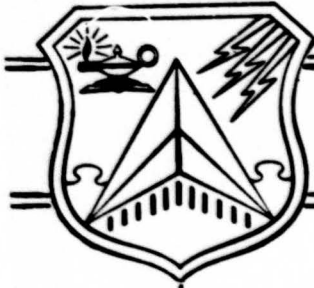


LEVEL II

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Air War College

MEDICAL WARTIME TRAINING PROGRAMS FOR
PHYSICIANS OF THE ARMED FORCES: 1979-1981

RESEARCH REPORT

No. MS119-81 By Charles R. Terry

AIR WAR COLLEGE
AIR UNIVERSITY (ATC)
UNITED STATES AIR FORCE
MAXWELL AIR FORCE BASE, ALABAMA

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REPORT NO. MS119-81

MEDICAL WARTIME TRAINING PROGRAMS
FOR
PHYSICIANS OF THE ARMED FORCES:
1979-1981

by
Charles R. Terry, [REDACTED]
Lieutenant Colonel, USAF, MSC

A RESEARCH REPORT SUBMITTED TO THE FACULTY
IN
FULFILLMENT OF THE RESEARCH
REQUIREMENT

MAXWELL AIR FORCE BASE, ALABAMA
MARCH 1981

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TITLE: Medical Wartime Training Programs for Physicians of
the Armed Forces: 1979-1981

AUTHOR: Charles R. Terry, Lieutenant Colonel, USAF, MSC

↓ In 1978, it was determined by the Surgeon Generals of the various Armed Forces, and the Assistant Secretary of Defense for Health Affairs that the services were not prepared to meet their medical readiness mission to support the line forces in various levels of confrontation. As part of the overall medical readiness initiatives, three medical wartime training programs for physicians were implemented. The Air Force instituted the Medical Red Flag Exercises and the Battlefield Medicine Course, and the Army implemented the Combat Casualty Care Course under the auspices of the Uniformed Services University of the Health Sciences. This study compares and evaluates each course in detail to determine its effectiveness and if it contributes to the employment of joint medical service support. Finally, the study recommends ways to improve the courses and several approaches to improving the overall medical readiness capabilities of the Armed Forces.

↑

BIOGRAPHICAL SKETCH

Lieutenant Colonel Charles R. Terry, USAF, MSC, (M.S., Troy State University) is a Health Services Administrator who holds the rating of Chief Medical Service Corps Officer in the USAF Medical Service. Born [REDACTED] Colonel Terry was commissioned a Second Lieutenant from The Citadel through the Air Force Reserve Officers Training Course in 1963. He has served as squadron commander, hospital engineer, hospital administrator, and, prior to attending the Air War College, the course supervisor of the Military Indoctrination for Medical Services Officers Course at the School of Health Care Sciences, Sheppard Air Force Base, Texas. Since 1966, Colonel Terry has been interested in disaster preparedness and medical wartime training. In 1979, he developed and implemented the first Air Force Medical Red Flag Exercise and Workshop related to wartime medical training for physicians. He is a graduate of Squadron Officers School and the Armed Forces Staff College. Colonel Terry is a graduate of the Air War College, Class of 1981.

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CHAPTER I

INTRODUCTION

The history of failure in war can be summed up in two words: Too Late. Too late in comprehending the deadly purpose of a potential enemy; too late in realizing the mortal danger; too late in preparedness; too late in uniting all possible forces for resistance; too late in standing with one's friends.

General Douglas MacArthur
American Caesar

On 19 February 1981, at 9:04 PM eastern standard time, President Ronald Reagan addressed the joint session of Congress and the American people on his recommended budget proposals for 1981-1985. He stated that the national debt was approaching one trillion dollars, and that for the first time in 60 years the United States had experienced double-digit inflation for two consecutive years. (37) He affirmed that his four-point program would reduce government spending, increase jobs, gain control of inflation, and balance the national budget by 1985. (37) He emphasized that the programs would attack government waste and duplication, and that every major program would be cut with the exception of defense spending, which would be increased. (37)

At this turning point in history, why did President Reagan advocate a cut in all government programs except defense? He stated that since 1970 the Soviet Union has spent \$300 billion more on its military forces than the United States, giving them a numerical advantage in weapon

systems which if allowed to continue would constitute a threat to our national security. (37) He reasoned that in order to fund various government programs in the past, defense programs had been reduced. (37) What the President did not say was that the readiness and power projection of the US to meet national security interests and commitments worldwide was in question; that the nation did not have the will to support a strong defense during and after Vietnam; and that the indicators for war in the next five to ten years were at its highest probability since World War II.

War is a short three-letter word, but it has had a tremendous impact on history and world events. "War is hell and war is a waste." (11:13) No one knows this better than a nation that has mobilized its total resources to fight an enemy. No one knows it better than the individuals that have fought in wars. No one knows it better than those family members who have lost loved ones on the field of battle far from home. No one knows it better than the dedicated individuals who treated and cared for the wounded and diseased by war.

A short look at the casualties experienced by the United States from World War I through the war in Southeast Asia gives us an idea of the waste in lives and suffering experienced by our gallant military men and women. (See table 1.) Since the Revolutionary War, we have lost 575,009

men and women from battle deaths, and 445,722 from other causes; 1,429,823 have been wounded but not mortally.

(10:150-151)

How wonderful it would be if the world could be free of war; however, history is not on the side of the world community. From the period, 1500 B.C. to 1980 A.D., over 3,3027 year, the world has been at total peace for only 268 years. (12:697)

If, historically, war seems to be the international consequence of poor diplomacy, how can we look at past lessons and learn from them? In order to keep this study in perspective, let us look at military medicine. The best way to get a quick look at the need for military medicine and some lessons learned is to review statements from the 1975 Emergency War Surgery, North Atlantic Treaty Organization (NATO) Handbook.

Success in military medicine, furthermore, has been achieved despite the fact that, over the ages, sometimes most of the lessons of the past, all learned by hard experience, ordinarily lie fallow between conflicts. Almost invariably, they have had to be rediscovered, relearned by additional hard experience, and expanded and adapted by succeeding medical generations as new emergencies have arisen.

The milestones of history, unfortunately, very often are represented by wars, and modern wars may not be limited conflicts between nations. Instead they may be fought between groups of nations. The role of the medical profession, therefore, extends to the care of collaborating nationalities. It must be carried out in widespread geographic areas and in extremes of climate. These facts, highlighted by the continuing tensions of the times in which we live, explain the need for the expansion of the curriculums of medical education to include the doctrines and principles of military

TABLE 1

PRINCIPAL WARS IN WHICH THE UNITED STATES PARTICIPATED:
U.S. MILITARY PERSONNEL SERVING AND CASUALTIES

WAR/CONFLICT	BRANCH OF SERVICE	NUMBER SERVING	CASUALTIES		
			BATTLE DEATHS	OTHER DEATHS	WOUNDS NOT MORTAL
WORLD WAR I 6 APR 1917- 11 NOV 1918	TOTAL	4,734,991	53,402	63,114	204,002
	ARMY	4,057,101	50,510	55,868	193,663
	NAVY MARINES	599,051 78,839	431 2,461	6,856 390	619 9,520
WORLD WAR II 7 DEC 1941- 31 DEC 1946	TOTAL	16,112,566	291,557	113,842	670,846
	ARMY	11,260,000	234,874	83,400	565,861
	NAVY MARINES	4,183,466 699,100	36,950 19,733	25,664 4,778	37,778 67,207
KOREAN CONFLICT 25 JUN 1950- 27 JUL 1953	TOTAL	5,720,000	33,629	20,617	103,284
	ARMY	2,834,000	27,704	9,429	77,596
	NAVY MARINES AIR FORCE	1,177,000 424,000 1,285,000	458 4,267 1,200	4,043 1,261 5,884	1,576 23,744 368
VIETNAM CONFLICT 4 AUG 1964- 27 JAN 1973	TOTAL	8,744,000	47,194	10,441	153,303
	ARMY	4,368,000	30,864	7,249	96,802
	NAVY MARINES AIR FORCE	1,842,000 794,000 1,740,000	1,593 13,059 1,678	907 1,682 603	4,178 51,392 931
(10:151)		35,311,577	425,782	208,014	1,131,435

SOURCE: US Department of Defense, Director for Information Operations and Reports,
Selected Manpower Statistics for 1979 (Washington, D.C.: Government Printing
Office, March 1980) p. 151, Table P28.2

medicine. Some medical students will make military medicine their careers. Those who do not may be called upon in an emergency to serve in the medical department of some branch of the Armed Forces. They too, must know the fundamentals of military medicine. Military knowledge, in short, is no longer a function of professional medical officers alone. (9:1-2)

With the above in mind, what is the current medical wartime readiness of the Armed Forces, and what programs have been initiated to improve their readiness capability? Dr. John Moxley III, Assistant Secretary of Defense for Health Affairs, recently stated, "The medical readiness mission is being prepared to support the line forces in any level of confrontation anywhere in the world. We are currently not at the necessary state of preparedness for our readiness mission." (39:13) He pointed out that this shortfall in readiness is correlated with health manpower, especially physicians in the active and reserve forces, as well as medical supplies. (39:13) He emphasized that there was an active duty physician shortage of 2,800 to 5,000, depending on the criteria used, even though the deployable medical force are in the Reserve components. (39:13) The services have a "current minimum requirement of 15,000 physicians" to provide essential services, but a review of the assigned physicians versus authorizations gives the reader an appreciation of this impact. (30:9)

TABLE 2

NUMBER OF ACTIVE DUTY PHYSICIANS VERSUS AUTHORIZATIONS

<u>Fiscal Year</u>	<u>No. of Active Duty Physicians</u>	<u>Authorizations</u>
1970	15,587	15,289
1972	13,869	13,312
1975	11,195	11,729
1977	10,791	11,841
1978	10,836	11,340
1979	11,297	11,357
1985	12,300*	12,436

*Projected

SOURCE: Dr John Moxley III, "Where Are the Doctors?"
Defense 80 (December 1980) p. 19.

Dr Moxley points out the following:

Authorizations for physicians are budget constrained and seldom equal requirements. Furthermore, over the past few years, requested authorizations have been based on the number of physicians we could realistically expect to recruit and retain. Thus, actual requirements exceed authorizations by a substantial rate. (30:9)

Major General John W. Ord, Commander, Aerospace Medical Division, Brooks Air Force Base, Texas, points out the medical wartime capabilities, "Clearly the size of the medical staff--and the facilities in which they work--will be inadequate for the workload." (39:13)

Lieutenant General Paul W. Myers, Surgeon General, United States Air Force, has emphasized the following:

Experts say we will probably be involved in a 'come as you are' war. Time will be against us, we won't have the advantage we had before. . . . There could be casualties the likes of which we've never seen before. We have an inadequate number of providers in the Air Force, especially general surgeons, neurosurgeons and orthopedic surgeons, as well as deficiencies in combat training for health care personnel. (39:13)

If the above is true, what is being done to improve our capabilities? The Department of Defense (DOD) has undertaken many medical readiness initiatives concerning theater medical support, aeromedical evacuation, and Continental United States (CONUS) medical support. These initiatives concern both near-term, one to five years, and far-term, five to ten years, goals. In the near term, one of the initiatives involves training programs for health care providers, other medical personnel, and members of the Armed Services. For physicians, these programs consist of Medical Red Flag Exercises, Battlefield Medicine, the Combat Casualty Care Course, and Annual Wartime Training. These programs are conducted by the Air Force with the exception of the Combat Casualty Care Course which is conducted by the Army.

Statement of the Problem

The problems to be considered in this study are: (1) how effective are the current medical wartime training programs conducted by the Armed Forces for its physicians, and (2) do they contribute to the employment of joint medical service support?

On 1 March 1980, Rapid Deployment Joint Task Force (RDJTF) Headquarters was established at MacDill Air Force Base, Florida. (44:1) The following provides some insight into the RDJTF's staff, composition of units, mission, and concept:

The 253 person staff includes personnel representing all four Services--Army, Air Force, Navy, and Marine Corps. Units from all Services have been identified for designation as JTF rapid deployment forces. The RDJTF's mission provides for planning, joint training, exercising and being prepared to deploy and employ designated forces in response to non-NATO contingencies threatening United States vital interests worldwide. The RDJTF provides a concept of flexibility and is not a separate category of fixed size forces. Rather, it is a central "reservoir" comprised of units based primarily in the US from which forces can be drawn for a specific contingency. The key to the RDJTF concept is the ability to tailor a "package force"--the force size and composition would depend upon the crisis and the threat. The RDJTF in coordination with US Readiness Command will conduct frequent joint readiness exercises designed to train in joint tactics, techniques and procedures. This will permit the four Services to work together as a team, improving US military capability. (44:1)

The RDJTF has been designated by the Department of Defense as having one of the highest priorities in defense spending. It was established shortly after the Soviets invaded Afghanistan on 25 December 1979. Although it was formulated to react to a crisis in Southwest Asia, the Persian Gulf area, it could also be utilized for other contingencies. General David C. Jones, Chairman of the Joint Chiefs of Staff, recently reported in his Annual Report to the Congress the following:

The United States would be hard pressed to defend its vital interest in the event of a Soviet thrust into the Persian Gulf. . . . In most engagements we would have to fight outnumbered and outgunned, at least initially. In a case of conflict with the Soviets, particularly in Southwest Asia, there would be no way for the West to match the weight of effort that the Soviets could hurl into a conventional battle. . . . Moreover, although our European and Pacific interests remain vital, the most critical and immediate vulnerability to our collective interests lies in the Southwest Asia/Arabian Gulf region. (35:15)

To date, 96 Army and Air Force medical units have been task-designated by organization to support the RDJTF.

(19) The types and sizes of these units cannot be provided in this study because of the classification level. In addition, the Navy and Marine Corps, who have medical units organic to their forces are tasked to support the RDJTF; however, specific unit designations have not been provided to date.

(19)

Thus far, it has been revealed that defense spending will be increased to protect our national interest, that war is a waste, there is a need for military medicine in medical education, and that medically the military is not prepared for its readiness mission. In addition, DOD medical readiness initiatives pertaining to the training of physicians have been revealed. The author has explained the establishment of the RDJTF, the threat in Southwest Asia, and our ability to meet that threat. Lastly, the problems of the study have been determined.

Purpose of the Study

It is the purpose of this study to determine if the current Medical Wartime Training Programs conducted by the Army, Navy, and Air Force for its physicians are effective for that specific service and whether they contribute to joint operations.

Delimitations

This study will be limited to the evaluation of the three medical wartime training programs conducted for physicians by the Armed Forces. These training programs are Medical Red Flag Exercises, the Battlefield Medicine Course and the Combat Casualty Care Course.

Theoretical Framework

There were three basic assumptions to the collection and analysis of the data used: (1) that the Services are receptive in improving the training of their physicians, (2) that any deficiencies revealed in the findings could be corrected by the Service to improve its training procedures, and (3) that medical wartime training should be conducted to mutually support and enhance the warfighting capabilities of the Services.

