collection in animals as well as techniques in anesthetics and sterile procedures.

Lee

- The second half of the study evaluating the efficacy of the new blood additive solution alone by 24 hour in vivo survival was completed. In vitro diagnostics (ATP, hemolysis, vesicle production, lactate, and glucose) were done on a weekly basis and carried out to 14 weeks from the time the blood was collected. Seven of ten subjects completed the study.
- In vitro experiment to study effects of lactate build up in RBC's stored anaerobically and in the new blood preservative solution was completed. This study involved analyzing cell size and effects of different hematocrits throughout the 14 week storage period. This data will be used to evaluate the changes needed for the in vivo human study protocol.
- Data from the in vivo survival study were analyzed. Based on this analysis as well as from the in vitro experiment, amendments were made to the protocol and submitted to the FDA and the UNM HRRC for approval.

Shea

Alzheimer project:
- The number of animals at various time points after NMDA lesioning has been increased.
- The analysis of neurotransmitters is on schedule and has been included in the results.

Oxygen toxicity project:
- Only a few animals have been run this quarter due to technical difficulties with the microdialysis equipment during a dive. After modifications of this equipment we are now continuing with experiments. The emphasis is now on the effects of oxygen during a dive on basal transmitter release. We are doing this by potassium perfusion before and during a dive at various depths.

Dityrosine Project:
- The HPLC assay for dityrosine is almost completed and we have just completed a standard curve and intra-assay variation calculations. The human urine samples were completed for this compound but there was no correlation of dityrosine with treatment. A number of other models of stress in animals has been looked at for changes in dityrosine during microdialysis but nothing has been positive as of present.

Obowa

- Prepared animal CNS tissues for all staining procedures.
- Assisted investigators with dive chamber operation.
- Responsibility for maintenance of laboratory facility and supplies.
- Implemented specific staining procedures on brain and spinal cord tissues for NADPH diaphorase to demonstrate nitric oxide synthase (NOS) activity in neurons and cerebral microvasculature in animals affected by decompression sickness.

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Cortes

- To finish the microdialysis trials with perfusion of NMDA to be presented at the neuroscience meeting.
- To assist in the experimental procedures using the implanted animals.
- To continue in the training of military as well as civilian staff of more advanced surgical procedures.
- To finish the posters for neuroscience and get ready for presentation.

Lee

- Begin the next phase of the in vivo survival study incorporating the amendments to the protocol. The goal of this study is to obtain acceptable survival data for storage periods of 11 weeks or more using oxygen removal and the new blood additive solution. Another study survival study will also take place whereby current blood banking methods for storing blood will be used, except that oxygen removal will be incorporated into the storage.
- Another goal is to initiate an in vitro storage where blood will be stored in a carbon monoxide environment.

Shea

<u>Alzheimer project:</u>
- Finish the time course study for post lesioning NMDA animal studies.

Oxygen toxicity project:

- Continue experiments using microdialysis in rats that will be subjected to dives involving 100% oxygen and monitor the effects form this procedure for changes in neurotransmitters and amino acids. This will include using potassium stimulation during microdialysis to determine the effects of dive upon stimulated neurotransmitter release.

Dityrosine Project:

- The main focus of this project will be to refine the assay conditions and to continue to look at various stressors that will demonstrate a change in the levels of dityrosine in different biological fluids.

- All the above experiments will be concluded within the next reporting period as I will be terminating my services at NMRI due to insufficient funds based on the military down sizing.

Obowa

- Nitric oxide synthase studies in progress for decompression may be utilized in the oxygen toxicity research area.
- Planned decompression studies will be focused towards study of the cerebral microvascular components of injury. The role of endothelial cell adhesion molecules and cytokines in ischemia reperfusion injury will be evaluated utilizing histochemistry and immunohistochemical techniques, also counter receptors to these molecules on white blood cells will be studied using flow cytometry. Blood or plasma markers of decompression sickness will be evaluated for usefulness in prediction of decompression outcome in rodents and swine.
- Commence collaborative effort with NMRI Toxicology Detachment to investigate the neurotoxicology of TMPP.

II. NMRI, Bethesda, MD

B. PERSONNEL PERFORMANCE ENHANCEMENT STUDIES

DESCRIPTION OF WORK TO BE PERFORMED

Wolf

- MEDICAL PROJECT MANAGER: Provide management support to the Naval Medical Research and Development Command. Duties include reviewing medical research plans and progress reports, recommending laboratory guidance, evaluating research proposals, drafting periodic and ad hoc management reports and developing presentation materials.

McCowin

- Provide management support to the Special Operations Forces Medical Technology Development Program at the Naval Medical Research and Development Command. Duties include reviewing and evaluating medical research proposals, reviewing incremental reports and comparing them with the approved research plans, recommending guidance, and drafting periodic and ad hoc management reports, developing presentation materials and managing financial budget. The scope of research includes all topics within the Special Operations Forces Medical Technology Development Program. This includes investigations relevant to the treatment of disease, trauma, effects of environmental extremes and treatment for medical support of Special Operations Forces Operations. In addition, from time to time, collect, process and report findings on critical issues which are directly related to other urgent military medical research issues within the purview of the Special Operations Forces Medical Technology Development Program.

TECHNICAL OBJECTIVES FOR THIS REPORTING PERIOD

Wolf

- Continue to identify those areas where Geo-Centers, Inc may assist NMRDC in the transition to whatever its future will be (it should be noted that this remains a difficult task in that we do not know from day to day (sometimes hour to hour) what the future is). Facilitate the production of reports for the Director of Research and Development.
- Continue to support the Independent Research Area Manager and the Diving Medical Research Area Manager (one in the same, please note) as well as the Combat Casualty Care Research Area Manager in the routine functions.

McCowin

- Collect monthly obligation and expenditure reports from principal investigators.
- Evaluate and distribute 1st incremental progress reports for FY 97.
- Resubmit contract package for Duke Univ. to ONR.
- Evaluate and distribute pre proposal submissions for the FY98 new start project.
- FY96 and FY97 obligations and expenditure report and obligation plan to Special Operation Acquisitions Center (SOAC) for Execution Review Conference.
- Submit monthly FY96 and FY97 unobligated funds report to SOAC.
- Compose and submit the 3rd draft of the USSOCOM B.A.A. to ONR for submission into the C.B.D.
- Attend Biomedical Initiative Steering Committee (BISC) meeting Dec 96.
- Evaluate and reorganize work unit file of principal investigators for funding and deliverable status. Submit final baseline agreements for SOCOM FY97 new start funded projects to be signed by Program Manager, BISC Chairman, and SOAC Deputy of Acquisition.
- Continued to learn the Program Base Accounting System (PBAS) for maintaining USSOCOM funding.
- Maintain funding authorization using PBAS.
- Trained the Command Comptroller support staff on PBAS.
- Prepared briefing slides for all USSOCOM funded projects.
- Work in conjunction with Booz Allen & Hamilton, Inc. to prepare a USSOCOM Med-Tech Program Briefing Package to be delivered to USSOCOM Component Command Surgeon's.

- Prepare and update files of all USSOCOM and Diving & Submarine Medicine P.E. N63713 for the incorporation into new 3-D Uninex-based computer program system.
- Prepared Diving & Submarine Medicine P.E. N63713 briefing slides for ONR and DDR&E briefing.
- Prepare Diving & Submarine Medicine P.E. N63713 budget submission for the FY98 POM.
- Prepare and submit Abbreviated System Decision Paper (ASDP) for Command approval of new computer hardware and software purchase.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Wolf

- Continued to be the ONR INRIS database manager for NMRDC. Entered new Proposals and Procurement Requests and monitored those which were already present in the system.
- Supported the Research Area Manager for Diving and Submarine Medicine in the preparation of presentations (graphics) and the collection and dissemination of data.
- Supported the Research Area Manager for Independent Research in the completion of her responsibilities under ONR guidance and requirements. This entailed presentation graphics as well as the collection and transmission of considerable information for the annual report.
- Continued to work the NMRDC NAVRIMS database as the primary data entry person for Combat Casualty Care. Also, developed two simple reports to determine the status of certain work units.

McCowin

- Work from reporting period objective section (I) was performed during this reporting period

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Wolf

- As I have submitted my resignation, there are no objectives for next quarter.

McCowin

- Attend Special Operations Medical Association (SOMA) Meeting and USSOCOM BISC Meeting in Mar 97.
- Collect and Evaluate 2nd incremental progress reports.
- Collect monthly obligation and expenditure reports from principal investigators.
- Submit monthly obligation and expenditure reports to SOAC.
- Provide input for the reversion of the USSOCOM Project Reference Book.
- Provide assistance with Diving & Submarine Medicine P.E. N63713 special projects.

II. NMRI, Bethesda, MD

E. BREAST CARE CENTER

DESCRIPTION OF WORK TO BE PERFORMED

Patient Service Representatives
Grimes, Jenkins, Lozoya, Williams

- Process and interview patients, incorporated standard patient registration procedures. Maintain uniform policy for check-in/check-out procedures.
- Collect third party insurance forms on each patient.
- Receive patients and incoming telephone calls/inquiries, determine priorities and refer to proper person/department.
- Ensure that all incomplete patient records and third party forms are corrected or returned to proper staff for completion/correction.
- Set up records and filing system for paperwork associated with each patient record. Ensure that all documents processed are in accordance with department standards and that all forms are in designated order in the patient records. Label files for permanent shadow files.
- Orient new support team members and clinical team staff to office routine.
- Call all no-shows, record reason for not keeping appointment in shadow file and initial.
- Print Composite Health Care System (CHCS) daily schedule and end of day reports. Check end of day report for accuracy.
- ADS System: Educate providers, ensure completeness/accuracy of ADS forms, scan forms.
- Maintain spreadsheet on percentage of open appointments on a daily basis to track number of appointments available vs number of appointments needed.
- Inform Technical Assistant of supply levels.

Balintona

- Responsibilities include addressing the psychosocial status, mental status, patient concerns, and the impact of diagnosis on family relationships of breast cancer patients.
- Assess newly diagnosed breast cancer patients and provide them with social work educational materials. The assessment includes a screening for depression, adjustment, patient social history and support systems available to patient.
- Facilitation of the Stage I & Stage II Breast Cancer Survivors' Group
- Facilitation of the Advanced Breast Cancer Support Group on Thursday mornings at 8:30am
- Facilitate the Spouse's of Breast Cancer Patient's Support Group.
- Collect and analyze research data on the Adjustment and Social Support in Male Spouse's of Breast Cancer Patients.
- Liaison with the National Naval Medical Center Social Work Staff . Attend all social work staff meetings to coordinate communication and colleague interaction.
- Coordinate individual, family, group and marital psychotherapy based on Social Work assessment and clinical intervention needed
- Key contact person for the Look Good, Feel Better program run in the Breast Care Center. This program is offered in our center to facilitate coping and increase patients' self-esteem during radiation and chemotherapy treatments. The responsibilities of this program are to keep monthly contact with the American Cancer Society and promote the program to our patients.

Durand

- Acts as a liaison between the patient and the family and all other health care providers, intervening at key points (and or when significant problems occurs) for individual patient. Addresses and resolves issues that have a negative impact , creating opportunities and systems to enhance positive outcomes.
- Performs on site visits with patients in various clinical areas.(i.e. Radiology Oncology (Rad. Onc.) Medical Oncology (Med. Onc.) and Post-Op areas.
- Initiates and contributes via multidisciplinary team approach modifications or changes in caregiver practice patterns to maximize quality patient care and resource utilization.
- Assists in the development and implementation of the Care Manager program with Ellora Corporation.
- Checks daily for outstanding biopsy results.

- Page and inform physician of biopsy results if positive. (If necessary).
- Make follow-up phone calls to post operative patients to check on their well-being, this can be weekly, monthly, and every 3 months for maximum of 6 months, then prn.(whenever necessary.)
- Schedule follow-up appointments to Rad. Onc, Med. Onc, Physical Therapy, Nuclear Medicine, and C.T. Scan etc. and various other referrals when ordered.
- Verify consults to clinical areas for breast cancer patients with follow-up phone call.
- Follow-up visit to clinical areas with patients after surgery.
- Verify surgical dates via surgical clinic and OR schedules.
- Perform pre-op teaching specific for nurse case manager with patient and family members.
- Acts as support system for patient and family , in conjunction with the Social Worker and Nurse Educator for newly diagnosed cancer patients.
- Instructs post-op mastectomy patients on breast prosthesis, and issues dealing with the appointments for fitting.
- Initiate order forms with prescription for the patient's acquisition of breast prosthesis.
- Acts as liaison between prosthetic company and patient/clinic.
- Hand delivers consults to various clinical areas.
- Follow-up with overseas patients, to assure their re-entry back into the system when appropriate.

