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Five Actions to Improve Military Hospital Performance

John Whitley
Institute for Defense Analyses

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Foreword


Daniel J. Chenok

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, *Five Actions to Improve Military Hospital Performance*, by John Whitley of the Institute for Defense Analyses.

The rising costs of healthcare in DoD have placed a spotlight on the importance of sound management of DoD's Military Treatment Facilities (MTFs) in recent years. This, combined with concerns about adequacy in direct health care support for the readiness mission and quality, has led Congress to direct a major overhaul of the direct care system in the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2017, signed into law December 23, 2016.


Mark Newsome

Whitley's report finds that the direct care system's central role in DoD's readiness and beneficiary missions means that ensuring effectiveness and efficiency in care delivery is vital for accomplishing defense mission goals. The direct care system provides an "operating base" for the military medical community, and flexibility for rapidly transitioning and deploying personnel. However, the system faces growing challenges that hinder effectiveness in delivering on its mission—challenges that include utility for readiness and high cost, which are the focus of Whitley's report. A third challenge identified but not detailed in this report involves the quality of care and care experience attributes, such as wait times and access.

This report presents background information on the challenges of the direct system to provide context for the modernization reforms directed by the NDAA. Whitley describes specific actions DoD can take to improve performance and reduce costs in MTFs. This includes, where applicable, illustration of examples where DoD has already taken these actions in a limited fashion or in other areas of the department. Many of the recommended actions have been implemented on limited scales (or in other mission areas). It also draws lessons learned from these experiences for reform across other government healthcare delivery systems.

The actions identified in Whitley's report start with clear articulation of the mission of a facility. Congress has provided direction for facilities in section 703 of the FY 2017 NDAA, giving DoD a useful starting point to organize and unify its modernization efforts. Data driven management, along with leadership and operational management reform, are both directed by Congress and basic elements of modernization. Finally, public-private partnerships are essential; DoD cannot execute reform alone and the private sector brings a wealth of knowledge and experience (in addition to patient base) that could be leveraged to modernize military hospitals.

We hope that Dr. Whitley's insightful report will help efforts of military healthcare leaders to improve military hospital performance. Modernizing DoD's direct care system benefits national security, military service members and the taxpayer—and can be done in a way that also helps to improve civilian care across the country.

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Introduction

The U.S. Department of Defense (DoD) has two primary medical missions: maintain an operational medical capability to support combat operations (the "readiness" mission) and provide a healthcare benefit to DoD beneficiaries (the "beneficiary" mission). These missions are large; the readiness mission includes about 200,000 military medical personnel (120,000 active duty personnel and 80,000 National Guard and Reserve personnel), while the beneficiary mission is responsible for over nine million eligible beneficiaries. DoD spends over $50 billion per year on these missions—making military healthcare one of the largest areas of expenditure in the defense budget and larger than most cabinet agencies.

In support of these missions, DoD operates a large network of military treatment facilities (MTFs) that includes inpatient hospitals and outpatient clinics. In 2017, DoD operated 40 inpatient hospitals in the continental United States (CONUS), 15 additional inpatient hospitals outside of the continental United States (OCONUS) and over 300 clinics. This network of MTFs is called the "direct care" system by DoD and provides over one-third of beneficiary healthcare. Although the bulk of the care provided in these facilities is to beneficiaries, the beneficiary mission is not a military essential function and is not the purpose for operating the direct care system. The MTFs are operated to support the readiness mission by providing training platforms for the military medical force. DoD spends about $25 billion per year operating the direct care system.[1]

The rising costs of healthcare in DoD and the high cost of the direct care system have placed a spotlight on the management of DoD's MTFs in recent years. This, combined with concerns about adequacy in supporting the readiness mission and quality, has led Congress to direct a major overhaul of the direct care system in the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2017 signed into law December 23, 2016. The purposes of this report are to:

- Present background information on the challenges of the direct system, to provide context for the modernization reforms directed by the NDAA.
- Describe specific actions DoD can take, consistent with the direction of the NDAA reforms, to improve performance and reduce costs in MTFs. This includes, where applicable, illustration of examples where DoD has already taken these actions in a limited fashion or in other areas of the department.
- Draw lessons learned from this modernization discussion for reform across government operated healthcare delivery systems.

1. On MTFs, see Phil Lurie, "Comparing the Costs of Military Treatment Facilities with Private Sector Care," Institute for Defense Analyses, IDA Paper NS P-5262, February 2016, https://www.ida.org/idamedia/Corporate/Files/Publications/IDA_Documents/CARD/2016/P-5262.ashx. For a broad overview of the military health system, see "Evaluation of the TRICARE Program: Access, Cost, and Quality, Fiscal Year 2016 Report to Congress", http://www.health.mil/Reference-Center/Reports/2016/05/19/Evaluation-of-the-TRICARE-Program-Fiscal-Year-2016-Report-to-Congress.

The next chapter provides the introductory material on challenges in the direct care system and briefly outlines NDAA modernization reforms. The report then provides a detailed review of a wide-range of reforms to modernize DoD MTFs. The final chapter provides lessons learned for challenges across the government and concluding remarks.

Challenges Facing DoD's Direct Care Mission

The direct care system's central role in both the readiness and beneficiary missions means that ensuring its effectiveness and efficiency is vital for mission accomplishment. It provides an "operating base" for the military medical community and provides flexibility for rapidly transitioning and deploying personnel. The direct care system faces growing challenges that hinder its effectiveness in delivering on its mission—its utility to readiness and its high cost. The recommendations outlined in this report focus on two of these challenges—the direct care system's utility to readiness and its high cost. A third challenge not taken up in this report involves the quality of care and care experience attributes such as wait times and access.[2]

Readiness

The readiness mission is to provide a medical force ready to deploy to provide medical care in theater. This medical care can be divided into two general categories: the routine medical care of maintaining forces healthy and effective in the field and the specialized care of treating traumatic injuries and exotic diseases in combat. The first category is very important and provides many of the encounters the medical community experiences on a deployment, but it is not the primary driver of required medical readiness skills. The second category is the primary driver of required medical readiness skills. This care is mission essential for saving life and limb on the battlefield. The readiness requirement is driven by the high skill, mission essential tasks the medical force undertakes on deployment.

To build and maintain these skills, the military medical force delivers a portion of beneficiary healthcare in MTFs. There have been long-standing challenges with this model[3] as it arose in a period of time when medicine was less specialized and extensive in-theater care as practiced in World War II and Korea was the model. These challenges have grown over time as warfighting and the practice of medicine have evolved. Examples of these growing changes include:[4]

- Moving to a more decentralized, mobile battlefield—which drives a smaller medical footprint in operational theaters;
- Evacuating casualties early—which is better for the casualties and reduces risk to forces in theater;

2. Quality is not addressed because there is less existing quantitative evidence to draw upon and it merits its own detailed analysis, but the NDAA reforms and the recommendations outlined in this report could result in the improvement of the quality of care delivered at MTFs.

3. For an historical survey, see Bernie Rostker, Providing for the Casualties of War: The American Experience through World War II, RAND, 2013. http://www.rand.org/content/dam/rand/pubs/monographs/MG1100/MG1164/RAND_MG1164.pdf

4. This material is drawn from John E. Whitley, Brandon Gould, Nancy Huff, and Linda Wu, "Medical Total Force Management," IDA Paper P-5047 (Alexandria, VA: Institute for Defense Analyses, May 2014). https://www.ida.org/idamedia/Corporate/Files/Publications/IDA_Documents/CARD/P-5047.ashx See that paper for a more detailed discussion. It also draws on the author's testimony to the Senate Armed Services Committee on February 23, 2016. http://www.armed-services.senate.gov/imo/media/doc/Whitley_02-23-16.pdf

- Greater specialization in the profession of medicine; and
- Shifts in medical workload on the modern battlefield, e.g., more immediate and less definitive care, different wound and injury patterns as body armor and weapons evolve and earlier transportation of patients than would have occurred in earlier conflicts.

Changes in the way wars are fought have led to changes in the way in-theater medical care is delivered. The shift to more mobile operational forces with a lighter theater footprint resulted in a change to operational medical capabilities. Medical forces may be deployed closer to front-line units providing more immediate complex care, but less extended in-theater care with the focus on rapid evacuation to hospitals outside the operational theater.

Given medical forces closer to the battle providing more immediate care with less extended care, this new reality limits the ability for substitution across specialties. Thus, increasing the demand for highly specialized medical personnel. In addition, as medicine becomes more specialized the idea of substitution itself raises concerns about the standard of care being delivered on the battlefield. In summary, the degree of overlap between the operational mission and the beneficiary care mission has eroded over time, causing the readiness requirement to become increasingly focused on more complex immediate life-saving care that is seldom seen in peacetime MTFs.