For the purpose of this study medical readiness is defined as, "a measure of the capability of a given medical unit, system or individual to provide, under given conditions, the military support for which it is organized, designed, trained, or tasked." (6:9) Even though there is a specific definition for education and training, in this report the terms training and education will be used synonymously, and is defined as programs presented wherein an individual can obtain subject knowledge, skill, and proficiency to perform a specific job within his or her specialty or career field. Effectiveness is defined as the

degree by which stated goals are met related to a defined standard. Operational training is defined as training which is conducted in a realistic simulated combat environment and designed to meet the requirements of assigned missions.

(1:4-10) Joint is defined as operations or training which involves two or more of the military services. Tri-service is defined as relating to the Army, Navy, and Air Force.

Review of Related Literature

A survey of the related literature from the period January 1947 to February 1980 has revealed that very few articles have been written stressing or advocating joint medical training for physicians. In addition, no articles or reports have been written which evaluate or compare the current wartime medical training courses given to physicians by the Armed Forces. Internal evaluations have been written; however, they have not, to the author's knowledge, been published in any professional military or medical journal.

The above seems to be significant because the Air Force is conducting two courses, Medical Red Flag Exercises and the Battlefield Medicine Course, whereas the Army is conducting the Combat Casualty Care Course. The Air Force courses are service specific, whereas the Army course has the working concept and approach of being tri-service. All the courses have common core characteristics; therefore, it would seem feasible from an overall resources standpoint that a tri-service medical wartime training course should be

developed that would present a common core curriculum as well as present service specific areas if necessary.

Ranking medical officers and physicians who have had wartime experience advocate a standardized tri-service training course for physicians. These individuals stressed that on a modern high intensity, integrated battlefield medical resources will be taxed to and beyond their limits. They feel that the understanding of each service's mission, tactics, and resources is essential in maintaining overall medical effectiveness. This effectiveness would include the cross-service utilization of all medical resources for the best possible care of the patients. Even though opinions have been voiced, nothing has been written recently recommending these actions.

A review of Army Field Manual 8-8, Navy Medical Publication 5047, and Air Force Manual 160-20 consolidated in Medical Support in Joint Operations dated 1 June 1972, (14) affirms the following:

The purpose of this manual is to familiarize Armed Forces command and staff officers with the general doctrine, organizations, and practices of the medical components of the Army, Navy, and Air Force. It outlines the employment of these components in joint operations. . . .

The primary mission of the medical elements of the Armed Forces is to conserve military manpower. (14:1-1)

During the employment of forces, a unified or joint task force commander has operational responsibilities and support responsibilities which include medical support.

(14:1-2) To assist in discharging the medical support

responsibilities, the commander designates a unified or joint task force surgeon. (14:1-3) Eight of the surgeon's thirteen responsibilities are:

- a. Insuring that hospitalization and evacuation facilities provided meet medical support requirements of the command and that the unnecessary duplication of facilities among component commander does not occur
- b. Assisting in the formulation of the theater patient evacuation policy
- c. Supervising the activities of the joint medical regulating officer (JMRO)
- f. Preparing medical portions of support annexes to unified command plans
- g. Coordinating joint utilization in such medical areas/facilities as convalescent facilities, aeromedical staging units . . . aeromedical evacuation, and all cross-service medical arrangements
- j. Establishing medical training policies for joint operations
- k. Planning and supervising the medical portion of joint exercises
- l. Preparing patient estimates based upon the casualty factors established by the components. These estimates will be the basis for other aspects of medical planning by the unified command surgeon (e.g., aeromedical evacuation requirements and overall bed requirements) (14:1-3)

Each component Medical Service (Army, Navy, and Air Force) in joint operations "operates its portion of the overall military hospitalization system and determines requirements in accordance with service policy." (14:1-3)

Hospitals may be jointly staffed and used, or they may be staffed by one service and used by all. . . . When one service uses personnel from another service, the borrowing service assumes operational control over those individuals. (14:1-4)

It also specifies that each component is responsible for evacuation within its area of operations but, ". . . the transportation of patients of the Armed Forces will be by aircraft when air transportation is available and feasible." (14:1-4)

In the area of joint planning, it is advocated that:

Planning adequate medical support in an area of operations also involves determining the amount and type of medical training required. . . .

The efforts of the health services of the component forces must be coordinated for maximum use of resources available. . . . (14:5-1, 6)

The RDJTF, which was specified earlier in this report, utilizes the forces of the three services. Even though it is hoped that the RDJTF will have an invited and unopposed landing to support friendly governments, it must plan for a forced entry to establish itself ashore. If it must perform a forced entry by the projection of combat power, a joint amphibious operation or airborne operation may be necessary. The main projection force of the RDJTF for forced entry is the Marine Amphibious Force (MAF). A joint amphibious operation is a complex operation requiring close coordination of all forces. The following general statements can be made:

The application of the principles to medical support in joint amphibious operations requires a knowledge of the special problems encountered in such operations. . . .

The highest casualty rates usually occur during the critical assault phase. . . .

Because of the complex nature of joint amphibious operations, it is essential that intensive training of all personnel precede any actual operation. . . . All medical personnel must be trained in their specific duties. . . . All training must culminate in joint patient-handling exercises conducted in conjunction with other joint training and rehearsals. (14:7-1, 4)

The various services have developed doctrine pertaining to the employment and training of their forces. The following are selected references from Air Force Manual 1-1, Function and Basic Doctrine of the Air Force, and Army Field Manual 100-5, Operations:

To make sure that our people can do the tasks required of them, we must inform them, motivate them, and teach them to do their jobs professionally.

Training develops skill and proficiency for specific jobs or work centers within specialties. It teaches precise, efficient, and standard methods for people to use in doing their jobs. . . .

Our operational training must be designed to meet the requirements of our assigned missions. To prepare our forces for combat, our training must be realistic as possible. We must train in the same environment and under the same conditions in which we expect to fight (1:4-9, 10)

Training development must provide training standards and techniques matched closely to the realities of the modern battlefield.

Moreover, US Army commanders must recognize that battlefield success is dependent to a major degree upon US Air Force, US Navy or US Marine Corps support and our ability to work with our allies. In all of our 20th century wars, we have fought as a member of an international coalition, alongside the other US services, and so we are likely to fight again. Team work in joint and combined operations is integral to readiness for land combat. (15:1-4, 5)

Training management may appear as a simple process to the laymen; however, the developing, implementing, and managing, an effective training program require a tremendous amount of hard work and effort. It requires a constant reevaluation to insure that it is current and meets mission essential requirements.

Regardless of the organizational structure or complexity, training managers usually perform similar tasks regarding the development and implementation of training programs; their efforts involve managing money, time, personnel, equipment and curriculum. This interactive process transforms Air Force requirements for trained personnel into programs which produce qualified graduates. (31:399)

The above factors can be utilized in measuring the effectiveness of a course or program; however, task analysis, tests, graduate evaluations, and internal evaluations can also be used to measure effectiveness. (31:400-401)

Air Force Manual 50-2, Instructional System Development (ISD), provides "a systematic but flexible process for applying training technology to curriculum development." (31:404) The ISD is a five-step model consisting of (1) analyzing system requirements, determining a valid need for training; (2) defining training requirements, examining target student population to compare their knowledge and skill to a job task listing; (3) developing objectives and tests; (4) planning, developing, and validating instruction; and (5) conducting and evaluating instruction. (31:404) "Since all steps of the model are interrelated, feedback and interaction between the steps are

essential. . . . A change in one step may effect other steps. . . ." (31:404)

Research Design and Procedures

This study combined descriptive and historical methods of research and utilized both primary and secondary reference materials as its data sources. The basic technique was to analyze each course as to course formulation, purpose, length, participants, workload, schedule, general course contents, specific course content, staffing, support, and course cost. The author identified curriculum subjects which were common core, service specific and those that contributed to joint operations. The writer then evaluated the effectiveness of each course by utilizing available course evaluations and testing results. In conclusions, an overall effectiveness evaluation of the three courses was addressed.

CHAPTER 11

FINDINGS

Historically, after every war the United States Government has acted swiftly to demobilize the size of the Armed Forces, reduce spending, and curtail programs related to its war fighting capability. Each war was looked at as the "war to end all wars." This "mind-set" has had tremendous impact on the military services. The decrease in defense spending did not allow the services to modernize their equipment or properly train their forces. In addition, they did not have the forces to respond quickly to meet contingencies or to initially fight a war effectively. Prior to every war the U.S. was unprepared to go to war. War or the threat of war has caused a tremendous upheaval in the U.S. Defense spending has been increased, and a vast number of individuals have been called to military service.

A review of the total manpower in the military services during certain selected time periods from 1916 to 1980 will give an appreciation of the mobilization and demobilization of Armed Services. (See table 3)

Wars of the past have given the U.S. time to build up its resources; however, future wars may not give us this luxury; especially regarding medical resources.

Within the past 75 years, the United States has engaged in four armed conflicts abroad. These generated various levels of need for medical services. In all four instances, however, there was reasonable time available for the build-up of resources, thus allowing

the peacetime military medical support system to be expanded to meet emerging needs. Future conflicts may well not permit such a mobilization process. In a rapidly moving wartime scenario, it is conceivable that the conflict may be resolved before full mobilization can be achieved. (30:11)

TABLE 3
MILITARY PERSONNEL ON ACTIVE DUTY
1916-1980

<u>YEAR</u>	<u>TOTAL PERSONNEL</u>
1916	179,376
1917	643,833
1918	2,897,167
1920	343,302
1940	458,365
1941	1,801,101
1942	3,858,791
1945	12,123,455
1946	3,030,088
1947	1,582,999
1950	1,460,261
1951	3,249,455
1955	2,935,107
1961	2,483,771
1967	3,376,880
1979	2,027,494
1980	2,050,100

(43:1141, 8:268)

SOURCES: U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States, Part 1 (Washington, D.C.: Government Printing Office, September 1975), p. 1141 and U.S. Department of Defense, Annual Report Fiscal Year 1982 (Washington, D.C.: Secretary of Defense, 19 January 1981), p. 268.

The author, as well as many others, feels that the time to prepare for war is during peacetime. This preparedness must stress training for every officer and enlisted person. The writer feels than any training in wartime medicine during peacetime is better than no training.

In a report such as this, it would be impossible to cover medical wartime training for all personnel; however, it is possible to review medical wartime training programs for physicians. These programs, as previously indicated, are Medical Red Flag exercises, Battlefield Medicine, and the Combat Casualty Care Course.

The data will be analyzed in the terms of providing answers to the following questions: Are the present medical training programs conducted by each service effective? Do these training programs contribute to the employment of joint medical service support? Are service specific areas so critical that they have to be conducted by the separate services? Can the resources be better utilized in a true tri-service course? What is the future for medical wartime training programs for physicians? Answers to these types of questions should provide the ultimate answer. Are the Armed Services getting the most for their medical training dollar?

The author will use tables extensively throughout the report. All the tables, with few exceptions, were derived by the writer from information provided by the course directors, support staff, and associated course documents. The informational source, where applicable, will be provided at the end of each table utilizing the double-number reference system.

Course Formulation

In December 1978, the Surgeon General of the United States Air Force (USAF/SG), Lieutenant General Paul W. Myers, directed the Air Force Medical Service Center (AFMSC) to develop and implement a wartime training program. (33)

In March 1979, the AFMSC training proposal was briefed to the Surgeon General, who approved the proposal and directed that medical wartime training be given a high priority within the USAF Medical Service. The acronym for the overall wartime medical training effort was "Patch Team" (Train Each Air Force Member). (33) Within the "Patch Team" concept plan, Medical Red Flag exercises and the Battlefield Medicine Course were cited. The tasking to develop and implement the courses was assigned to the Surgeon, Air Training Command (ATC/SG) per USAF/SG Program Action Directive 2-79. (34) The ultimate tasking was assigned to the School of Health Care Sciences, Sheppard AFB by ATC/SG. The responsibility for the development and implementation of the Battlefield Medicine Course was later given to the USAF School of Aerospace Medicine at Brooks AFB.

The author was the project officer for the Medical Red Flag Exercises from 22 April 1979 to 1 December 1979. My duties were assumed by Lieutenant Colonel James A. Ellis, USAF, Medical Services Corps, Chief, Medical Readiness Division, School of Health Care Sciences, Sheppard AFB, Texas. Lieutenant Colonel George K. Anderson, USAF, Medical

corps and Senior Flight Surgeon, USAF School of Aerospace Medicine, Brooks AFB, Texas, was the project officer for the Battlefield Medicine Course.

The training plan for Medical Red Flag was approved on 8 June 1979, and the training proposal for Battlefield Medicine was approved on 15 October 1979.

On 24 May 1979, after reviewing the increased threat in Western Europe, USAF Europe (USAFE) presented a proposal to the Air Staff titled "Wartime Casualty Management in USAFE--The Four Echelon Concept." (46) After several planning meetings in July and September 1979, USAF/SG published the "Patch Sword Concept of Operations," on 19 December 1979. (41) This concept of operation expanded the USAFE concept to make it applicable worldwide. (41)

To provide the reader with certain reference points, portions of the concept of operations as related to the four echelons of care are described below.

First echelon care is first aid performed by the casualty (self-aid) or by comrades (buddy care). This care includes such things as administration of nerve agent antidote, control of hemorrhage, immobilization of fractures, protection of wounds and limited decontamination. Assisting the injured to the nearest casualty collection point or to the next echelon. . . .

Second echelon care is provided by medical personnel at predesignated locations as close to the site as the threat permits. . . . Emergency care will be provided to include initiating such measures as intravenous fluid administration, hemorrhage control, provisions for an airway, protection of wounds and chest tube insertion. . . . Transportation to the next echelon will be the responsibility of the 2nd echelon. . . .

The third echelon is the first medical facility staffed and equipped to provide specialty care. Medical care provided is considered an extension of field medical care, directed toward saving lives and limited stabilization of casualties to permit further evacuation A field hospital will be established out of the area where combat is threatened. . . .

At fourth echelon, casualties will be provided comprehensive medical care. Patients will be retained at this echelon throughout their recovery if rehabilitation can be accomplished within the approved evacuation policy. If not, evacuation to the Continental United States (CONUS) for additional treatment and convalescence will be arranged. . . . (41:4-7)

A review of the echelons of care concept determined that there was an urgent need for training of physicians at the second echelon. (3:1)

On 21 February 1980, a tri-service general officer steering committee formalized the tri-service combat casualty care course (C4). (49:1, 3:2)

This tri-service course will be hosted by the Army under the Academic auspices of the Uniformed Services University of the Health Sciences, School of Medicine and will have major support from: Brooks School of Aerospace Medicine, U.S. Army Academy of Health Sciences, United States Health Services Command, Brooke Army Medical Center, the 507th Air Ambulance Company, and the 41st Combat Support Hospital of the United States Army Forces Command, and elements of the First Marine Division United States Marine Corps. (49:1)

Lieutenant Colonel Barry W. Wolcott, U.S. Army Medical Corps, Chief, Section of Operational and Emergency Medicine, Uniformed Services University of the Health Sciences, School of Medicine was designated as the Project Officer for the Combat Casualty Care Course. The Navy elected to send its physicians to the Combat Casualty Care Course and Medical Red Flags Exercises instead of developing

a Wartime Medicine Program for its physicians. Now that the reader has the history of the formulation of the various courses, the purpose of each course should be presented.