Richman (Fields)

- Perform technical services including mammograms.
- Assisting in biopsies and ultrasounds.
- Perform quality control.

Higgins

- Continue to recruit and register patients for participation in research
- Conduct individualized patient information sessions
- Attend a demonstration of "4th Dimension" software for data collection
- Continue to generate diagnosis/treatment records for QA of breast cancer patients charts
- To attend Fox Chase conference on genetic counseling
- Analyzing QA data and presenting it to BCC staff
- Patient education/counseling relating to protocols
- Continue to act as liaison between BCC and other governmental/research institutions

- Continue to coordinate research proposal/grant development
- Utilizing Care Manager to identify trends of care in the BCC
- Keeping the BCC staff abreast of research issues relevant to patient care and staff development
- Attending seminars/conferences for staff and professional development
- Participation and case study presentation at BCC staff meetings and multidisciplinary meetings

Lopez

- Develop and integrate a breast care educational program for female Department of Defense beneficiaries and their support persons.
- Educational program to include all breast care issue with an emphasis on early detection of breast cancer.
- Provide pre-operative teaching and educate patients regarding breast cancer and treatment options.
- Being available as an information resource person for the patient and their support person.
- Plan staff development programs and maintain BCC staff development records.
- Act as relief Ambulatory Care Nurse under the direction of the nurse manager.
- BCC designated safety representative, responsible for safety manuals, monthly safety meetings and BCC safety issues.

Louie

- Serve as mammographer in the department of radiology at National Naval Medical Center (NNMC).
- Serve as consult for referral cases from outside institutions as well as the Breast Care Center (BCC) here at NNMC. Many of these are complex cases which are sent to NNMC for further evaluation or a second opinion.
- Serve as liaison between the medical staff in the BCC and the mammography section of the radiology department.
- Serve as occasional consultant radiologist for weekly surgical tumor board meetings.
- Continue to develop the system to evaluate and submit 150-200 suitable mammograms for the Transfer of Intelligence Technologies to Improve Breast Cancer Imaging Project (TITIBCI Project).

- Supervise the radiology resident assigned to the mammography section of the radiology department.
- Serve as consultant to radiology staff regularly rotating through the mammography section.
- Supervise the mammography technologists to insure that the mammograms meet American College of Radiology (ACR) and Food and Drug Administration, Division of Mammmography (FDA) standards for mammography accreditation.
- Investigate and participate in the planning of other mammography research projects in which NNMC may be a participant.

McIntyre

- Support a research program which focuses on breast cancer.
- Liaison between the Radiology Department-Mammography Section, the Breast Care Center (BCC), and other hospital departments.
- Perform nursing duties.
- Perform managerial duties.

O'Halloran

- Acts as relief clinical nurse manager in the absence of team leader and nurse manager
- Coordinates patient flow activities
- Collaborates with physicians concerning unscheduled patient appointments
- Performs professional nursing assessments
- Teaches breast self examination and pre and post biopsy education
- Triages patient phone calls and consults with physicians as needed
- Prepares patient charts with appropriate medical, lab, and x-ray reports
- Responsible for entering physician orders into computer
- Assists physicians with all procedures such as FNA or cyst aspirations
- Provides physical and emotional support to patients during their appointment
- Collaborates with a multidisciplinary staff concerning patient needs and identifies patients who may benefit from services such as social service, physical therapy, or nurse case management
- Responsible for preparing all clinical areas for patients and securing clinical areas at the end of the day
- Processes linens and hazardous wastes within the BCC
- Maintains supplies at par level and reorders supplies as needed

Portee

- Coordinates patient flow activities
- Performs professional nursing assessments
- Teaches breast self examination
- Prepares patient charts with appropriate medical, lab ,and x-ray reports
- Assists physicians with all procedures such as FNA or cyst aspirations
- Provides physical and emotional support to patients during their appointment
- Collaborates with a multidisciplinary staff concerning patient needs and identifies patients who may benefit from services such as social service, physical therapy, or nurse case management
- Responsible for preparing all clinical areas for patients and securing clinical areas at the end of the day
- Processes linen and hazardous wastes within the BCC
- Maintains supplies at par level and records supplies needed

Prindle

- Coordinates patient flow activities
- Acts as relief clinical nurse manager in the absence of nurse manager
- Collaborates with physicians concerning unscheduled patient appointments
- Performs professional nursing assessments
- Teaches breast self examination and pre and post biopsy education
- Triages patient phone calls and consults with physicians as needed
- Prepares patient charts with appropriate medical, lab, and x-ray reports
- Responsible for entering physician orders into computer
- Assists physicians with all procedures such as FNA or cyst aspirations
- Provides physical and emotional support to patients during their appointment
- Collaborates with a multidisciplinary staff concerning patient needs and identifies patients who may benefit from services such as social service, physical therapy, or nurse case management
- Management of clinical supply needs
- Supervising clinical nursing staff: 1 RN's and 1 LPN
- Team Leader for clinical practice

Snee

- Case manages new breast cancer patients
- Utilizes the "Care Manager" software to document and track the patient's progress through the clinical care pathway of breast cancer treatment
- Helps to educate newly diagnosed breast cancer patients about disease, treatment, and follow up care
- Provides educational materials to patients and families
- Coordinates and plans appointments for multidisciplinary care in hospital, including, but not limited to hematology/oncology, radiation/oncology, plastic surgery, physical therapy, and social services
- Teaches patients about prosthetics and assists patient in preparing appropriate forms necessary to obtain prosthetic
- Provides emotional support to women and their families who are facing cancer treatment through verbal and nonverbal communication
- Provides support, comfort, and education to the patient through the use of pre and post op phone calls and by visiting the patient while they are an inpatient.
- Ensures that patients are receiving adequate follow up care
- Tracks breast biopsies and notifies doctor of any malignant pathology reports and ensures that patient is scheduled for appointment with physician
- Teaches and demonstrates the "Care Manager" software to interested personnel both within NNMC and at outside facilities
- Assists as needed in clinic as either ambulatory care nurse or nurse educator

Taylor

- Manage and maintain the conference room schedule and database.
- Write, edit, and update correspondence.
- Maintain electronic filing system.
- Order supplies for various departments within the center.
- Manage and maintain the procurement process and database.
- Generate reports relative to supply issues
- Point of contact for procurement and the conference room
- Ensure all mail is picked up and delivered daily.
- Organize supplies and monitor supplies on hand

Vaughn

- Medical filing for the Radiology department and the Breast Care Center.
- Enter CHCS orders for comparison mammograms.
- Track mammogram films.
- Handle mail and telephone correspondence regarding radiology films.
- Pull and file mammograms.
- Make copies of mammogram films for physicians.

Wallace

- Coordinate administrative activities of the Breast Care Center (BCC). In absence of Administrator act as administrator of the BCC.
- Manage workload collection system, ensure reliability of data, collect and report all workload. Monitor accuracy of Care Manager and other data sources.
- Manage budget. Maintain close working relationship with Budget Department, investigate future funding alternatives.
- Monitor legal issues. Make Staff Judge Advocate's office aware of potential litigation.
- Work with administrative team to develop plans for guiding future clinic operations.
- Oversee procurement ordering process. Ensure appropriate supply management system.
- Oversee four Patient Service Representatives and one Technical Assistant
- Manage patient/physician schedule templates in the Composite Health Care System (CHCS).
- Oversee use of the Ambulatory Data System (ADS) for the BCC.
- Assist Contract Management Department with maintaining accurate and complete files on BCC employees.
- Assist in preparation for VIP tours and briefings.
- Other administrative functions as necessary.

TECHNICAL OBJECTIVES FOR THIS REPORTING PERIOD

Patient Service Representatives
Grimes, Jenkins, Lozoya, Williams

- Streamline and organize front-desk procedures.
- Retrieve and ensure completion of third party insurance forms
- Improve routing and response to incoming telephone calls/inquires
- Use standard registration procedures requiring plastic green card for imprinting all forms pertinent to each patient.
- Coordinate policies for scheduling appointments/procedures for patients calling/walk-ins/consults/cards.
- Streamline physician schedule notification process.
- Refine CHCS daily schedule and end of day reporting.
- Became familiar with use of ADS.

Balintona

- Started a new Breast Cancer Survivors group which meets on Friday's in the BCC.
- Oriented a psychiatry and psychology team on the Breast Care Center support groups and my interaction with patients throughout the treatment process. Provided them with resources and information.
- Beginning the I CAN COPE program at the BCC. This program will serve to help our BR CA survivors communicate with other survivors and cope with diagnosis/treatment.
- Beginning involvement with the BRCA Gene Study. Social Worker will serve as individual providing therapy to patients who experience anxiety, depression or other feelings related to the gene testing process and results of the tests. Examining the option of starting a genetic support group.
- Continued to increase Social Work integration with the Breast Care Center Care Manager computer program. This includes formation of a social work critical pathway, patient integration and chart documentation according to the Care Manager format.
- Provided individual psychotherapy to patients experiencing significant emotional distress following diagnosis. Also provided on-going therapy to patients who have experienced specific types of concerns at the completion of treatment including sexuality/intimacy issues, fear of reoccurrence and family support post treatment.

- Addressed the psychosocial status and mental status of individual patients in the Breast Care Center.

Durand

- Continue to improve Care Manager through ongoing collaboration with Ellora Corporation.
- To continue to develop through multidisciplinary collaboration, Standard Operating Procedures (S.O.P.) for the Nurse Case Manager's position.
- Continue to enter in" Care Manager" program all Newly diagnosed Breast Cancer Patients/ All new Biopsies.
- Refine techniques for capturing statistical data that would impact future studies of the Breast Care Center.
- Continue to develop case manager guidelines for the new Breast Cancer diagnosed patients.
- Continue to improve the guidelines for the consult process to the various providers.
- Effectively manage resources in the care of patients.
- Ongoing data entry to maintain the statistical information gathered in the BCC.
- Continue to review patient's outcomes, to assure that they are met, and in a timely fashion.

Richman (Fields)

- Perform various studies within the department thereby increasing knowledge and experience.
- Broaden understanding of the BCC's procedures and personnel. Expand relationship with BCC.
- Will take full advantage of any educational opportunities which may arise as time and schedule permits.
- Continue to increase knowledge of mammography and breast diseases using the doctors as teachers.

Higgins

- Utilizing NCI Investigator's Handbook to review research process
- Set up blood drawing area in Room 7
- Organization of work area and files for Research Nurse position
- Developed an orientation schedule and agenda for the Research Nurse position
- Further developed computer skills utilizing Windows -NT software
- Met with Digital to install Care Manager software on my PC and initiate usage
- Began to investigate available statistical software programs
- Investigated possible journal subscriptions relevant to the Research Nurse position
- Discussion and planning of data base development within the BCC
- Creating an area in physician's library for advertisement of BCC research protocols
- Developing the final version of BRCA script and slides
- Develop patient education/session overview booklet for BRCA testing
- Patient education guidelines relating to research participation and information
- Utilize "Guidelines for Research Proposal" program to start to develop protocols for BCC
- Data collection forms and log-books of patients on protocol
- Discussion and planning of data base development within the BCC

Lopez

- Continue to provide patient education.
- Continue to act as relief ambulatory care nurse.
- Continue to develop array of patient educational materials.
- Continue staff development and safety representative responsibilities.
- Continue to construct SOP manual.
- Prepare for JCAHO survey.

Louie

- Continue to follow and further develop the protocols established in the mammography section for evaluating patients with breast abnormalities.
- Continue to perform stereotactic needle core breast biopsies.
- Continue to perform ultrasound-guided procedures of the breast, as well as ultrasound scans of the breasts for focal abnormalities.
- Meet with and maintain communication with the various participants (from other institutions) in the TITIBCI Project.

- Continue to collect suitable mammography cases to submit for the TITIBCI Project
- Evaluate cases, collect documentation, copy case films, and maintain records of films sent to Massachusetts General Hospital (MGH) for the TITIBCI Project.

McIntyre

- Assist the Radiologists/staff with stereotactic and ultrasound guided breast biopsy procedures.
- Perform assessments on all stereotactic/ultrasound biopsy patients and provide these patients with post breast biopsy teaching instructions.
- Assist with continued development between the BCC and Radiology Department, as the patient volume increases.