To illustrate this challenge, Table 1 provides the top ten inpatient diagnoses in the military hospital system in 2015 and Table 2 provides the top ten inpatient diagnoses in Iraq in 2007 (a year with a high level of medical activity).[5]

Table 1. Top Ten Inpatient Diagnoses in Military Hospitals, 2015

Clinical Classification Software (CCS) Grouping	Dispositions
Newborn Care	48,490
Normal Pregnancy and Delivery	46,947
Complications of Pregnancy	45,427
Unclassified Care	44,281
High Blood Pressure	43,701
Perinatal Conditions	37,695
Screening/History of Mental Health and Substance Abuse	36,403
Complications of Pregnancy - Care of Mother	32,708
Disorders of Lipid Metabolism	31,305
Nutritional, Endocrine and Metabolic Disorders	27,887

5. These tables and the accompanying discussion are adapted from Whitley, et al., "Essential Medical Capabilities and Medical Readiness," July 2016, IDA Paper NS P-5305. https://www.ida.org/idamedia/Corporate/Files/Publications/IDA_Documents/CARD/2016/P-5305.ashx

Table 2. Top Ten Inpatient Diagnoses in Iraq, 2007	
Clinical Classification Software (CCS) Grouping	**Dispositions**
Open wounds of head, neck and trunk	3,488
Open wounds of extremities	2,650
Other injuries and conditions due to external causes	2,274
Fracture of lower limb	992
Nonspecific chest pain	986
Abdominal pain	683
Crushing injury or internal injury	589
Other specified and classifiable external causes of injury	571
Fracture of upper limb	563
Skin and subcutaneous tissue infections	543

The largest categories of care in MTFs are obstetrics and pediatric related while the mission essential care in theater is generally trauma related. These tables understate the challenge. In addition to having different preponderances of diagnoses, even when the diagnoses overlap, they differ in their severity. For example, some open wounds of the head, neck and trunk are seen in military hospitals, but the cases seen in Iraq were over twice as severe (as measured by probability of death) as those seen in military hospitals. For open wounds of extremities, the Iraq cases were almost four times as severe as the military hospital cases.

The lack of appropriate case mix in MTFs affects the ability of medical personnel to respond most effectively to in-theater trauma events. A primary challenge is that military medical personnel are not as ready for their deployed mission as they could be. The Military Compensation and Retirement Modernization Commission (MCRMC) reported that:

> [s]urgeons overwhelmingly cited vascular surgeries as the most difficult cases [they faced in combat], followed by neurosurgical procedures, burns and thoracic cases. Surgeons reported they had difficulty with these procedures because they had not performed them in nondeployed clinical settings and because there had been a substantial time lapse since they had last treated these types of injuries.[6]

In an earlier study, the Government Accountability Office (GAO) reported that

> "[s]ince most military treatment facilities provide health care to active-duty personnel and their beneficiaries and do not receive trauma patients, military medical personnel cannot maintain combat trauma skills during peacetime by working in these facilities."[7]

This reality may lead to tragic results during wartime. In a detailed examination of the over 4,000 deaths of American service members in Iraq and Afghanistan from 2001 to 2011, nearly a quarter of the deaths may have been from potentially survivable injuries.[8]

6. MCRMC Final Report, 63–64, citing Joshua A. Tyler et al., "Combat Readiness for the Modern Military Surgeon: Data from a Decade of Combat Operations," Journal of Trauma and Acute Care Surgery 73, No. 2 (2012): S64–S70, http://www.ncbi.nlm.nih.gov/pubmed/22847097.

7. General Accounting Office, "Medical Readiness: Efforts Are Underway," 12.

8. Eastridge, B. J., R. L. Mabry, P. Sequin, J. Cantrell, T. Tops, P. Uribe, O. Mallett, T. Zubko, L. Oetjen-Gerdes, T. E. Rasmussen, F. K. Butler, R. S. Koltwal, J. B. Holcomb, C. Wade, H. Champion, M. Lawnick, L. Moores, and L. H. Blackbourne. "Death on the battlefield (2001-2011): implications for the future of combat casualty care." Journal of Trauma and Acute Care Surgery 73, No. 6 Suppl 5 (December 2012): S431–7. doi: 10.1097/TA.0b013e3182755dcc.

A second impact of this challenge is that

> "[r]elying on existing MTF medical cases as a training platform for combat care can result in a misalignment of military medical personnel compared to the medical requirements necessary to support the operational missions."[9]

Table 3 illustrates this misalignment in the early years of Operation Iraqi Freedom and Operation Enduring Freedom. During these operations, the in-theater medical force required specialties, such as surgeons and anesthesiologists, but the actual deployed force was composed of specialties that were more in demand for beneficiary healthcare provided at MTFs.

Table 3. Misalignment of Medical Force

Specialty	FY 2004 Military Requirement	FY 2004 Executed End-Strength	End-Strength Minus Requirement
Pediatrics	286	645	359
Obstetrics	208	387	179
Anesthesiology	318	259	-59
General Surgery	685	443	-242

Source: "DoD Force Health Protection and Readiness—A Summary of the Medical Readiness Review, 2004–2007," June 2008.

Although the misalignment reduced somewhat during the wars,[10] more recent research has found that misalignment challenges remain:

> Today the U.S. Army has less than a dozen prehospital physician specialists and about the same number of trauma surgeons on active duty. By comparison, the Army has roughly the same number of radiation oncologists and nearly three times the number of pediatric psychiatrists and orthodontists. This is largely because medical specialty allocations are based on traditional peacetime beneficiary care needs. Refocusing on the wartime needs could populate key institutional and operational billets with a critical mass of trained prehospital and trauma specialists and drive further advances in battlefield care during peacetime.[11]

These alignment issues are a significant readiness challenge. During the wars, the medical force experienced uneven deployment rates, with the operationally required specialties having relatively high deployment rates and experiencing potential force stress while other specialties hardly deployed.[12]

High Costs

A second major challenge is that DoD's direct care system is expensive to operate. The average military hospital costs about 50 percent more to deliver inpatient care than it would cost to purchase that care in the local markets at current payment rates.[13]

9. MCRMC Final Report, 64–65.
10. John E. Whitley et al., "Medical Total Force Management."
11. R. L. Mabry and R. DeLorenzo, "Challenges to Improving Combat Casualty Survival on the Battlefield," Military Medicine 179, No. 5 (May 2014): 477–82.
12. Whitley et al., "Medical Total Force Management."
13. See Philip Lurie, "Comparing the Costs of Military Treatment Facilities with Private Sector Care," IDA P-5262 (Alexandria, VA: Institute for Defense Analyses, 2016) (forthcoming). See Table 6, p. 27.

Table 4 illustrates this cost difference for three markets in which DoD operates.[14]

Table 4. Military Hospital Inpatient Costs versus Private Sector Care

Market	Inpatient Military Hospital Cost	Cost of Purchasing Same Care in Local Market
Nellis Air Force Base, NV	$34,624,144	$29,909,465
Naval Air Station Pensacola, FL	$31,180,755	$13,747,915
Ft. Polk, LA	$14,727,029	$6,604,439

Source: Lurie, "Comparing the Costs of Military Treatment Facilities with Private Sector Care."

When the direct care system is successfully delivering its readiness mission, i.e., providing readiness training for the military medical force, this excess cost may be justified—a necessary cost for ensuring our warfighting capability. When the direct care system is not successful at meeting that readiness mission, this excess cost is a source of inefficiency—consuming taxpayer resources that could be used to increase compensation or be reallocated elsewhere in the defense budget.

DoD recently conducted an extensive internal study of the direct care system. It found that many military hospitals did not have economically viable inpatient capacity. It recommended that these facilities should be right-sized to the workload they can effectively support. This study, the MHS Modernization Study, was unable to directly assess the degree to which military hospitals were meeting the readiness mission. Instead, it focused on workload in major specialty areas. Although imperfect, this workload analysis provided a valuable measure for the readiness question—a hospital that does not have enough workload in a particular medical specialty area to maintain an economically viable capacity cannot maintain the readiness of military providers in that area.

The MHS Modernization Study also provided evidence on one cause of the direct care system's high cost. It found low levels of productivity across medical specialties and facilities. The study compared workloads of DoD providers in the direct care system with civilian provider workloads. It found that DoD providers were generally below the tenth percentile of civilian providers in workload produced per year. This is a cause of the cost difference and also contributes to the readiness challenge of the MTFs.

NDAA Reforms

In response to these and other challenges, the FY 2017 NDAA directs the most sweeping reforms of the military health system in over a generation. The NDAA requires a wide range of reforms that include:

- Changes to the healthcare benefit, including changes to the healthcare benefit plans and higher cost shares, expanded access to urgent care and extended coverage to reserve personnel.
- Changes to the TRICARE contracts for private sector care, including expanded use of value based purchasing methods.
- Increased focus on readiness and changes to force management, including establishing a joint trauma system and a joint trauma education and training directorate, and removal of restrictions converting non-readiness functions to civilian performance.

14. Inpatient care is used for illustrative purposes. Comparisons of outpatient care yield similar results.

Significant provisions of the NDAA also focus on improving and modernizing the direct care system. Specifically, sections 702 and 703 outline reforms for the direct care system. Section 702 transfers responsibility for administering the MTFs from the military Services to the centralized Defense Health Agency (DHA). This is a major change. The conference report states:

> "a single agency responsible for the administration of all MTFs would best improve and sustain operational medical force readiness and the medical readiness of the Armed Forces, improve beneficiaries' access to care and the experience of care, improve health outcomes and lower the total management cost of the military health system. The conferees believe that the current organizational structure of the military health system—essentially three separate health systems each managed by one of the three Services—paralyzes rapid decision making and stifles innovation in producing a modern health care delivery system that would better serve all beneficiaries. A streamlined military health system management structure would eliminate redundancy and generate greater efficiency, yielding monetary savings to the Department while leading to true reform of the military health system and improving the experience of care for beneficiaries."

Section 703 builds on this change, establishing the requirements for the types of MTFs that can be maintained in the direct care system. Three types of MTFs are identified:

- Medical Centers: Can be designated in areas with a large population of military personnel and covered beneficiaries, to serve as referral facilities. These provide inpatient and outpatient care, and provide graduate medical education and residency programs. Importantly, medical centers shall have level one or two trauma capability. They may also be designated as a center of excellence for specialized care such as polytrauma or burn care. In short, medical centers will be the flagship hospitals of the direct care system and must be trauma centers to ensure they have workload relevant to readiness.
- Hospitals: These MTFs are to be maintained in areas where civilian healthcare facilities are unable to support the healthcare needs of military personnel and covered beneficiaries. These have traditionally been called community hospitals and DoD has identified isolated CONUS (ICONUS) locations that are underserved by civilian healthcare.
- Ambulatory care centers: Facilities that cannot be made into medical centers (e.g., with level one or two trauma capability) or justified as hospitals (e.g., ICONUS locations) are to be transitioned to outpatient facilities. Ambulatory care centers will provide outpatient care to support the medical readiness of the force and work in partnerships with civilian facilities for other care.

