
**MEDICAL READINESS AND OPERATIONAL
MEDICINE**

The readiness mission of the MHS makes the system unique among U.S. health-care organizations. Its stated mission—to provide, and to maintain readiness to provide, medical services and support to the armed forces during military operations—implies several tasks that are the responsibility of MTF commanders and commanders of deployable medical units.

First, while at their home stations, active-duty personnel must be kept at the peak health needed for military effectiveness. This task is sometimes performed at deployable medical units, where medical personnel provide acute, minor care for personnel who are deployed or involved in training exercises. Otherwise, active-duty personnel are enrolled in TRICARE, and their healthcare is overseen by the MTFs.

Second, deployable medical units must be manned by personnel trained in individual military skills and specific medical specialties needed for wartime medicine. The development and maintenance of these skills call for training and experience in MTFs and with deployable units.

Third, the medical departments conduct operational missions by manning both medical and line units with appropriately trained medical personnel and deploying to provide support to operational units. These manning and training requirements fall to the services under Title 10 and imply continuous staffing of deployable medical

units at some level in order to maintain equipment and perform both military- and medical-specific unit training.

Finally, the tasks required by the readiness mission must be balanced against the benefits mission because the benefits mission is required for the maintenance of trained medical personnel and both missions draw upon overlapping resources. A key consideration when structuring the MHS is the coordination required to effectively execute both missions.

MEDICAL READINESS SKILLS

While training and maintenance of deployable medical units are essential to medical readiness, the manning of these units with qualified medical personnel is equally important. The requirement for maintaining qualified medical personnel who have skills and knowledge that are relevant to military demands makes medical readiness unique from other military readiness activities in some respects. Medical personnel who are specially qualified to support readiness across the spectrum of military activities, from humanitarian to combat missions, must possess several attributes:

- Medical training
- Clinical experience
- Military training
- Military experience.

In total, these attributes constitute the essential component to maintain medical readiness: the building and maintenance of expert human capital. These attributes are not exclusive, but are interrelated in several ways.

Medical training includes formal education as well as on-the-job training. Medical training can also be categorized as general or military-specific. Military medical personnel receive the same clinical training as their civilian counterparts. The DoD provides this training to various degrees among the services.

The Uniformed Services University of the Health Sciences (USUHS) is the DoD medical school, although most physicians in uniform are

acquired through civilian sources, often with their medical school funding provided by the DoD in return for a service commitment. Residency programs and other forms of graduate medical education (GME) are performed in the larger MTFs or in civilian programs. Other commissioned medical personnel, such as nurses, also are educated largely in civilian schools and incur a service commitment if their education is funded by the DoD. Their continuing and specialty training may be conducted in MTFs or civilian programs. In contrast, enlisted personnel who perform many medical technical specialties receive the majority of their training in DoD units and MTFs.

Medical readiness requires a specific set of specialized medical skills, some of which fall outside the civilian curricula. While some specialized skills that relate directly to military medicine may be covered in civilian curricula, their importance in the military setting may imply that the DoD should take the lead in the training of these skills, as it has done in several cases. Treatment of chemical agent casualties, some preventive medicine expertise, and management of mass casualties are some examples.

In addition to skills that may be included in civilian training but are useful in a military setting, some medical skills are specific to military applications and exclusive of civilian training. Aspects of undersea and flight medicine and stabilizing combat casualties for rapid evacuation are examples of these sorts of skills. Specific training for military medical personnel includes training that prepares them to support a particular type of unit or operation.

Medical personnel who deploy to perform wartime medicine must be proficient in specialties that are relevant to military operations. This requirement necessitates a peacetime case mix that allows personnel to maintain these specialized skills through clinical experience while they are assigned to MTFs. Maintaining an appropriate case mix for military health-care providers can be challenging, especially in the current managed-care environment of the MHS.

The challenge of balancing the benefits and readiness missions is underscored by a recent study conducted at the USUHS (LaMar, 1997). Researchers there developed a model to estimate the provider workforce composition needed to serve a defined population, such

as an MTF catchment area. They asserted that such models, which seek to define the most cost-effective mix of supply (providers) and demand (patients) and are based on MTF-like staff-model HMOs, do not account for the military medical readiness mission.¹ Some coordination required to ensure that the readiness mission is balanced effectively with managed care is discussed later in this chapter.

Certainly, medical personnel highly trained in general medical skills, as well as relevant medical specialties, are paramount to medical readiness. However, a need also exists for these personnel to be sufficiently trained in military skills. This training includes individual skills such as those required for survival in combat, which are taught in basic officer and enlisted training.

Although some medical professionals do ultimately follow operational career paths that require more-advanced individual, unit, and leadership training, this type of career path is often the exception. More commonly, medical personnel require military knowledge and experience that facilitates their ability to provide medical care in a military setting. Practicing medicine in an operational context, for example, often requires working under austere conditions characterized by high stress and limited resources. Such experiences usually require that medical personnel train with operational units, and the allocation of these personnel between the benefits and readiness missions is a challenge for the MHS.