O'Halloran

- Continue development in the role of the ambulatory care nurse
- Continue development of computer skills, especially the use of the hospital system called CHCS
- Ongoing evaluation of nursing assessment tool
- Continue to gain further knowledge and education in breast cancer and its treatment
- Ongoing development and assessment of nursing protocols for telephone triage
- Continue working with Patients Service Representatives to achieve a fluid transition between PSR/Patient/Nurse

Portee

- Continues development in the role of the ambulatory care nurse
- Inventory or needles and syringes
- Continues development of computer skills, especially the use of hospital's system called CHCS
- Ongoing evaluation and revision of nursing assessment tool
- Continues to gain further knowledge and education in breast cancer and it's treatment

Prindle

- Continue development in the role of the ambulatory care nurse
- Continue development of computer skills, especially the use of the hospital system called CHCS

- Ongoing evaluation and revision of nursing assessment tool
- Continue to gain further knowledge and education in breast cancer and it's treatment
- Ongoing development and assessment of nursing protocols for telephone triage
- Continue working with Patients Service Representatives to achieve a fluid transition between PSR/Patient/Nurse (Developing Algorithm format)
- Develop role as Team Leader for clinical practice
- Participate in staff interviews for clinical nurse educator position
- Supervise/Train new staff nurses in clinic procedures
- Schedule new staff into computer training courses
- Develop new appointment template system to better utilize patient flow
- Develop new chart system with management staff to accommodate multiple disciplines : rad/onc and hem/onc
- Develop new algorithm format with Digital for clinical process
- Increase nursing continuing education instruction
- Develop new position descriptions for the ambulatory nursing staff
- Supervise and participate in Clinical Nurse Educator roles
- Train and supervise new Clinical Nurse Educator

Snee

- Ongoing development in the role of the nurse case manager
- Implement processes that will enable appropriate follow up care for breast cancer patients
- Continue to revise and perfect methods to discuss cancer diagnosis with patients
- Continue to gain further knowledge and education in breast cancer and its treatment
- Ongoing development of organizational skills to manage multiple patients and their individual needs
- Prepare speech, slides and syllabus for presentation at The Spectrum of Breast Care Conference on nurse case management of the breast cancer patient in Italy and Germany in the Spring of 1997

Taylor

- Streamline and organize office procedures to promote a work smarter environment.

Vaughn

- Alphabetize the main mammography file system.
- Systematic checking for quality improvement.
- Improve report filing to allow for more efficient operations.
- Being readily available for assistance to co-workers, the BCC staff, physicians and patients requiring assistance with mammography films.

Wallace

- Coordinate administrative activities of the BCC.
- Assist in preparation of Statements of Work and proposals for obligation of future funding. Complete and submit expenditure of funds reports to the Budget Department and Tricare Region 1.
- Manage schedule templates for BCC attending physicians.
- Manage workload collection. Investigate integrity of data.
- Develop system for expenditure tracking.
- Develop Strategic Plan and Marketing Plan, Information Systems Plan.
- Oversee use of ADS in the BCC. Maintain compliance with the Surgeon General's standards.
- Attend weekly meetings of the Information Management Quality Management Board to keep up-to-date on all information systems issues.
- Oversee procurement ordering process. Make sure all necessary supplies are ordered in a timely fashion. Ensure proper documentation.
- Provide information to Contract Management to ensure accuracy of their files.
- Participate in genetics research and cancer database development working groups.
- Work with Nurse Manager and Team Leader in to ensure appropriate physician coverage of the clinic.
- Develop procurement mechanism for research projects.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Patient Service Representatives
Grimes, Jenkins, Lozoya, Williams

- Continued organization of front-desk procedures
- Assisted in development of standard operating procedures.
- Processed and interviewed patients through CHCS and designated forms, obtained and updated all patient demographic information and ensured completion of forms.
- Obtained and verified pertinent insurance information utilizing available forms. Obtained third party insurance forms from physicians at end of each visit.
- Required identification card from each patient and imprinted all clinic forms pertinent to that patient.
- Received patients and incoming telephone calls/inquiries, determined priorities and referred to the proper source.
- Explained clinic procedures to patients.
- Retrieved/returned Mammogram films daily.
- Obtain authorization for release of mammogram films from patient, for NNMC file tracking.
- Open monthly clinic schedules and make changes as necessary, based on physician schedule changes.
- Ensured completion of incomplete patient records and third party insurance forms.
- Set up records and maintain filing system for paperwork associated with each patient record. Ensured that all documents processed are in accordance with department standards. Filed all forms in designated order in patient record. Labeled files for permanent shadow files.
- Scheduled and coordinated front desk procedures in accordance with department policy. Identified process problems and helped develop suitable solutions.
- Oriented new support team members and clinical team staff to office routine.
- Participated in team planning to assure team members meet team quality standards. Maintain department standards of productivity.
- Notified physicians the day before they are scheduled for clinic; let them know approximately how many patients they will have.
- Became familiar with the Ambulatory Data System (ADS).

Balintona

- Addressed the psychosocial status, mental status and patient/family concerns in the Breast Care Center
- Worked closely with the CHAMPUS office to ensure that patient's breast prosthetics and wig paperwork is approved by CHAMPUS prior to patient's purchase of these items.
- Compiled a list of wig salons for patient who are undergoing chemotherapy. This further enhances patient access to services and empowers patient to locate a wig which can increase self-esteem.
- Development of the Social Work Assessment that can be completed on computer. This enhances the social workers efficiency because of time savings and rapid chart documentation.
- Worked closely with the BCC Nurse Case Managers to provide seamless care to patients. This includes daily integration and discussion of services provided to ensure patient care continuity and enhanced patient satisfaction.
- Liaison with the National Naval Medical Center Social Work Department. This included integration with the Social Work department with the signing of a Memo of Understanding signed by the director of Breast Care Center and NNMC Social Work Department during the current reporting period. This ensures that social work coverage will be provided in absence of BCC social worker (during a time of unplanned illness or planned vacation days).

Durand

- Have assisted Ellora Corporation in the development of the Care Manager.
- Have successfully entered approximately 37 new Breast Cancer patients, and 47 new diagnostic procedures in the Care Manager system.
- Have resolved critical issues between patient and providers concerning their methods of treatment.
- Was influential in organizing a Multimodality meeting with the Hem Onc. Rad ONC. and Surgery to resolve issues with a patient.
- Have generated statical data for monthly evaluation within the Breast Center.
- Have developed guidelines for slides to be evaluated from outside facilities, here at NNMC..
- Developed guidelines for slides for outside evaluation, leaving NNMC.

- Developed a list of documents necessary for outside consults / and or second opinions.

Richman (Fields)

- Performed a variety of mammograms, stereotactic biopsies, needle localizations and ultrasound procedures.
- Interfaced with mammography doctors to increase knowledge in the areas of mammography and breast disease.
- Became more familiar with the BCC personnel.
- Started doing QA on stereotactic biopsy machine.

Higgins

- Obtained certification to draw research labs in BCC
- Co-investigator on a multidisciplinary team of researchers involved with BRCA1 and BRCA2 testing in the BCC
- Met with the Clinical Nurse Researcher and medical staff in Hem/Onc
- Created addendum to Nursing Assessment forms to identify patients for TAM/4-HPR study
- Developed patient information pamphlets for TAM/4-HPR study
- Staff inservice on the implementation of TAM/4-HPR study
- Wrote and developed BRCA education/counseling script and slides
- Staff inservice on breast cancer and African American women
- Developed research manual for tracking agenda and minutes of BCC research meetings
- Prepared agendas/minutes and handouts for research meetings
- Defined and developed the roles and responsibilities of the Research Nurse position Developed and completed an orientation schedule for the Research Nurse position
- Coordinated with the Cancer Genetics Nurse from NCI an agenda for orientation with nurse researchers from Bethesda, NCI and NIH
- Became familiar with the tracking system of patients involved with NSABP protocols
- Attended NIH Consensus Conference on breast cancer screening
- Literature search on current trends in the area of nursing research
- Literature review of BRCA1 and BRCA2 testing and patient education
- Performed individualized patient information sessions on research participation
- Created breast cancer treatment/diagnosis reports for QA utilizing Care Manager Data collection

- Liaison between BCC and other governmental/research institutions
- Enhanced nursing knowledge base on breast cancer issues
- Further developed personal computer skills
- Patient education related to research participation
- Became familiar with the tracking system for patients involved with NSABP protocols
- Coordinated research protocol development
- Attended seminars/conferences on breast cancer issues and professional nursing issues
- Met with the Technical Assistant to discuss data base for research
- Met with Digital to discuss potential technical needs and resources of the Research Nurse

Lopez

- Continued responsibility as the designated safety representative of the BCC.
- Maintained credentialing data base on all Geo-Center employees.
- Planned and instituted staff education calendar and events.
- Functioned as Clinical Educator providing teaching on breast self examination, pre- and post-operative instruction and breast cancer.
- Functioned as relief ambulatory care nurse providing breast self exam teaching, assisting the physicians with physical exams, procedures, and scheduling of diagnostic test when needed.
- Development of departmental SOP and construction of manual.
- Preparation of educational records for JCAHO training.
- Participated in several health fair/wellness programs.

Louie

- Continued to perform stereotactic needle core biopsies of the breast as well as needle localizations for surgical excision, on a regular basis.
- Continued case collection and records for TITIBCI Project. NNMC is one of only two institutions of the entire group of participating institutions who have kept up with the projected timetable for case collection. This has demanded a lot more time than previously assumed. This is due primarily to the fact that an administrative assistant, who was to do much of the work, including labeling and copying the films, and maintaining thorough records of what has been sent to MGH, could not be hired, as originally planned.

- Met with members of the Division of Mammography Quality and Radiation Programs, FDA, as well as with CDR Bakalar to discuss ongoing telemedicine projects as well as possible future projects.

McIntyre

- The above technical objectives were met during the current reporting period.
- Assisted with the re-organization of the mammography scheduling process.
- Supervised other mammography personnel.
- Obtained mammography statistical data for ACR/FDA credentialing.
- Tracked 6 month follow-up patients with outcome analysis via BCC Task Management Tool.
- Assisted new employees and BCC visitors with orientation of the Radiology Department- Mammography section.
- Correlated mammography and pathology findings via CHCS.

O'halloran

- Attended NIH Consensus Forum of Breast Cancer
- Coordinated patient flow activities
- Collaborated with many physicians concerning unscheduled patient visits
- Performed professional nursing assessments
- Provided BSE and biopsy teaching
- Triaged patient phone calls and made telephone consults to physicians
- Prepared patient charts appropriately with medical, lab, and x-ray reports
- Entered physician orders into the computer
- Assisted physicians with many procedures done in the BCC
- Provided physical and emotional support to patients
- Collaborated with the radiology team to improve patient flow through the BCC and mammography
- Collaborated with social service, nurse case manager, clinical nurse educator, physical therapist and many physicians to ensure exceptional patient care
- Prepared patient areas and secured them at the end of the day
- Disposed of linens and hazardous wastes appropriately
- Attended conference entitled "The Spectrum of Breast Care"
- Read many journal articles about breast cancer and its treatment

Portee

- Coordinated patient flow activities
- Performed professional nursing assessments
- Provided BSE teaching
- Prepared patient charts appropriately with medical, lab, and x-ray reports
- Assisted physicians with many procedures done in the BCC
- Provided physical and emotional support to patients
- Collaborated with social service, nurse case manager, clinical nurse educator, physical therapist and many physicians to ensure complete patient care
- Disposed of linens and hazardous wastes appropriately
- Prepared needle and syringe inventory document
- Read many journal articles about breast cancer and it's treatment
- Attended Breast Cancer Consensus Conference at NIH

Prindle

- Coordinated patient flow activities
- Acted as relief nurse manager for the BCC on several occasions
- Collaborated with many physicians concerning unscheduled patient visits
- Performed professional nursing assessments
- Provided BSE and biopsy teaching
- Triaged patient phone calls and made telephone consults to physicians
- Prepared patient charts appropriately with medical, lab, and x-ray reports
- Entered physician orders into the computer
- Assisted physicians with many procedures done in the BCC
- Provided physical and emotional support to patients
- Collaborated with social service, nurse case manager, clinical nurse educator, physical therapist and many physicians to ensure complete patient care
- Ongoing development of role as Team Leader
- Managed/Supervised new nursing staff for the ambulatory care area
- Developed BCC medical reference library list
- Acted as Clinical Nurse Educator for patient education processes
- Assisted the Reservist RN in her role for Educate the Educator Program
- Developed and designed a BSE poster for outside NNMC clinics with the reservist RN
- Completed Position Descriptions for the ambulatory nurses

- Attended a two-day conference on Cancer Awareness in PA
- Completed a 90-day performance review for the ambulatory RN

Snee

- Suggested and implemented useful changes in the care manager software
- Helped to educate patients and families on breast cancer
- Provided emotional support to women from diagnosis to completion of breast cancer treatment
- Collaborated with multiple disciplines to arrange for patient care
- Developed useful methods for managing many varied and complex patients
- Taught many new cancer patients about breast and wig prosthetics and assisted them in obtaining the prosthetics
- Attended tumor board meetings and was prepared to give additional information concerning breast cancer patients if required or requested by physicians
- Collaborated with staff on the development of a cancer database
- Provided education and working demonstration of the "Care Manager" software to interested personnel both within NNMC and to outside facilities
- Prepared speech, slides and syllabus for a presentation entitled " The Art of Case Managing the Breast Cancer Patient" to be presented to US military medical personal at the Spectrum of Breast Care Conference in Vicenza, Italy and Garmisch, Germany from March 27 to April 1, 1997

Taylor

- Created presentation slides for BRCA gene testing.
- Performed word processing for the center's staff.
- Organized supplies to allocate more usable space.
- Ensured a smooth correspondence flow/distribution.
- Maintained 4 databases to assist with streamlining and improving the procurement process, conference room scheduling, and breast cancer research.
- Maintain the electronic filing system.
- Wrote patient correspondence for appointment and medical issues.
- Generated supply reports.
- Performed upgrades, installs, and troubleshooting for BCC Computer Systems.
- Became Assistant Administrator for BCC computer systems.