This creates a formal structure for MTFs that will be discussed in more detail in the next chapter. To enable this rationalization of the direct care system, section 706 of the NDAA directs establishment of military-civilian integrated delivery systems, i.e., public-private partnerships. As MTFs that cannot support readiness (medical centers) or be justified as ICONUS hospitals are transitioned to clinics, public-private partnerships are to be used to:

- Improve access to health care for covered beneficiaries;
- Enhance the experience of covered beneficiaries in receiving health care;
- Improve health outcomes for covered beneficiaries;
- Share resources between the DoD and the private sector, including such staff, equipment and training assets as may be required to carry out such integrated health delivery systems;

- Maintain services within military treatment facilities that are essential for the maintenance of operational medical force readiness skills of health care providers of the Department; and
- Provide members of the Armed Forces with additional training opportunities to maintain such readiness skills.

The final enabling provision to be focused on here is section 717, which expands the patient base of MTFs to include civilians and veterans. Treating civilians and veterans is authorized when necessary to attain the relevant mix and volume of medical casework required to maintain medical readiness skills and competencies of health care providers at the facility. This will be essential to comply with section 703 which requires medical centers to maintain level one or two trauma capability. Maintaining this capability requires a high volume of trauma cases and the DoD beneficiary mission does not provide sufficient volume, so it must be obtained by expanding the patient base.

Five Actions to Improve Military Hospital Performance

The previous chapter identified major MTF challenges (readiness, cost and quality) and the reform direction set by the FY 2017 NDAA. It specifically focused on the readiness and cost challenges as well as highlighted key reforms required by the NDAA. This chapter identifies five specific recommended actions DoD can take to transform and modernize military hospitals. The NDAA reforms direct specific changes consistent with most of these recommendations. Many of the recommended actions have been implemented on limited scales (or in other mission areas). Where available, these examples are illustrated.[15] There are also some gaps in the NDAA reforms, which are identified in the below actions.

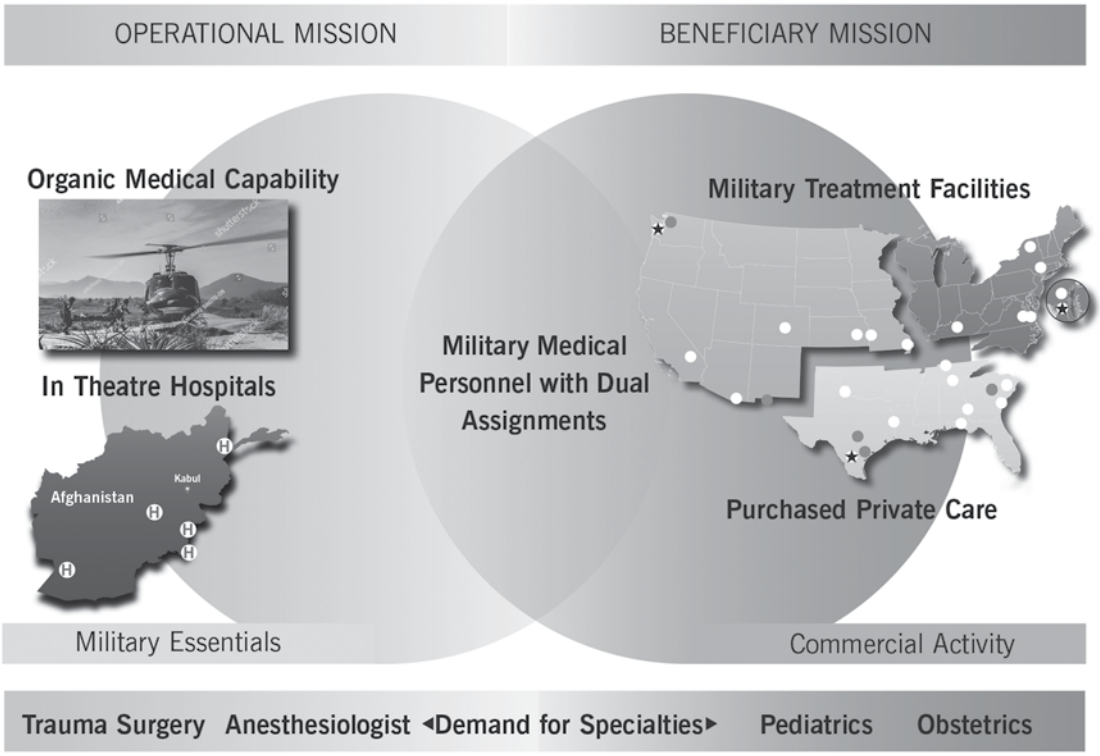
Provide Clear Roles and Missions

The Military Health System (MHS) is a complex interweaving of missions (beneficiary care and readiness), delivery systems (MTFs and purchased care), benefits and funding sources. Over time, this has led to duplicative management layers and a structure that fails to incentivize unity of effort on the key outcomes of maintaining readiness, providing a high-quality benefit and controlling cost. Reform must begin with improving incentives within the system to focus on outcomes.

Chapter 2 outlined the dual-mission framework of the MHS and how the MTFs sit at the intersection of the readiness and benefit missions. Military medical personnel have had dual assignments; they are assigned to a MTF to provide beneficiary healthcare and are also assigned (directly in their assignment orders or indirectly by forming a pool of available personnel) to an operational platform such as a theater hospital or a surgical company. Figure 1 illustrates this dual-mission framework.

15. Much of this chapter is adapted from the author's written testimony to the Senate Armed Services Committee, Subcommittee on Personnel, February 23, 2016. https://www.armed-services.senate.gov/imo/media/doc/Whitley_02-23-16.pdf

Figure 1. Dual-Mission Framework of MHS



The dual-mission framework dominates the organization of the MHS. Military personnel are required for the operational mission, but used for the beneficiary care mission. MTFs are justified as readiness training platforms for the operational mission, but used for the provision of beneficiary healthcare. A large portion of the funding for both missions is provided in the consolidated Defense Health Program (DHP) appropriation. Military medical leaders are responsible for both missions, but typically have their performance evaluations dominated by beneficiary care considerations.

The challenge with this dual-mission framework is that, as identified earlier, there is little overlap in the case mix between the two missions. Military hospital commanders are placed in the impossible situation where they are told to keep the medical force ready, but are evaluated and spend almost all of their time on beneficiary healthcare with few tools and little opportunity to get their providers the case mix needed for maintaining readiness competencies. Some simple examples of the confusion created by the lack of clarity on roles and missions include:

- Emergency Medicine: Emergency medicine physicians were one of the specialties with the highest deployment rates to Iraq and Afghanistan.[16] But touring a typical MTF reveals that the Emergency Department is often staffed with contracted civilian physicians while pediatrics and obstetrics (specialties with relatively low deployment rates) are mostly military.
- Outsourcing Surgical Workload: Surgical workload is generally more relevant for maintaining the clinical skills of the military medical force, but MTFs generally outsource this workload to private sector care while retaining in house more care in areas like obstetrics. Table 5 illustrates this for three DoD markets and it can be seen that obstetric workload is

16. Whitley et al., "Medical Total Force Management." See Figure 2, p. 32.

generally kept in house at over twice the rate of surgical workload.

Table 5. Surgical versus Obstetric Workload Mix

Market	Surgical Workload			Obstetric Workload		
	Military Hospital	Purchased Care	% Military	Military Hospital	Purchased Care	% Military
Las Vegas, NV	1,315	4,749	22%	582	651	47%
Pensacola, FL	657	5,403	11%	368	888	29%
Ft. Polk, LA	192	203	49%	409	24	94%

- Graduate Medical Education (GME) Programs: The direct care system supports DoD-run GME or residency programs, but there has historically been little attempt to focus these on operationally required specialty areas like trauma, surgery, emergency medicine, etc.

The bottom line is that maintaining the readiness of the military medical force and operating an MTF system for beneficiary healthcare are two different missions. Effective and efficient management of military hospitals requires them to have a clearly defined mission and for their leaders to have this mission clearly communicated to them. Currently they are supposed to provide clinical workload for readiness but fail to do so and instead, practically speaking, are focused almost exclusively on providing beneficiary healthcare. To improve the direct care system, DoD should end this confusion over missions by clearly articulating why MTFs are being maintained and what they are to be managed to produce.

The NDAA reforms provide clear framework for DoD to work within:

- Section 702 moves management of the MTFs from the Services to DHA. This helps to resolve a conflict of interest within the Service medical departments. The military services are supposed to be focused on the readiness mission, the benefit mission is a non-military essential personnel management function. But ownership of the MTFs, which brings significant funding, staff and visibility with beneficiaries, has biased the Service medical departments to focus on beneficiary healthcare and protection of MTFs at the expense of readiness. Transferring responsibility for the MTFs to a supporting defense agency reduces this conflict of interest.
- Section 703 directs classification of MTFs based on their mission. To be classified as a DoD medical center the MTF must become a trauma center that receives civilian patients (section 717), which would allow it to provide the relevant case mix for readiness. These would be the only MTFs that directly support the readiness mission and be managed with that as an objective. All other MTFs are to be classified as community hospitals—which would be focused on beneficiary healthcare and managed solely for the quality and cost of that healthcare—or be downsized to clinics.
- If rigorously executed by DoD, this clarification of roles and missions will be an important element of improving MTF management. The Service medical departments will be responsible for the readiness of the military medical force. DHA will be responsible for managing MTFs and delivering the benefit. MTFs classified as medical centers will have a readiness mission which can be factored into their funding level and management plan. All other MTFs would only be focused on beneficiary healthcare and managed for quality and cost.