Purpose of the Course

Medical Red Flag Exercises (MRF)

The purpose of MRF was to provide physicians assigned to the six Air Force Medical Centers and other selected physicians with realistic readiness training (hands-on familiarization) as well as didactic training in combat medicine related topics. (32)

Battlefield Medicine Course (BMC)

The purpose of the BMC was to conduct a course for active duty, Air Force Reserve, and Air National Guard physicians, not carrying surgical or surgical subspecialty Air Force Specialty Codes (AFSC), to prepare them to practice medicine in the battlefield environment. (34, 45:1)

Combat Casualty Care Course (C4)

The purpose of the C4 course was "to prepare military medical officers to function on an integrated battlefield during a high intensity conflict at forward points in the casualty care system." (50:1)

Course Length and Training Hours

Medical Red Flag--Five days/36 hours (5)

Battlefield Medicine--Six days/45 hours (45)

Combat Casualty Care--Seven days/60 hours (4)

Target Participants

Medical Red Flag

Training emphasis was directed toward the direct care providers, i.e., the physicians (MCs), physician assistants (PAs), and nurse practitioners assigned to the Medical Centers. Attendance was later opened up to dentists in Oral Surgery (ORS). In addition, quotas were provided to the Air Force Reserve (AFRES), Air National Guard (ANG), and physicians in the Medical Center, Department of Defense (DOD) referral area. The exercise also allowed observers and students from the other services.

Battlefield Medicine

Training emphasis was directed toward active duty physicians and Air Reserve Forces (ARF) physicians who were being assigned or programmed to be assigned to high threat areas, especially those involving second echelon medical activities. (3:1)

Combat Casualty Care Course

Training emphasis was directed toward physicians of the three services who were being assigned or programmed for assignment to operational units that would function at second or third echelons. (49)

Student Workload and Course Schedule

Medical Red Flag

During MRF 1, the large number of observers and students saturated the training facilities and billeting

accommodations. Even though this situation was considered to be due to the fact that this was the first time presentation of this type of course by any of the services, it was directed that during future MRF exercises a quota system would be utilized. This quota system would not be applicable to those direct care providers assigned to the Medical Centers, except to adjust quotas correlated to training and billeting accommodations. Quotas were also adjusted to correlate with the accommodations required to support temporary duty (TDY) support staff, and specially invited guests, instructors and guest speakers. On the average the student quota was distributed as follows:

TABLE 4
MEDICAL RED FLAG STUDENT QUOTAS

<u>STUDENTS</u>	<u>QUOTAS</u>
Medical Center Providers*	150-100
AFRES	40
ANG	10
MCs in the DOD referral area (2 per facility)	40
Army	20
Navy (including the Marine Corps)	<u>20</u>
	280-330
	(13)

*No quotas--all would attend.

Table 5 on the following page reflects the current projected MRF schedule and the number of students projected. For those MRF exercises that have been conducted the actual attendance is reflected.

It should be noted at this time that because of the 790 direct care providers assigned to the Wilford Hall USAF Medical Center, Lackland AFB, Texas, no other student quotas will be provided. Because of this fact an MRF exercise will be conducted at Sheppard AFB, Texas.

It should also be noted that the original MRF exercises were to be restricted to Continental United States (CONUS); however, because of the threat focused in Europe, the Air Force Surgeon General directed that exercises would be conducted in Europe. This decision generated the requirement for an exercise to be conducted in the Pacific.

TABLE 5
MEDICAL RED FLAG EXERCISE SCHEDULE

<u>DATE</u>	<u>LOCATION</u>	<u>STUDENTS ATTENDED OR PROJECTED</u>
26-30 November 1979	Keesler AFB, Mississippi	235
17-21 March 1980	Travis AFB, California	267
27-31 October 1980	Scott AFB, Illinois	222
16-21 March 1981	Lackland AFB, Texas	790
26-28 August 1981	Europe 1, Munich Germany	300
31 Aug - 1 Sep 1981	Europe 2, Munich Germany	300
21-23 October 1981	Andrews AFB, Maryland	250
26-28 October 1981	Andrews AFB, Maryland	250
Spring 1981	Sheppard AFB, Texas	400
Summer 1982	Wright-Patterson AFB, Ohio	350
Summer 1982	Pacific	<u>250</u>
		3,614
		(13)

The actual number of attendees at MRF 1-3 are reflected in table 6.

TABLE 6

ATTENDEES AT MEDICAL RED FLAG EXERCISES

DATES LOCATION	MRF 1 26-27 NOV 79 KEESLER AFB, MISS	MRF 2 17-21 MAR 80 TRAVIS AFB, CALIF	MRF 3 27-31 OCT 80 SCOTT AFB, ILL
Medical Ctr & Referral Area Providers	204	209	178
AFRES	25	17	12
ANG	4	1	12
ARMY	2	11	10
NAVY	<u>0</u>	<u>19</u>	<u>10</u>
SUB TOTAL	235	267	222
<u>OBSERVERS</u>			
USAF	32	18	17
ARMY	1	1	2
NAVY	2	6	1
OTHER	<u>1</u>	<u>5</u>	<u>4</u>
SUB TOTAL	36	30	24
GRAND TOTAL	271	297	246

(13)

Battlefield Medicine

Classes will be offered four times per year and will consist of 40 students per class. (3:1) Quotas per class are reflected in table 7.

TABLE 7

BATTLEFIELD MEDICINE STUDENT QUOTAS

<u>STUDENTS</u>	<u>QUOTAS</u>
Air Force Active Duty	27
AFRES and ANG	<u>13</u>
TOTAL	40 (2)

Table 8 below reflects the current project BMC schedule and the number of students who have or are projected to attend.

TABLE 8

BATTLEFIELD MEDICINE COURSE SCHEDULE AND ATTENDEES

<u>DATE</u>	<u>LOCATION</u>	<u>STUDENT ATTENDED/ PROJECTED</u>
8-14 Feb 81	Brooks AFB, Texas	34
26-30 Apr 81	Brooks AFB, Texas	40
20-24 Sep 81	Brooks AFB, Texas	40
Dec 81	Brooks AFB, Texas	40
Jan 82	Brooks AFB, Texas	40
Apr 82	Brooks AFB, Texas	40
Sep 82	Brooks AFB, Texas	<u>40</u>
TOTAL		274 (2)

The actual number of attendees at the BMC to date are reflected in table 9.

TABLE 9

PHYSICIAN ATTENDEES AT THE BATTLEFIELD MEDICINE COURSE

<u>STUDENT ATTENDEES</u>	<u>8-14 FEB 81</u>
USAF Active Duty	28
AFRES	6
ANG	<u>0</u>
SUB TOTAL	34 (2)

Combat Casualty Care Course

The C4 course is to be conducted four times per year and will consist of 120 military physicians per class. (4)
There are strong indicators that in the future the course will be conducted ten times a year and will be expanded to 150 students per class. (48)

The first two classes were conducted 27 April-3 May 1980 and 4-10 May 1980 respectively. Quotas per class are reflected in Table 10.

TABLE 10

COMBAT CASUALTY CARE COURSE

<u>STUDENTS</u>	<u>QUOTAS</u>
ARMY	60
NAVY	40
AIR FORCE	<u>20</u>
TOTAL	120 (4, 48)

Table 11 reflects the current projected C4 schedule and the number of students who have or are projected to attend.

TABLE 11
C4 SCHEDULE AND ATTENDEES

<u>DATE</u>	<u>LOCATION</u>	<u>STUDENTS ATTENDED/ PROJECTED</u>
27 Apr-3 May 80	Camp Bullis Ft Sam Houston, Texas	120
4-10 May 80	Camp Bullis Ft Sam Houston, Texas	120
10-17 Jan 81	Camp Bullis Ft Sam Houston, Texas	97
17-24 Jan 81	Camp Bullis Ft Sam Houston, Texas	108
21-28 Mar 81	Camp Bullis Ft Sam Houston, Texas	120
28 Mar-4 Apr 81	Camp Bullis Ft Sam Houston, Texas	<u>120</u>
TOTAL		685 (48)

The actual number of attendees at the C4 course to date are reflected in table 12.

TABLE 12
PHYSICIAN ATTENDEES
AT THE COMBAT CASUALTY CARE COURSE

DATES	27 Apr-3 May 1980	4-10 May 1980	10-17 Jan 1981	17-24 Jan 1981
LOCATION	Camp Bullis, Texas	Camp Bullis, Texas	Camp Bullis, Texas	Camp Bullis, Texas
PHYSICIAN ATTENDEES				
ARMY	60	60	40	39
NAVY	40	40	39	38
AIR FORCE	<u>20</u>	<u>20</u>	<u>18</u>	<u>31</u>
TOTAL	120	120	97	108 (48)

During the two classes in January 1981, the student quotas were adjusted to allow 40 students per service; however, an enrollment shortfall was experienced primarily related to the Air Force.

General Course Content and Special Requirements

Medical Red Flag Exercises

The general course content of MRF consists of didactic training, 76.4 percent, and practical exercises, 19.0 percent. (5) As indicated earlier, it was targeted at all direct care providers. Therefore, it can be concluded that the MRF exercises are primarily informational, geared to subject knowledge awareness with minimal hands-on application.

The Medical Red Flag Exercises had several special requirements. It was determined that, to prevent a complete disruption in patient care at the Medical Centers, the providers assigned to the Medical Centers would attend class only half a day (5 hours) and would be required to work in the Medical Center half a day (5 hours). (33) This required that the course be conducted twice per day, once in the morning (0700-1200) and again in the afternoon (1300-1700). Careful scheduling was necessary for the attendees for each session as well as requiring that enrichment sessions be conducted so the providers could take advantage of the entire training course. (5) The same schedule was followed in MRFs 1-3 and will also be followed in MRF 4. After MRF 4 the exercises will be conducted in two sessions. Each session will be conducted over

a three-day period which will allow the providers to attend either of the sessions on a full-time basis. This will also allow patient coverage of the Medical Center.

During MRF 1 all instructional periods and practical exercises were video taped as they were conducted, either in the classroom or in the field. In the MRF 2 and 3 exercises, instructional periods were recreated and video taped in a studio.

The video tapes are part of an immediate range program goal to provide all medical units, including the Air Reserve Forces, with a complete set of the MRF training tapes. (13) These tapes will aid the medical units in conducting their required annual Wartime Medical Training programs for its providers and other applicable personnel.

Battlefield Medicine Course

The general course content of the BMC consists of didactic training, 51.1 percent, and practical exercises, 45.4 percent. (45) The practical exercise portion of the course consists of laboratory practicals using animal models: dogs, cats, and goats. (45) This type of training develops both medical and surgical related skills under the most realistic simulation that can be created. The practical exercises reinforce the lectures by allowing application of the knowledge gained into manipulation skills. The course, therefore, prepares medical officers to serve in combat situations by developing basic casualty triage, initial care, and evacuation skills. (45)

The special requirement for the course is the use of live animal models. It should be noted that when live animal models are used in training, strict protocol procedures must be utilized to prevent any undue suffering to the animals. Animal usage requires that experienced veterinary officers prepare the animals for the exercise and be available should their services be required. The goat laboratory practical is conducted at the facilities at Fort Sam Houston, Texas. It was also noted that, in order to keep a proper instructor to student ratio and not saturate the laboratory facilities, the class was divided into "A" and "B" groups, thus generating a double teaching schedule.

(2)

Combat Casualty Care Course

The general course content of C4 consists of didactic training, 36.7 percent; practical exercises, 45.0 percent; and small group activities, 8.3 percent, as related to three major roles of the entry level military physicians, "the military care of individual battlefield casualties . . . supervision of enlisted medics . . . medical staff officers at the maneuver battalion." (49)

The special requirements for the C4 consist of the use of animal models similar to the Battlefield Medicine Course; however, the goat is the only animal used. Another special requirement in the C4 course is that all students are required to undergo their entire training while living in the field.

(4)

This provides them with the experience of living under field conditions as well as additional time to train in the evening hours. The training facilities located at Brooks AFB, Texas, were utilized in conducting the subjects pertaining to aeromedical evacuation and chemical and nuclear casualty management.

All three courses utilized guest lecturers in providing the didactic training portion of their respective courses. These lecturers, either military or civilian, were considered experts in a specific subject area. A vast majority of these individuals gained their expertise in combat and through research.

Table 13 provides a recap of the general course content for rapid review. It also provides a separate breakout of the time devoted to animal models and administration.

TABLE 13
COMPARISON OF GENERAL COURSE CONTENT

	MRF HRS/PERCENT	BMC HRS/PERCENT	C4 HRS/PERCENT
ADMINISTRATION	2.0/5.6	2.0/4.4	6.0/10
DIDACTIC	27.5/76.4	23.0/51.1	22.0/36.7
PRACTICAL EXERCISES			
ANIMAL MODELS	0/0	16.0/35.6	6.0/10
SMALL GROUPS	0/0	0/0	5.0/8.3
OTHER	<u>6.5/18.0</u>	<u>4.0/8.9</u>	<u>21.0/35.0</u>
TOTAL	36.0/100	45.0/100	60.0/100

Specific Course Content and Training Standards

In this portion of the report, the author will identify the three courses in terms of three primary areas: subject, time allotment, and proficiency level. The subject area of each course will be reviewed by its primary teaching method; didactic and practical training. The writer will also identify those subjects which are service specific and those which contribute to joint operations. After completing the above actions, the author will provide a comparison of the three courses to identify service specific subjects and those which contribute to joint operations. To preclude a long narrative, the above information will be presented in table form.

Prior to beginning the above evaluation, the reader should have a means of interpreting the proficiency levels that will be presented. A proficiency code key is provided in table 14. It should be noted that the proficiency code key is utilized by the Air Force and is not common for the other services; therefore, for the C4 course, the course administrator had to provide the appropriate proficiency code for each subject to maintain a standard of evaluation.

