Defense Health Board Report

Prolonged Theater Care Part 2

September 5, 2024

President's Memorandum

DEFENSE HEALTH BOARD
7700 ARLINGTON BOULEVARD, SUITE 5101
FALLS CHURCH, VA 22042-5101

Defense Health Board

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE FOR HEALTH AFFAIRS

SUBJECT: Prolonged Theater Care Report, Part 2

On September 28, 2023, the Assistant Secretary of Defense for Health Affairs tasked the DHB, through its Trauma and Injury Subcommittee, provide recommendations to best prepare Department of Defense (DoD) personnel at military-civilian trauma training partner sites for prolonged theater care in near-peer conflicts. The Defense Health Board (DHB) is pleased to submit Part 2 of its response to the tasking. This report provides detailed analysis, findings, and recommendations to optimize training of military medical personnel for prolonged casualty care in large-scale combat operations through military-civilian partnerships.

The DHB consulted widely with stakeholders from across the military services, the Defense Health Agency (DHA), and civilian institutions to complete this report. We reviewed both established and new military-civilian trauma partnerships to assess their effectiveness in sustaining trauma readiness. In addition, the Board considered lessons learned from past conflicts and evolving threats that necessitate advanced and integrated trauma care capabilities.

The Subcommittee presented its report to the DHB on September 5, 2024. Key recommendations in this report include the need to establish a clear network of military-civilian trauma training partnerships and ensure geographic proximity between Military Treatment Facilities and civilian trauma centers to optimize training and disaster response. The findings also underscore the need for consistent and structured data tracking of clinical readiness metrics and the creation of a registry for trauma partnerships.

On behalf of the DHB, I appreciate the opportunity to provide this comprehensive review to the Department and hope that it informs further improvements to trauma readiness and military medical training partnerships. We believe the implementation of these recommendations is critical to ensuring the readiness and effectiveness of military medical personnel in future combat environments.

Karen Guice, M.D., M.P.P.
President, Defense Health Board

Attachment:
As stated

The Defense Health Board

The Defense Health Board is a Federal Advisory Committee to the Secretary of Defense that provides independent advice and recommendations pertaining to health-related matters of special interest to the Department of Defense (DoD). The Defense Health Board supports the Military Health System, one of America's largest and most complex health care institutions.

The Defense Health Board's mission is to provide independent advice and recommendations to maximize the safety and quality of, as well as access to, health care for DoD beneficiaries. The Defense Health Board addresses matters pertaining to:

- DoD health care policy and program management
- The delivery of high-quality health care services to DoD beneficiaries
- The promotion of health, wellness, and prevention within the DoD
- The treatment of disease and injury by the DoD
- Health research priorities
- Other health-related matters of special interest to the DoD

The main Board is supported by five subcommittees including Public Health, Health Systems, Trauma and Injury, Neurological and Behavioral Health, and Health Care Delivery. With the assistance of Defense Health Board Staff, the Board and Subcommittees investigate matters pertaining to health and health care to provide detailed analyses, insights, findings, and recommendations for deliberation by and final endorsement of the main Board.

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There is broad consensus among Congress, the Department of Defense (DoD), and the U.S. interagency about the threats to America's national security. The People's Republic of China poses an increasing threat to the U.S. and our allies and partners in the Indo-Pacific. Russia is committed to expanding its malign influence on the global stage and is willing to inflict widespread violence to achieve its aims. Iran seeks to exploit violence in the Middle East, expel the U.S. from the region, and further sabotage the free world's interests. Threats from North Korea are growing, with more nuclear capabilities in its arsenal.

- Executive Summary, U.S. Senate Committee on Armed Services on the National Defense Authorization Act for Fiscal Year 2025. June 2024

Introduction

Prolonged Theater Care

The primary mission of the Military Health System is to sustain ready medical forces to ensure high-quality medical care for Service members injured during U.S. military operations.[1] A ready and capable medical force not only improves casualty care, but also provides assurance to allies and partners, and decision space for Combatant Commanders who make risk-based determinations across the competition continuum (Figure 1). The U.S. Senate Committee on Armed Services clearly articulates concerns that the U.S. is moving toward the right on this continuum.[2]