To effectively implement the NDAA direction, DoD should direct that:

- The military medical departments are responsible for readiness of the medical force.[17] They should document their mission in a strategic plan that clearly articulates the goal of maintaining a medical force that can start the next war with zero deaths from potentially survivable injuries and ensures unity of effort across the military chain of command on this goal.
- The DHA is responsible for professional management of MTFs. In many cases, this will likely be civilian management (government civilian or contracted) since MTF management is not a military essential function.[18] The articulated goal for medical center management should include readiness in addition to quality and cost. The goals for community hospital and clinic management should be clearly defined as quality and cost, professional management employed to achieve these goals, and when the goals are not achieved the facilities should be considered for closure.

The remaining four actions described in this chapter all tie back to these recommendations and provide additional mechanisms for their implementation.

Financial Management Reform

The NDAA provided a nearly comprehensive reform of military hospitals, but one major area of reform was omitted—financial management reform. The lack of transparency in the funding of the MHS is a root cause of many of its challenges today. Funding for most of the direct care system is provided through the DHP budgetary account. Within the MHS, the DHP appropriation provides almost all of the funding for the beneficiary mission and a portion of the funding for the readiness mission in a single, undifferentiated amount. The impact of this on resource allocation decision making includes:

- Healthcare benefits and medical readiness are put into a direct competition for resources. Decision makers are forced to make tradeoffs between increasing medical readiness at the expense of the health benefit or vice versa, with no direct considerations of readiness more broadly or compensation more broadly.
- Medical readiness is removed from tradeoff considerations with other readiness functions within each Service. Services cannot easily create a balanced readiness plan across medical and non-medical functions.
- Healthcare benefits are removed from tradeoff considerations with other compensation instruments (e.g., base pay, special and incentive pays, retirement and quality of life programs). Compensation cannot be easily understood and balanced across the range of compensation instruments by DoD personnel officials.

This distortion of decision making trade-offs is compounded by the lack of visibility and transparency available to the Service leadership, Office of the Secretary of Defense (OSD) and Congress. This reduces incentives to manage healthcare. For example, a Service Chief has little incentive to actively manage the healthcare portfolio because doing so incurs the political cost of managing a three-star officer within the Service while failing to yield a budgetary benefit (the savings are within an OSD DHP account and unlikely to be given to the Service).

17. Section 711 of the FY 2018 NDAA passed by the House of Representatives provides this direction.
18. Section 723 of the FY 2018 NDAA Senate draft specifically authorizes civilian directors of MTFs.

Financial management reform was included in the recent Military Compensation and Retirement Modernization Commission (MCRMC) recommendations.[19] In its report, the MCRMC explained:

> "[The] MHS is currently funded from a variety of sources, including Defense Health Program appropriations (operations and maintenance, procurement and research and development), the Services' military personnel appropriations, Defense-wide military construction appropriations and payments from the Medicare-Eligible Retiree Health Care Fund (MERHCF). These funds cover medical readiness costs, including delivering care to active-duty Service members and training for military medical personnel and the costs of delivering care to beneficiaries. The budgeting process, as currently designed, does not allow for distinction between these two expenditures. This flow of funding can have a negative effect on the MHS. As GAO has written, 'choices about the method of budget reporting represent much more than technical decisions about how to measure cost, rather they reflect fundamental choices about the controls and incentives to be provided by the decision-making process."[20]

In developing its recommendations in this area, the MCRMC was guided by basic principles of funding and budgetary account structure:

- Costs of personnel benefits should reside in military personnel budget accounts.
- Costs of readiness should appear in Service readiness-related budget accounts.
- MTFs and other activities replicating commercial activities should be funded according to outputs produced, not inputs consumed.
- Costs should be recognized in the budget when the obligation is incurred.

The third principle addresses the MTF funding challenge directly, which is a subset of the broader military healthcare financial management challenge. Military hospitals replicate commercial activities (i.e., commercial hospitals) and produce readily identifiable outputs (i.e., healthcare procedures), but they are not paid according to their outputs and instead receive a budget for inputs (personnel, operating expenses, procurement expenses and construction expenses). Funding large DoD support missions that approximate commercial activities with direct appropriation for their inputs rather than on a reimbursable basis for outputs produced is a funding mechanism long ago abandoned in most other large support areas, e.g., logistics, financial services and information services. Military hospitals, however, still receive funding for inputs consumed instead of outputs they produce.

19. Military Compensation and Retirement Modernization Commission Final Report, 2015. http://www.mcrmc-research.us/02%20-%20Final%20Report/index.html

20. Government Accountability Office, Accrual Budgeting: Experiences of Other Nations and Implications for the United States, Report to the Honorable Benjamin L. Cardin, House of Representatives, GAO/AIMD-00-57, accessed December 19, 2014, http://www.gao.gov/assets/160/156759.pdf.

Funding the Support Establishment at DoD

There is extensive literature on the funding of supporting activities that replicate commercial activities and it is useful to review some of this literature in detail:

> "Improving the support establishment requires, above all, a financial management system that provides accurate and timely information on costs to customers, employees, managers and decision makers at all levels of DoD, the Administration and Congress. Cost and performance must be linked. Although DoD is not a business to make a profit, DoD activities need a businesslike financial management system that concentrates on outcomes or outputs.[21]
>
> … All Support Must Be Reimbursable: The organization generating a requirement should justify and obtain the funding for that requirement. Goods and services needed to meet the requirement should then be purchased from specialized organizations set up to provide those products. Under this concept, the customer drives the workload, quality and timeliness; the supplier is responsible for and held accountable for the unit cost of meeting these requirements. Every dollar spent on support represents a dollar not available to the operating force and one more tax dollar. Every dollar reduced from the cost of support represents a dollar to increase the size and readiness of the force, to obtain new equipment, or to reduce the deficit. The reimbursable procedure makes sure that decisions are made in the right place.[22]
>
> … The following rules are necessary:
>
> **1.** All costs of an organization must be allocated to an output, or product. The sale of products to customers must fund the total support operation. All production costs should be charged to that product, no matter who incurs them.
>
> **2.** Customers of a support organization, no matter who they are, should dictate workload and performance.
>
> **3.** Standard business accounting methods should relate all overhead costs of support organizations to the output of those organizations.
>
> **4.** Each business area should pay other supporting units for service they receive, including automated data processing (ADP), communications, civilian personnel administration, accounting and financial operations such as payroll, security and so forth. Individual support activities are the requirers when they purchase support and make capital investments such as new facilities, major repairs and renovations. These investments impact the quality and cost of the organizations' products, so managers and those affecting working conditions should make the investments. Only they can make those judgements for which their bosses and customers should hold them accountable.
>
> **5.** The prices of the outputs of each support organization should reflect all the costs of their operations, including depreciation of investments and the cost of assigned military personnel.
>
> **6.** The cost of operating and maintaining a DoD installation (base operations) should be allocated to the businesses and units located on that installation using standard allocation methods."[23]

21. Shycoff, Don, "The Business of Defense," JKS Publishing Company, 1995. Page 30.
22. Shycoff, Don, "The Business of Defense," JKS Publishing Company, 1995. Page 33.
23. Shycoff, Don, "The Business of Defense," JKS Publishing Company, 1995. Page 34.

The mechanism used for implementing this management change is a revolving fund. Military hospitals are a major outlier in defense management. By far, MTFs are the largest supporting activity of this type not funded through a revolving fund. The most common type of revolving fund used for supporting activities in DoD is a working capital fund (WCF). The Secretary of Defense may create WCFs for support activities under 10 USC 2208.[24] The statute gives the WCF purpose as, "To control and account more effectively for the cost of programs and work performed in the Department of Defense." Because these programs can require some or all of the costs of the supporting activity to be paid by the customer, in turn they force the supplier to more fully account for their costs and control their expenses. The U.S. Government "Red Book," the "Principles of Federal Appropriations Law," discusses the DoD WCFs in general as permitting, "the financing of some entity or activity on what is regarded as a more "business-like" basis.[25] More specifically, the DoD Financial Management Regulation (FMR) discusses the design of the WCF as providing, "... a more effective means for controlling the costs of goods and services required, produced, or furnished by [Defense WCF] activities." In addition, the FMR indicates they are designed to create contractual relationships among DoD activities, provide managers flexibility to promote efficiencies, encourage cross servicing and facilitate the budgeting process to underline the cost consequences of choosing among alternatives.[26]

24. The material in this paragraph was summarized and provided by Dan Cuda of the Institute for Defense Analyses.
25. Principles of Federal Appropriations Law, Volume 3, pg 12-85.
26. DoD Financial Management Regulation (DoD 7000.14-R), Volume 11B, Chap 1, pg 1-3 & 14.

The box below illustrates some examples of how other DoD supporting activities are funded using revolving funds.

Defense Working Capital Funds for Mission Support Activities

DoD uses revolving funds for most large mission support activities, including depot maintenance, supply, finance and accounting services and IT. One large example is the DoD supply function administered by the Defense Logistics Agency (DLA). DLA manages the supply of almost $40B of items ranging from aircraft parts to ammunition to medical supplies. In the Defense Working Capital Fund, consumers of DLA's goods pay for the items they need from their operating budgets providing revenue to the fund. DLA purchases goods and funds its operating expenses (personnel, transportation, etc.) from this revenue. As discussed above, this creates incentives for the operating forces to understand and control their demand (they have to pay for what they consume) and it creates a business environment for DLA to discipline this mission support function.