Vaughn

- Provided assistance to staff requesting help with mammography films.
- Organized log book to improve film tracking.
- Continued to disseminate films to patients via CHCS computer.
- Assisted radiologists with research projects by providing mammogram films.
- Performed increased duties as patient volume increased within the BCC.

Wallace

- Coordinated administrative activities of the BCC. Acted as administrator during the absence of the Administrator.
- Monitored data on open appointments to determine 1) percentage of open appointments daily and 2) need or lack of need for more appointments.
- Addressed legal concerns with Staff Judge Advocate's office.
- Identified alternative patient filing system, plan for system change. Developed plan for implementing change to new system.
- Researched reliability of Care Manager data.
- Noted need for quality control in Care Manager. Discussed options with Nurse Manager. Mechanism established and in place.
- Managed schedule templates for BCC attending physicians in five subclinics.
- Maintained relationship with Contract Management Department.
- Developed relationship with 2 new budget liaisons and established reporting relationship.
- Expanded use of CHCS standard reports.
- Participated in interviews for Clinical Educator.
- Revised budget based on new funding, coordinating with Budget Department to match records.
- Cross referenced BCC supply records with Budget Department supply records.

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Patient Service Representatives
Grimes, Jenkins, Lozoya, Williams

- Become proficient in the use of ADS.
- In effort to continuously improve quality, streamline and organize front-desk procedures.
- Coordinate scheduling with other clinics for smoother follow-up visit for the patient.
- Maintain department standards.
- Attend classes involving CHCS training as well as computer training.
- Assist Mammography File Clerk several mornings/afternoons per week.
- Rotate on a monthly basis as Team Leader.

Balintona

- Expand the BCC social work library to include more texts that address the emotional issues related to breast cancer. (Pt frequently request reading material or suggest books that helped them cope with treatment)
- Begin the next Stage I/II group on 14 MAR 97.
- Continue working relationship with the American Cancer Society to bring programs that address psychosocial issues related to cancer to the Breast Care Center.
- Enhance Care Manager (computer program utilized in BCC for patient care)usage for patient care integration. This objective will include daily documentation on the Care Manager and continued discussion with computer programmers to make it compatible to social work service provision.
- Liaison with Dr. Ken Miller, Nursing Researcher, and Mrs. Sherri Higgens for further feedback and input on the research proposal.
- Provide social work services to patients by addressing psychosocial status, mental status, patient and family concerns.
- Coordinate individual, family and group psychotherapy for patients.

Durand

- Continue to work in collaboration with Ellora to improve the "Care Manager"
- Continue to develop the Standard Operating Procedures for the processes of the Nurse Case Manager.

- For a more effective and efficient process, continue to evaluate the patient outcomes and make improvements, that would benefit the patient and the BCC.
- To continue to be the patient advocate in situations that lends to that interaction, as the nurse case manager representing the patient.
- Attempt with the Social Worker to institute the **"I Can Cope"** program for the first time here in Montgomery County, at NNMC.
- Provide Prep- teaching in conjunction with the physician , for the patients and their families regarding alternative treatments for breast cancer. (Required by the dept. of Health and Mental Hygiene)
- Distribute educational material for treatment options to patients and their families.
- Evaluate the patient outcomes and make improvements when necessary, for a more efficient, and effective process.

Richman (Fields)

- Prepare to take mammography certification exam in October 1997.
- Attend an educational mammography seminar.
- Broaden my knowledge of breast diseases and mammography.
- Become acquainted with new mammography personnel.

Higgins

- Begin to obtain patient lab work related to protocols
- Assist BCC interested staff on blood drawing procedures
- Become certified through Fox Chase Cancer Center to perform genetic counseling
- Produce final report of BCC first 100 cancer diagnosis
- Register 5-10 patients on TAM/4-HPR protocol
- Improve the screening process for patient participation in BCC research
- Complete BRCA script and slides
- Begin to counsel and educate patients regarding BRCA testing when study opens
- Continue to keep abreast on breast cancer issues using NCI Current Clips
- Continue to further develop personal computer skills
- Continue to attend seminars/conferences on breast cancer issues and professional nursing issues
- To initiate nursing and clinical protocol development in the BCC

Lopez

- EMPLOYEE RESIGNED. LAST DAY OF WORK 24 JANUARY 1997

Louie

- Continue to provide coverage in the mammography section of the radiology department.
- Continue to evaluate and collect mammography cases for the TITIBCI Project as well as send the films to MGH as per the projected timetable.
- Plan to attend future (approximately quarterly) Missiles-to-Mammograms strategy meetings. Multiple projects involving the application of defense and intelligence technologies to mammography are being planned. The radiology department at NNMC is eligible to participate in some of these projects.
- Continue communication with members of the mammography section of FDA for possible future projects.
- Plan to organize a screening mammography program (for asymptomatic patients) separate from the present diagnostic mammography program (for patients with abnormalities) now that two more mammography technologists have just been hired. However the logistical problems of limited number of mammography rooms in which to x-ray patients, as well as the limited space in which to read the mammograms remain. When the screening program is instituted, it will enable the mammography department to process a larger number of patients more efficiently, and accommodate the increasing demand for mammography services here at NNMC.

McIntyre

- Continue to perform nursing and managerial duties, as described above.
- Continue to obtain mammography statistical data for FDA purposes on a monthly basis.
- Track 6 month follow-up patients with outcome analysis via BCC Task Management Tool.
- Attend nursing/management conferences when available.

O'Halloran

- Continue to enhance education in breast cancer and its treatment
- Continue to improve patient flow management
- Continue to improve computer skills
- Will attend a seminar/conference related to breast cancer and genetic counseling in Philadelphia
- Continue to participate in multidisciplinary meetings
- Improve expertise in patient education for APU patients having breast surgery
- Provide APU teaching for those patients having breast surgery
- Work with staff to improve patient record keeping system

Portee

- Continue to enhance education in breast cancer and it's treatment
- Continue to improve patient flow management
- Continue to improve computer skills
- Will attend a seminar/conference related to breast cancer
- Continue to participate in multidisciplinary meetings
- Continue to learn teaching including biospy and APU
- Continue to improve chart review

Prindle

- Develop breast care center medical reference library
- Continue to enhance education in breast cancer and it's treatment
- Continue development of nursing protocols and quality assurance documents, especially in the area of telephone triage
- Continue to develop Team Leader Role and patient flow activities
- Continue to improve computer skills
- Attend a seminar/conference on breast cancer at GBMC 4/4/97
- Continue to participate in multidisciplinary meetings
- Improve upon and fine tune presentation on ambulatory care nursing for future presentations
- Improve expertise in patient education for APU patients having breast surgery
- Attend a seminar for Health Professionals in utilizing the Internet
- Continue to develop new processes to better enhance clinic management

- Attend the Maryland Nurses Association's Annual Dinner and presentation and seek office in the MNA as member of the district 5 Board of Directors position

Snee

- Prepare for breast cancer conference and present the speech to the Breast Care Center staff on March 19,1997
- Present "The Art of Case Managing the Breast Cancer Patient" at The Spectrum of Breast Care Conference in Vicenza, Italy and Garmisch, Germany, March 27- April 1, 1997
- Continue to improve skills as a nurse case manager
- Assist in the development of a breast cancer database
- Develop concise methods to manage multiple patients
- Continue to enhance education in breast cancer and it's treatment
- Continue to improve computer skills
- Attend a seminar/conference related to breast cancer
- Continue to participate in multidisciplinary meetings
- Establish guidelines for case management follow up after the acute stage of diagnosis and treatment of the breast cancer patient
- Plan and develop, with nursing and medical personal, a form to be placed in the patient's chart that indicates that patient's individual recommended clinic follow-up schedule after she is diagnosed with breast cancer

Taylor

- Continue with streamlining office procedures and processes to improve efficiency.
- Maintain and improve databases to improve productivity and organization of data.
- Continue efforts to learn more in regards to computer systems.
- Define a personal development program to assure continuing professional growth.

Vaughn

- Continue with duties as described above.
- Reduce turn around time for mammogram films returned to the department from the BCC, General Surgery Clinic and patients.
- Purge duplicate mammogram folders.

Wallace

- Continue participation on genetics research and cancer database working groups.
- Continue to coordinate administrative activities of the BCC.
- Implement system change for patient filing.
- Continue development of Strategic Plan, Information Systems Plan, and Marketing Plan.
- Increase budget management, actively seek new avenues of funding.
- Monitor legal issues.
- Monitor compliance between BCC supply records and Budget Department supply records.
- Monitor procurement process more closely

II. NMRI, Bethesda, MD

F. DIRECTED ENERGY EFFECTS RESEARCH

DESCRIPTION OF WORK TO BE PERFORMED

Thompson

- To provide technical and analytical support for pulsed laser glare projects.
- To provide support in the experimental design and analytical support for visual psychophysical studies.

TECHNICAL OBJECTIVES FOR THIS REPORTING PERIOD

Thompson

- To coordinate support for experimental data collection and analysis in the pulsed laser glare project.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Thompson

- Provided technical assistance in the modification of programming driving the pulsed laser glare study.
- Participated in the construction of the laser bench components organization thereby maximizing laser efficiency of the pulsed laser output.
- Performed calibration procedures for screen displays in the pulsed laser glare study.
- Performed diagnostics on shutter device output of pulsed laser.
- Performed numerous luminance measurements of laser output to ensure both maximization of laser efficiency and subject safety.
- Provided support in the development of viable methods for performing luminance measurements on HUD and MFD displays.
- Performed extensive research on suitable monitors to be used in the aircraft cockpit instrument simulation study.

- Provided technical assistance in purchasing equipment for both the pulsed laser glare study and the aircraft cockpit simulation studies.
- Participated in numerous high level DoD demonstrations of the pulsed laser glare study.
- Setup and installed the screen calibration system used with the Cambridge Research Systems VSG2/3 software.
- Performed extensive research for establishing a literature review for the pulsed laser glare study.
- Provided communication between developers of the Scanning Laser Ophthalmoscope and NMRI thereby enabling NMRI to establish their own in house computer system to drive the SLO.
- Provided support in the development of an experimental protocol for the aircraft cockpit simulation study.
- Completed the development of the pulsed laser glare experimental workstation.
- Developed and calibrated pulsed laser glare laboratory experimental setup.
- Revised standard operating procedure for the safe operation of a class 4 laser in human experimentation.

GOALS/OBJECTIVE FOR NEXT REPORTING PERIOD

Thompson

- To collect and analyze data resulting form the pulsed laser glare study.
- To begin development of the experimental workstation and design a method for simulating aircraft cockpit instrumentation symbology.

