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Force Health Protection: 10 Years of Lessons Learned by the Department of Defense

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The Department of Defense has applied lessons learned since the Persian Gulf War to develop the force health protection (FHP) strategy. The goal of this new, unified strategy is to protect the health of military members from medical and environmental hazards associated with military service to the maximum extent possible. FHP is an evolving strategy that seeks to balance the military health system's responsibilities to promote and sustain health and wellness throughout each person's military service; prevent acute and chronic illnesses and injuries during training and deployment; and rapidly stabilize, treat, and evacuate casualties. In addition, FHP demands a continuous assessment of the current and future health of military members through medical surveillance, longitudinal health studies, adequate medical record documentation, and clinical follow-up. Effective communication with military members, leaders, veterans, families, and the public regarding military members' health status and the health risks of military service is a key element of the FHP strategy.

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Introduction

In the 10 years since the Persian Gulf War, the U.S. military has had to address the concerns of Gulf War veterans regarding their health and service in that war. At the same time, U.S. military forces have deployed to Somalia, Rwanda, Haiti, Bosnia, and Kosovo and have continued to deploy to southwest Asia. Many lessons have been learned from the successes and failures in disease prevention, health risk communication, and military health care from responding to past and current deployments. These lessons learned are being incorporated into new policy and programs that will fundamentally change and improve how the Department of Defense (DoD) addresses the health needs of military personnel.[1]

Recent Health Concerns

To understand the impetus behind this change, it is important to review the health concerns that began with the deployment of U.S. troops to the Persian Gulf in August 1990. There was substantial apprehension that the harsh desert environment would place the health of troops at risk and that a full-scale war with Iraq would produce massive casualties.[2,3] Fortunately, the successful military operation limited deaths among U.S. forces: 147 died as a result of combat injuries, and 225 died from noncombat causes, mainly training and motor vehicle accidents.[4] On the battlefield, U.S. troops were in good health: overall injury and illness rates were lower in this conflict than in previous wars.[5,6] At the end of the Gulf War, the primary health concern was the potential effect of exposure to smoke from 600 oil well fires ignited by the retreating Iraqi army.[7]

Within the DoD and the military health system, the Gulf War was judged to be a victory in 1991, not only for our combat forces but also for military medicine.[3] Consequently, reports of ill health among veterans that began to emerge several months after the war ended were unexpected.[8,9] For many within and

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outside the DoD, it was difficult to understand how serious health problems could develop after a war that had produced so few battlefield casualties. Initial investigations failed to find a unique disorder or a likely wartime exposure that could explain the delayed medical problems.[5,10] A decisive response was delayed, and the protracted public and scientific debate about a possible "Gulf War syndrome" began.

One of the primary mistakes made after the Gulf War was the failure to understand the importance of health effects on veterans and the impact on society of even a brief and successful war. After every war, many veterans require increased health care and compensation for illnesses and injuries. In addition, questions about unexplained symptoms or "war syndromes" have been a recurring problem since at least the U.S. Civil War.[11] Just as importantly, after the trauma of armed conflict, a national period of adjustment and reassessment follows. The U.S. Government should have been better prepared to address the concerns that inevitably arise about wartime events. Considering the acrimony of the Agent Orange controversy after the Vietnam War, more extensive risk assessment and communication efforts should have been initiated during and after the Gulf War.[12] When the DoD could not answer questions about wartime exposures and the extent of health problems among veterans, misunderstandings and doubts inevitably resulted.

Two additional factors contributed to the developing controversy and criticism of government efforts. As a result of recent structural changes in U.S. combat forces, more than 100,000 Gulf War troops were reservists and National Guard personnel.[5] On their return to the United States, these war veterans lost ready access to military medical care because only actively serving troops are eligible for full health care benefits in military treatment facilities.[13] Additionally, the rapid and unprecedented shrinking of the all-volunteer military force in the early 1990s resulted in a reduction of the active force by more than 600,000 personnel by 1995.[14] Many active duty troops who had served in the Gulf War were involuntarily separated from the military, losing financial and social stability and access to routine military health care. Gulf War veterans faced further limitations in obtaining health care and compensation from the Department of Veterans Affairs (VA) because of specific legal guidelines for eligibility. Even when civilian medical care was obtainable, health care providers were not always knowledgeable about the unique environmental and infectious disease exposures during the Gulf War. Many veterans were left without support, frustrated, and confused about the potential health effects of their wartime experiences. The veterans' service organizations, the press, and elected officials were appropriately alarmed by the plight of veterans.