Another example is transportation, and the Transportation Working Capital Fund (TWCF) illustrates a particular point relevant to healthcare. The TWCF covers a wide range of transportation, including airlift, sealift, surface deployment and distribution and courier services. For airlift, the military uses planes that are designed for combat operations, e.g., they are constructed to be more rugged than civilian aircraft, can operate in more austere conditions and have countermeasures to protect against hostile attacks. This makes military aircraft more expensive to operate than typical civilian aircraft. This creates a challenge for TWCF operations. To create incentives for efficient management, operating forces should be allowed to compete their demand between civilian and military air transport service providers. But if the TWCF had to achieve full cost recovery, it would have to charge higher rates than civilian carriers because of its more expensive aircraft (the readiness requirement). To deal with this challenge, reimburse rates for the TWCF are set equal to approximate civilian rates and the excess readiness cost is directly funded through appropriations. This is similar to the challenge MTFs would face if they maintain a more expensive workforce to meet readiness requirements. Following the TWCF model, MTFs could be reimbursed for care at commercial healthcare reimbursement rates and direct funding applied for readiness costs.[27]

The structure of a reformed MTF funding process was provided in the MCRMC report in the context of a full transformation of MHS funding. The box below provides the MCRMC recommendation on funding reform in full. The key element for MTF reform is that the MTFs should be funded in a revolving fund that earns revenue from provision of healthcare services and, for medical centers, from the provision of readiness services. The payments for healthcare services should come from the health benefit plan manager(s), which are funded from military personnel accounts, and any readiness payments should come from the military Services' readiness accounts. This will provide direct visibility and accountability for cost in the direct care system.

27. This section draws on material that was provided by Dan Cuda and Jim Dominy of the Institute for Defense Analyses.

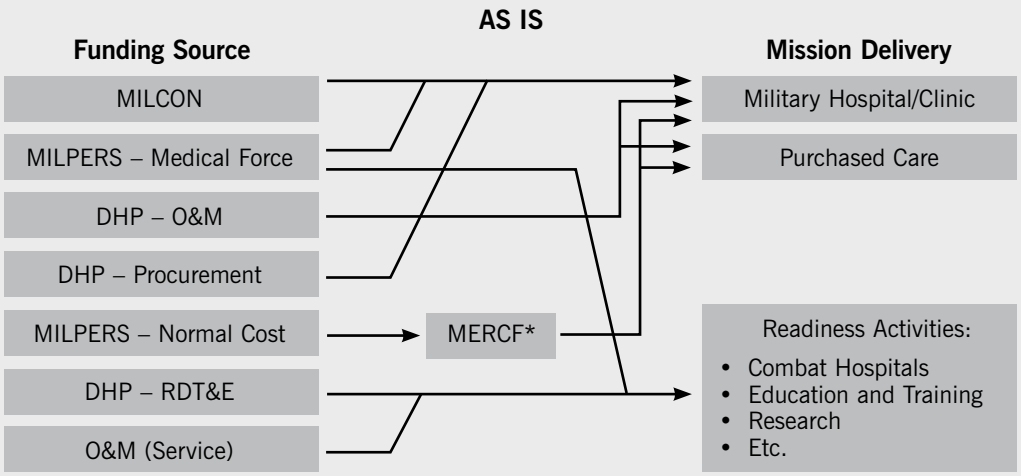
Comprehensive MHS funding Reform Recommended by MCRMC

"The Congress should adjust the flow of funding to better align DoD medical programs with their purpose and operations.

- Funding for active-duty family, retiree and Reserve Component health care should be contained in Services' Military Personnel (MILPERS) budget accounts.
- The MERHCF should be expanded to cover the health care and pharmacy programs for non-Medicare-eligible retirees. Non-Medicare-eligible retiree health care should be accrual-funded, similar to how Medicare-eligible retiree health care is today.
- To finance the new health care program for active-duty families, RC members and families and non-Medicare-eligible retirees (see Recommendation 6), funds should be transferred as follows:
    - For active-duty families and RC members and families, funds should be transferred from the MILPERS accounts to the Employee Health Benefits Fund managed by the Office of Personnel Management (OPM).
    - For non-Medicare-eligible retirees, funds should be transferred from the MERHCF to the Employee Health Benefits Fund managed by OPM.
- To finance the existing pharmacy and dental programs for families and RC members and families and pharmacy, dental and health care for active-duty Service members, a new trust fund should be created and managed by DoD for health care expenditures appropriated in the current year.
- The MTFs should be funded through a revolving fund using the reimbursements they receive for care delivered.
- In the case of MTF operations that are deemed required for EMC skill maintenance, costs that exceed the revenue generated from the delivery of care should be paid by the Services' Operations and Maintenance (O&M) accounts. This amount would be a necessary cost of readiness of the medical force.
- The Congress should eliminate the Defense Health Program budget account because health care should be funded from MILPERS accounts for transfer to the trust funds referenced above and readiness costs should be resourced from Services' O&M accounts."

The Commission's recommendation substantially improves the transparency of funding of the Military Health System (MHS). As shown in the following charts, the MHS is currently resourced by multiple funding categories (operations and maintenance, procurement, military personnel, etc.), rather than supported mission (readiness vs. beneficiary health care).

Figure 2. Current MHS Resourcing

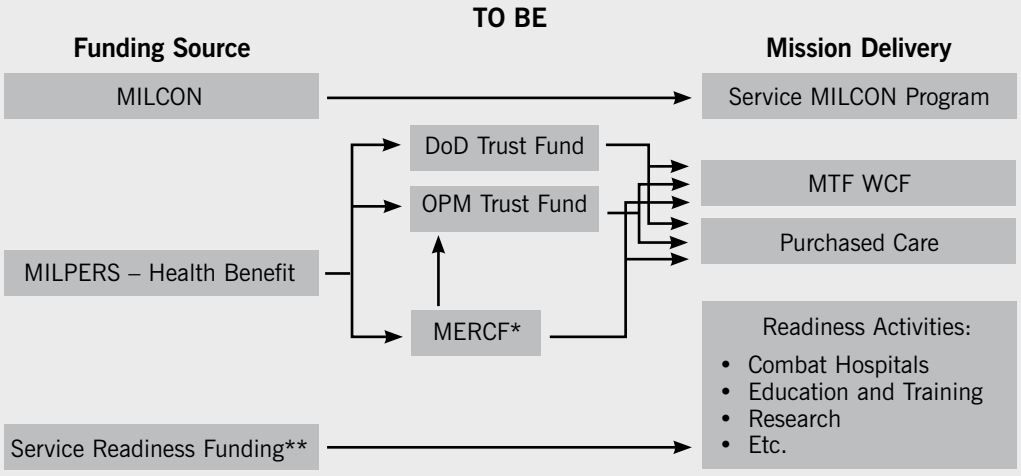


*Also receives a payment from Treasury for amortization of unfunded liability.

Comprehensive MHS funding Reform Recommended by MCRMC (continued)

The Commission recommendations result is a more streamlined, efficient flow of MHS resources, thereby improving MHS transparency, effective management and the ability to identify and protect readiness funding.

Figure 3. Proposed MHS Resourcing



* Also receives a payment from Treasury for amortization of unfunded liability.
** Services would now have all readiness funding (MILPERS, O&M, and RDT&E) provided to them. Service readiness funding may be used to subsidize MTFs that are required for readiness but not able to cover their costs.

Under the Commission's recommendation, medical readiness operations would be funded from the Services. Beneficiary costs would be funded from the Services' Military Personnel (MILPERS) and Military Construction (MILCON) accounts. This approach makes these costs separately identifiable and allows for the direct monitoring of readiness funding. The key flows of funding illustrated in the figure above include the following:

- AC Service member health benefits are funded from MILPERS accounts and transferred to the DoD trust fund for use in paying for health care.
- ADFM health benefits are funded from MILPERS accounts and transferred to the DoD Trust Fund for dental and pharmacy benefits and OPM Trust Fund for commercial health plans.
- Retiree (both Medicare-eligible and non-Medicare-eligible) health benefits are funded from MILPERS and paid into the Medicare Eligible Retiree Health Care Fund. Major disbursements from the fund include payments to the OPM Trust Fund for commercial health plans for non-Medicare-eligible retirees and to the Military Treatment Facility revolving fund and purchased care for the pharmacy benefit of non-Medicare-eligible retirees and for all benefits for Medicare-eligible retirees."

Data Driven Management Reform

A significant implication of not having clearly defined roles and missions combined with comingled non-transparent funding is that there has been little emphasis on data driven management within the MHS. This is particularly striking given the enormous amount of data generated by MHS operations, e.g., detailed healthcare encounter and procedure records numbering in the hundreds of millions. Basic questions the MHS cannot, or struggles to, answer include:

- How ready (i.e., clinically proficient) is the military medical force working in MTFs?
- What is the cost of maintaining readiness and the cost of delivering the health benefit?
- What is the quality of care delivered to beneficiaries in the MTF system?[28]

These are difficult questions for any medical system, public or private, to answer, but civilian medical systems have the disciplining force of competition—if a system fails to perform, the patients go elsewhere—and the requirement to remain economically viable. For a public system spending over $50 billion per year of taxpayer funding with the lives of its service members in combat at stake, implementing data driven management is an important action to undertake.