To varying degrees, medical personnel must also understand the military context in which they will provide care. This is especially true for those medical personnel who work in combat units. These health-care providers should be able to deliver more-effective care if they understand their patients' working environments and occupations. Furthermore, these medical personnel often have additional, non-medical roles to play in support of the operational unit. For example, medical personnel on a submarine must also understand how to fight fires and perform other tasks required of the crew.

¹Although current challenges may exist in maintaining the skill mix required for wartime medicine, the treatment of a predominantly healthy population—such as obstetric and pediatric care—can satisfactorily maintain the skill mix generally required for military operations other than those for wartime.

Experience in operational units is important for medical personnel who must be able to communicate with supported units and earn the trust and respect of the supported personnel. Such ongoing relationships between medical personnel and operational personnel underscores an important cultural component to maintaining readiness.

This is not to suggest, however, that all medical support must be segregated based on service or mission. While cases may exist in which for medical reasons, military reasons, or both, medical personnel should be specifically trained and associated with a service or mission, there are other cases in which such division exists for what are essentially common functions. For example, the need for flight surgeons may on the surface suggest service-specific requirements, but in fact each of the services has aviation components, and the differences that have arisen across the services seem largely unrelated to medical effectiveness. The Navy trains flight surgeons in a six-month course that includes instruction on aviation physiology but also includes land and water survival and some flight training. The Air Force and Army teach flight surgeons only aviation physiology in a two- or three-month course and do not teach their surgeons to fly.

Unless a significant need exists for Navy flight surgeons to be trained to fly, or significant differences exist in the medical aspects of the service aviation components, the idea that these requirements are truly service-specific should be further investigated before they are accepted. The aviation components, however, present but one example. There are others, including the often assumed need for Army and Marine (Navy) medics and corpsmen to have more training in trauma medicine than their shipboard counterparts because gunshot wounds occur less frequently at sea.

There are trade-offs in balancing the attributes required for medical personnel to maintain readiness skills. Some trade-offs come in determining the allocation of effort between medical and military training: Military physicians do not need to know how to drive tanks or captain ships, but should be able to communicate with those who do and understand the medical ramifications of those activities. Medical personnel must gain experience in delivering health care under the unique constraints inherent in operational environments while also maintaining clinical proficiency. Other trade-offs arise in

considering whether medical and military training should be provided in service-specific programs or provided jointly.²

The assumed benefits from combining training activities include lower costs, which result from economies of scale, and improved interoperability across the services. Where there are considerable service-specific training requirements, joint training may not be less costly and can be less effective. Therefore, the true need for service-specific training must be determined before training activities are combined. Currently, the Defense Medical Readiness Training Institute (DMRTI) performs this determination with executive oversight by the Defense Medical Readiness Training and Education Council (U.S. Department of Defense, 1998; Assistant Secretary of Defense/Health Affairs, 1997).³ The DMRTI also provides a number of joint training courses in medical readiness skills.⁴

The growth and maintenance of human capital are at the core of medical readiness and are reliant on relevant medical and military training and experience. Such training and experience are related in many ways and efforts to consolidate activities in support of them should be considered, while using medical practicality and military relevance as guidelines for any consolidation.

OPERATIONAL MEDICINE AND JOINT DOCTRINE

The service medical departments generally employ similar strategies to supply medical personnel to combatant CINCs in support of large-scale operations. These strategies involve deploying medical personnel from MTFs to complement those personnel already assigned to combat medical units. Reserve personnel, or personnel from other

²A related trade-off to consider lies in evaluating the costs and benefits of civilian versus military medical training and education, but such analysis is beyond the scope of this study.

³The DMRTI's mission is to "coordinate, evaluate and develop Joint Medical Readiness Training initiatives with a focus on evolving doctrine and joint operational requirements. DMRTI conducts and facilitates selected joint medical readiness training programs to prepare Defense Department Medical Personnel for a wide range of military operations" (Assistant Secretary of Defense/Health Affairs, 1997).

⁴These issues are discussed further in Appendix A.

MTFs, may be assigned to replace the deployed personnel. In some cases, reserve personnel are also deployed to the combat theater.

In such large-scale operations, combat medical units deploy as part of their service component commands. This type of large-scale mobilization was last seen during Operations Desert Shield and Desert Storm. Today, like then, each service has somewhat different plans to support a major deployment.

Approximately 70 percent of the Army's combat medical force is in the Reserve Component, and the Army plans that these units will often be among the earliest deploying forces. In contrast, the Navy and Air Force have smaller reserve medical components. These services rely more on active-duty personnel to support large-scale deployments. Currently, the Air Force is considering an approach that is similar in some respects to the Navy approach. The medical personnel for the Air Force's deployment units would be drawn from its larger MTFs, which support more medical specialties, leaving smaller family practice clinics less affected by deployments.