Finally, the public and scientific debate over the health of Gulf War veterans and their exposures in the war merged with the ongoing and much larger national debate regarding environmental risks and unexplained illnesses.[15] The public already had concerns about unexplained illnesses such as chronic fatigue syndrome, the threat of another new disease such as acquired immunodeficiency syndrome or Lyme disease, and the potential health risks from low-level chemical exposures in everyday life. It was understandable for the public, the media, and scientists to be concerned that veterans might be experiencing a new, unexplained illness caused by their exposures in a hazardous environment half a world away.

Force Health Protection

The military health system needed to change to deal with concerns and unanswered questions about the health of veterans and war-related exposures after a future hazardous deployment. These changes evolved during the course of the decade, culminating in a Joint Staff vision for force health protection (FHP).[16] The FHP strategy balances the DoD's responsibilities to (1) promote and sustain health and wellness throughout each person's military service; (2) prevent acute and chronic illnesses and injuries; and (3) rapidly stabilize, treat, and evacuate casualties. In addition, FHP acknowledges the importance of conducting health surveillance and longitudinal health studies and ensuring adequate health record documentation and clinical follow-up for deployed forces.[1]

FHP arose from earlier initiatives to improve the military health system's response to deployments and the health of deployed forces. A January 1996 policy memorandum directed a detailed medical surveillance and health protection plan for U.S. military forces deploying to Bosnia.[17] In August 1997, the DoD issued a directive, "Joint Medical Surveillance," and an accompanying instruction, "Implementation and Application of Joint Medical Surveillance for Deployments," which corrected many inadequacies in the military's response to health and health protection during deployments (Table I).[18,19] In 1998, the Joint Staff, in collaboration with the Assistant Secretary of Defense for Health Affairs, specified the preventive actions that must take place before, during, and after deployments to ensure better disease surveillance, health protection, and properly documented health care.[20,21] The FHP strategy encompasses the integrated preventive, clinical, and operational programs necessary to protect the health of the "total force."[16] The Joint Staff is now updating deployment guidance to expand surveillance and documentation of environmental and occupational hazards and is developing the plan to ensure progress in achieving all of the elements in the FHP vision.

FHP is a significant departure from previous medical readiness planning, which focused on conventional combat medicine and casualty care. FHP places increased emphasis on helping service members and families stay healthy and fit and on preventing injury and illness, while maintaining an exceptional casualty management system. The DoD has been guided in these efforts by a series of expert panels that have evaluated Gulf War and deployment health issues. Recommendations have come from several Institute of Medicine committees,[22-27] a Defense Science Board Task Force,[5] a National Institutes of Health Technology Assessment Workshop,[28] a Presidential Advisory Committee,[29] and a Presidential Review Directive.[30] Within the DoD, the Joint Staff obtained recommendations from 11 FHP working groups.[16] In 1999, direct guidance was provided in the Institute of Medicine report "Strategies to Protect the Health of Deployed U.S. Forces: Medical Surveillance, Record Keeping, and Risk Reduction."[27] The perspectives of independent panels of scientific and public health experts have been vital in developing effective policy to address the complex and controversial health issues of importance to military members and veterans.