TABLE 14

PROFICIENCY CODE KEY

	<u>Scale Value</u>	<u>Definition</u>
Task Performance Level	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (EXTREMELY LIMITED)
	2	Can do most parts of the task. Needs help only on hardest parts. May not meet local demands for speed or accuracy. (PARTIALLY PROFICIENT)
	3	Can do all parts of the task. Needs only a spot check of completed work. Meets minimum local demands for speed and accuracy. (COMPETENT)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (HIGHLY PROFICIENT)
Task Knowledge Level	a	Can name parts, tools, and simple facts about the task. (NOMENCLATURE)
	b	Can determine step-by-step procedures for doing the task. (PROCEDURES)
	c	Can explain why and when the task must be done and why each step is needed. (OPERATING PRINCIPLES)
	d	Can predict, identify, and resolve problems about the task. (ADVANCED THEORY)
Subject Knowledge Level	A	Can identify basic facts and terms about the subject. (FACTS)
	B	Can explain relationship of basic facts and state general principles about the subject. (PRINCIPLES)
	C	Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)

TABLE 14 - CONTINUED

D Can evaluate conditions and make proper decisions about the subject.
(EVALUATION)

(5)

SOURCE: School of Health Care Sciences, Training Operations Division. Proficiency Code Key. Training Standards Medical Red Flag Exercise and Workshop. TS MRFEW 003 (Sheppard AFB, Texas, 19 August 1980), p. 2.

Tables 15-17 provide the specific course content of the Medical Red Flag Exercise, and the Battlefield Medicine and Combat Casualty Care Courses. It should be noted that on those subjects which are service specific and contribute to joint operations they are coded with a "Y" for "yes." If the subject is service specific but does not contribute to joint operations, it is coded "N" for "no."

TABLE 15

MEDICAL RED FLAG EXERCISES--SPECIFIC COURSE CONTENT

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
1. DIDACTIC				
Threat and the Future Battle- field Environment	1.0	C		
Emergency Manage- ment of the Airway	1.0	D		
Gunshot wounds to include vascular, chest and abdominal injuries	2.0	C		
Air Transportable Hospital	1.0	C	Y	Y

TABLE 15--CONTINUED

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
Hypovolemic Shock and Use of Blood Fluids	1.0	D		
Aeromedical Evacu- ation and Aero- medical Staging	1.0	C		
Hypothemal/Hypo- thermal Stress and Injuries	1.0	C		
Orthopedic Injury Management Includ- ing Open Fractures	1.0	C		
Chemical Injury Management	1.5	C		
Burn Management	1.5	C		
Maxillofacial Injuries	1.0	C		
Neurological Injuries	1.0	C		
Triage and the Initial Evalu- ation Battlefield	1.0	C		
Triage Exercise Instruction	.5	B		
Practical Exercise Critique	.5	C		
Splinting and Bandaging Instruction	1.0	D		
Wartime Anesthesia	1.0	C		
Nuclear Casualty Management	1.5	C		
War Psychiatry	1.0	C		

TABLE 15--CONTINUED

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
Infectious Diseases of War	1.0	D		
Selected Readiness Subjects USAFE/SHCS Soviet Threat Briefing MRF 1 & 2 Video Tapes	2.0	C		
Chemical Warfare Defense Expedient Shelter	.5	C		
High/Low Threat Chemical Warfare Briefing	.5	C		
Air Rescue Control Center Familiari- zation	1.0	C	Y	Y
Aeromedical Evacu- tion Facilities Utiliza- tion Patient Airlift Ctr Mobile Aeromedical Staging Facili- ties	2.0	C	Y	Y
C-9 C-141 C-130 UH-1				
TOTAL	27.5			

2. PRACTICAL

Triage Decision Model Exercise	2.0	4d
Triage Practical	1.5	4d

TABLE 15--CONTINUED

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
Splinting and Bandaging Practical	1.5	4d		
Gas Mask/ Protective Suit Instruction and Practical	1.5	3c		
	—			
TOTAL	6.5			
3. ADMINISTRATIVE				
Introduction	.5			
Summation/ Critique	.5			
Pretest	.5			
Post Test	.5			
TOTAL	2.0			
GRAND TOTAL	36.0			

(5)

SOURCE: School of Health Care Sciences, Training Operations Division. Training Standards Medical Red Flag Exercise and Workshop, TS MRFEW 003 (Sheppard AFB, Texas, 19 August 1980), pp. 3-4.

TABLE 16

BATTLEFIELD MEDICINE COURSE--SPECIFIC COURSE CONTENT

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
1. DIDACTIC				
History of Battlefield Medicine	1.0	A	N	Y
Current Threat Briefing with Emphasis on Modern Weapons	1.0	B	Y	N
The Modern Battlefield and Casualty Expecta- tions	1.0	C	Y	N
Medical Aspects of Nuclear Warfare	1.0	B		
Medical Aspects of Chemical Warfare	1.0	C		
Triage	1.0	D		
Casualty Manage- ment				
Breathing and Airway	1.0	D		
Hemorrhage and Shock	1.0	D		
Burns	1.0	D		
Head and Neck Injuries	1.0	D		
Fractures and Spine Injuries	1.0	D		
Chest and Abdom- inal Injuries	1.0	D		
Battlefield Psychiatry	1.0	C		

TABLE 16--CONTINUED

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
Environmental Considerations				
Infectious Diseases/ Biological	1.0	C		
Field Hygiene, Heat Cold and Alti- tude	1.0	C		
Multiple Wound Management	2.0	D		
Medical Resources Review	2.0	D	Y	Y
Air Evacuation Field Facilities ATH Surgical Unit				
Special Interest Subjects	4.0	B		
	<hr/>			
TOTAL	23.0			

2. PRACTICAL

Basic and Advanced
Life Support

Life Support	1.0	4d
Examination		
Resuscitation	1.0	4d
Mannequin		
Airway Mannequin	1.0	4d
Airway Lab--Dog and Cat	1.0	4d
Ballistics and Missile Wounds	4.0	3c
Surgical Techniques	4.0	3c

TABLE 16--CONTINUED

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
Chemical Agent Effect on Animal Models	4.0	3c		
Field Exercise	<u>4.0</u>	3d		
TOTAL	20.0			
3. ADMINISTRATIVE TIME	<u>2.0</u>			
TOTAL	2.0			
GRAND TOTAL	45.0			
		(45,2)		

SOURCE: USAF School of Aerospace Medicine, Course Outline,
Battlefield Medicine Course (Brooks AFB, Texas, undated),
p. 2.

TABLE 17

COMBAT CASUALTY CARE COURSE--SPECIFIC COURSE CONTENT

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
1. DIDACTIC				
Advanced Life Support	5.0	D		
Threat Briefing	1.0	C		
Initial Evalua- tion and Treat- ment of the Combat Casualty	1.0	D		
Triage	1.0	D		
Burn Management	.5	D		
Chest Trauma	.5	D		

TABLE 17--CONTINUED

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
Abdominal Trauma	.5	D		
Extremity Trauma	.5	D		
Field Sanitation and Public Health Problems	1.0	B		
Field Management of Environmental Casualties	1.0	D		
Chemical Casualties	4.0	C		
Dermatology	.5	B		
Podiatry	.5	B		
Psychiatry and Substance Abuse	1.0	C		
Medical Evacuation	1.0	D	Y	Y
Nuclear Casualty Management	1.0	B		
Battlefield Medicine Philoso- phies Seminar	2.0	C		
TOTAL	22.0			
2. PRACTICAL				
Goat Laboratory (Surgical Skills)	6.0	3d		
Advanced Life Support Testing	5.0	3d		
Chemical Decon- tamination Procedures	2.0	3c		
Aeromedical Evaluation Procedures	2.0	3c	Y	Y

TABLE 17--CONTINUED

<u>SUBJECT</u>	<u>TIME (HOURS)</u>	<u>PROFICIENCY LEVEL</u>	<u>SERVICE SPECIFIC</u>	<u>JOINT OPERATIONS</u>
Helicopter				
C-141				
C-9				
Triage Exercise	2.0	3d		
Bandaging	2.0	2c		
Splinting	2.0	2c		
Litter Carries	2.0	2c		
Evacuation	2.0	2c		
Medical Support of Combat Units	5.0	2c	N	Y
Primary Patient Care Simulation Exercise	2.0	3d		
	—			
TOTAL	32.0			
3. ADMINISTRATIVE	<u>6.0</u>			
TOTAL	6.0			
GRAND TOTAL	60.0			

(7,48)

SOURCE: Combat casualty care course. (Ft Sam Houston, Texas, 27 April 1980), pp. 1-3.

Table 18 provides a comparison of the specific content of each course. The reader is requested to review the code at the end of the table before starting. As a comparison, the subject titles of the C4 course were used as the baseline. Subjects that were not included in C4 were added to the table, where all didactic and practical subjects of significance could be compared.

The author must also advise the reader that certain interpretations had to be made as to where certain subjects would or should fit in the table. Interpretations have been approved by the various course administrators.

Regarding joint operations subjects, the writer acknowledges that all medical subjects lend themselves primarily to joint operations or cross servicing; however, some subjects contribute more to operations than others. These will be the ones considered in the table.

TABLE 18
COMPARISON OF SPECIFIC COURSE CONTENT

<u>SUBJECT</u>	<u>C4</u>				<u>MRF</u>				<u>BMC</u>			
	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>
1. DIDACTIC (C4)												
Advanced Life Support-3	5	D	-	-	2	D	-	-	2	D	-	-
Threat Briefing-3	1	C	-	-	1	C	-	-	1	B	Y	N
Initial Evaluation and Treatment of the Combat Casualty-3	1	D	-	-	1	C	-	-	2	D	-	-
Triage-3	1	D	-	-	1	C	-	-	1	D	-	-
Burn Management-3	.5	D	-	-	1.5	D	-	-	1	D	-	-
Chest Trauma-3	.5	D	-	-	1	C	-	-	.5	D	-	-
Abdominal Trauma-3	.5	D	-	-	1	C	-	-	.5	D	-	-
Extremity Trauma-3	.5	D	-	-	1	C	-	-	1	D	-	-
Field Sanitation and Public Health Problems-2	1	B	-	-	-	-	-	-	1	C	-	-
Field Management of Environmental Casualties-3	1	D	-	-	1	C	-	-	1	C	-	-
Chemical Casualty Management-3	4	C	-	-	4	C	-	-	1	C	-	-

TABLE 18--CONTINUED

<u>SUBJECT</u>	<u>C4</u>				<u>MRF</u>				<u>BMC</u>			
	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>
Dermatology-1	.5	B	-	-	-	-	-	-	-	-	-	-
Podiatry-1	.5	B	-	-	-	-	-	-	-	-	-	-
Psychiatry and Substance Abuse-3	1	C	-	-	1	C	-	-	1	C	-	-
Medical Evacuation-3	1	D	Y	Y	1	D	Y	Y	1	C	Y	Y
Nuclear Casualty Management-3	1	B	-	-	1.5	C	-	-	1	B	-	-
Battlefield Medicine Philosophies Seminar-1	2	C	-	-	-	-	-	-	-	-	-	-
2. PRACTICAL (C4)												
Goat Laboratory (Surgical Skills)-2	6	3d	-	-	-	-	-	-	8	3c	-	-
Advanced Life Support Testing-2	5	3d	-	-	-	-	-	-	4	4d	-	-
Chemical Decontamination Procedures-2	2	3c	-	-	-	-	-	-	4	3c	-	-
Aeromedical Evacuation Procedures-1	2	3c	Y	Y	-	-	-	-	-	-	-	-
Triage Exercise-3	2	3d	-	-	2	4d	-	-	2	4d	-	-
Bandaging-2	2	2c	-	-	1	4d	-	-	-	-	-	-
Splinting-2	2	2c	-	-	1.5	4d	-	-	-	-	-	-
Litter Carries-1	2	2c	-	-	-	-	-	-	-	-	-	-
Evacuation-1	2	2c	-	-	-	-	-	-	-	-	-	-
Medical Support of Combat Units-1	5	2c	N	Y	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 18--CONTINUED

<u>SUBJECT</u>	<u>C4</u>				<u>MRF</u>				<u>BMC</u>			
	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>	<u>T</u>	<u>P</u>	<u>S</u>	<u>J</u>
Primary Patient Care Casualty Simulation Exercise-2	2	3d	-	-	-	-	-	-	2	4d	-	-
3. OTHER SUBJECTS												
Air Transportable Hospital-2	-	-	-	-	1	C	Y	Y	1	C	Y	Y
Maxillo Facial Injuries-2	-	-	-	-	1	C	-	-	.5	D	-	-
Neurological Injuries-2	-	-	-	-	1	C	-	-	.5	D	-	-
Wartime Anesthesia-1	-	-	-	-	1	C	-	-	-	-	-	-
Infectious Diseases-2	-	-	-	-	1	D	-	-	1	C	-	-
Air Rescue Control Center Familiarization-1	-	-	-	-	1	C	Y	Y	-	-	-	-
Patient Airlift Control Center Familiarization-1	-	-	-	-	1	C	Y	Y	-	-	-	-
Mobile Aeromedical Staging Facilities Familiarization-1	-	-	-	-	1	C	Y	Y	-	-	-	-
Modern Battlefield and Casualty Expecta- tion-1	-	-	-	-	-	-	-	-	1	C	Y	N
History of Battlefield Medicine-1	-	-	-	-	-	-	-	-	1	A	N	Y

CODE

- 1 - Taught in One Course
- 2 - Taught in Two Courses
- 3 - Taught in Three Courses
- T - Time in Hours
- P - Proficiency Level
- S - Service Specific
- J - Contributes to Joint Operations
- - Not Applicable

A review of table 18 reveals that of the 37 total combined subjects taught in the courses, 13 subjects (48 percent) are common to all three; five subjects (19 percent) are common to two; and five subjects (19 percent) are common to one of the courses. Of the 11 total combined practical exercises taught in the courses, one practical (9.0 percent) is common to all three, six practicals (55 percent) are common to two, and three practicals (27 percent) are common to one of the courses. A breakout of the subjects common to all three courses will not be provided since it is coded in table 18 for easy reference.

Table 19 provides a course comparison of the Service Specific subjects and those subjects which contribute to joint operations.