Since the time of the Gulf War, the DoD has experienced an increase in the number of smaller deployments. In providing medical support to these missions, the general scheme of deploying personnel from MTFs and replacing those personnel with reservists seems to be followed less rigorously. Organizing support for these missions is often viewed as a unique, non-systematic exercise, supported by the most-convenient organization for the task under the given circumstances and the assignment of personnel in a more ad hoc manner than what wartime planning would envision. This less-systematic approach is most commonly used when only a few medical personnel are tasked to support a mission. Furthermore, these medical support missions typically are performed by only one service at a time.

In smaller missions that do not require the majority or all of a geographic combatant command, a Joint Task Force (JTF) commander is usually appointed by the CINC.⁵ Often, this commander is a service component commander in the geographic combatant command.

⁵This is one organizational option often employed by CINCs. Other options include service component command, functional component command, and subordinate unified command.

The JTF commander appoints a JTF surgeon to coordinate health service support; in most cases, this individual is the component command surgeon. As the component commands are divided along service lines, these smaller missions are often service-oriented, although they are still technically under the command authority of the geographic CINC.

These JTF missions are conducted on a smaller scale than major theater wars, and medical units are often pieced together to support them. Medical planners in each of the service components coordinate with the JTF surgeon to identify and assign medical personnel from MTFs (or reservists) to deploying units as necessary. Each service supports this process on a largely individual basis; in other words, there appears to be for all practical purposes no high-level authority that looks across all services to allocate medical personnel and assets.

Missions that primarily involve medical units are oftentimes among the smallest operations. In such cases, a medical unit is not merely in support of other deploying units but is in fact the centerpiece of the mission. These operations include humanitarian and disaster relief missions. For example, the Air Force has recently been active in sending ophthalmology teams on humanitarian missions to South America. By most accounts, these medical missions are almost always service-specific. Although coordination with the geographic CINC is essential to their success, the missions are often planned and executed by the service's medical department.

Although each of the services operates a distinct medical system within the MHS, operational medicine *doctrine* is joint in nature. As a former Commander-in-Chief, Central Command said,

Orchestrating land, sea, and air medical operations is demanding and requires joint medical expertise to integrate health service support (Peay, 1996–1997).

Several functions in operational medicine are coordinated jointly by doctrine, especially in a wartime setting. For example, patient

movement across the different echelons of care in the combat zone⁶ is normally the responsibility of the service component commands, but it is coordinated by a Theater Patient Movements Requirement Center. A command surgeon employing a joint staff oversees such coordination.⁷

In addition to this joint coordination, some operational activities are assigned to a single service. For example, the Army evacuates patients from Navy hospital ships and evacuation from the combat zone is normally an Air Force responsibility (U.S. Department of Defense, 1995).⁸

COORDINATING READINESS

A key consideration with organizational structures is the coordination required to effectively execute an organization's mission or missions. In this case, there are some notable coordination issues associated with the medical readiness mission and operational medicine. We distinguish between *situational coordination* and *institutional coordination* because each implies different requirements and levels of effort among organizations.

Situational coordination facilitates planning and execution for a situation that is unanticipated or distinct from normal operations. Institutional coordination results in standing agreements about how organizations will jointly conduct anticipated missions and normal day-to-day operations. By its nature, situational coordination is ephemeral whereas institutional coordination is more long-lasting. Situational coordination often must be done quickly as a situation unfolds. Institutional coordination can be accomplished more sys-

⁶This movement generally corresponds to the movement or evacuation of casualties to or between MTFs in the combat zone (generally forward of corps level).

⁷Although regulations state that "a Joint Force Surgeon (JFS) should be appointed for each combatant command, sub-unified command, and joint task force" (U.S. Department of Defense, 1995), we use the more familiar term "command surgeon" here. Command surgeons are medical officers (generally health-care delivery professionals and most often physicians) who serve as staff officers reporting ultimately to the combatant commander (the "Joint Forces Commander" in Joint Pub 4-02).

⁸Additionally, evacuation from the theater is the responsibility of CINC, Transportation Command.

tematically through a variety of means, including contractual agreements, letters of understanding, or through the careful distribution of resources, incentives, and objectives across organizations.

The MHS has a peacetime institutional coordination requirement to balance the distribution of medical personnel between peacetime health-care delivery and readiness training. In some cases, readiness training involves training with combat units. Effective combat training will necessitate removing medical personnel from delivering peacetime health care to some degree. Conversely, medical personnel assigned to combat units require ongoing medical skills training, which may often be provided at MTFs or by personnel from MTFs during unit training.