Given the operational mission of DoD, the most important place to start is readiness evaluation. The lack of assessment of readiness of the medical force was highlighted by the MCRMC, which recommended establishment of Essential Medical Capabilities (EMCs) for tracking readiness:

> "EMCs should include clinical and logistics capabilities necessary to accomplish operational requirements such as combat casualty care; medical response to and treatment of injuries sustained from chemical, biological, radiological, nuclear and explosives incidents; diagnosis and treatment of infectious diseases; aerospace medicine; and undersea medicine. EMCs also include a limited number of SMCs [Specialized Military Conditions], not primarily performed in theater but commonly associated with military operations (e.g., therapy for post-traumatic stress disorder). EMCs should not include medical missions or specialties not commonly associated with operational military medicine or SMCs. The Congress should require the Secretary of Defense and GAO [Government Accountability Office] to report annually on EMCs and their associated readiness metrics."[29]

Researchers and clinicians have developed detailed frameworks for assessing readiness. Establishing competence of personnel in providing healthcare is relatively straightforward because it can be measured by basic certifications. In contrast, clinical currency denotes a higher skill standard. Boston (2013) defines clinical currency as the "state of having up-to-date clinical qualifications in a practice environment that maintains readiness and leads to proficiency."[30]

28. This question is outside the scope of this report, but is included here for illustrative purposes.
29. MCRMC, Final Report, pg. 75.
30. COL Mark Boston, "Readiness and Currency: The Competency Continuum," (Briefing, HQ U.S. Air Force, November 2013), slide 8.

In other words, currency has two requirements beyond competence: readiness and proficiency. Readiness, the focus of DoD, is being prepared to act or be used immediately. Proficiency is the level of skill beyond competent and requires the provider to be highly competent, skilled and adept.[31,32]

Boston (2013) adapted the term proficiency from Dreyfus' model of skill acquisition.[33] The Dreyfus framework provides a hierarchical continuum of skills from novice to advanced beginner to competent to proficient to expert.[34] In this framework, proficient is the step beyond competent and refers to expertise. Clinical currency combines this higher level of skill (proficiency or, even better, expert) with readiness—the ability to execute that level of skill immediately without requiring additional time to attain the level of skill.

Similar to Boston (2013), Graser et al. (2010) defined a surgeon to be clinically current if he or she is "capable of performing surgery in his or her specialty immediately after arrival at a deployment site."[35] They define clinical currency as

> what medical personnel possess who have received the required training and experience to perform their medical duties without further training, instruction, or experience. Thus, a surgeon would be clinically current if he or she were capable of performing surgery in his or her specialty immediately after arrival at a deployment site.[36]

An important element of these definitions is that, while competence is largely based on factual (or declarative) knowledge, proficiency is focused to a greater extent on procedural knowledge and the higher level cognitive skills related to problem solving and decision making. In short, the skill levels from beginner to competent are based in large part on classroom knowledge and instruction, proficiency and readiness are based on extensive clinical experience. This creates a direct tie to data driven management because it means that experience is a key element (although not the only element) of readiness and experience is a key method used across DoD in assessing and documenting readiness.

31. Ibid.
32. For a discussion of data-driven management in DoD trauma care improvements, see Haut, Mann, and Kotwall, "Military Trauma Care's Learning Health System: The Importance of Data Driven Decision Making," Commissioned by the National Academies of Sciences, Engineering, and Medicine Committee on Military Trauma Care's Learning Health System and Its Translation to the Civilian Sector. http://nationalacademies.org/HMD/~/media/Files/Report%20Files/2016/Trauma-Care/Importance-of-Data-Driven-Decision-Making-CP.pdf?_ga=2.155538427.159631149.1494116960-2073173892.1494116582
33. S. E. Dreyfus, "The five-state model of adult skill acquisition," Bulletin of Science, Technology & Society 24 (2004): 177–81.
34. Boston, "Readiness and Currency," slide 9.
35. John C. Graser et al., The Economics of Air Force Medical Service Readiness, Report TR-859 (Santa Monica, CA: The RAND Corporation, 2010), xxiii.
36. Ibid., footnote 2, 2.

Use of Volume in Civilian Healthcare as a Measure of Proficiency[37]

"The use of volume as a partial measure of quality (and, for our purposes, proficiency) has expanded into many areas of civilian healthcare. For example, ACGME standards for residency training include some lower limits on the number of procedures done.[38] Moreover, some medical insurance programs specify minimum annual volumes for some procedures for candidates for their facility recognition programs.[39] Table 6 shows volume standards for Aetna's Institutes of Quality and Institutes of Excellence. Table 7 shows volume standards for Blue Cross Blue Shield Blue Distinction Centers.

Table 6. Aetna Institutes of Quality and Institutes of Excellence Volume Standards

Procedure	Required Annual Surgeon Volume	Required Annual Facility Volume
Bariatric surgery (inpatient)	100	125
Bariatric surgery (ambulatory)		75
Open heart procedures		200
Angioplasty or stent		200
Cardiac resynchronization (pacemaker, implanted defibrillator)		125
Knee replacement	50	200
Hip replacement	50	100
Spinal surgery	50	200
Adult kidney transplant		40
Adult bone marrow transplant		40
Adult liver transplant		30
Infertility clinic implant	20	

Source: Aetna Institutes of Quality® Facilities Fact Book. Extracted from Brevig et al., 2015.

37. This section is adapted from Holly Brevig et al., "The Quality-Volume Relationship: Comparing Civilian and MHS Practice" (Arlington, VA: CNA, January 2015) http://www.mcrmc-research.us/02%20-%20Final%20Report/CNA-Public-Release-Version_B237-DIM-2014-U-009221-Final.pdf and Whitley et al. "Essential Medical Capabilities and Medical Readiness," 2016, Institute for Defense Analyses, P-5305 5305 https://www.ida.org/idamedia/Corporate/Files/Publications/IDA_Documents/CARD/2016/P-5305.ashx
38. Boston, "Readiness and Currency."
39. Holly Brevig et al., "The Quality-Volume Relationship: Comparing Civilian and MHS Practice" (Arlington, VA: CNA, January 2015).

Use of Volume in Civilian Healthcare as a Measure of Proficiency

(continued)

Table 7. Blue Cross Blue Shield Blue Distinction Centers Standards		
Procedure	**Required Annual Surgeon Volume**	**Required Annual Facility Volume**
Total joint (knee + hip) replacement	At least 21% of the program's active surgeons performed at least 50 total joint replacements	250
Spine surgery	At least 32% of the program's active surgeons performed at least 50 total spine surgeries	100
Bariatric surgery	Primary surgeon performed 50 in last 12 months, at least 125 in career	
Cardiac care		10 episodes
Bone marrow transplant		24

Source: Blue Cross Blue Shield Association. Extracted from Brevig et al., 2015.

In some cases, volume is used as an implicit measure of quality. For example, eleven states have publicly accessible websites that provide hospital quality and cost information. This includes volume data but not standards. Additionally, some medical professional associations have policy statements that recognize the importance of procedure volume but without proposing or specifying volume standards. However, no associations have, to date, used volume as an explicit indicator of surgeon or facility quality.

The Leapfrog Group is a non-profit organization that compiles and publishes safety ratings based on data provided by hospitals that volunteer to participate in its program. Leapfrog membership includes many large corporations and public agencies that buy health benefits for their enrollees—covering more than 34 million beneficiaries and representing more than $62 billion in healthcare expenditures. Leapfrog ratings are publicly available on the organization's website.[40] The hospitals are rated on patient outcomes, on their use of appropriate safety processes and on meeting minimum annual volumes for select procedures. Table 8 shows Leapfrog Group volume standards for select procedures.

Table 8. Leapfrog Hospital Volume Targets					
Procedure	**Annual Surgeon Volume**		**Annual Surgeon Volume**		
	2008 Fact Sheet	2011 Fact Sheet	2008 Fact Sheet	2011 Fact Sheet	2014 Fact Sheet
CABG	100		500	≥450	
PCI	75		≥400		
Aortic valve replacement	22		≥50	≥120	≥120
Elective abdominal aortic aneurysm (AAA) repair	8		3	≥50	≥50
Pancreatic resection	2		≥11		
Esophagectomy	2	50	6	≥13	
Bariatric Surgery High-risk births	20 N/A	N/A	>125	≥50	≥50

Sources: Leapfrog Group data (Evidence-based Hospital Referral (EBHR) Fact Sheets for 2008, 2011 and 2014), cited in Brevig et al., 2015.

40. The Leapfrog Group, accessed February 23, 2016, http://www.leapfroggroup.org/.

Use of Volume in Civilian Healthcare as a Measure of Proficiency

(continued)

The Leapfrog Group's volume standards are supported by a study done by Allareddy et al.,[41] which showed that meeting Leapfrog Group minimum hospital volumes for a number of these procedures correlated with lower in-hospital mortality rates for those procedures.

The Agency for Healthcare Research and Quality (AHRQ), an agency of the US Department of Health and Human Services, publishes Inpatient Quality Indicators (IQI) in order to provide insight into hospital care quality and to identify areas for further attention. AHRQ calculates these metrics from hospital administrative records. The IQI program contains 34 measures, which can be broken down into three types of metrics:

- Mortality rates for different types of surgery and conditions (17 measures). An example is IQI 12, Coronary Artery Bypass Graft (CABG) Mortality Rate, which measures in-hospital death rates for CABG patients aged 40 and older. AHRQ finds that high-quality facilities have lower mortality rates.
- Procedure rates within a given population (11 measures). For example, IQI 21 is Cesarean Delivery Rate, Uncomplicated. AHRQ finds that high-quality facilities perform fewer C-sections on uncomplicated patients.
- Metrics based on procedure volume (6 measures). These metrics address procedures for which lower mortality is known to be associated with procedure volume. As provided by Brevig et al.,[42] these metrics are as follows:
  - IQI 01, Esophageal Resection Volume;
  - IQI 02, Pancreatic Resection Volume;
  - IQI 04, Abdominal Aortic Aneurysm (AAA) Repair Volume;
  - IQI 05, Coronary Artery Bypass Graft (CABG) Volume;
  - IQI 06, Percutaneous Coronary Intervention (PCI) Volume; and
  - IQI 07, Carotid Endarterectomy Volume."