TABLE 19
COURSE COMPARISON OF SERVICE SPECIFIC
AND JOINT OPERATION SUBJECTS

<u>Service Specific Subjects</u>	<u>Hours Instructed</u>		
	<u>MRF</u>	<u>BMC</u>	<u>C4</u>
Aeromedical Evacuation	1.0	1.0	3.0
Air Transportable Hospital	1.0	1.0	-
Air Rescue Control Center Familiarization	1.0	-	-
Patient Airlift Control Center Familiarization	1.0	-	-
Mobile Aeromedical Staging Facilities Familiarization	1.0	-	-
Threat Briefing--Casualty Expectation	-	1.0	-
	<hr/>	<hr/>	<hr/>
TOTAL	5.0	3.0	3.0

TABLE 19--CONTINUED

	<u>Hours Instructed</u>		
	<u>MRF</u>	<u>BMC</u>	<u>C4</u>
<u>Subjects That Contribute To Joint Operations</u>			
Aeromedical Evacuation	1.0	1.0	3.0
Medical Support of Combat Units	-	-	5.0
Air Transportable Hospital	1.0	1.0	-
Air Rescue Control Center Familiarization	1.0	-	-
Patient Airlift Control Center Familiarization	1.0	-	-
Mobile Aeromedical Staging Facilities Familiarization	1.0	-	-
History of Battlefield Medicine	<u>-</u>	<u>1.0</u>	<u>-</u>
TOTAL	5.0	3.0	8.0
Percentage of Instructional Subjects Hours	14.7%	7.0%	14.8%

It is interesting to note the high percentage of subjects taught which contribute to joint operations as correlated to all the instructional hours. A closer look at the 16 subject hours, however, reveals that 50 percent are related to the aeromedical evacuation system. A knowledge of this system is a very important part of conducting joint operations; however, the understanding of medical logistics, medical support planning, theater operations, and medical support organizations is also essential in developing a well-rounded physician. The understanding of joint operations

and the capabilities of the other services medical units reduce training time in a "come as you are" situation and also provides the flexibility of utilizing the physician in a cross service staffing function with minimal disruption. The secret in developing training is determining where to add these subjects in an already tightly packed training schedule. Some possibilities are to delete other subjects, reduce administrative time, provide the subjects as enrichment utilizing video tapes, and expanding the course to meet the needs of the students. Generally some manipulation can be made to the course; but usually the best approach is to expand it.

Although not reflected in the specific course content, it should be pointed out to the reader that in both the Battlefield Medicine Course and the Combat Casualty Care Course the physicians practice the following surgical procedures on animal models: venous cutdown, a terial cutdown, peritoneal lavage, chest tube insertion, cricothyroidotomy, debridement of high and low velocity gunshot wounds, repair of deep lacerations, and open chest massage. (48, 2) The Battlefield Medicine Course provides eight hours of surgical technique, whereas the C4 course expends four hours on surgical procedures. On the basis of this factor, the physicians in the Battlefield Medicine Course should have a better understanding on surgical manipulative skills than those in the C4 course.

The author was informed that all the courses have lesson plans for each subject taught which specify the learning objective, proficiency level, teaching steps, the equipment and student materials required to teach each lesson. The writer has high confidence in the above since each course has been accredited by the American Medical Association for Category I credit. This accreditation means that the courses meet educational standards for physicians. All the courses shown have strong points to varying degrees. They also have some weaknesses which will be pointed out later in this study.

After reviewing this portion of the study, the writer feels that some other general improvements in administration could be made in the courses. Each course, to varying degrees, uses a different terminology in titling its subjects. The author feels that it is important to use the same terminology in describing subjects taught. Doing so would aid in interpretation or comparing each course and would allow a common interchange between the course administrators and other medical personnel. The author also noted that, in some areas, the proficiency levels of correlated subjects in each course did not match the other courses even though the same teaching method and amount of time were devoted to the subject. For example, the triage exercise in the three courses consisted of a two-hour practical; however, the Medical Red Flag Exercise had a proficiency level of "4d" while the other courses had a proficiency level of "3d." The

attainment of the proficiency level of "4d" in Medical Red Flag Exercises is extremely doubtful concerning the amount of time that the other courses devote to patient management and evaluation procedures. Adjustment of the proficiency levels is an easy process and should be accomplished.

Staffing

This section will consider staffing, which has the primary role of coordinating and conducting the various courses. This staff will be considered the course administration unit. Tables 20-22 below reflect the assigned and authorized staff for the various courses.

Medical Red Flag

The table below reflects the authorized and assigned administrative staff for the Medical Red Flag exercises.

TABLE 20

MEDICAL RED FLAG COURSE: ADMINISTRATIVE STAFF

<u>Career Field</u>	<u>Rank/Grade</u>	<u>Authorized</u>	<u>Assigned</u>
Medical Service Corps (MSC)	Lt Col	1	1 (1-MRF1)*
Medical Service Corps (MSC)	Maj	1**	1**
Medical Service Corps (MSC)	Capt	2	1
Enlisted	Unknown	0	0
Civilian (Typist)	Unknown	<u>0</u>	<u>0</u> (1-MRF1)*
TOTAL		4	3 (2-MRF1)*

*Additional Duty--Medical Red Flag 1.

**Operating Location with the Combat Casualty Care Course, Ft Sam Houston, Texas (effective 1 April 1981).

(13)

Battlefield Medicine

The table below reflects the authorized and assigned administrative staff for the Battle-field Medicine Course.

TABLE 21

BATTLEFIELD MEDICINE COURSE: ADMINISTRATIVE STAFF

<u>Career Area</u>	<u>Rank/Grade</u>	<u>Authorized</u>	<u>Assigned</u>
Medical Corps (MC)	Lt Col	1	0 (1*)
Enlisted	E-5/E-6	2	0 (1*)
Civilian	GS-4	<u>0</u>	<u>0 (1*)</u>
TOTAL		3	0 (3*)

(2)

*Additional Duty.

Combat Casualty Care

The table below reflects the authorized and assigned administrative staff for the Combat Casualty Care Course.

TABLE 22

COMBAT CASUALTY CARE COURSE: ADMINISTRATIVE STAFF

<u>Career Area</u>	<u>Rank/Grade</u>	<u>Authorized</u>	<u>Assigned</u>
Medical Corps (MC)	Lt Col	0	0 (1*)
Medical Service Corps (MSC)	Col	0	0 (1*)
Medical Service Corps (MSC)	Maj	2 (1-Army) (1-AF)	1** (2*) (1-Army) (1-AF)
Medical Service Corps (MSC)	Lt	1 (Navy)	0
Enlisted	E-7	0	0 (1*)
Civilian (Typist)	Unknown	<u>0</u>	<u>0</u> (1*)
TOTAL		3	1** (6*) (48)

*Additional Duty.

**Effective 1 April 1981, USAF.

TABLE 23

COURSE ADMINISTRATIVE STAFF COMPARISON

<u>Career Area:</u>	<u>MRF</u>		<u>BMC</u>		<u>C4</u>	
	<u>AUTH.</u>	<u>ASSGN.</u>	<u>AUTH.</u>	<u>ASSGN.</u>	<u>AUTH.</u>	<u>ASSGN.</u>
Medical Corp	0	0	1	0	0	0
Medical Service Corps	4	3	0	0	3	1
Enlisted	0	0	2	0	0	0
Civilian	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	4	3	3	0	3	1

A review of the above tables reveals a serious flaw in the conduct and operation of the Medical Red Flag Exercises, the Battlefield Medicine, and Combat Casualty Care Courses. This flaw is the lack of an assigned primary staff to conduct the courses. This lack is significant in view of the fact that the training plans for Medical Red Flag Exercises and the Battlefield Medicine and Combat Casualty Care Courses were approved 8 June 1979, 15 October 1979, and 21 February 1980 respectively. Since October 1979, the Medical Red Flag Exercises have trained 724 students; one Battlefield Medicine Course has trained 34 students; and four Combat Casualty Care Courses have trained 445 students.

These courses have been conducted by utilizing personnel in an additional duty capacity. To date, only the School of Health Care Sciences (SHCS), Sheppard AFB, Texas, has assigned personnel to conduct the Medical Red Flag Exercises and operate the Medical Readiness Division at the SHCS. This was accomplished by a realignment of manpower spaces within SHCS until such spaces could be authorized in the manning documents. The Medical readiness Division is now manned at 75 percent of its requirements. During Medical Red Flag 1, the course was conducted by utilizing additional duty staff personnel assigned to the SHCS.

It has been revealed to the author that none of the manpower authorizations have been approved for any of the three courses since they were only recently submitted in the Fiscal Year 1983-1985 Air Force Program Objective Memorandum (POM). (17) This POM submission includes manpower positions as follows: Battlefield Medicine Course--3, Combat Casualty Care Course--10; and the School of Health Care Sciences--54. The 54 SHCS spaces are to be allotted as follows: Medical Readiness Division--8 and a new Medical Readiness course--46. The Medical Readiness Division will be the course administrator of the new Medical Readiness Course, which must be attended by all newly assessed Air Force Medical service personnel. It should be noted that if the POM submission is approved the first manpower space will not be authorized or funded until 1 October 1982.

The author acknowledges that the approval of manpower spaces does take time and that requirements are et, even though stressfully at times. It would seem that other actions could have been accomplished within 13 to 21 months for such priority programs.

Support Staff and Course Cost

It requires a vast number of personnel to conduct successful courses such as the Medical Red Flag Exercises, Battlefield Medicine, and the Combat Casualty Care Courses. However, the support personnel physically assigned to the

base where training is conducted will not be counted in the support staff. As a "rule of thumb," only those personnel who are required to perform temporary duty (military) or received travel and fees (civilians) were counted in the support staff. In addition, only the average number of staff members for those courses which have been conducted more than once was used.

The author also acknowledges that there are many costs associated with conducting the above courses. These costs may, in fact, vary from class to class within the same course as a result of the student load or special requirements. For this report, student travel and per diem as well as the cost associated with transporting equipment to the course location will not be included in the overall cost. This delimitation will allow a baseline to evaluate the cost effectiveness of each course. For special requirement (for example, animal models), these costs will be identified separately. Only the average cost per course will be utilized for those courses which have been conducted more than once.

The writer feels that detailed accounting for both support staff and costs associated with the courses should be performed; however, these numbers were not readily available. Table 24 reflects the support staff and course cost and provides a cost per student determination as related to the average number of students attending.

TABLE 24

SUPPORT STAFF AND COURSE COST COMPARISON

	<u>MEDICAL RED FLAG</u>	<u>BATTLE- FIELD MEDICINE</u>	<u>COMBAT CASUALTY CARE</u>
AVERAGE TDY SUPPORT STAFF			
GENERAL SUPPORT	10	1	3
SPECIAL INVITED GUESTS	3	0	0
INSTRUCTORS	15	0	12
GUEST SPEAKERS	<u>21</u>	<u>15</u>	<u>15</u>
TOTAL	49	16	30
AVERAGE STUDENT LOAD PER CLASS	241	34	111
TDY SUPPORT STAFF TO STUDENT RATIO	1:5	1:2	1:4
COURSE ADMINISTRATION STAFF	2	3	5
AVERAGE COURSE COST	\$50,200.00	\$15,160.00	\$42,092.00 (18)
AVERAGE SPECIAL REQUIREMENTS COST			
CONTRACT QUARTERS	\$ 7,706.00	0	0
ANIMALS MODELS	0	\$ 1,450.00	\$ 1,200.00
VIDEO TAPES	\$ 1,000.00	0	0
MAINTENANCE AND SUPPLIES FOR ANIMALS	0	\$ 2,500.00	\$ 1,342.00
TOTAL	\$ 8,706.00	\$ 3,950.00	\$ 2,542.00

TABLE 24--CONTINUED

	<u>MEDICAL RED FLAG</u>	<u>BATTLE- FIELD MEDICINE</u>	<u>COMBAT CASUALTY CARE</u>
COURSE COST PER STUDENT			
WITH SPECIAL REQUIREMENTS	\$ 208.30	\$ 445.88	\$ 379.20
WITHOUT SPECIAL REQUIREMENTS	\$ 172.17	\$ 329.71	\$ 356.31
COURSE LENGTH IN HOURS	36	45	60
COST PER STUDENT HOUR			
WITH SPECIAL REQUIREMENTS	\$ 5.79	\$ 9.91	\$ 6.32
WITHOUT SPECIAL REQUIREMENTS	\$ 4.78	\$ 8.04	\$ 5.94
COURSE PER COURSE HOUR	\$ 1,391.00	\$ 337.00	\$ 705.53
COST OF TDY SUPPORT (\$465 PER INDIV.)	\$22,785.00	\$ 7,440.00	\$19,350.00
PROJECTED COURSE COST WITHOUT CONTRACT QUARTERS, VIDEO TAPES, OR TDY SUPPORT	\$19,709.00	\$ 7,720.00	\$22,742.00
PROJECTED ADJUSTED COST PER STUDENT	\$ 81.78	\$ 227.06	\$ 204.88
PROJECTED COST FOR 15,000 STUDENTS			
USING ACTUAL EXPERIENCE COST PER STUDENT	\$3,124,500	\$6,688,200	\$5,688,000

TABLE 24--CONTINUED

	<u>MEDICAL RED FLAG</u>	<u>BATTLE- FIELD MEDICINE</u>	<u>COMBAT CASUALTY CARE</u>
USING PROJECTED COST PER STUDENT	\$1,226.700	\$4,945,650	\$3,073,200
SAVINGS	\$1,897,800	\$1,742,550	\$2,614,880
			(13, 2, 48)

The author feels that any professional course that is conducted for less than \$500 per student is cost effective. It should be noted that civilian medical meetings or executive management workshops often charge more than \$500 to enroll in their programs. This enrollment does not include travel and living costs, which are additive to an individual's needs. This also correlates to attending the three medical wartime training programs. It is also felt the practical application training provided by the courses is more beneficial than the standard medical meeting lectures.

The reader should note that the costs of the various courses differ: The greater the number of students the lower the cost per individual, and courses which have special requirements, such as practicals, are more expensive because of the higher cost of supplies.

The author also showed the projected cost savings of training 15,000 students if costs associated with contract quarters, video tapes, and TDY support were eliminated from the overall course costs. The savings demonstrate that a permanently assigned staff of experts to conduct training in the Battlefield Medicine Course or the Combat Casualty Care Course would be most advantageous if the student were required to live in the field environment. The Medical Red Flag Exercises do not lend themselves to this savings because of the necessity of conducting the course on a traveling basis.

Evaluation Procedures and Results

In this section the author will review the evaluation procedures used in each course and provide a summary of the results in tables. Wherever possible the writer tried to maintain the same formats throughout so that all courses could be compared.

In order to provide the reader with a point of reference, the evaluation methodology will be explained for each course, the results will be provided and student and evaluator recommendations will be presented.

Medical Red Flag

The three Medical Red Flag Exercises were evaluated by Captain William A. McHail, USAF, Medical Service Corps, Training Evaluation Division, SHCS. These evaluations were

performed on site, and a special report was written for each exercise. Each report addressed the following objectives:

1. Objectives

- a. The relevancy and utility of subject matter as perceived by Medical Corps personnel;
- b. The adequacy of presentations by various guest speakers; and
- c. The adequacy of support materials such as visual aids, handouts, and associated reading materials.

2. Survey Methodology. Each attendee was given a questionnaire on which he/she was asked to rate each presentation as it was delivered. The possible ratings that were available to the attendee were that the topic was emphasized adequately, needed increased emphasis, or needed decreased emphasis. In addition, general questions were asked which queried the participant for opinions on ways in which the course format and/or content could be altered to improve the course. Findings from these questionnaires were tabulated and analyzed using statistical methodology where applicable.