III. NDRI, Great Lakes, IL and NDRI Detachment, Bethesda, MD

A. DENTAL DISEASES-RELATED RESEARCH

DESCRIPTION OF WORK TO BE PERFORMED

Beck

- Provide technical assistant with ongoing research projects. Participate in linkage analysis projects with Molecular Epidemiology, NDRI. Maintain and upgrade the laboratory such that the research experiments are carried out smoothly. Maintain and record proper technical procedures and data produced for each experiment.

Jones

- Senior Research Scientist. Responsible for the Molecular Biological and Molecular Genetic aspects of the projects. This includes the development, evaluation and refinement of molecular biological research protocols.

Miller

- Senior Research Scientist and Group Supervisor. Responsible for all aspects of Immunological, Microbiological, and Tumor Biomarker activities within the Naval Dental School. This includes the development and supervision of research protocols, dental resident mentoring activities, instruction of courses in dental microbiology and dental immunology, serving as a link between NIH sponsored research and Naval Dental Research programs, and troubleshooting of research programs, computers, instrumentation and equipment.

TECHNICAL OBJECTIVE FOR THIS REPORTING PERIOD

Beck

- Grow and maintain various fibroblast cell lines.
- Isolate RNA's from the stimulated and non-stimulated fibroblast cell lines.
- Run reverse transcriptions on each fibroblast samples produced and also carry out PCR's to amplify specific loci of interest.

- Assist Molecular Epidemiology division of NDRI with linkage analysis studies of genetic disorders.
- Isolate DNA's from micro-sections of tissues. Various techniques of isolations will be compared for quality of DNA's via PCR and gel electrophoresis techniques.

Jones

- Relative to the program entitled "Biomarkers for Oral Cancer," it is anticipated that the characterization of a major portion of the genetic polymorphisms in the Taiwan oral cancer study will be completed. The data will be analyzed for differences in the frequencies of these polymorphisms between the cancer cases and unrelated controls to determine if one or more is associated with increased oral cancer risk.
- The arrival of DNAs and/or tissues from a Taiwan-based study of nasopharyngeal carcinoma (NPC) using multiplex families is anticipated. DNAs will be analyzed for the frequencies of several genetic polymorphisms that have been associated with increased risk of cancer. In addition, these DNAs are to be characterized relative to polymorphisms at the complex HLA locus.
- Will continue involvement in the project on cytokine production by oral fibroblasts. Methods presently in use are sufficient to permit a semiquantitative assessment of levels of expression of the cytokine encoding genes. Will continue to explore the development of an internal standard molecule to facilitate more precise quantitation of specific cytokine gene expression.

Miller

- Relative to the project "Cytokine Production by Polymorphonuclear Leukocytes Resident in Periradicular and Periodontal Lesions" (Work Unit: 0601152N.MR00001.001-0063); work will begin on the development of *in situ* hybridization and *in situ* PCR methodology to permit sensitive identification of cytokine mRNA in tissue sections.
- Relative to the program " Protein Pattern Recognition for Risk Assessment of Periodontitis" (work unit number 0601152N 00004.001.0701) , in as much as funding through an IR is now forthcomming work will be reinitiated during the coming quarter. This will primarily be directed toward the upgrading of computer software for analysis of 2-D PAGE patterns.
- Relative to the program entitled "Evaluation of Disproportionate Expression of T-cell Receptor Vβ Regions in Lymphocytes from Patients with Advanced Periodontitis" (Work Unit: 0601152N.MR00001.001-0063). It is anticipated that this work will be

presented at the International Association for Dental Research Annual meeting in Orlando, Fl. In March, 1997.

- Relative to the program entitled "Biomarkers for Oral Cancer," it is anticipated that this work will be presented at the International Association for Cancer Research Meeting in San Diego, Ca. in April and that work will be extended to include a variety of additional tissue biopsies.
- Work Unit: 0601152N.MR00001.001-0063. Long term frozen storage of lymphocytes. A manuscript covering work on cytokine production by long term frozen stored cells will be completed and submitted for publication. This project is now closed.
- Complete teaching the course Oral Immunology for Dental Residents.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Beck

- Several lines of fibroblast are being maintained for continuous growth. These cells, gingival , pulpal, and OT-1 (tumor cell line), were subjected to various growth factors and bacterial cell components to observe modifications at nuclear and cellular levels. RNA's were isolated from these cells after two days of incubations.
- Begun reverse transcription of these samples to convert RNA into cDNA. Cytokine (IL-1, IL-6, and IL-8) activities are measured at the nuclear level using prepared cDNA via PCR technique.
- Continued to participate in NDRI Molecular and Epidemiology experiments. These studies deal with the inherited genetic disorders. Primarily, linkage analysis is done by amplifying DNA loci that may be associated with disorder and/ or scanning the entire genome for potential linkage. These amplified DNA fragments are processed through acrylamide gels to visualize the PCR products.
- Begun the process of isolating DNA from thin tissue sections. These samples along with other samples isolated by different biotech companies are being evaluated for quality using PCR technique.

Jones

- Relative to the program entitled "Biomarkers for Oral Cancer," screening has been completed for the majority of the biomarkers for association with increased risk for oral cancer in the case-control study for oral cancer in Taiwan. Two genetic polymorphisms within the *CYP1A1* gene have been characterized and have been shown to confer increased risk for oral cancer to those individuals that carry it. A manuscript describing these findings is in preparation.
- The first of several shipments of the DNAs for the Taiwan Nasopharyngeal Carcinoma Study has arrived. These DNAs are being collected from large "multiplex" families in which more than one individual has been diagnosed with nasopharyngeal carcinoma (NPC). Genetic mapping studies have begun and the initial results are very encouraging. These samples are also being analyzed for the association of genetic polymorphisms with increased risk for NPC. The first set of PCR-based assays has been carried out using the same markers used in the Taiwan Oral Cancer Study.
- DNAs and tumor sections from a case-control study of oral cancer in Puerto Rico have been received. The DNAs will be analyzed for the association of a novel genetic polymorphism in the gene that encodes the Ah receptor ligand-binding protein. In animal studies, variation within this gene is a significant risk factor for various forms of cancer. Various methods for the isolation of high molecular weight DNA from the tumor sections are being investigated. The tumor-derived DNA will be screened for the presence of specific genetic alterations using "cold" single-strand conformation polymorphism analysis (SSCP).
- Relative to the project on cytokine production by oral fibroblasts, primers for additional cytokines have been obtained. The PCR conditions for the amplification of specific cDNAs derived from various gingival and pulpal fibroblasts cultured with bacterial stimulators will soon be optimized.

Miller

- Relative to the project " Protein Pattern Recognition for Risk Assessment of Periodontitis" work unit number 0601152N 00004.001.0701 ; the recently approved IR funding has permitted work to be reinitiated. Salivary and gingival crevicular fluid samples have been collected. In addition, effort has also been directed toward the upgrading of computer software for analysis of 2-D PAGE patterns.
- Relative to the program entitled "Evaluation of Disproportionate Expression of T-cell Receptor Vβ regions in Lymphocytes from Patients with Advanced Periodontitis"

(Work Unit: 0601152N.MR00001.001-0063), all bench work has been completed, data is being evaluated, and statistical analysis performed. In general it has been observed that although bacteria associated with periodontal disease etiology carry superantigens disproportionate expression of TCR Vβ mRNA is not seen in peripheral blood lymphocytes when nornal and diseased subjects are compared. An abstract has been submitted for presentation at the International Association for Dental Research Annual meeting in Orlando, Fl. in March, 1997. A final manuscript is being completed for submission to the Journal of Periodontology.

- Work Unit: 0601152N.MR00001.001-0063. Long term frozen storage of lymphocytes. A final manuscript entitled "Cytokine Production by Cryopreserved Peripheral Blood Mononuclear Cells" has been completed and submitted for publication. This final paper will result in the closure of this project area.
- Relative to the program entitled "Biomarkers for Oral Cancer," effort has been directed toward the evaluation of efficient DNA isolation procedures for use on paraffin embedded specimens. The goal is to extract DNA in sufficiently large sizes to permit obtaining PCR products of about 1kb. One of the methods tested will allow 1.2 bp PCR products with NAT-2 primers as well as 1157 bp fragments of p53 exons 5-7. Tissue samples have been made available from Puerto Rico, Greece, and Taiwan for evaluation of various polymorphisms and for detection of HPV. Buccal brush samples for the Taiwan Nasopharyngeal Carcinoma Study have arrived and a method for isolation of large DNA fragments has been identified. It is anticipated that DNA will also be isolated from these samples and evaluated for HPV.
- Relative to studies designed to evaluate antibacterial activity of currently used endodontal medicaments, Vitapex® and Calasept®, this project has been completed and a final manuscript is nearing completion. It is anticipated that this paper will be submitted to the Journal of Endodontics. This will complete all aspects of this project.
- Relative to the project concerning the evaluation of cytokine production by oral fibroblasts, preliminary evaluation of reference markers (actin and cyclophyline) has been completed. In addition, a variety of cDNA's have been obtained from RNA isolated from gingival fibroblasts, pupal fibroblasts and endothelial cells stimulated in culture with a variety of stimulators (TNF, growth factors, and bacterial components).
- A project designed to evaluate the relationship of HPV, CMV, and EBV in the etiology of Sjorgren's Syndrome has been initiated and tissue samples for DNA isolation have been identified and prepared as paraffin sections. Control salivary gland material has also been secured. The presence of viral DNA associated with the tissue samples will be identified using a PCR based method with evaluation of PCR products on an ABI 373 gene sequencer. Appropriate primers have been identified and submitted for synthesis.

- The course "Oral Immunology for Dental Residents" has been successfully completed.

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Beck

- Main objective of this upcoming quarter is to continue with NDRI Epidemiology projects.
- Continue growing fibroblast cell lines.
- Continue isolating RNA's from stimulated fibroblasts and quantifying cytokine levels (both at molecular and cellular levels).
- Continue evaluating DNA isolations in search for the most longest and consistent DNA fragments.

Jones

- Relative to the program entitled "Biomarkers for Oral Cancer", we anticipate the completion of the characterization of genetic polymorphisms in the Taiwan Oral Cancer Study. As noted, a manuscript, detailing the association of two of the genetic polymorphisms with increased oral cancer risk, is in preparation.
- The arrival of additional DNAs and/or tissues from the Taiwan-based multiplex-family study of nasopharyngeal carcinoma is anticipated. These samples will be incorporated into the ongoing study.
- Anticipate completion of analysis and statistical interpretation of the data from the characterization of the Ah receptor polymorphism in the case-control study of oral cancer in Puerto Rico. Incorporation of additional genetic markers into this study is under investigation.

Miller

- A project titled "Changes in Immunoglobulins as a Result of Smoking Cessation and Relation to Neurotransmitter Genes" funded by NDRI/NIH and jointly conducted by the Navy, Geo-Centers, NDRI, and individuals at the Jerry L. Pettis VA Medical Center in Loma Linda, CA. has recently been given IRB approval. During the next quarter we anticipate receiving serum and blood samples for subsequent testing of DNA for neurotransmitter alleles such as those for dopamine receptors and for Immunoglobulin G_2 levels.

- Relative to the project " Protein Pattern Recognition for Risk Assessment of Periodontitis" work unit number 0601152N 00004.001.0701 ; work will continue regarding collection of salivary and gingival crevicular fluid samples.
- Relative to the program entitled "Evaluation of disproportionate expression of T-cell receptor Vβ regions in lymphocytes from patients with advanced periodontitis" (Work Unit: 0601152N.MR00001.001-0063), a final manuscript will be completed and submitted for publication in Periodontology.
- Relative to the program entitled "Biomarkers for Oral Cancer," a portion of this work relating HPV involvement with oral tumors will be presented at the International Association for Cancer Research Meeting in San Diego, Ca. in April. It is also anticipated that the evaluation of HPV in buccal brush DNA from the Taiwan Nasopharyngeal Carcinoma study samples and in DNA obtained from paraffin embedded tissue obtained from the Puerto Rico Head and Neck Cancer study, will be completed.
- Relative to the Sjogren's Syndrome project it is anticipated that all aspects of the project will be completed during this quarter and that a final paper will be written.

Speeches:

Invited seminar on the topic of cancer genetics, Epidemiology and Disease Prevention Branch, NDRI/NIH. February, 1997.

V. NMRI TOX/DET Dayton, OH

A. TOXICOLOGICAL STUDIES

DESCRIPTION OF WORK TO BE PERFORMED

Ademujohn

- The purpose of the neurobehavioral laboratory coordinator at NMRI/TD is to provide technical support to various aspects of ongoing on-site projects in neurobehavioral research. During this quarter the coordinator has been and will be involved in neurobehavioral testing for the effects of simulated stress factors relating to the Gulf War Syndrome on animal models via computer-aided qualitative and quantitative methods. The coordinator also supervises animal training protocols for upcoming pharmaceutical exposure studies.