DoD should expand the Defense Readiness Reporting System (DRRS) to include specific measurement of clinical currency for the medical force. To establish the systems needed for this level of reporting, the Air Force's Medical Readiness Decision Support System (MRDSS) has made great progress. What is still required, however, is developing standards for the type of care performed in theater (e.g., for inpatient care refer back to Table 2).

41. V. Allareddy, V. Allareddy, and B. R. Konety, "Specificity of procedure volume and in-hospital mortality association," Annals of Surgery 246, No. 1 (July 2007): 135–9.
42. Brevig et al., "The Quality-Volume Relationship."

Sections 707 and 708 of the NDAA direct improvements in data driven management for readiness. Section 707 directs the establishment of a joint trauma system that, among other things, is tasked with establishing "standards of care for trauma services provided at military medical treatment facilities." Section 708 establishes a joint trauma education and training directorate to "to ensure that the traumatologists of the Armed Forces maintain readiness and are able to be rapidly deployed for future armed conflicts."

The second question identified above is the cost of beneficiary care and readiness. Implementing the second action on financial management reform above would force data driven management in this area. In the absence of this reform, however, cost information at the MTF level can be actively tracked and used in management. Data driven management in this area is easier than in other areas of government because the core activity, delivery of healthcare procedures, is a commercial activity with extensive civilian data that can be drawn upon. Prices for civilian procedures are widely known (e.g., Medicare prices by location are already used by DoD and private sector price data can be purchased in many instances).

The Army is the most advanced in this area of data driven management, with its Integrated Resourcing and Incentive System (IRIS). IRIS is an enterprise funding method that, at least from the medical command headquarters to the facility level, funds MTFs for outputs rather than inputs. MTF funding levels are computed within IRIS based on a range of workload measures and performance adjustments.

Leadership and Operational Management Reform

The fourth set of actions is based on operational considerations summarized in testimony the author made to the Senate Armed Services Committee in 2016 that include:

- **Direct care system run as military units:** Military hospitals are led and administered as military units and justified by their readiness mission. But in actual practice they are almost exclusively focused on beneficiary healthcare delivery. This misalignment of leadership and administrative structure with actual operations and functions means that the wealth of experience in civilian healthcare at running effective and efficient hospitals is not applied to military hospitals. Professional business management of these large complex businesses is not used.
- **Military hospitals don't have to directly compete for business:** Private hospitals that cannot manage themselves effectively lose business and either get better or go bankrupt. Military hospitals are protected from this disciplining force of markets by simply being given bigger budgets to account for their inefficiency and attempts are made to coerce beneficiaries that choose to go elsewhere to return to the system.[43]
- **Military hospitals overuse military personnel for non-operational specialties:** As discussed in the challenges chapter earlier, the military medical force is overstaffed in beneficiary care areas like pediatrics and obstetrics. Military personnel are generally more costly than civilian personnel, so the use of military personnel not required to be in uniform for delivery of beneficiary care is inefficient and drives higher costs.

43. See, for example, Amy Bushatz, "Families Forced to Give Up Civilian Health Care," June 27, 2014. http://www.military.com/daily-news/2014/06/27/some-families-forced-to-give-up-civilian-health-care.html

The actions to be taken are direct corollaries to these challenges:

- **MTFs should be professionally managed:** Organizing and operating MTFs like military units when the majority of the daily operations are the provision of beneficiary healthcare with little difference from civilian hospitals is inefficient. It fails to take advantage of the expertise resident in the healthcare sector at running medical facilities. A simple incremental step that could be taken as part of TRICARE reform is directing that a group of MTFs be placed under civilian management (e.g., as government owned, contractor operated (GOCO) facilities) on a trial basis. One limited example of professional management being used in the management of the direct care system already is two outpatient clinics in the national capital region, and by most accounts this is considered very successful (this is discussed in more detail in the final action below). Military hospitals should be led and operated by business professionals.
- **MTF management layers should be reduced:** The direct care system is actually four separate systems, three systems separately managed by each Military Department and one additional system (the National Capital Region) managed by the Defense Health Agency (DHA). This duplication of overhead functions is another driver of high costs. Consolidating oversight of the MTFs in conjunction with the introduction of professional management per the item above would likely reduce cost. If MTFs were managed separately from the readiness function (e.g., the MTFs are consolidated within the DHA), this would also help improve the focus on medical readiness within the Services by removing the conflicting priority they face. Section 702 of the NDAA moving the MTFs to DHA is an attempt to reduce management layers, but early signs from DoD suggest that it may choose to execute the change in a way that increases layers. This would be a mistake.
- **MTFs should face competition:** Competition is the ultimate disciplining force in markets, and lack of competition is a primary driver of inefficiency. Ensuring that the MTFs face competition for beneficiaries and care delivery is the most important structural reform for focusing them on improvement. It should also be noted that this does not threaten readiness. The care the MTFs are primarily delivering and that would be at risk of moving to the private sector if the MTFs failed to effectively compete is obstetrics and other areas of beneficiary care that are not readiness related. In areas where DoD has invested in developing world-class readiness capabilities (e.g., burns and orthopedic rehabilitation in San Antonio), DoD should have no trouble competing for patients.
- **MTFs that cannot succeed in their mission should be downsized or closed:** Many MTFs today are not providing sufficient workload of the required case mix to support their readiness mission. For many of these, there is no reasonable or practical way to get the right workload into the facility and, thus, the facility will not be able to succeed in its mission. These facilities should be transitioned to clinics or closed.

Public-Private Partnerships

Although there are individual examples of outreach at the local level, as a whole the direct system is an isolated system that is not integrated with its healthcare neighbors in the civilian marketplace. Greater integration with civilian healthcare is necessary to improve direct care performance and is specifically directed by section 706 of the NDAA. Public-private partnerships can be implemented in a wide range of ways across the direct care system. Some examples of current public-private partnerships include:

- Contractor provision of a direct care product line or function: One simple way to bring private sector best practices into the direct care system is to contract with a civilian healthcare organization to operate a specific function in an MTF or in the direct care system. Examples could include the radiology department or the third-party collections function at an MTF. One successful example in DoD is the management of two outpatient

clinics in the National Capital Region. Spectrum Healthcare Resources operates clinics in Dumfries and Fairfax Virginia.

- MTF provision of a community need: Another way to engage is by integrating into the civilian systems. In San Antonio, Texas, the MTF is a level one trauma center integrated into the Emergency Medical System of Texas. The MTF receives (civilian) trauma patients along with the civilian trauma centers in the system, operating as a co-equal partner in the civilian regulation of trauma patients.
- Military personnel assigned to civilian facilities: The readiness need of DoD is for adequate case mix to maintain the clinical skills of the military medical force. One way to get this case mix is to place military personnel in civilian trauma centers that have more workload of the right type than MTFs. A limited form of this is "just-in-time" training where military providers rotate through civilian trauma centers prior to deployments. Examples include the Air Force's partnership with the R Adams Cowley Shock Trauma Center in Baltimore, Maryland; the Army's partnership with Ryder Trauma Center in Miami, Florida; and the Navy's partnership with Los Angeles County and University of Southern California Medical Center in Los Angeles, California. A more effective arrangement is the permanent stationing of personnel in facilities with the best case mix, like the Air Force special operations community does with the University of Alabama at Birmingham's Level I trauma center.

These examples are isolated, however, and systematic, wide-scale integration of the direct care system with the civilian sector is necessary for DoD to achieve its mission goals, maintain a viable direct care system and comply with the NDAA. Achieving these partnerships benefits both DoD and the civilian sector, and the most pressing need is in trauma care. Research cited above indicated that as many as 25% of pre-hospital deaths of service members in Iraq and Afghanistan were potentially survivable. Research in the civilian sector has found that up to 20% of civilian trauma deaths may be potentially survivable.[44]

A committee of the National Academies of Sciences, Engineering and Medicine recently called for the integration of the military and civilian trauma systems.[45] In the press release for their report, they state:

> "The low volume of military trauma cases when combat decreases, especially between wars, makes it impossible for trauma teams to acquire and maintain the expertise necessary to deliver casualty care at the level of excellence that is both deserved and needed, the committee said. Military and civilian trauma centers should be integrated to help maintain military trauma training and transfer wartime lessons learned and best practices to the civilian sector. This should include embedding military trauma teams in the busiest and best civilian trauma centers across the nation."[46]

A recently released report from the Institute for Defense Analyses provides detailed examples of how these partnerships can be implemented and the benefits that can be achieved.[47]

44. National Academies of Sciences, Engineering, and Medicine, "A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury," June 17, 2016. http://www.nationalacademies.org/hmd/Reports/2016/A-National-Trauma-Care-System-Integrating-Military-and-Civilian-Trauma-Systems.aspx
45. Ibid.
46. http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=23511
47. Lurie, Burns, and Whitley, "Medical Readiness Within Inpatient Platforms," forthcoming IDA Paper P-8464.

"The largest DoD hospital in North Carolina is Womack Army Medical Center, located on Fort Bragg in Fayetteville, NC. Womack has 156 beds and an average patient load of 79 (a 51 percent capacity rate). In FY 2015, there were 30 civilian emergency hospitalizations—less than 1 percent of total inpatient admissions. The surgical staff at Womack includes general, oral maxillofacial, orthopedic and vascular surgeons. Several specialties including neuro and cardiac/thoracic surgery are not currently assigned.

The city of Fayetteville has a population of approximately 200,000 while the larger metropolitan area has just over 375,000. Only one high-level trauma center currently serves the trauma region and it is located in the Raleigh-Durham area, over one hour away. There is a Level III trauma center in the Fayetteville, Cape Fear Valley Medical Center (CFVMS), approximately 10 miles to the southeast of Womack.