3. Statistical Methodology. Statistical methods used to analyze data consisted of two techniques. These were the mean rating and the two-tail of means utilizing derived z values.

a. Mean Rating (Weighted Average). The mean rating was obtained by averaging numerical values (weights) assigned to qualitative ratings, for example, on overall course ratings where "outstanding" -4, "very satisfactory" -3, "satisfactory" -2, "marginal" -1, and "unsatisfactory" -0. The responses were multiplied by the appropriate weight, summed and divided by the number of responses to arrive at the average value.

b. The Two-Tail Test of Means (z Values). z Values were derived from a two-tail test of each mean rating in order to determine whether or not the computed mean differed significantly from the "Satisfactory" mean rating. Accordingly, a null hypothesis was formulated where $X = M$. The following equation was used to compute z:

$$z = \bar{X} - M$$

X = the mean (average) rating derived from questionnaire responses.

M = the "Satisfactory" mean rating.

SD = the standard deviation of the ratings (derived from \bar{X}).

N = the total number of ratings for the task.

Numerical values of 0, 1, and 2 were assigned to the respective ratings of "increase emphasis," "emphasis adequate," and "decrease emphasis." At the 99 percent level of confidence, a z value of +2.58 was used for differentiation and was considered the critical value. To reduce the chance of mathematical errors in the calculation of these statistical indices, all computations were performed on the PLATO IV computer-based instructional system. (PLATO stands for Programmed Logic for Automatic Teaching Operations and is a registered trademark of Control Data Corporation.) A special statistical package was developed for the Training Evaluation Division by the PhD director of the Computer Assisted Instruction Branch, Training Services Division of the School of Health Care Sciences, USAF. (25:1-2)

The results of Medical Red Flag Exercises 1-3 are shown in Table 25.

TABLE 25

MEDICAL RED FLAG EXERCISE EVALUATION RESULTS

	<u>MRF1</u>	<u>MRF2</u>	<u>MRF3</u>
Average Number of Graduates Responding	217	192	186
Graduate Profile Rank	Capt-Col	Capt-Col	Capt-Col
Completed up to Seven Years of Post Graduate Medical Education	96.5%	92.2%	93.29%
Completed a Residency Training Program	51%	53%	61%
Personal Wartime Medical Experience	Unknown Not Surveyed	10.3%	12.82%
General Course Rating			
Overall Evaluation			
Satisfactory or Above	95.8%	97.0%	100%
Marginal	3.4%	2.5%	0%
Unsatisfactory	0.7%	1%	0%
Course Concepts			
Satisfactory or Above	97.9%	98%	99%
Marginal	1.4%	1%	0%
Unsatisfactory	0.7%	1%	2%

TABLE 25--CONTINUED

	<u>MRF1</u>	<u>MRF2</u>	<u>MRF3</u>
Classroom Instruction			
Satisfactory or Above	92.4%	93.1%	99.5%
Marginal	6.9%	6.9%	0.5%
Unsatisfactory	0.7%	0%	0%
Practical Instruction			
Satisfactory or Above	95.1%	87.1%	99.5%
Marginal	4.1%	10.4%	0.5%
Unsatisfactory	0.7%	2.5%	0%
Handout Literature			
Satisfactory or Above	92.4%	94.1%	97.8%
Marginal	7.6%	5.9%	1.6%
Unsatisfactory	0%	0%	0.6%
Visual Aids			
Satisfactory or Above	92.5%	96%	94.1%
Marginal	6.1%	4%	5.4%
Unsatisfactory	1.4%	0%	0.5%
Testing (22, 23, 24)			
Number of Questions	50	50	50
Number Completing Pretest	199	279	222
Number Completing Post Test	198	267	206

TABLE 25--CONTINUED

	<u>MRF1</u>	<u>MRF2</u>	<u>MRF3</u>
Group Overall Average			
Pretest	51.04%	51.22%	50.24%
Post Test	64.16%	63.54%	67.61%
Improvement	27.41%	25.26%	34.91%
Range (Low-High)			
Pretest	26-68	22-70	24-72
Post Test	28-100	22-82	40-86
Specialty			
Highest Score Pretest	Anesthesiolo- gists	Aerospace Medicine	Occupa- tional Medicine
Highest Score Post Test	Emergency Physicians	Aerospace Medicine	Medical Students
Improvement	Pediatricians	Psychiatrists	Health Service Adminis- trator
Practical Exercises			
Performance Test	Yes	Yes	Yes
Percent That Failed	0%	0%	0%

(25:2, 26:1-2, 27:1-2)

A review of graduate comments for course enhancement in the three exercise evaluation reports indicated, in general, that the students desired more practical training and regarded the lectures as too detailed in surgical treatment of wartime injuries. (25, 26, 27) There were also some administrative comments, but they were not significant or uncorrectable. During Medical Red Flag 1, nine didactic

subjects were identified for increased emphasis, and one was identified for decreased emphasis. (25:2-3)

It should be noted that the Training Evaluation Division, SHCS, has a formal follow-up procedure to insure that recommendations or findings in their reports are "suspended" and followed up until all items are closed or resolved. This type of procedure assists in maintaining momentum toward correction of findings similar to an inspection system.

Battlefield Medicine

The Battlefield Medicine Course was evaluated by the Education and Methodology Division, School of Aerospace Medicine, Brooks AFB, Texas. The survey methodology used was to provide each attendee with a questionnaire at the end of the course which asked the following eight questions:

1. How well did you like the overall content of the course?
2. Was the Battlefield Medicine Course what you wanted?
3. Was the course helpful to you?
4. Which topic should have been presented but was not?
5. Which topic should be deleted?
6. What did you like best about the course?
7. What did you like least about the course?
8. What recommendations do you have to improve the course? (16)

The statistical method used was a mean rating (weighted average) by averaging numerical values (weights) assigned to qualitative ratings, e.g., "outstanding" -1, "excellent" -2, "satisfactory" -3, "marginal" -4, "unsatisfactory" -5. The responses were multiplied by the appropriate weight and summed and divided by the number of

responses at the average value. (16) Data can be displayed as numerical or percentage response. The only questions weighted were 1-3; the remainder were narrative responses.

Questionnaires are tabulated and then reviewed by the course staff, other instructors, and various staff officials and maintained on file after commented on by the course director. Items found to be significant are then "suspended" and followed up until the item is closed or completed.

Evaluation results of the first Battlefield Medicine Course are found in Table 26.

TABLE 26

BATTLEFIELD MEDICINE COURSE EVALUATION RESULTS

8-14 Feb 81

Average Number of Graduates Responding	34
Graduate Profile	
Rank	Capt-Col
Completed up to Seven Years of Post Graduate Medical Education	Unknown
Completed a Residency Training Program	Unknown
Personal Wartime Medical Experience	Unknown
General Course Rating	
1. How well did you like the overall content of the course?	

TABLE 26--CONTINUED

8-14 Feb 81

1 - Outstanding (highly liked)	79.4%	
2 - Excellent	11.8%	Satisfactory or
3 - Satisfactory	0%	Above - 91.2%
4 - Marginal	5.9%	
5 - Unsatisfactory (disliked)	2.9%	

2. Was the Battlefield
Medicine Course what
you wanted?

1 - Outstanding	73.5%	
2 - Excellent	14.8%	Satisfactory or
3 - Satisfactory	2.9%	Above - 91.2%
4 - Marginal	8.8%	
5 - Unsatisfactory	0%	

3. Was the course
helpful to you?

1 - Outstanding	76.5%	
2 - Excellent	14.7%	Satisfactory or
3 - Satisfactory	0%	Above - 91.2%
4 - Marginal	8.8%	
5 - Unsatisfactory	0%	

Pretest No

Post Test No

Comprehensive Exam No

Practical Exercises

Performance Test Yes

Percent that Failed Unknown
First Test Unknown
Retest Unknown

(16)

The following comments were provided by the students to
questions 4-8:

4. Which topics should have been presented but were not?
More information or time should be provided on nuclear
casualty management, triage exercises. Need to provide

topics on battlefield anesthesia, battlefield decision by the medical commander, and site security. (16)

5. What topic should be deleted? History of Battlefield Medicine, in-depth detail on surgical procedures, tentage, sanitary latrines, and infectious diseases of wars. (16)

6. What did you like best about the course? Hands-on practical experience in the animal labs--34 responses. Hand-on Chemical Warfare defense equipment. (16)

7. What did you like least about the course? Film on setting up tents and in-depth lecture on surgical procedures. (16)

8. What recommendations do you have to improve the course? Course should be longer. Need more company grade officers. Limit information to second echelon medical care. Need informal sessions with the guest speakers. Eliminate after lunch lectures. (16)

Combat Casualty Care Course

The 4-10 May 1980 C4 course was evaluated by Henry B. Slotnich, Ph.D., Consultant to the C4 Evaluation Committee. (38) He prepared a 70-page report titled Combat Casualty Course Evaluation dated October 1980. The report had 37 conclusions and 33 recommendations. Since the methodology took 14 pages to describe, it would be extremely difficult to summarize the procedures utilized; therefore, a portion of the report is provided as follows:

Like the lectures, happiness and anecdotal information was also collected here, and a specially prepared form was completed by a random sample of students after each activity.

The activity evaluation instrument was prepared in a manner parallel to the one used for lectures: Major problems were sought, and no efforts were made to discriminate among activities. The activities were rated on: (i) the clarity with which their purpose was described; (ii) the clarity of the instructions; (iii) the quality of the handouts, equipment, and supplies; and (iv) each activity's importance.

In brief summary, there were eight curricular assumptions treated (in this evaluation) as objectives, objectives which were either behavioral or facilitative in nature. The data collected bearing on these statements of instructional intent were based on performance, reports of happiness with instruction, and anecdotal reports.

These evaluative strategies--as described so far only in broad strokes--were in keeping with the C4 curriculum committee's desires of an evaluation. The committee specified that they wished to see the evaluation consider three attributes:

First, it should be on-site and be conducted by educators (as distinguished from physician-educators). This report summarizes the results of that activity.

Second, there should be an on-site evaluation of structure by both senior military physicians and by senior officers with combat experience. These two evaluative aspects were handled very informally (e.g., many star grade officers visited the course, but their views were not collected in a systematic manner).

Third, an evaluation of the structure and process was to be done by the students. The manner in which this was accomplished has already been partially described (e.g., the use of the instruments to rate both the lectures and the hands-on activities); other aspects need to be considered in more detail.

In keeping with the tri-service aspect of the course, an evaluation committee was formed under the chairmanship of Capt Donald Gragg, MC, USN, the USUHS representative: Col William Moore, MC, USA; LTC Phyllis Goins, USAF; and Lt Com Marcel Iczkowski, MSC, USN. The author of this report functioned formally as a consultant to the committee, although the evaluation proposed was approved, funded, and contracted for through USUHS. (38:9-10)

The following is the executive summary of Dr Slotnich's evaluation:

EXECUTIVE SUMMARY

Based on the evaluation described in this report, the following statements can be made summarizing both conclusions reached and recommendations made.

1. In order to make the Combat Casualty Care Course (C4) instruction more congruent with the responsibilities of a junior Medical Corps officer, additional emphasis must be placed on the training and evaluation

of medics, and the physician's responsibilities as a consultant to the CO.

2. Integration of the various curricular topics should be implemented.
3. Instruction on how to teach and learn will increase both the students' efficiency in profiting from C4 and their effectiveness in training medics.
4. Evaluative methodology in C4 needs additional work, especially in the areas of achievement testing and hands-on skills.
5. C4 should be lengthened in order to better train its students.
6. Officers-in-charge (squad leaders) should have an increased instructional role.
7. Students, at the end of C4, demonstrate good command of primary patient care skills and knowledge.
8. Students hold attitudes toward medical support of operational units which can be described as favorable and reasonably accurate.
9. C4 has a major "team building" component to it which should help students crystalize their identities as military--and not civilian--physicians. (38)

The writer must acknowledge that the report was more formulative than summative and was very difficult to digest, analyze, and review without losing track.

The two classes conducted during 10-24 January 1981 were evaluated by an Air Force representative assigned to the SHCS and a Navy representative assigned to the Naval School of Health Services. Each officer took certain portions of the evaluation back to his home station to evaluate. Questionnaires were provided to each student, a procedure different from that of the previous evaluation, which used

some random sampling. The author was provided the information found in table 27 by Captain Mellail, SHCS.

The results of the C4 evaluations are found in table 27. It should be noted that because of random sampling in the 4-10 May 1980 evaluation, it was impossible to correlate the results with those of the 10-24 January 1981 evaluation in some areas.

TABLE 27

COMBAT CASUALTY CARE COURSE EVALUATION RESULTS

	<u>4-10 May 80</u>	<u>10-24 Jan 81</u>
Average Number of Graduates Responding	110	149
Graduate Profile		
Age Mean	30.6 yrs	Unknown
Rank	Capt-Col	Capt-Col
Completed A Residency Program	20%	Unknown
Personal Wartime Medical Experience	Unknown	Unknown
Evaluation		
Pretest	Yes	No
Post Test	Yes	No
End of Course	Yes	Yes
Testing		
Pretest	No	No
Post Test	Yes	No
Comprehensive	Yes	No

TABLE 27--CONTINUED

	<u>4-10 May 80</u>	<u>10-24 Jan 81</u>
Practical Exercises		
Performance Test	Yes	Yes
Percent That Failed		
First Test	Unknown	Unknown
Retest	Unknown	Unknown
Would you recommend C4 to colleagues slated for assignments to combat units?		
Yes	98%	93.8%
No	2%	6.2%
How do you feel about managing medics under combat conditions?		
Positive	NOTE*	80.8%
Reservations		17.8%
Could Not Do It		1.4%
How do you feel about being asked to perform surgical procedures?		
Positive	NOTE*	85.6%
Reservations		14.4%
How do you feel about being tasked to support a combat unit?		
Positive	NOTE*	96.1%
Could Not Do It	NOTE*	3.9%

TABLE 27--CONTINUED

	<u>4-10 May 80</u>	<u>10-24 Jan 81</u>
How do you feel about practicing medicine in the field?		
Positive	NOTE*	98%
Negative		2%
Has your attitude toward line officers and enlisted personnel changed?		
Positive Change	NOTE*	72%
Do you perceive the threat as briefed?		
Agree	NOTE*	59%
Disagree		41%
		(38, 28)

*Findings were positive. However, they could not be correlated with the 10-24 Jan 81 evaluation by percentage.

The following are student comments from the 10-24 January 1981 classes:

What did you like best about the course? Leadership exercises, field exercise, ambush, escape and evasion, animal lab, and triage exercises were the highlights of the course. (28)

What did you like least about the course? Living conditions, weather and lectures in cold tents were the low aspects identified by the students. (28)

It should also be pointed out to the reader that all the courses have been accredited by the American Medical Association for Category I credit as follows: Medical Red Flag, 34 hours; Battlefield Medicine, 40 hours; and the Combat Casualty Care Course, 53 hours. (13, 2, 48) In

addition, the Combat Casualty Care Course is certified by the American Heart Association for Advanced Cardiac Life Support (ACLS). (2, 48) This is significant because of the difficulty of passing the strict requirements that they specify.