Briggs

- General Manager and Senior Contractor representative for Geo-Centers, Inc. for the NMRI contract at the Toxicology Detachment. He also serves as a toxicologist and performs research as an Associate Investigator. He is responsible for coordinating the Geo-Centers, Inc. resources in support of the toxicology research projects and the Toxicology Detachment mission. Dr. Briggs responds to taskings from the Officer In Charge which includes assuring compliance with the Quality Management Plan.

Connolly

- Cataloging print and non-print materials for circulation
- Ordering and maintaining serials collection, including claiming missing issues
- Handling reference questions
- Providing interlibrary loan assistance
- Locating needed materials in other libraries
- Preparing book orders
- Preparing journals for binding, and processing bound journals back into library

Horton, Rix

- Maintain Local Area Network (LAN)
- Maintain and upgrade individual Desktop and Laboratory Computers
- Provide answers, support and expertise in correcting computer problems, including all peripherals attached to these systems
- Continue comprehensive program for maintaining system integration and reliability through back-up procedures, documentation, and redundant systems
- Continue to update information Databases HMIS, IRIS, Medline and Toxline
- Organize Media, Manuals and Spare Parts
- Prepare ASDPs for procurement of new computer systems, software and peripherals
- Maintain in-house software and databases

Jung, Narayanan, T.K.

Trimethylolpropane (TMPP) Evaluation
- Preparation of a poster of this data for presentation at SOT in March
- Continue culturing the mouse neuroblastoma cell line N2-A
- Completion of the TMPP neurotransmitter study

Cell Model Project
- This project is on hold until further funding is received

General
- Several of the laboratories in our building are being remodeled. Equipment has been moved out of several of the labs and stored in others.

Kimmel, Reboulet, Whitehead

- Continued to build an inhalation exposure/pulmonary toxicology research laboratory in building 824 WPAFB. Retrofit of the physical plant was completed and the inhalation facility was completed to the 90 % level and is now functional.
- Work to install and calibrate electronic and mechanical systems for assessment of pulmonary function in small animals was begun.
- A presentation for the Naval. Environmental Health and Preventative Medicine Conference entitled "The Acute Respiratory Distress Syndrome: Inhalation Insult" was prepared for delivery by CAPT. K.R. Still, USN. The accompanying report will be submitted as a technical report.

- Two abstracts and presentations for the Society of Toxicology Annual meeting in March were prepared. They are entitled:
- "Pulmonary Toxicity of Co-exposure to Acrolein and Aerosol Particles in F-344 Rats"
- "Pulmonary Edemagenesis in F-344 Rats Exposed to SFE Atmospheres".
- Completed first working version of a computer model of aerosol deposition in rant and in humans based on respiratory system structure and function as well as aerosol physics and airways fluid dynamics. (For risk assessment and publication).
- Completed and abstract and presentation for the Tri-Service Toxicology conference in April entitled. "Smoke Induced ALI/ARDS: a Review and Animal Model".
- Completed a synopsis for CDR Knectyes of NMRDC a synopsis of requirements for a programmatic effort to assess acute pulmonary injury and respiratory incapacitation with focus toward development of real-time risk assessment sensors of potential acute pulmonary toxicity due to inhalation of aerosol (and other) atmospheres.

Ritchie

- Dr. Ritchie serves as Assistant Group Leader for the Neurobehavioral Toxicology Group at the Tri-Service Toxicology Consortium and NMRI/TD and as Associate Principal Investigator (API) for all currently funded neurobehavioral toxicology-related work units (FY97 funding of $650K).Dr. Ritchie's purpose is to assist in all areas of program management, budgetary control and procurement, research design, protocol preparation, research supervision, statistical analysis and preparation of scientific papers and abstracts in the area of neurobehavioral toxicology research. During the current quarter, Dr. Ritchie has continued research in five areas:
- (A) TMPP Mechanisms of Action: Development of Neurobehavioral Molecularization Techniques (WU .1516): anatomical disposition and neurobehavioral effects of trimethylolpropane phosphate (TMPP), a potent neurotoxicant produced through the pyrolysis of synthetic lubricants used in military ships and aircraft.
- (B) Mechanisms Involved with Exposure to Select Neurotoxicants (WU .1712): development, testing and validation of new physiological and mathematical modeling techniques for estimation of expected concentrations of selected toxicant in major CNS regions following dermal, oral or respiratory exposures.
- © Development of the Navy Neuro-Molecular Assessment System (the NTAS) [WU .1713]: Development and validation of a number of neuro-molecular (cellular-level) analytical techniques for eventual inclusion in the NTAS.

- (D) Neurobehavioral Toxicity Assessment Battery (NTAB): Assessing Animal Responses to Pharmacological Challenge (WU .1605): Predictive validation of the NTAB by comparison of animal and (known) human responses to identical pharmacological challenges on neurobehavioral tests with topographical similarity.
- (E) Persian Gulf War (PGW) Simulation Using Sprague-Dawley Rats (US Army Research Development & Materiel Command, Armstrong Laboratories and NMRI/TD): Development of an animal model to simulate exposure encountered by Persian Gulf War veterans.

TECHNICAL OBJECTIVES FOR THIS REPORTING PERIOD

Ademujohn

- Testing various pharmaceuticals on animal models using diminished capacity as the endpoint in Carneaux pigeons and Wistar rats.
- Range finding using operant - trained animals and measuring subsequent stages of diminished capacity.
- To compile, catalog and computerize the above mentioned data.
- To train pigeons and rats for problem solving protocols
- Daily maintenance of pigeon intake and logging performance results.
- To obtain operant testing and training data for animals used in operant exposure testing .
- To organize, catalog and generate computer graphics, cumulatively from the above mentioned data.
- To maintain data for future reference in upcoming publications.
- To be responsible for the procurement and securing of all materials used in testing and training protocols.
- Responsible for documenting and maintaining operant weights.
- Responsible for writing and procurement of standard operating procedures for pigeon and rat training protocols.
- Responsible for making daily accurate and detailed entries and updates of all work unit laboratory books.
- Responsible for compiling information for and conducting weekly meetings with / between work unit P. I.'s and laboratory technicians.

Briggs

- Ensure that the contractor resources are available for coordinating the toxicology research in support of the NMRI/TD mission
- Prepare a reproductive risk assessment plan and submit it for approval
- Continue to conduct the Quality Management Program and write a technical article relating to the quality improvements that have been accomplished.
- Write two articles relating to endocrine disruptors and have them presented at the NEHC Conference
- Prepare a poster for the NEHC Conference
- Perform a technical review of the HFC 236fa toxicology characterization profile
- Perform a technical review of the chromate risk assessment document

Connolly

- Catalog materials as received
- Catalog materials not yet cataloged
- Provide library service to the toxicology community at WPAFB
- Continue working on a manual card catalog

Horton, Rix

- Enhancement of the operation of MS Exchange Server (Enterprise)
- Installation of redundant hardware to allow users to work off-line at off site locations
- Continue developing ADP SOP manual

Jung, Narayanan, T.K.

<u>TMPP</u>

- Prepare a poster for SOT
- Finish the analysis of the data for this study
- Continue culturing the neuroblastoma cells for future use in experiments with TMPP and to place a stock of these cells in cryostorage

Kimmel, Reboulet, Whitehead

- Continuing development of laboratory facilities as well as budget constraints did not permit experimental (technical) objectives to be scheduled for this period. In addition, lack of a respiratory protection program for inhalation exposure personnel tasked to work with lethal concentrations of test materials has hampered research efforts.

Ritchie

- To complete negotiations for the complete relocation of the WPAFB Neurobehavioral Group Laboratories from the WPAFB Veterinary Medicine Division Building to the Medical Research Laboratories of the Veterans Administration Hospital, Dayton, OH.
- (A) To continue a study evaluating the capacity of an experimental GABA-B receptor antagonist to prevent or counteract spontaneous absence-like seizures or EEG paroxysms induced by exposure to low doses of trimethylolpropane phosphate (TMPP).
- To assistant in completion and presentation of nine (9) abstracts and scientific posters for the NHEC, Society of Toxicology (SOT), Hope Hotel Toxicology, and Society for Neuroscience annual conferences.
- (B) Funding began 01 Oct 1996.
- To complete research planning (in conjunction with Dr. Carpenter and Dr. Lindsey) for microdialysis tracking of TMPP concentrations occurring in the blood and two distinct brain regions at various time points following intraperitoneal, intravenous or dermal exposure to selected neurotoxicants.
- © Funding began 01 Oct 1996.
- To continue work with Dr. Jan Lin in development of methods and techniques for hippocampal tissue slice.
- To continue work with Dr. T.K. Narayanan for development of methods and techniques for cell culturing of neuroblastoma cells.
- To continue to work with Dr. Eldon Smith for development of quantitative techniques for analysis of neuroprotein markers (i.e., cFOS, GFAP) in response to toxic insult.
- To continue to work with Dr. James Lindsey for development of fast scan cyclic voltammetry techniques.
- To work with Dr. Chip Aucker at NMRI (Bethesda, MD) for literature search and initial planning for programmed research involving histological immunochemistry for neuroprotein analysis following toxic insult.

- (D)To continue to work with Dr. Alan Nordholm in development of testing methods for conditioned eye blink classical conditioning of rats, rabbits and human subjects.
- To complete evaluation of the spectral and pattern discrimination capacity of 21 pigeons during repeated exposure to amphetamine.
- To complete evaluation of the operant (higher cognitive) capacities of 18 rats during exposure to amphetamine or PCP.
- (E) To complete abstracts, documentation for DoD clearance, scientific posters and a $1,000,000 proposal for further funding through the Army Research Development & Materiel Command (ARDMC) related to simulation of a Persian Gulf war environment using an animal model.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Ademujohn

- Compiled , organized, cataloged ,via computer-aided graphics, the weekly data on Pigeon 'Match' and 'Shapes ' protocols .
- Trained and conditioned new and incoming rodent and pigeon groups to protocol adaptation.
- Maintenance of all laboratory work unit notebooks
- Implemented several data methods to compile training data and weight maintenance on the pigeon operants.
- Trained incoming personnel on standard procedures for lab techniques.

Presentations, Publications, Abstracts, Etc.

- Prepared an overview article/presentation for CAPT Still to present to NEHC entitled, "An Overview Of HTLV / HIV Virus Etiology" February, 97. Rossi III, J., Ritchie, G.D., Nordholm, A., Ademujohn, C.Y., Smith J. and Cassell, J. Neurobehavioral changes in rats exposed to simulated Persian Gulf war environment. Abstract, 38th Navy and Occupational Health and Preventative Medicine Workshop, Feb 1997, Virginia

Briggs

- Collaborated with NMRI/TD management in project reviews and budget planning to facilitate improvements in efficiency, effectiveness and quality of data to be used for human risk assessment and formulating appropriate exposure levels of hazardous chemicals
- Submitted the reproductive risk assessment plan and achieved support for establishing the reproductive risk laboratory. Attended two endocrine disruptor workshops to learn of the progress being made new research being developed to comply with new regulations and for advising the NMRI/TD O.I.C. on technical and policy matters
- The Quality Management Plan focused on the development of new protocols to provide support for the improvement of quality and integrity of data used for risk assessment. Two draft technical reports were submitted to management for publication.
- Two presentations and a poster were prepared to be presented in the Toxicology and risk assessment workshops at the NEHC Conference
- The technical review of the toxicology characterization of the refrigerant, HFC 236fa, was prepared and sent to the Senior Scientist at NMRI/TD. These data will be used to determine appropriate exposure levels on ships
- A technical review of the chromate draft risk assessment document was conducted and a report was issued to NMRI/TD management
- A review of the DBNP exposure data proposal was conducted and a document was prepared for the O.I.C. as tasked

Presentations, Publications, Abstracts, Etc.