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TABLE I

MAJOR DOD FORCE HEALTH PROTECTION POLICIES

Policy Type/Number	Title	Date
DoD Directive 6490.2	Joint Medical Surveillance	August 30, 1997
DoD Instruction 6490.3	Implementation and Application of Joint Medical Surveillance for Deployments	August 7, 1997
Joint Staff Memorandum MCM-251-98	Deployment Health Surveillance and Readiness	December 4, 1998
ASD Health Affairs Policy	Policy for Predeployment and Postdeployment Health Assessments and Blood Samples	October 6, 1998
DoD Directive 4715.1	Environmental Security	February 24, 1996
DoD Directive 6490.5	Combat Stress Control Programs	February 23, 1999
DoD Directive 6205.3	DoD Immunization Program for Biological Warfare Defense	November 26, 1993
DoD Instruction 6055.1	DoD Safety and Occupational Health Program	August 19, 1998
ASD Health Affairs Policy	Policy for National Surveillance for Birth Defects among Department of Defense Health Care Beneficiaries	November 17, 1998
ASD Health Affairs Policy	Establishment of DoD Centers for Deployment Health	September 30, 1999
DoD Directive 6200.2	Use of Investigational New Drugs for Force Health Protection	August 1, 2000

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Lessons Directing New Policy

The FHP strategy evolved from five major lessons learned during the past decade. FHP represents an integration of these lessons to shape the current and future development of programs and policies within the DoD to achieve health protection for the military force.

Lesson One: Improved Communication

For the DoD, Gulf War illnesses and the anthrax vaccine controversy demonstrated the challenges of risk communication on issues involving the health of military members, veterans, and their families.[31,32] A central component of FHP must be improved health risk communication with military members and veterans. The instant availability of information, factual and otherwise, on the Internet means that the DoD must be proactive in providing accurate health information developed using the effective tools of risk communication.[33,34] Highly educated, all-volunteer troops expect detailed information on issues that affect their health. To maintain their military readiness, they also need accurate information on health hazards so that they can take appropriate actions to protect their health and seek appropriate care. Informed troops will be both healthier and more confident, which will improve morale and performance.

A major goal of FHP is to make military members partners in protecting their health by supplying them with the knowledge, skills, and resources needed to stay healthy during military service. Risk communication on health risks and preventive countermeasures is a required element before, during, and after deployments.[18-20]

One example of this component of FHP is the Health Risk Communication Office at the U.S. Army Center for Health Promotion and Preventive Medicine. Its mission is to develop risk communication products and skills throughout the U.S. Army and the DoD by (1) providing risk communication expertise and training, (2) delivering consultation to senior leadership, (3) developing health risk communication publications, and (4) responding to emergency situations. The Health Risk Communication Office sponsors training workshops on effective, evidence-based tools and techniques for risk communication in high-concern, sensitive, or controversial situations.[32]

Another communication initiative is the DoD Deployment Health Clinical Center at the Walter Reed Army Medical Center.[35] A primary mission of the clinical center is to develop and implement clinical risk communication strategies. Both veterans and clinicians need and want sound and timely information regarding deployment-related exposures and deployment-specific health outcomes. The center is developing a dynamic World Wide Web site to sustain a dialogue with those it is charged with protecting and their clinicians regarding exposures, diseases, health concerns, and medically unexplained symptoms.

An interagency initiative supporting improved communication is the Health Risk Communication Working Group of the Military and Veterans Health Coordinating Board.[30] This working group provides recommendations and coordination for the health risk communication efforts of the DoD, the VA, and the Department of Health and Human Services (HHS) for military members, veterans, deployed civilians, and their families. The working group's primary focus is on health risk communication before, during, and after combat operations and other major deployments.

Finally, the DoD has recognized that it must convey to the nation at large its intentions and programs regarding health hazards affecting military members and veterans. To substantially improve risk communication, the media will have to be better informed about military health care and the health impact of military service. Increased openness and communication by the DoD on these issues will in turn enhance the credibility of the military health system.

Lesson Two: Health Surveillance

Improved health surveillance and health risk assessment have to be a major component of an effective FHP program.[27] One of the main obstacles in resolving many of the Gulf War health questions has been the lack of individual data on predeployment health status, exposures during deployment, and health status assessment at the war's end. Without baseline and longitudinal health data, it has been difficult to determine the nature of health changes among Gulf War veterans.