A recent survey of the personnel assigned to 63 Air Force Medical Facilities revealed that only 354 physicians, 155 nurses and 234 other personnel were qualified in ACLS. (28)

Both courses could qualify for the Trauma Life Support under the American College of Surgeons in conjunction with the Registry for Emergency Physicians; however, only the Combat Casualty Care course has asked for recognition.

(2, 48) There are some problems with the C4 course because of class sizes but this is being resolved. The Battlefield Medicine Course is also recognized by the American Academy of Family Physicians.

The author feels on the basis of the high ratings (satisfactory or above) by the graduates of Medical Red Flag Exercises, Battlefield Medicine Courses and the Combat Casualty Care Courses, that the student needs and understanding of medical readiness are being met. This fact is also confirmed by the respective course administrators, who feel that outcomes are being met and exceeded. Their primary goal now is to make an excellent course better.

One area that should be improved is the evaluation process. A strong, standardized course evaluation instrument

should be developed. At present, each course has a different evaluation procedure for questionnaires and testing. It is felt that to justify training dollars and survive an audit by the General Services Administration (GSA), outcomes must be quantitatively expressed and recorded. Testing should provide positive evidence that students have learned from the instruction. Unfortunately, it is easy to justify dollars for a material object, such as a tank or plane, but intangible benefits must be justified in other ways. The courses are too important to lose a single training dollar.

Overall Evaluation

The author has provided the reader with two means of comparing the Medical Red Flag Exercises, the Battlefield Medicine Course, and the Combat Casualty Care Course, the narrative and the tables. In the narrative portion, the writer has pointed out various problem areas and strengths of the courses. The final overall effectiveness evaluation is provided in table form where the reader can draw his conclusion about the study by reviewing selected recap topics. Table 28 on the next page provides this comparison.

TABLE 28

OVERALL EFFECTIVENESS EVALUATION RECAP

<u>Reference Item</u>	<u>Medical Red Flag</u>	<u>Battlefield Medicine</u>	<u>Combat Casualty Care</u>
Course Formula- tion Directed by	USAF/SG	USAF/SG	Tri-Service Steering Committee
Date Directed	Dec 78	Dec 78	Unknown
Training Plan Approved	8 June 79	15 Oct 79	21 Feb 80
Course Purpose	Wartime Medical Training	Wartime Medical Training	Wartime Medical Training
Course Length/ Training Hours	5 Days/ 36 Hours	6 Days/ 45 Hours	7 Days/ 60 Hours
Target Partici- pants	Primarily <u>Air Force</u> Physicians Physician Assistants Nurse Practi- tioners Dentists <u>Secondary</u> Tri-Service Physicians	Only <u>Air Force</u> Physicians without a surgical AFSC as- signed to or pro- grammed to an opera- tional unit	Tri-Service Physicians assigned to or programmed to an opera- tional unit
First Course Conducted	26 Nov 79	8 Feb 81	27 April 80
Number of Courses Per Year (Programmed)	3	4	4
Total as of Feb 81	3	1	4
Student Workload Anticipated quotas	280	40	120
Actual Average	241	34	111

TABLE 28--CONTINUED

<u>Reference Item</u>	<u>Medical Red Flag</u>		<u>Battlefield Medicine</u>		<u>Combat Casualty Care</u>	
	724		34		445	
Number Trained as of Feb 81						
General Course Content	Hrs.	%	Hrs.	%	Hrs.	%
Didactic Training	27.5	76.4	23.0	51.1	22.0	36.7
Practical Exercise	0	0	16.0	35.6	6.0	10.0
Animal Models						
Small Group Activities	0	0	0	0	5.0	8.3
Other	6.5	18.0	4.0	8.9	21.0	35.0
Administration	<u>2.0</u>	5.6	<u>2.0</u>	4.4	<u>6.0</u>	10.0
TOTAL	36.0		45.0		60.0	
Emphasis	Wartime Medical Awareness		2nd Echelon Care Realistic		2nd and 3rd Echelon Care Realistic	
Special Requirements	Double Teaching		Double Teaching		Double Teaching	
	Expert Guest Lecturers		Expert Guest Lecturers		Expert Guest Lecturers	
	Video Taping		Animal Models		Animal Models	
	Equipment Support		Equipment Support		Equipment Support	
					Field Living Conditions	
Specific Course Content	See Table 15		See Table 16		See Table 17	

TABLE 28--CONTINUED

<u>Reference Item</u>	<u>Medical Red Flag</u>	<u>Battlefield Medicine</u>	<u>Combat Casualty Care</u>
Total Course Subjects	31	28	28
No. of Subjects All Courses	37	37	37
No. of Common Subjects			
Didactic Training	13 48%	13 48%	13 48%
Practical Exercises	1 9%	1	1 9%
Service Specific Subjects Hours	5 hours Air Force	3 hours Air Force	3 hours Air Force
Could Be Taught In Other Courses	Yes	Yes	Yes
Joint Operational Subjects Hours	5 hrs	3 hours	8 hours
% of Instructional Hours	14.7%	7%	14.8%
Hours of Surgical Procedures - Practicals	0	8	4
Course Documents			
Training Plan	Yes	Yes	Yes
Lesson Plan	Yes	Yes	Yes
Training Standards	Yes	Yes	Yes

TABLE 28--CONTINUED

<u>Reference Item</u>	<u>Medical Red Flag</u>	<u>Battlefield Medicine</u>	<u>Combat Casualty Care</u>
Certified			
American Medical Association			
Category I Credit	Yes	Yes	Yes
Hours Credited	34	40	53
American Heart Association Advanced Cardiac Life Support			
	No	No	Yes
American College of Surgeons Trauma Life Support			
	No	No	Yes
American Academy of Family Physicians			
	No	Yes	No
Staffing			
Authorized	4	3	3
Assigned	3	0	1
Support Staff			
Average No. - TDY Support	49	16	30
Course Cost			
Average Cost	\$50,200	\$15,160	\$42,092
Per Student	\$ 208	\$ 446	\$ 379
Cost Effective	Yes	Yes	Yes
TDY Support (\$465 each)	\$22,785	\$ 7,440	\$19,350

TABLE 28--CONTINUED

<u>Reference Item</u>	<u>Medical Red Flag</u>	<u>Battlefield Medicine</u>	<u>Combat Casualty Care</u>
Training Cost for 15,000 Physicians	\$3,124,500	\$ 6,688,200	\$ 5,685,000
TDY Cost for 15,000 Physicians (\$465 ea)	NA	\$ 6,975,000	\$ 6,975,000
TOTAL COST	NA	\$13,663,200	\$12,666,000
Time Required to Train 15,000 Physicians			
Normal Schedule	20.7 years	93.8 years	31.3 years
Continuous Schedule	62 classes/ 1 year	375 classes/ 6.2 years	125 classes/ 2.4 years
Evaluation Procedures Questionnaires			
Avg Overall Rating Satis- factory or Above	97.6 %	91.2%	95.9%
Testing			
Pre/Post Testing	Yes	No	No
Written	Yes	No	No
Practicals	Yes - Unrefined	Yes - Refined	Yes - Refined
Meets ISD Model	Yes	No	No
Non Compliance	NA	Written Test Staffing	Written Test Staffing

TABLE 28--CONTINUED

<u>Reference Item</u>	<u>Medical Red Flag</u>	<u>Battlefield Medicine</u>	<u>Combat Casualty Care</u>
Time Required to Meet Compliance			
Testing	NA	2-3 Weeks	2-3 Weeks
Staffing	Within Standard	6 months	6 months
Major Strenghts	Wartime Medical Awareness, High Student Flow, Test- ing and Evaluation Procedures Video Tapes, Open to Tri- Service	High Wartime Medical Skill Development, Animal Models, Medical Evalu- ation Skills	Tri-Service, High Flow, Small Group Activities, Field Living Conditions, Medical Evaluation Skills, Animal Models
Weaknesses	Low Number of Practical Exercises, Low Medical Skill Devel- opment, Lack of Field Liv- ing Conditions, Detailed Financial Accounting	Lack of Assigned Staff, Ser- vice Spedific Low Student Flow, Lack of Field Living Conditions, Evaluation Procedures, Detailed Financial Accounting	Lack of Assigned Staff, Evaluation Procedures, Detailed Financial Accounting
Meet Course Formulation Directive	Yes	Yes	Yes
Effective	Yes	Yes	Yes
Requires More Joint Train- ing Subjects	Yes	Yes	Yes
Course Length Needs to be Expanded	No	Yes	Yes

TABLE 28--CONTINUED

<u>Reference Item</u>	<u>Medical Red Flag</u>	<u>Battlefield Medicine</u>	<u>Combat Casualty Care</u>
Course Should be Cancelled	No	No	No
Course Should be Combined	No	With C4	With BMC
Program Manager	NA	Support	Uniform University of the Health Sciences--Ft Sam Houston, Texas

Related Author's Comments

The author feels that some comments should be made about his findings in research as a student at the Air War College and as a Medical Service Corps officer for 17 1/2 years. Prior to attending the Air War College, he was the Course Supervisor for the Military Indoctrination for Medical Service Officers (MIMSO) course, Sheppard AFB, Texas. This course provided the initial 2 1/2 weeks of training for all newly commissioned Medical Service officers of all corps: Medical Corps, Dental Corps, Nurse Corps, Biomedical Science Corps, Veterinary Corps, and the Medical Service Corps. These officers varied in age from 21 to 54, in rank from second lieutenant to colonel, and in education from nurses who had completed a two-year associate degree to physicians who had completed a residency program, had wartime experience, and had completed many years of civilian practice.

During the course, the author provided instruction in disaster preparedness and wartime orientation subjects to 4,503 MINSO students and over 100 individuals attending the Hospital Commander's Course in a three-year time period. During the lecture periods, the students were surveyed to determine if they could meet peacetime medical cross training requirements by corps on various medical subjects. Only 115 indicated that they could meet the standards. In May 1979, the students were surveyed to ascertain whether they could meet the new wartime medical training requirements as correlated by corps subjects. Negative replies were received from all. To the author, this points toward a serious deficiency both in peacetime disaster and wartime medical knowledge.

During the initial research formulation period, the author was considering a study of wartime medical training from World War I to the present but determined that to undertake such a challenge and accomplish it in the desired detail, it would jeopardize the author's Air War College program. Therefore, an alternate study was instituted.

In concert with the original study, research showed some common problems associated with the training of medical personnel during World War I (WWI) and II. These problems involved poor mobilization plans; lack of experienced teaching cadre; inadequate housing, equipment, supplies, training plans, etc. The demands were tremendous when you consider some facts about WWI.

When the United States entered the war, there were on duty in the Medical Department 491 Regular medical officers, 342 temporary officers, 86 officers of the Dental Corps, and 62 veterinary officers. The actual strength of the enlisted men . . . was 6,619, many of whom were new men, authorized by the national defense act of June 3, 1916. (26:IX)

On the day war was declared, the Army Surgeon General put out a 14 point letter on training.

On the basis of raising of the initial war forces of 1,000,000 men this means a complementary force of 7,000 medical officers immediately required; of whom 500 may be regarded as now well trained, 1000 as partly trained, 5,500 not trained at all . . . 100,000 enlisted men . . . 5,000 trained . . . 5,000 partly trained . . . 90,000 not trained at all (29:2)

The number of men in the U.S. Army Medical Department in WWI peaked at 340,000 and by a ratio comparison of the Army Surgeon General's directive letter would have generated the requirement of over 24,000 physicians for the Army alone. (42:1) This is approximately more than twice the total number of physicians we presently have on active duty to support all the Armed Forces.

WWII had a similar situation. In June 1939, the Army Medical Department had "a little over 11,500 officers and enlisted men. . . ." It was noted that "between December 1941, and August 1945, the Medical Corps alone expanded from approximately 11,000 to nearly 47,000." (42:43) In another reference it was pointed out that over 50,000 medical officers had been discharged from the services by December 1946. (11:1) The training periods for physicians in WWI were three months and in WWII it was five months, which was

decreased to six weeks because of demand requirements.

(29:8, 42:45)

It was also noted that the Army Medical Department wrote training histories for both WWI and II. The one for WWI was published in 1927, nine years after the war, and the WWII volume was published in 1974, 29 years after the war and one year after Vietnam. The author was the first individual to check out the WWI Training History since 1943, from the Air University Library at Maxwell AFB, Alabama.

Department of the Army publications titled Battle Casualties and Medical Statistics, U.S. Army Experience in the Korean War and Vietnam Studies Medical Support 1965-1970 were written in 1973; however, no training to physicians was specifically mentioned.

During the formulation phases of the Medical Red Flag Exercises, the writer visited the Army Academy of Health Sciences, during May and June 1979, to try and obtain course materials used in training physicians for the Korean and Vietnam Conflicts. Discussions with senior physicians and the medical librarian and a search of the archives failed to produce the documents.

It was once said by George Santayana in the book The Life of Reason, "Those who cannot remember the past are condemned to repeat it." (40) As pointed out earlier in the study, lessons of previous wars have to be relearned; this is true both medically and militarily. During the initial research, the author identified 60 articles in the Military

Surgeon and Military Medicine journals written between January 1947 and February 1980. These articles were on training and lessons learned during previous wars. They reveal a somewhat consistent trend in that during wars they increase in number; after wars they decrease; during wars they glorify medical care; and after a considerable time period they criticize the medical faults. Is this because no one wants to criticize people in high places, especially physicians? On the basis of the writer's medical experience, the question can be answered in the affirmative.

As an example of lessons learned, the following quotation from a speech presented by Major General M. S. White, Command Surgeon Pacific Air Force (PACAF), at the Command Surgeon's Conference, Washington, D.C., 21-22 September 1966, on "Lessons Learned and Relearned in SEA," is provided.

Lesson #12 - Battle casualty treatment requires open debridement, delayed primary closure, adequate drainage, split casts, fluids and electrolyte balance.

Related to patient carried in the aeromedical evacuation systems some lessons we relearned again at originating hospitals on the treatment of battle casualties, concerned the necessity for open debridement, delayed primary closure. . . . (47:8)

Delayed primary closure of wounds except to the facial area was discovered prior to WWI and was relearned in every war including Vietnam. Will we have to learn this lesson and all the others over again?

What is the reason for having to learn lessons over and over again? The author contends that it is the loss of the institutional or corporate memory of the military medical services of the Armed Forces caused by the following: lack of reading of military medical war histories, loss of trained military medical personnel between and during wars, a lack of an updated standardized training system, the carryover of civilian medical practices which do not conform to the hostile field medical environment, too much information to comprehend, and lack of a central repository where information can be retrieved rapidly.