- Assessment of Endocrine Disruptors In the Naval Environment. NEHC Conference, Virginia Beach, VA February, 1997
- Environmental Effects of Endocrine Disruptors. NEHC Conference, Virginia Beach, VA February, 1997
- Assessment of Endocrine Disruptors In the Naval Environment. NEHC Conference, Virginia Beach, VA February 1997

Connolly

- 151 books cataloged and prepared for circulation
- 407 card sets prepared for manual card catalog
- 57 journal volumes prepared for the bindery
- 54 articles obtained from local libraries

- 3 books borrowed from local libraries for customers here
- 3 interlibrary loans obtained
- 7 interlibrary loans provided to another library
- 6 literature searches conducted using in-house CD/ROM database capabilities
- 3 searches successfully conducted on the internet for customers, including downloading of documents as required
- 17 reference questions answered
- 11 telephone inquiries on journal locations in local area handled successfully
- 19 requests for articles located and filled from in house resources
- 1 article obtained using the CARL UnCover system via the internet
- 2 orientation training sessions conducted
- 240 journal volumes consulted by customers

Horton, Rix

- Successful enhancement of MS Exchange Server (Enterprise). This state-of-the-art mail system has dramatically improved the E-Mail service to all members of staff as it streamlines local and internet mail services on all workstations.
- Avoided network shutdown through vigilance and early detection of problem with shared network resources. Through reconfiguring TCP/IP services and server workload, enhanced availability of network resources.
- Installed new software and drivers on 35mm slide making software on Personal LFR PC. This change greatly reduced the time needed to prepare software presentations on 36 exposures of 35mm Kodachrome film, from 14 hours to 72 minutes. In addition, the images made have increased in sharpness by over 66%.
- Continued to refine our three pronged approach of data archiving and preservation through use of on-board tape system and Magneto-Optical system as well as Back-Up Exec software
- Updated Service Packs as needed on Exchange and Network Servers
- Ordered various software and hardware upgrades
- Continued to reconfigure Windows Browser and WINS for WAN
- Initiated orders for equipment that will allow the final conversion of all WFW systems to Windows 95 and MS Office 95
- Continued maintenance of Servers including backing up data files
- Continued support of hardware and software for TOXDET personnel
- Continued to update information Databases
- Continued development of ADP SOP manual - this is an ongoing process that will assist NMRI/TD to meet GALP guidelines

- Mr. Horton attended the Microsoft Certified System Engineer (MCSE) prep course in Feb 97. In addition, he is attending the full MCSE course at Miami-Jacobs College on his own time.

Jung, Narayanan, T.K.

TMPP

- The mouse neuroblastoma cell line was removed from cryostorage and put on plates in the incubator with media. The cell line will be cultured and cells periodically stored for future use. The equipment for the tissue culture lab was removed and set up in another room while that one is being remodeled. Experiments are waiting until the remodeling is completed and we can get things back into a tissue culture room. Our goal is to simply maintain the cell line without contamination until things are moved back into a tissue culture lab.
- We are also assisting Dr. James Lindsey with the analysis of the levels of neurotransmitters in 130 brain homogenate samples that he has.

Cell model

- This project was put on hold until further funding was received. The liver hepatocyte cells were placed in cryostorage until they will be needed.

Presentations, Publications, Abstracts, Etc.

- The SOT poster is entitled "Effects of Trimethylolpropane Phosphate on Neurotransmitter Levels in the Rat Brain." A. Jung*, T. K. Narayanan*, and J. Rossi III. Naval Medical Research Institute (Toxicology Detachment) *Geo-Centers, Inc., Wright-Patterson Air Force Base, Oh 45433-7903.

Kimmel, Reboulet, Whitehead

- Additional efforts included the completion of three research proposals submitted to the Office of Naval Research.

Ritchie

- Completed extensive negotiation with the Dayton, OH Veterans Administration Hospital and Wright State University Medical School to contract permanent (3 year) relocation of the WPAFB Neurobehavioral Group Laboratories to the VA, to occur by 01 June 1997.
- (A) Began preparation of publication related to a major study evaluating the relative capacities of well known human anticonvulsant agents (valproic acid, ethosuximide, diazepam and phenobarbital) to prevent or counteract absence-like seizures to generalized motor seizures induced by exposure to low doses of TMPP.
- Continued a study evaluating the capacity of an experimental GABA-B receptor antagonist to prevent or counteract spontaneous absence-like seizures or EEG paroxysms induced by exposure to low doses of trimethylolpropane phosphate (TMPP).
- Presented five (5) scientific posters at the NEHC annual meeting in Virginia Beach, VA in Feb 1997.
- (B) Completed initial research planning for investigating neurobehavioral consequences of exposure of animals or humans to low levels of TMPP or hydrocarbon fuels.
- © Assisted in preparation of publications related to consequences of acute or chronic exposure to low doses of TMPP on: (1) gross behavior and correlative changes in EEG and CNS neurotransmitter concentrations in the nucleus accumbens (NA), and (2) sensitization of evoked response in the NA in response to repeated electrical stimulation of the ventral tegmental area (VTA).
- (D) Completed evaluation of 21 pigeons on well-learned spectral and geometric pattern operant discrimination tasks during exposure to various concentrations of amphetamine.
- Completed evaluation of rats on operant (higher cognitive) discrimination tasks during exposure to amphetamine.
- Completed analysis of 17 rats on am intracranial self-stimulation (ICSS) tasks during exposure to various concentrations of phencyclidine (PCP).
- (E) Completed data analysis and initial preparation for publication of two studies related to the neurobehavioral and physiological consequences of exposure of rats to a simulated Persian Gulf war environment.
- Prepared three extensive DoD briefing packages to facilitate clearance for public release of the data summarized in the above described research project.

- Prepared and submitted proposal for $1 MM (one year) funding to continue and expand upon evaluation of rats to low doses of sarin war gas and other Persian Gulf war chemical toxicant and stressors

Presentations, Publications, Abstracts, Etc.

- Rossi III, J., Ritchie, G.D., Macys, D.A. and Still, K.R. An overview of the development, validation, and application of neurobehavioral and neuromolecular toxicity assessment batteries: potential applications to combustion toxicology. Toxicology, 115, 107-117, 1996
- Lindsey, J.W., Prues, S.L., Alva, C., Ritchie, G.D. and Rossi III, J. Trimethylolpropane phosphate microperfusion into the nucleus accumbens of rat: electroencephalic, behavioral and neurochemical correlates. Submitted for publication, NeuroToxicology, Oct 1996.
- MacMahon, K., Rossi III, J. and Ritchie, G.D. Evaluation of the effects of a simulated Persian Gulf war exposure on male Sprague-Dawley rats. Society for Neuroscience Abstracts, Vol 22, 1997
- Rossi, III, Ritchie, G.D. and MacMahon, K. Neurobehavioral changes in rats exposed to a simulated Persian Gulf war environment. Society for Neuroscience Abstracts, Vol 22, 1997
- MacMahon, K, Rossi III, J., Wolfe, R., Leahy, H., Narayanan, L., Witzmann, F., Eggers, J. and Ritchie, G. Physiological responses of Sprague-Dawley rats exposed to low doses of pyridostigmine bromide, N,N-diethyl-M-toluamide (DEET), JP-4 jet fuel and stress. The Toxicologist, 1997.
- Rossi III, J., Ritchie, G.D., Nordholm, A., Ademujohn, C.Y., Smith, J. and Cassell, J. Neurobehavioral changes in rats exposed to a simulated Persian Gulf war environment. Abstracts, 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA
- Lin, J., Cassell, J., Ritchie, G.D. and Rossi III, J. Repeated Exposure To Trimethylolpropane phosphate (TMPP) induces mesolimbic dopamine system sensitization in male rats. Abstract, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.
- Rossi III, J., Bekkedal, M.Y.., Knutson, B., Ritchie, G.D. And Panksepp, J. Long-term behavioral sensitization induced by a bridged organophosphate. Abstract, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.
- Cassell, J., Holmes, M., Ritchie, G.D. and Onyika, C. The Role Of The Navy Hospital Corpsman at the Tri-Service Toxicology Consortium At Wright-Patterson AFB.

Abstract, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.

- Ritchie, G.D., Rossi III, J., Nordholm, A., Cassell, J. and Smith, J. Protection against absence-like seizures induced by the organophosphate trimethylolpropane phosphate. Abstract, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.
- Lin, J., Cassell, J., Ritchie, G.D. and Rossi III, J. Repeated exposure to trimethylolpropane phosphate (TMPP) induces mesolimbic dopamine system sensitization in male rats. Abstract, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.
- MacMahon, K., Rossi III, J. and Ritchie, G.D. Evaluation of the effects of a simulated Persian Gulf war exposure on male Sprague-Dawley rats. Scientific Poster, Society for Neuroscience International Meeting, 1997
- Rossi, III, Ritchie, G.D. and MacMahon, K. Neurobehavioral changes in rats exposed to a simulated Persian Gulf war environment. Society for Neuroscience International Meeting, 1997
- MacMahon, K, Rossi III, J., Wolfe, R., Leahy, H., Narayanan, L., Witzmann, F., Eggers, J. and Ritchie, G. Physiological responses of Sprague-Dawley rats exposed to low doses of pyridostigmine bromide, N,N-diethyl-M-toluamide (DEET), JP-4 jet fuel and stress. Society of Toxicology International Meeting, 1997.
- Rossi III, J., Ritchie, G.D., Nordholm, A., Ademujohn, C.Y., Smith, J. and Cassell, J. Neurobehavioral changes in rats exposed to a simulated Persian Gulf war environment. Scientific Poster, 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA
- Lin, J., Cassell, J., Ritchie, G.D. and Rossi III, J. Repeated Exposure To Trimethylolpropane phosphate (TMPP) induces mesolimbic dopamine system sensitization in male rats. Scientific Poster, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.
- Rossi III, J., Bekkedal, M.Y.., Knutson, B., Ritchie, G.D. And Panksepp, J. Long-term behavioral sensitization induced by a bridged organophosphate. Scientific Poster, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.
- Cassell, J., Holmes, M., Ritchie, G.D. and Onyika, C. The Role Of The Navy Hospital Corpsman at the Tri-Service Toxicology Consortium At Wright-Patterson AFB. Scientific Poster, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.
- Ritchie, G.D., Rossi III, J., Nordholm, A., Cassell, J. and Smith, J. Protection against absence-like seizures induced by the organophosphate trimethylolpropane phosphate.

Scientific Poster, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.

- Lin, J., Cassell, J., Ritchie, G.D. and Rossi III, J. Repeated exposure to trimethylolpropane phosphate (TMPP) induces mesolimbic dopamine system sensitization in male rats. Scientific Poster, The 38th Navy Occupational Health and Preventive Medicine Workshop, Feb 1997, Virginia Beach, VA.

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Ademujohn

- Accurately train rodents for various testing protocols, such as EEG, swimtest.
- Accurately train pigeons for upcoming testing protocols for upcoming drug studies.
- Successfully work with rabbits for upcoming neurobehavioral studies.
- Maintain a clean and orderly laboratory environment.
- Provide technical support in testing relative toxicity of various pharmaceuticals in pigeons and rats and rabbits.
- Procure and document pigeon maintenance pertaining to preparatory requirements for 'shaping' activities , pre-testing and testing protocols.
- Maintain quality assurance in all levels of data acquisition, processing and retrieval for all completed and ongoing lab experiments and protocols.

Briggs

- Set up the reproductive risk assessment laboratory and develop Standard Operating Procedures for the methods proposed in the strategic plan and train the technician in these techniques
- Initiate study inspections and data audits and present findings to management to evaluate quality and integrity issues.
- Continue to provide support for the cardiac sensitization and ARDS projects
- Publish the article relating to the Quality Management Program at NMRI/TD
- Provide reviews of human risk assessment documents as tasked by the O.I.C.
- Provide quality assurance support for projects as tasked
- Attend the Society of Toxicology Annual meeting and the Endocrine Disruptor workshop and the Tri-Service Spring Conference; a poster will be presented at the Spring Conference
- Assist management in facility improvement and policy issue decision-making that relate to the research mission

Connolly

- Continue cataloging
- Continue preparing cards for the manual card catalog
- Continue training program

Horton, Rix

- Continue developing ADP SOP manual
- Complete the enhancement of existing WFW systems to migrate all of this command to Windows 95 & Office 95
- Mr. Horton should attend a comprehensive Network Security course
- Provide information to assist with finding replacement for Mr. Rix

Jung, Narayanan, T.K.

- Increase the productivity in the lab
- Continue the TMPP binding studies on the benzodiazapine receptor using ^{35}S and ^{36}Cl.
- Begin human cortical neurons for experiments with TMPP
- Continue the work with the rat liver cells of the cell model project
- Begin a study on the enzymes glutamic acid decarboxylase and GABA transaminase, serine -trans-hydroxymethylase, aspartate aminotransferase, and glutamine oxidase.
- Begin a study based upon the four endocrine preproposals written earlier.