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Since the Gulf War, the DoD has issued policies for expanded health surveillance, especially during military deployments.[17-19] These FHP policies mandate routine health surveillance activities during all major deployments and during any deployment identified as posing a significant health risk to deployed personnel.[20,21]

One of the innovative aspects of improved surveillance has been the establishment of the Defense Medical Surveillance System.[36] In March 1997, the Assistant Secretary of Defense for Health Affairs directed the Army to establish a Defense Medical Surveillance System by transitioning from an Army-specific system. The Army Medical Surveillance Activity, U.S. Army Center for Health Promotion and Preventive Medicine, developed and now operates the new surveillance system. The Defense Medical Surveillance System contains up-to-date and historical data on diseases and medical events (e.g., hospitalizations, ambulatory visits, reportable diseases, human immunodeficiency virus tests, and health risk appraisals) and longitudinal data on personnel and deployments. The Defense Medical Epidemiology Database provides authorized users worldwide with real-time access through the Internet to user-defined queries of aggregate data in the surveillance system.

The Defense Medical Surveillance System provides the link between health surveillance data and specimens in the DoD Serum Repository, which contains more than 26 million frozen serum specimens from military personnel. As part of routine screening for human immunodeficiency virus infection, these specimens are routinely collected during military service and before major deployments and are available for analysis when new health questions arise.[37] Another innovation has been the registry of birth defects, which combines both active and passive surveillance.[38,39] Because women represent an increasing proportion of the military force, women's health issues have been an important consideration in developing FHP policy.[40]

One example of this component of FHP has been the unprecedented health screening for troops sent to the Balkans.[17] Troops were administered predeployment and postdeployment health questionnaires, serum samples are stored at the DoD Serum Repository, and data have been analyzed both in real time and in retrospect for health outcomes related to this deployment.[41,42]

Improved health surveillance will lead to more accurate risk assessment, which is particularly important during and after hazardous deployments. As demonstrated by unresolved questions regarding the health of Gulf War veterans, it is difficult to assess risks without accurate exposure data.[43] Although there has been much speculation about the effects of wartime exposures—oil well fire smoke, pesticides, chemical weapons, vaccines, and psychological stress—no single cause has been demonstrated to have produced widespread health problems among Gulf War veterans.[44] As part of FHP, preventive medicine, forward laboratory, and environmental surveillance teams are now a routine aspect of military deployments, and guidelines on short-term chemical exposures are available for deployed personnel.[41,45]

Lesson Three: Health Records

The full benefit of increased medical and environmental surveillance will be realized only if medical record keeping and data access are improved within the DoD.[27] An integrated information system, which collects all health and exposure data, translates data into useable formats, and makes them available worldwide, is needed. Consequently, a long-term goal of FHP is for each military member to have a comprehensive, lifelong, computer-based patient record of all illnesses and injuries, medical care, immunizations, and exposures to potential health hazards.[46] With standardized, readily-accessible medical and exposure data, health assessments of military personnel and veterans can be a routine process during future deployments and after military service. A computer-based record will enable more accurate assessments of the effectiveness of military health care, will help direct preventive services for military members, and will be useful for other agencies with responsibility for veterans' health.[47]

The Composite Health Care System II, the military health system's medical and dental clinical information system, is the major information technology enabler for FHP. This system will provide the computer-based patient record for every military member. Release 1, currently in on-site testing, includes capabilities for clinical and dental outpatient care, population health, preventive health care, ambulatory computer-based patient record, and regional clinical data repositories. It also will interface with existing health information systems and the Defense Enrollment Eligibility Reporting System. Release 2 will support general dentistry, worldwide availability of records, optometric services, automated clinical practice guidelines, and occupational health/industrial hygiene.

The Theater Medical Information Program, which is being developed to function in the operational environment, will gather individual medical information throughout a deployment. Because this program is integrated with Clinical Health Care System II, military medical personnel will be able to move readily from health care in a clinic or hospital to the field, and medical information from deployments will be more accessible for future clinical and health surveillance uses.