As an example of the last, there is no repository to provide the number of medical personnel by officer corps and enlisted personnel for each of the wars without going to the three services. Based on the author's research and judgement, an institutional memory system must be developed.

While the author has been at the Air War College, it has become vividly reinforced that the students do not have an accurate conception of the casualty rate they will experience in future wars. These individuals are the senior and future leaders of the various services, but they estimate only that the casualty rates will be high. Do commanders and other appropriate personnel need to know what these rates will be and what medical action are being taken to care for their personnel? The writer thinks that they do.

CHAPTER III

CONCLUSIONS AND RECOMMENDATIONS

The problems under consideration in this study are to determine if the current medical wartime training programs conducted by the Armed Forces for its physicians are effective, and whether they contribute to the employment of joint medical service support?

Three courses were identified as meeting the criteria of medical wartime training programs for physicians. These programs were the Medical Red Flag Exercises and the Battlefield Medicine Course, conducted by the Air Force, and the Combat Casualty Care Course, conducted by the Army under the auspices of the Uniformed Services University of the Health Sciences.

Using primary course documents and inputs from course administrators, the author evaluated each course as to its formulation, purpose, length, participants, workload, schedule, general course content, specific course content, staffing, support, and course cost. The author identified curriculum subjects which were common core, service specific, and contributed to joint medical service support operations. The writer then reviewed the course evaluation reports and the results of student testing. In conclusion, an overall effectiveness evaluation of the three courses was made.

Analysis of the findings determined that each course was being conducted and managed in an effective and cost efficient manner and was meeting the graduates' needs as prescribed in the course purpose and formulation directive.

Evaluation of the findings also revealed that each course provided some subjects which contributed to the employment of joint medical service support; however, in the author's opinion, the diversification, number, and time allotted were insufficient to meet the overall needs of the physicians on the modern battlefield. No service specific subjects were identified as being so critical that they could not be taught in other courses.

Interpretation of the findings also revealed that each course had major strengths. Even though some weaknesses were revealed in each course, only one major weakness was identified that could compromise each course. This was the lack of a permanently assigned course administrative staff unit which had the primary, rather than an additional, duty of conducting the courses.

Based on the findings of this report, the following recommendations are submitted.

1. That the present courses be continued as directed
2. That each course be provided with a permanent administrative staff unit
3. That the Medical Red Flag Exercises complete its program cycle
4. That the length of the Battlefield Medicine and Combat Casualty Care courses be increased in length and that more time be devoted to joint medical service support and other critical subjects which could not be included in the original course because of time constraints

5. That the Tri-Service General Officer Steering Committee review all the medical wartime training programs for physicians to determine the effectiveness and advisability of the development and implementation of a major medical wartime training course model for all physicians and other officer corps and enlisted members. It is recommended that the model include the standardization of subjects, course length, staffing, class size, methodology, cost determinates and its ability to meet the training requirements for all officers. It should consider its ability to be expanded or be duplicated at other training locations in the event of wartime mobilization. It is further recommended that the course be initially based at Fort Sam Houston, Texas, under the auspices of the Uniformed Services University of the Health Sciences and that expanded sites be designated

6. That the approved video tapes of wartime medical subjects developed during Medical Red Flag Exercises be distributed to the tri-service military medical community as soon as possible

The following related recommendations to improve medical wartime capabilities, awareness, and mobilization requirements are submitted:

1. That a tri-service briefing be developed on the Combat Casualty Simulation Model, its uses and the projected casualty rates by type of conflict and that it be provided to the Armed Services Professional Military

Education schools, appropriate line commanders, medical commanders, NATO planners, and students of the Combat Casualty Care Course

2. That the military sponsored civilian medical school program entitled Medical Education for National Defense (MEND) program, conducted from 1958 to 1968, be reviewed for possible reimplementation

3. That reviewing the Medical Red Flag video tapes be required of all Health Professional Scholarship Program (HPSP) students during their 45-day summer active duty tours and that copies be provided to those hospitals which have elected to participate in the wartime Civilian Military Contingency Hospital System program

4. That all physicians, both military and civilian, be provided a free copy of the second United States revision of The Emergency War Surgery NATO Handbook once it has been published. This most factual and important book will inform military physicians in wartime, and civilian physicians of the wartime medical procedures used and the treatment of mass casualties in thermonuclear warfare. It also has many civilian medical care spinoffs

5. That a system be developed to improve the institutional or corporate memory of wartime medical procedures and training. This would require that an office or committee be formed with the task of reviewing medical procedures and training programs from past wars and updating lessons learned, and that its findings be

available both in manuscript and computer form for easy retrieval and use. This may prevent relearning expensive lessons of the past.

The author admits that with each war out medical skills and procedures improve, especially over time; however, we have to learn lessons over again, unfortunately at the expense of losing some lives that otherwise may have or should have been saved. The above recommendations are costly, but how does one equate the cost of one F-16 aircraft or one tank with X number of lives? These tremendous problems are being faced by the Surgeon Generals of the various Armed Services on a daily basis. They are trying to justify their need to obtain funds to improve the medical readiness of the services to meet minimal mission requirements. These needed funds, in relationship to the overall defense budget, are meager. They are a small price to pay for preparedness.

On 20 January 1981, as President Ronald Reagan gave his inaugural address, he faced toward the Washington Monument and Arlington National Cemetery, where "the Twin Gates of Eternal Sleep" serve as a grim reminder that war is a waste. At that time, he advocated a strong defense in order that our soldiers would not lose their lives on foreign soil again.

Each individual who goes into battle deserves and has a right to the best possible medical care that is available and obtainable. The author believes that, as George

Washington stated over 200 years ago, "In time of peace, [we should] prepare for war!" (36:329) The author hopes that we have time to prepare for our medical mission and that we are not TOO LATE!

LIST OF REFERENCES

1. Air Force Manual 1-1, Functions and Basic Doctrine of The United States Air Force. Washington, D.C.: Department of the Air Force, 14 February 1979.
2. Anderson, George K., Lt Col, USAF, MC. Course Supervisor, Battlefield Medicine Course. Education Division, USAF School of Aerospace Medicine, Brooks Air Force Base, Texas. Interview, 2 March 1981, 10 March 1981.
3. Anderson, George K., Lt Col, USAF, MC. Education Division, USAF School of Aerospace Medicine. "USAFSAM Battlefield Medicine Course Rationale for Development." Brooks Air Force Base, Texas. undated.
4. Bell, Maj, US Army, MSC. Information Paper. "Tri-Service Combat Casualty Care Course (C4)." Academy of Health Sciences, Fort Sam Houston, Texas, 18 October 1980.
5. Berry, Charles M., Lt Col, USAF, MSC. "Training Standards Medical Red Flag Exercise and Workshop, TS MRFEW003." School of Health Care Sciences, Sheppard Air Force Base, Texas: Training Operations Division, 19 August 1980.
6. Chester, Thomas M. "Definition of Medical Readiness." Medical Service Digest. Washington, D.C., Office of Surgeon General, USAF, July-August 1979.
7. "Combat Casualty Care Course Schedule." Fort Sam Houston, Texas, 27 April 1980.
8. Department of Defense. Secretary of Defense. Annual Report Fiscal Year 1982. Washington, D.C., 19 January 1981.
9. Department of Defense. Emergency War Surgery NATO Handbook. First Revision, Washington, D.C.: United States Government Printing Office, 1975.
10. Department of Defense. Director for Information Operations and Reports. Selected Manpower Statistics for 1979. Washington D.C., March 1980.
11. Dickinson, Frank G., PhD. "A Report to the Committee on National Emergency Medical Service." Chicago, Illinois: American Medical Association, 4 June 1947.

12. Dupuy, Ernest R. and Trevor N. Military Heritage of America. New York: McGraw-Hill, Inc., 1956.
13. Ellis, James A., Lt Col, USAF, MSC. Course Supervisor, Medical Red Flag Exercises and Chief, Medical Readiness Division, School of Health Care Sciences, Sheppard Air Force Base, Texas. Interview, 2 March 1981.
14. Field Manual 8-8, Navy Medical Publication-5047, Air Force Manual 160-20. Medical Support in Joint Operations. Washington, D.C.: Department of the Army, Navy, and the Air Force, June 1972.
15. Field Manual 100-5, Operations. Washington, D.C.: Department of the Army, 1 July 1976.
16. Forbes, John C., 1st Lt, USAF, MSC. Evaluation Officer. Education and Methodology Division, USAF School of Aerospace Medicine, Brooks Air Force Base, Texas. Interview, 11 March 1981.
17. Forister, Thomas C., Maj, USAF, MSC. Staff Officer. Medical Readiness Division, Office of the Surgeon General, USAF Bolling Air Force Base, D.C., Interview, 11 March 1981.
18. Fuhrerbacker, Charles, Lt Col, US Army, MSC. Chief, Budget Office. Academy of Health Sciences, Fort Sam Houston, Texas. Interview, 4 March 1981.
19. Fulfer, Jessie, Maj, US Army, MSC. Medical Services Officer. Rapid Deployment Joint Task Force, MacDill Air Force Base, Florida. Interview, 2 March 1981.
20. Holder, William L., Col, USAF, MSC. Letter. Commander, School of Health Care Sciences. "Medical Red Flag '2' Program Schedule." Sheppard Air Force Base, Texas. 14 March 1980.
21. Manchester, William. American Caesar. Boston, Mass: Little, Brown and Company, 1978.
22. McHail, William A., Capt, USAF, MSC. "Medical Red Flag 1 - Test Summary." Sheppard Air Force Base, Texas. Training Evaluation Division. Undated.
23. McHail, William A., Capt, USAF, MSC. "Medical Red Flag 2 - Test Summary." Sheppard Air Force Base, Texas. Training Evaluation Division. Undated.
24. McHail, William A., Capt, USAF, MSC. "Medical Red Flag 3 - Test Summary." Sheppard Air Force Base, Texas. Training Evaluation Division. Undated.

25. McHail, William A., Capt, USAF, MSC. Special Evaluation of Medical Red Flag 1 Exercise and Workshop (On-Site) JM80-1. Sheppard Air Force Base, Texas: Training Evaluation Division, 31 January 1980.
26. McHail, William A., Capt, USAF, MSC. Special Evaluation of Medical Red Flag 2 Exercise and Workshop (On-Site) JM80-6. Sheppard Air Force Base, Texas: Training Evaluation Division, June 1980.
27. McHail, William A., Capt, USAF, MSC. Special Evaluation of Medical Red Flag 3 Exercise and Workshop (On-Site) JM81-1. Sheppard Air Force Base, Texas: Training Evaluation Division, 24 December 1980.
28. McHail, William A., Capt, USAF, MSC. Evaluation Officer. Training Evaluation Division, School of Health Care Sciences, Sheppard Air Force Base, Texas. Interview, 11 March 1981.
29. Medical Department of the United States Army in The World War. VOL VII Training. Washington, D.C.: U.S. Government Printing Office, 1927.
30. Moxley, John, Dr III. "Where Are the Doctors?" Defense 80. American Forces Information Service. Arlington, Virginia, December 1980.
31. Muelhoefer, Alfred K., and Ramsey, Frank P., Majors, USAF. "Managing the Training System." Managing the Air Force 2nd ed. Maxwell Air Force Base, Alabama, August 1980.
32. Myers, Paul W., Lt Gen, USAF, MC. Letter. Surgeon General, USAF. "Medical Red Flag." Bolling Air Force Base, D.C., 22 March 1979.
33. Myers, Paul W., Lt Gen, USAF, MC. Letter. Surgeon General, USAF. "Wartime Medical Training." Bolling Air Force Base, D.C. Undated.
34. Meyers, Paul W., Lt Gen, USAF. Surgeon General, USAF. Program Action Directive 2-79 Wartime Medical Training. Bolling Air Force Base, D.C.
35. Pulitzer, Joseph IV. St. Louis Post Dispatch. "Chief of Staff Warns of Soviet Threat in Persian Gulf." St. Louis, Missouri, 8 February 1981.
36. Puryear, Edgar F., Jr. Nineteen Stars. Orange, Virginia: Green Publishers, 1973.

37. Reagan, Ronald. President of the United States.
"Address to the Joint Session of Congress."
Washington, D.C., NBC News. 19 February 1981.
38. Slotnick, Henry B., PhD., Consultant to the C4 Evaluation
Committee. Combat Casualty Care Course Evaluation.
October, 1980.
39. Staver, Sad. "American Medical News," Chicago: American
Medical Association, 5 December 1980.
40. Swan, Kenneth G., Col, USAR, MC. Professor of Surgery,
College of Medicine and Dentistry, New Jersey.
Handout. "Gunshot Wounds and Vascular Injuries." at
Medical Red Flag 2 Exercise, Travis Air Force Base,
California, 17 March 1981.
41. Swindell, H. V., Brig Gen, USAF, MC. Letter.
Director, Plans and Programs. "Patch Sword Concept
of Operations." Office of the Surgeon General USAF.
Bolling Air Force Base, D.C., 19 December 1979.
42. United States Army. Office of the Surgeon General.
Medical Training in World War II. Washington, D.C.:
U.S. Government Printing Office, 1974.
43. U.S., Department of Commerce. Bureau of the Census.
Historical Statistics of the United States, pt. 1
Washington, D.C., September 1975.
44. United States Readiness Command, "Fact Sheet Headquarters
Rapid Deployment Joint Task Force," Public Affairs
Office. McDill Air Force Base, Florida, 3 December
1980.
45. USAF School of Aerospace Medicine. "Battlefield Medicine
Course, Course Information." Brooks Air Force Base,
Texas. Undated.
46. USAFE Surgeon General's Office. "Wartime Casualty
Management In USAFE--The Four Echelon Concept."
Proposed publication. 24 May 1979.
47. White, M.S., Maj Gen, USAF, MC. Command Surgeon,
Pacific Air Force. Speech. "Lessons Learned and
Relearned in SEA." Command Surgeon's Conference,
Washington, D.C., 21-22 September 1966.
48. Wolcott, Barry W., Lt Col, U.S. Army, MC. Course
Supervisor Combat Casualty Care Course and Chief,
Section of Operational and Emergency Medicine.
Uniformed Service University of the Health Sciences,
School of Medicine. Fort Sam Houston, Texas.
Interview, 2 March 1981, 9 March 1981.

49. Wolcott, Barry W., Lt Col, U.S. Army, MC. Chief,
Section, of Operational and Emergency Medicine,
Uniformed Service University of the Health Sciences,
School of Medicine. "Combat Casualty Care Course
Briefing." Fort Sam Houston, Texas, 27 April 1980.
50. Wolcott, Barry W., Lt Col, U.S. Army, MC. Chief,
Section of Operational and Emergency Medicine,
Uniformed Service University of the Health Sciences ,
School of Medicine. "Report of Tri-Service Combat
Casualty Care Course Curriculum Steering
Subcommittee." Fort Sam Houston, Texas. Undated.