While the presence of only one high-level trauma center for the trauma region is consistent with the American College of Surgeons guidelines given the population, there is reason to believe the area might also be able to accommodate a second high-level center. While Fayetteville is not a dense population center, it does have a higher than average rate of trauma—especially penetrating trauma (i.e., gunshot wounds and stabbings). In 2014 these occurred at a rate of roughly 45 cases per 100,000 residents.

Table 9. Injury Data, Mid Carolina trauma region

	Firearm	Cut/Pierce	Burn	MVT	Other	Total	Penetrating* Cases
Trauma Cases	199	204	246	806	19,799	21,233	403
Cases per 100,000 Residents	22	23	28	90	2,214	2,374	45
Share of Trauma	0.9%	1.0%	1.2%	3.8%	93.3%	100.0%	2%

Source: North Carolina Department of Health and Human Services. Data are for 2014

* Penetrating Cases are defined as firearm and cut/pierce cases. This definition represents a lower bound on the penetrating trauma as it misses penetrating cases classified as MVT or Other (which are more commonly blunt trauma but can also involve penetrating traumatic injuries.)

While CFVMC is designated as a Level III center, it sees a volume and case acuity level consistent with most Level II and even some Level I centers. In 2015 there were over 1,500 trauma admissions to the facility (1,200 is the minimum for Level I status). The Emergency Department (ED) at CFVMC was ranked as one of the top 15 busiest in the country.[48] The facility is also very large compared to most Level IIIs, with over 800 beds (the median Level II has 233 beds). In addition to providing trauma care, CFVMS also runs the area's EMS.

48. This information was provided to the IDA team during a meeting with CFVMC staff.

One of the main factors that has prevented this facility from pursuing a Level II status is its struggle to recruit and retain a large enough pool of specialists (Fayetteville is a largely military town in a rural area, which can make attracting talent difficult). When the right specialists are on hand, CFVMC retains trauma cases and performs the required complex surgical procedures. When specialists are not available, patients are transferred to one of the three Level I facilities located to the north. Transfers out typically involve cases requiring neurosurgery, oral maxillofacial surgery and orthopedic injuries.

These data illustrate how Womack could be an ideal candidate for a public-private partnership with CFVMC. A joint trauma venture—the "Cape Fear/ Womack Trauma Center"—could be created on the existing CFVMC main campus (one reason being that the state of NC currently will not designate trauma centers behind gates).[49] In the joint facility, teams of military providers would work side by side with CFVMC personnel delivering trauma care. The infusion of military personnel in key specialties would allow CFVMC to expand their trauma capabilities and to retain a larger number of the area's civilian trauma cases. For instance, CFVMC noted that they have a need for OMFS and often have to transfer these cases to UNC or other Level I facilities. Womack, just a few miles away, has OMFS specialists and an OMFS residency program. By teaming up, the military providers would gain better access to complex cases and the local civilian trauma system would see its capabilities grow. By having the center jointly administered, the military could play a role in setting the schedule and determining how its providers would be used. For example, military personnel could be responsible for manning the ED several days a week. On those days, teams of military providers (i.e., surgeons, critical care nurses, nurse anesthetists and medics) would work together on any trauma cases that came through the door. This type of arrangement could also include DoD making capital investments in CFVMC and combining additional programs such as education and training (e.g., residency).

In summary, benefits of a public-private partnership between Womack and CFVMC include:

- DoD gets access to the case mix it needs.
- CFVMC is able to retain more patients in its facility.
- The local community is able to receive more care locally without transport to the Raleigh area an hour away."

49. Under current NC state law, facilities located behind gates (i.e., military installations) may not be state designated trauma centers. It could be possible to seek legislative relief from this stipulation.

Relating these Recommendations to the Veterans Health Administration

Military MTFs are just one element of federal government-operated healthcare facilities. Other major elements include the Veterans' Administration (VA) hospital network (with approximately 150 hospitals), the Indian Health Service and the Public Health Service (which, for example, operates facilities for Immigration and Customs Enforcement detention facilities). Although some of DoD's challenges are unique to DoD's mission (e.g., the readiness challenge), many of the challenges described in this report apply across federal healthcare.

VA's healthcare delivery system is also one of the largest in the world, and about three times larger than DoD's current system. Unlike DoD, the VA system relies almost exclusively on care it produces itself. A variety of factors, however, have placed the VA at the beginning of what will likely be a long-term transformation of its delivery structure away from its "brick-and-mortar" foundation towards a system that is more integrated with (and reliant upon) private sector healthcare. Although there are many differences, the changes beginning to occur in the VA healthcare system share similarities with the last major transformation of the DoD system, which occurred in the 1990s.

In the late 1980s, as the Cold War was ending, the DoD healthcare system had 120 military hospitals and 250,000 medical personnel providing the majority of its beneficiary healthcare in-house—making it similar in size and organization to the current VA system. By the 1990s, as large-scale post-Cold War rationalization of DoD infrastructure began, it had become clear that DoD healthcare was going to have to shift to a more integrated system with greater reliance on private sector care. DoD hospitals decreased by almost 50% over the following 20 years. VA is likely at the beginning of a similar journey.

Although VA facilities do many things well and are more advanced than DoD facilities in some ways (e.g., in public-private partnerships with civilian academic medical centers), many of the actions described in this report for reform of the DoD hospital network apply to VA as well. Some examples include:

- Provide Clear Roles and Missions: The traditional VA model of producing almost all of its care in-house is transitioning to an integrated delivery model for a variety of reasons, e.g., geographic distribution of veterans is shifting as new cohorts become eligible and older cohorts decrease in size and performance challenges with VA hospitals. Over time this will bring a key question into greater focus—"what is the purpose of VA fixed facilities?" Delivering healthcare is a commercial activity (i.e., not an inherently governmental function) that does not, by itself, justify government-run hospitals. One obvious example of a justification for VA infrastructure is to maintain centers of excellence in areas of specific veteran need, e.g., amputation and prosthetic care, traumatic brain injury care and treatment for post-traumatic stress disorders. The transformation of the VA delivery system will be smoother and more efficient if VA has a concrete answer to this key question and can demonstrate that it is managing its facilities for this role or mission.
- Financial Management Reform: Like DoD hospitals, VA hospitals generally receive a budget for inputs instead of generating revenue for the outputs they produce. There is little rationale for this funding model when outputs are readily definable and measurable (e.g., healthcare procedures and empanelment rates) and there are thickly traded commercial markets for the outputs. The sooner VA wrestles with this difficult area of modernization, the more defensible the VA system will be.
- Data Driven Management Reform: Although rapid progress is being made, VA data systems for capturing procedures performed and relative value have generally lagged behind DoD. The controversies with wait times and other care attributes at VA facilities add further urgency for maturing VA's ability to truly engage in data drive management.

Relating these Recommendations to the Veterans Health Administration

(continued)

- Leadership and Operational Management Reform: Most of the DoD examples provided above in this area apply to VA. Leadership and, in particular, vacancies in facility leadership have been an ongoing struggle within the VA. The effectiveness of the Veterans Integrated Service Network (VISN) structure in ensuring quality and cost control has been criticized. Increased competition between VA facilities and private sector care is already emerging and will likely grow over the coming years, providing a forcing function for VA modernization. And it is probably inevitable that marginal VA facilities are going to be downsized and closed in the coming years—VA will be best served by embracing these changes and trying to guide them with constructive analysis.
- Public-Private Partnerships: There are many examples in this area where VA is far ahead of DoD, but even here there is room to improve. VA is still maturing at basic billing, third party collections and integrating with civilian systems for healthcare delivery. These are basic, core tasks of any delivery system. The immaturity of VA and DoD in these basic functions is both a symptom (they have not kept up with modern healthcare practice) and cause (they are struggling now to integrate and adapt effectively modern healthcare practices) of the challenges within these systems. In addition, pressure is growing for further integration of DoD and VA with each other. All of these are necessary steps for the continued support VA's healthcare delivery infrastructure.

Conclusion

DoD's direct care system is one of the largest healthcare delivery systems in the world, producing valuable care for beneficiaries. But it has structural challenges that are hindering its ability to accomplish its mission in a cost-effective manner. Congress recognizes these challenges and has provided in the FY17 NDAA extensive direction and authorities for change. This report has described in detail some of those key challenges, how the NDAA reforms address these challenges and what actions DoD could take within the context of the NDAA to achieve a true transformation and modernization of the direct care system.

The actions identified in this report start with clear articulation of the mission of a facility. Congress has provided clear direction for facilities in section 703 of the FY 2017 NDAA, giving DoD a useful starting point for organizing and unifying its modernization efforts. The biggest area of reform not included in the FY 2017 NDAA was financial reform. DoD has been a leader in moving large support functions that replicate civilian activities into more business-like arrangements, working with Congress to extend that framework to military hospitals would correct an anomaly in DoD's "4th estate".[50] Data-driven management, along with leadership and operational management reform, are both directed by Congress and basic elements of modernization. Finally, public-private partnerships are an essential of reform, DoD cannot execute reform alone and the private sector brings a wealth of knowledge and experience (in addition to patient base) that should be leveraged to modernize military hospitals.

None of these reforms are surprising or new. All have been debated in Congress and most are explicitly directed and authorized in legislation. DoD has long been a leader in the use of revolving funds and data driven management, and has experience with public-private partnerships in healthcare delivery. Modernizing the direct care system is good for national security, military service members and the taxpayer—and can even be done in a way to improve civilian trauma care across the country.

50. The 4th estate is a term used in DoD to refer to supporting activities (e.g., defense agencies and field activities). Section 702 of the FY 2017 NDAA moves military hospitals to a defense agency.

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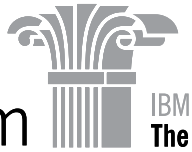

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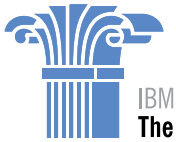

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