Lesson Four: Biomedical Research

Increased support for developing improved countermeasures to protect troops from a wide range of health risks has to be an important aspect of FHP. Major health hazards include infectious diseases, equipment and workplace hazards, environmental contaminants, heat and cold injuries, training and motor vehicle accidents, psychological stress, and chemical and biological warfare agents. The DoD maintains an extensive in-house biomedical research program, supports numerous research studies in civilian universities, and has dedicated funding and a new Defense Technology Objective to support FHP research requirements.[48]

In addition to these ongoing efforts, Congress authorized the DoD to establish a center devoted to "longitudinal study to evaluate data on the health conditions of members of the armed forces upon their return from deployment."[46] As a result, the DoD established two centers for the study of deployment health, one focusing on epidemiological research and another on clinical care.[35] In coordination with the VA and the HHS, these centers will actively investigate deployment-related health risks, the use of clinical practice guidelines to evaluate service members with health concerns and chronic symptoms after hazardous deployments, and new preventive and therapeutic modalities.

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A major initiative of the Deployment Health Research Center is the Millennium Cohort Study, which involves an initial cross-sectional sample of 100,000 military personnel who will be followed prospectively. The Millennium Cohort Study is an integral part of a strategy to prevent health problems after future deployments and to maintain troop morale, confidence, and effectiveness. The Deployment Health Clinical Center is working with the VA and national and international experts to develop an evidence-based postdeployment health clinical evaluation program for the primary care setting.[49] Evidenced-based clinical practice guidelines also are in development to assist health care providers in screening, evaluating, and treating service members with health concerns after their return from deployments. Future FHP developments will be guided by the findings of intramural and extramural research on health threats and effective preventive and therapeutic measures for adverse health effects of military service and deployment.

Lesson Five: Interagency Coordination

Health policy and program development benefit from formal and continuous communication among federal agencies.[7] Before the Gulf War, there was no established body responsible for maintaining coordination among the agencies responsible for health issues of military personnel and veterans. In January 1994, the triagency Persian Gulf Veterans Coordinating Board was instituted, which established a model of interagency collaboration.[50] Presidential Review Directive 5 recommended an ongoing coordinating board to facilitate interagency coordination on issues and programs enhancing the protection of military personnel, veterans, and their families before, during, and after future deployments.[30]

In November 1998, President Clinton directed the Secretaries of Defense, Health and Human Services, and Veterans Affairs to form the Military and Veterans Health Coordinating Board. The coordinating board serves as a focal point for coordination across the three departments of the policies, practices, and procedures on health issues related to current and future military deployments. The board's mission was broadened to include coordination on Gulf War health issues and the monitoring and evaluation of the $155 million portfolio of research on illnesses among Gulf War veterans. For the DoD, a critical component of FHP is to build on this foundation of improved coordination among federal agencies.

TABLE II

MAJOR DOD INITIATIVES ON FORCE HEALTH PROTECTION

1. Improvements in health risk communication and management, particularly for deployed military personnel and their families, including predeployment and postdeployment health education and increased use of combat stress control teams during hazardous deployments.
2. Assessment and documentation of the health status of both individual service members and the total force before and after hazardous deployments.
3. Improvement in the collection, analysis, and documentation of a wide range of health surveillance data during deployments, including the routine fielding of preventive medicine, forward laboratory, and environmental surveillance teams.
4. Initiation of large epidemiological studies by the DoD and the VA (e.g., the Millennium Cohort Study) to evaluate the long-term health consequences of future deployments.
5. Use of the DoD Serum Repository, which routinely stores serum samples serially collected from serving military personnel.
6. Establishment of a registry of birth defects using both active and passive surveillance.
7. Establishment of a baseline health database on all military recruits and improvements in the Defense Medical Surveillance System and medical record programs to improve monitoring and evaluation of hospitalizations, ambulatory visits, reportable diseases, immunizations, drug therapy, and other preventive health measures during military service.
8. Development of improved products to counter biological and chemical warfare agents.
9. Establishment of two DoD centers for the study of deployment health, one focusing on epidemiological research and the other on clinical care.
10. Formal, continuous coordination among the DoD, the VA, and the HHS on military and veterans' health issues through the Military and Veterans Health Coordinating Board.