As with all support functions, medical support must be carefully coordinated within an area of operations among supported and supporting units. All things being equal, it is reasonable to assert that the effectiveness of a support function will increase with the supporting commander's knowledge of what is being supported. In a medical setting, this may suggest, as some interviewees noted, an advantage of same-service support. One example is in the field of preventive medicine.

Preventive medicine specialists are likely to be more effective when they have an intimate understanding of the activities of the force they are supporting because the activities often have direct health consequences. This implies a need for not only situational coordination between medical and line units, but also some degree of institutional coordination to ensure that the medical personnel have adequate training to understand and effectively support the line unit.

Service-specific medical functions require institutional coordination between the medical and line elements in the service. These functions include elements of operational medicine, such as support for undersea warfare or for the various types of operations in which each service specializes. However, other examples of medical needs or operational medical support may not be as clearly service-specific, as discussed previously in the section "Medical Readiness Skills."

One coordination activity that is essential to ensuring medical readiness is the assignment of health-care workloads to the MTFs during peacetime. MTF commanders make these assignments indi-

rectly through pertinent policies, such as those governing patient appointments, while taking into account facility size and staffing constraints. A 1995 Congressional Budget Office (CBO) report found that the care furnished in MTFs during peacetime bears little relation to the care required by the numerous diseases and injuries that military medical personnel must be trained to treat during wartime (Congressional Budget Office, 1995). Furthermore, the CBO report predicted that under TRICARE most military medical providers would have a limited opportunity to prepare for their wartime mission. The opportunity exists to institutionally coordinate the benefits mission with readiness requirements by shaping the peacetime workload to best reflect treatment of the sorts of diseases and injuries expected in war.

MTFs provide priority access to TRICARE Prime beneficiaries—predominantly healthy active-duty service members and their families, and retirees under the age of 65. Some interviewees felt that this population does not adequately reflect the complex and sometimes rare medical cases encountered in other populations with lower access priority. For example, retirees over the age of 65 may present more cardiac surgery cases, but this population is treated only on a space-available basis at most MTFs.⁹ These patients often receive care from civilian providers under Medicare. The 1995 CBO report further recommends coordinating with civilian trauma centers for military physician training because the case mix at these centers more closely resembles wartime expectations.

The degree of institutional and situational coordination that is required to produce effective medical support and readiness is debatable, but it is clear that the degree of coordination needed for readiness should be considered a key driver in determining organizational structure.

⁹Beginning October 1, 2001, Medicare-eligible retirees also will be eligible for TRICARE benefits. If more of these older beneficiaries receive specialty care in the MTFs, at least some of the concern about case mix would be alleviated.

READINESS OBJECTIVES OF THE MHS ORGANIZATION

Problems with the medical readiness mission may surface only occasionally, but when they do, their consequences can be severe. Following Operations Desert Storm and Desert Shield, separate U.S. General Accounting Office reports questioned the services' capability to provide adequate medical care had the ground war started earlier, lasted longer, or resulted in the predicted number of casualties (U.S. General Accounting Office, 1993a; 1993b; and 1993c).

The criticisms in these reports included findings that the information systems that were used to identify and assign personnel to medical units contained outdated and incomplete information, and medical personnel had not trained during peacetime to perform their wartime missions. These and other issues were addressed in Medical Readiness Strategic Plans issued in fiscal years 1995 and 1998; the 1998 document records the steps taken to resolve identified problems (Assistant Secretary of Defense, Health Affairs, 1995; Assistant Secretary of Defense, Health Affairs, 1998).

Unlike the benefits mission of the MHS, the readiness mission is unmatched in its objectives and scale. Few lessons can be applied from the civilian sector, other than the general principles of organizational theory, which are discussed in Appendix B. Without other experiences to provide a basis for deciding on the best organizational approach to ensure medical readiness, we can highlight only those aspects of the medical mission and organizational principles that are most likely to be essential to ensuring success. Among those aspects are the requirement and ability to coordinate among the various elements of the organization and their respective missions. Such coordination could best be enabled with a structure that defines clear lines of authority and responsibility and is supported by appropriate and timely information, performance evaluation, and suitable incentives. The MHS currently employs a diffuse management structure that appears to lack some of these elements.

A main objective of any MHS reorganization is to ensure that the resulting organization is capable of maintaining readiness. Therefore, no barriers should exist that would preclude effective coordination between satisfying the demands of the benefits missions and the demands of the readiness medical missions.

Leadership will require the information, authority, and responsibility to allocate the resources necessary for efficient readiness training of medical personnel. Those who are charged with any reorganization of the health-care system should identify, and give careful consideration to, circumstances in which medical support would be specific to a certain service or mission. In this way, the relationships between each service's medical and line units can be fostered.

Those involved in the reorganization should also consider methods to ensure that the appropriate levels of interoperability between training and operations are maintained.