Kimmel, Reboulet, Whitehead

- Complete installation of first stage (fundamental measurements ventilation, respiratory mechanics, and gas exchange - approximately 50 % of parameter determination) of small animal pulmonary function testing laboratory.
- Write CRADA for collaborative research with Dr. C. Gairola (pulmonary biochemist) of the University of Kentucky.
- Complete protocol development for research program to investigate smoke inhalation induced Acute Lung Injury (ALI) and ARDS. Efforts of last period were postponed awaiting resolution of budgetary constraints and decisions.
- Complete design of non-rebreathing inhalation exposure system for large animals (dogs and pigs) in support of Cardiotoxicity research program.

- Complete construction of a non-rebreathing system for dosimetric determination of inhaled materials in small animals (for use with the ARDS project).

Ritchie

- (A) Evaluate the relative capacities of well known human anticonvulsant agents (valproic acid, ethosuximide, diazepam and phenobarbital), combined with a $GABA_B$ antagonist to prevent or counteract absence-like seizures induced by exposure to doses of trimethylolpropane phosphate.
- Complete testing of 21 rats implanted with intracranial self-stimulation electrodes (ICSS) following TMPP administration.
- (B) Continue initial research planning for exposure of rats to TMPP and hydrocarbon fuels.
- © Use of tissue slice methods to evaluate TMPP effects on single unit response in the rat hippocampus.
- Use of neuroblastoma cell cultures to evaluate effects of TMPP on cell development and differentiation, membrane integrity and apoptosis.
- Assistance in initiation of neuroprotein assay techniques.
- Completion of TMPP ligand binding studies.
- (D) Completion of the multi-test evaluation of rats and pigeons during administration of three additional psychotropic drugs for use in validation of the NTAB for human risk assessment..
- (E) Publication of the results of the Persian Gulf war study conducted in 1996.
- Preparation for conducting the $1 MM Persian Gulf war study follow-up, if funded.

V. NMRI, Natick, MA

A. HUMAN PERFORMANCE AND U.S. NAVY CLOTHING DEVELOPMENT

DESCRIPTION OF WORK TO BE PERFORMED

Lacerte, Macek, Pawar, Schneider, Buller, Burke, Meyers, Monarrez, Donaldson, Collins, Madden, Grafton, Reynolds, Smith S., Smith/PM, Kubler

Program I: Flame Protective Clothing Research **(Pawar)**

- The primary research goal for the current reporting period was to validate the Wissler mathematical model and to develop the prototype data acquisition system including hardware and software for the thermal response from a copper calorimeter and a skin simulant sensor.

Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment **(Macek)**

- GEO-CENTERS, INC. will establish a program to be used by NCTRF to certify commercial off-the-shelf protective clothing/equipment as meeting or exceeding Navy functional performance requirements. This program will make possible the direct purchase of certified commercial protective clothing/equipment for shipboard use by Navy personnel.

Program III: Database Search **(Macek, Collins)**

- Conduct an extensive search of databases to determine commercial, DoD and non-DoD government organizations with which the U.S. Navy Clothing & Textile Facility (NCTRF) may enter into cooperative R&D agreements for the research, development, and testing of dress and protective clothing systems.
- Determine cooperative opportunities for dual-use technology, technology transition, and technology exploitation.
- Prepare a technical briefing to highlight the technical expertise and unique facilities and equipment available at NCTRF. This briefing could be exploited by agencies seeking cooperative research, development, and acquisition agreements.
- Prepare documentation to convey the technical expertise and unique facilities and equipment available at NCTRF. This documentation could be exploited by agencies seeking cooperative research, development, and acquisition agreements.

Program IV: Great Lakes Prototype Footwear Test **(Buller, Collins)**

- Provide technical support in the development of the Enhanced Chukka Shoe surveys for recruits, leaders, shipboard personnel, and Naval Academy personnel.
- Provide technical support for experimental design of study.
- Provide software support in the production of an on-line data entry program and database management.
- Provide data collection support at the Recruit Training Center (RTC).
- Analyze data by test group and write final report of findings of the study.

Program V: Technical Reports **(Macek, Schneider)**

- Analyze and organize information provided on projects conducted in the Navy Clothing and Textile Research Facility (NCTRF).
- Develop technical reports and articles for publication in peer-reviewed journals.

Program VI: Utility Uniform Study **(Buller, Meyers, Collins)**

Commercial-Off-the-Shelf Utility Uniform Study

- Design questionnaire to assess fit, performance, durability and preference for two commercial off- the-shelf utility uniforms. The two styles are: 1) Redcap, and 2) Levi 505.
- Produce issue data sheets and explanatory package for subjects.
- Reproduce questionnaires and issue packages.

Main Utility Uniform Study

- Adapt questionnaire, data sheets, and explanatory package from COTS study for three uniform configurations: 1) 14 oz. Denim with 4 oz. Chambray Shirt, 2) 11 oz. Denim with 4 oz. Chambray Shirt, and 3) "Dickie" Style.
- Reproduce questionnaires and issue packages for all test participants.
- Provide support of two issuers to 16 test sites on the East and West Coasts, with approximately 75 test participants at each site.
- Provide support of two Human Factors Engineers to visit each test site twice during the duration of the study to issue and collect surveys and to collect subject comments. Visits will occur three and six months after issue of utility uniforms.
- Enter, clean, verify, and tabulate collected data.
- Analyze data based upon experimental design and study hypothesis, using standard univariate and multivariate statistical techniques.
- Write report detailing whole study providing a clear explanation of the analytical techniques adopted and the conclusions reached from analysis of the data.

Oxford Shoe Study

- Design questionnaire to assess fit, performance, durability and preference for three Oxford shoe sole configurations.
- Design issue data sheets.
- Enter, clean, verify, and tabulate collected data.
- Analyze data based upon experimental design and study hypothesis, using standard univariate and multivariate statistical techniques.
- Write report detailing whole study providing a clear explanation of the analytical techniques adopted and the conclusions reached from analysis of the data.

TECHNICAL OBJECTIVES FOR THE REPORTING PERIOD

Lacerte, Macek, Pawar, Schneider, Buller, Burke, Meyers, Monarrez, Donaldson, Collins, Madden, Grafton, Reynolds, Smith S., Smith/PM, Kubler

Program I: Flame Protective Clothing Research

- Develop a method to characterize thermal response of a copper calorimeter and that of a sensor with embedded thermocouple.
- Develop a prototype data acquisition system for above method.
- Validate Wissler mathematical model on basis of data from Steinman.

Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment

- Complete editorial changes to the certification program report and submit to NCTRF for review and comment.

Program III: Database Search

- Deliver a complete set of 35mm slides of the briefing (94 vu-graphs)
- Develop and deliver a high quality reproducible color brochure, which outlines the NCTRF capabilities, product developments and specialized laboratories and equipment.

Program IV: Great Lakes Prototype Footwear Test

- None.

Program V: Technical Reports

- Continue to make editorial changes and incorporate comments from NCTRF into the report entitled "Correlation of Thermal and Evaporative Resistances of Military Clothing Items, Measured on a Guarded Hot Plate and Thermal Manikin."

Program VI: Utility Uniform Study

COTS Study

- Produce questionnaire for COTS study.
- Produce issue data sheets, and package explaining study.
- Reproduce questionnaire and data sheets for study.

Main Utility Uniform Study

- Adopt questionnaire, data sheets, and subject package for use with the main utility uniform study.
- Provide support of two issuers to 16 test sites on the East and West Coasts, with approximately 75 test participants at each site.

Oxford Shoe Study

- Produce questionnaire to assess fit, performance, durability and preference for two commercial- off-the-shelf utility uniforms. The two styles are: 1) Redcap, and 2) Levi 505.
- Produce issue data sheets.

SUMMARY OF WORK PERFORMED DURING CURRENT REPORTING PERIOD

Lacerte, Macek, Pawar, Schneider, Buller, Burke, Meyers, Monarrez, Donaldson, Collins, Madden, Grafton, Reynolds, Smith S., Smith/PM, Kubler

Program I: Flame Protective Clothing Research

Mathematical Modeling

- Obtained new data on human subject response under cold water for float coat. An approximation of this data was used earlier to validate Wissler mathematical model. Analysis with this new data is under progress.

- Performed an analysis of cold water immersion data on human subjects from Steinman.
- Discussed the scope of the mathematical model for reporting purposes. Worked on the outline of the report. Planned new simulation runs of the Wissler mathematical model using the mannequin data for clo values and new data for the human subjects.
- Analyzed the simulation results of scenarios for float coat and standard anti-exposure suit for predicting the skin and the rectal temperatures under cold water.
- Helped in transferring HP based files to PC AT platform. Wrote file reading and bytes counting code. These files contain data for mathematical models and they exist on HP machines. Our tools of data analysis exist on AT machines.
- Completed analysis of data for calm seas. Summarized data on eight human subjects in rough seas. For further analysis, data translation utility mentioned above is needed.

Daq Development for Burn Injury Protection

- Work on development of thermal response of three types of sensor is initiated. These sensors are nonstandard copper calorimeter, skin simulant and the commercial radiometer. The data acquisition system interface is under progress. This system should be useful in making choice of sensor for different fire risks.
- Designed the program structure. Designed all interface elements. Worked on reconfiguring of the hardware for multi-channel data acquisition. Tested the configuration for its accuracy.
- Procured from National Instruments regarding upgrade of LabWindows CVI-4.0.1. Working on hardware problems associated with SCXI-1200 and the Windows 95.
- Searched for literature on current heat resistant materials for fire protection.
- Calibration of sensors can be started only after heat gun and its extension are procured.
- The calibration routines are debugged. Heat gun is required for further work.

Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment

- None.

Program III: Database Search

- Delivered a complete set of 35mm slides of the briefing (94 vu-graphs).

Program IV: Great Lakes Protective Footwear Test

- None.

Program V: Technical Reports

- The review of the draft copies of the technical report, *Correlation of Thermal and Evaporative Resistances of Military Clothing Items, Measured on a Guarded Hot Plate and Thermal Manikin*, was completed by personnel from the Navy Clothing and Textile Research Facility. Changes and corrections requested by the project officer were incorporated in the document. Following the completion of these changes, it was decided to add figures illustrating the thermal manikin and guarded hot plate instrumentation, as well as the six clothing systems used in the study. The final draft of the report was submitted for editorial review and, after the indicated corrections were made, the report was printed and copies were delivered to the project officer.

Program VI: Utility Uniform Study

COTS Study

- Questionnaire for COTS study was designed and reproduced.
- Data sheets for COTS study were produced along with the subject package.
- Questionnaires, data sheets, and subject package were reproduced for issue in COTS study.

Main Utility Uniform Study

- Questionnaire, data sheets, and subject package were adopted and redesigned for use in the main utility uniform study.
- Two GEO-CENTERS issuers traveled to Norfolk, VA (13 Jan to 24 Jan 1997) and San Diego, CA (4 Feb to 12 Feb 1997). Test supplies were organized and issued to Navy personnel aboard 16 ships. Issue sheets were completed and returned.

Oxford Shoe Study

- Questionnaire and issue sheet were designed, reproduced and forwarded to the project officer.

GOALS/OBJECTIVES FOR NEXT REPORTING PERIOD

Lacerte, Macek, Pawar, Schneider, Buller, Burke, Meyers, Monarrez, Donaldson, Collins, Madden, Grafton, Reynolds, Smith S., Smith/PM, Kubler

Program I: Flame Protective Clothing Research

- Test the thermal response of sensors using heat gun and calibrate the system including data acquisition hardware and the sensors.
- Create documentation for the data acquisition systems developed in the last year.
- Validate Wissler mathematical model using additional data on rough seas.

Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment

- Upon receiving comments from NCTRF on the certification program report, GEO-CENTERS, INC. will incorporate the changes into the report.

Program III: Database Search

- Develop and deliver a high quality reproducible color brochure, which outlines the NCTRF capabilities, product developments and specialized laboratories and equipment.

Program IV: Great Lakes Protective Footwear Test

- None

Program V: Technical Reports

- All efforts are currently on hold pending the availability of funding.

Program VI: Utility Uniform Study

COTS Study

- None.

Main Utility Uniform Study

- Enter, clean, and validate issue data.
- Two Human Factors Engineers to visit Norfolk, VA and San Diego, CA to conduct mid-point user survey.
- Enter, clean, and validate user preference survey data.

Oxford Shoe Study

- Enter, clean and validate issue data.