Understanding Limitations

The DoD has applied these five lessons in the development and implementation of more effective health policy (Table I) and a wide range of new FHP programs (Tables II and III). However, the Institute of Medicine stressed that the DoD and the individual military services needed to accelerate implementation of the existing FHP policy and programs to demonstrate the importance that should be placed on protecting the health and well-being of military members.[27]

Rapid implementation of the FHP strategy is constrained by several factors. Actions to protect the health of military members must be guided by current medical knowledge. Full understanding of the health impact of service in a combat or deployed environment depends on better understanding of the causes and prevention of unexplained, chronic illnesses in the general population. Similarly, actions to protect deployed forces from diverse low-level environmental exposures in the uncontrolled environment of a deployment need to be guided by better knowledge of the effects of such exposures in the general population. The DoD also has to strike a delicate balance between improved health protection and interference with military operational capabilities. During combat, the collection of comprehensive medical and environmental data must not hinder war-fighting efforts or put noncombatants unnecessarily at risk.[5] The surest way to limit combat and noncombat casualties is to win a quick and decisive war, as in the Gulf War.

To ensure both better health and an unimpeded fighting force, the related components of FHP must become a fundamental and automatic aspect of modern military operations. Consequently, health care, health protection, and information requirements need to be anticipated in advance, and not once a conflict has begun, if questions about the health effects of service are to be answered after the fighting has stopped. Structural changes within the DoD must be made before critical events occur and must become part of the institutional culture. To establish that infrastructure for FHP and to instill a new way of thinking, the Secretary of Defense, the Joint Chiefs of Staff,

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TABLE III

SELECTED INFORMATION RESOURCES FOR DOD FORCE HEALTH PROTECTION

Program	Responsible/Hosting Activity	World Wide Web Site[a]
Force Health Protection Vision Document	J-4, The Joint Staff	http://www.dtic.mil/jcs/j4/divisions/mrd/fmp.htm
Defense Medical Surveillance System	Army Medical Surveillance Activity, USACHPPM	http://amsa.army.mil
DoD Center for Deployment Health Research	Naval Health Research Center	http://www.nhrc.navy.mil/
DoD Deployment Health Clinical Center	Walter Reed Army Medical Center	http://www.deploymenthealth.mil/
Military and Veterans Health Coordinating Board	Department of Veterans Affairs	http://www.mvhcb.gov/
Deployment Environmental Surveillance Program	USACHPPM	http://chppm-www.apgea.army.mil/desp/
Health Risk Communication Office	USACHPPM	http://chppm-www.apgea.army.mil/dts/hrc/
Composite Health Care System II	Clinical Information Technology Program Office	http://citpo.ha.osd.mil/
Theater Medical Information Program	Program Management Office	http://tmip.hirs.osd.mil/

USACHPPM, U.S. Army Center for Health Promotion and Preventive Medicine.
[a]Addresses are valid as of March 30, 2001. Some sites may be accessible only from computers with a ".mil" domain name.

and the theater commanders in chief are developing guidance and pursuing a unified FHP strategy.[16]

Essential Public Support

FHP cannot succeed through the efforts of the military alone. The support of elected officials and veterans groups is essential. Already, Congress has enacted legislation to extend health care to all combat veterans for 2 years after discharge or release from active military service.[51] The support of military and veterans service associations is critical because these organizations maintain extensive educational programs and can quickly communicate important information. Finally, the support and involvement of the civilian medical community will be indispensable in the implementation of FHP. Because of the size and influence of the two largest government-run health care programs, changes in DoD and VA health care often set a precedent for the civilian sector.[1] Similarly, policies, regulations, and laws developed to deal with the potential adverse effects of low-level environmental exposures, drugs, and vaccines in the civilian population will affect DoD and VA health care options and capabilities.

During the last decade, the DoD has received one unambiguous message: the perceptions and expectations of military families, veterans, and the nation at large have changed. No longer can the military health system just deliver a fit fighting force and care for battlefield casualties. The DoD also must (1) address the potential long-term health effects of military deployment, including combat, low-level environmental exposures, occupational risks, and psychological stress; (2) monitor the health of military members and look for potential adverse effects of drugs and vaccines; (3) develop more effective treatment regimens for chronic health problems; (4) develop methods to accurately quantify and track environmental and occupational exposures of individual military members; and (5) be a leader in health risk communication. Trust can be maintained only when the DoD is seen as having the foresight to prepare in advance and decisively take responsibility for the health of the military men and women of the 21st century.

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