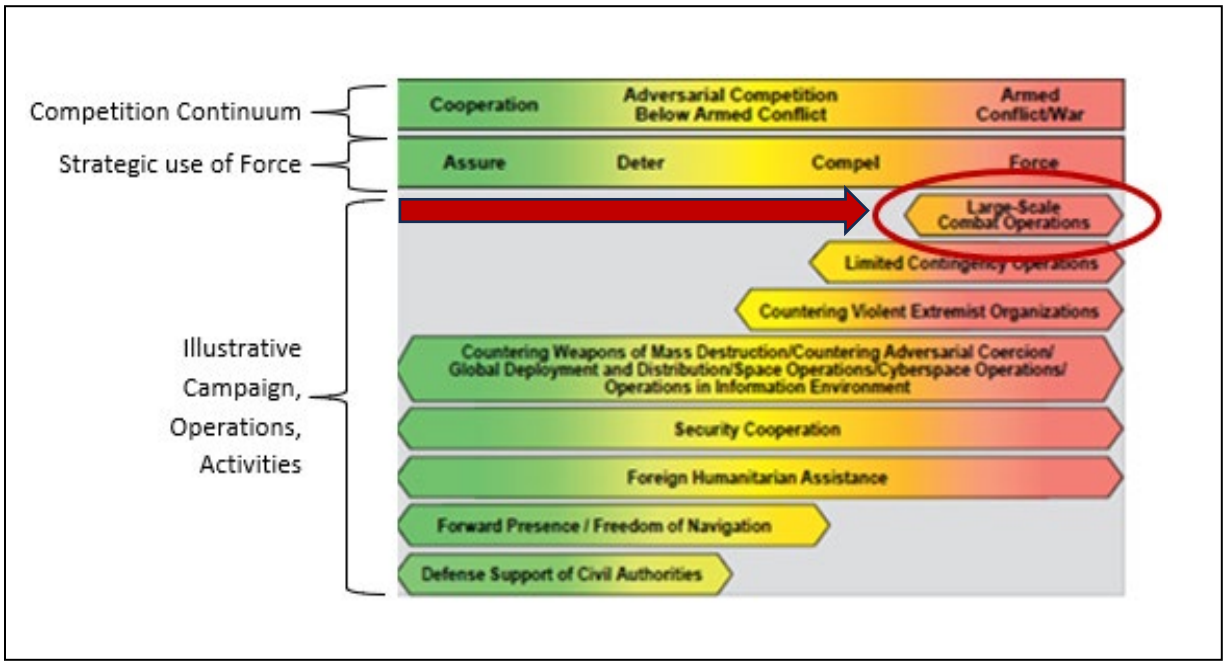


Figure 1. Competition Continuum.[3]

The potential for large-scale, multi-domain[4] combat operations with near-peer adversaries necessitates focus on training that addresses prolonged management of casualties in the field and into Roles 1 through 3 care (Figure 2). This may be especially important in the U.S. Indo-Pacific area of responsibility with its vast expanse (greater than 50% of the Earth's surface) and associated transportation challenges, made more difficult with China's attempt to limit

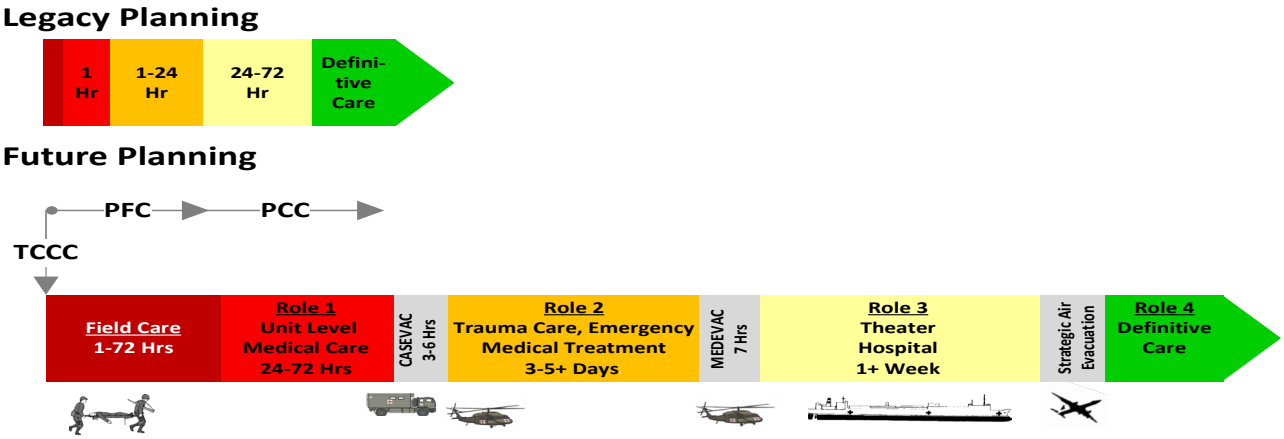
[1] Military Health System Strategy, 2024-2029. Available at https://health.mil/ReferenceCenter/Publications/2023/12/15/MHS_Strategic_Plan_FY24_29. Accessed June 12, 2024

[2] Executive Summary, U.S. Senate Committee on Armed Services on the National Defense Authorization Act for Fiscal Year 2025. June 2024

[3] Joint Publication 4-02, Joint Health Services. Dec 11, 2017

[4] Multi-domain operations are operations that take place across multiple domains, including land, air, sea, space, and cyberspace.

freedom of the seas through construction of artificial islands.[5] The increasing use of weaponized drones targeting casualties and medical personnel, as well as "gray zone"[6] tactics, will only add to the time required to move casualties from the point of injury to medical care. These considerations affirm and extend notional timelines outlined in Prolonged Theater Care Part 1 (Figure 2).[7]



Hr – Hour; TCCC - Tactical Combat Casualty Care; PFC - Prolonged Field Care; PCC - Prolonged Casualty Care; CASEVAC - Casualty Evacuation Transport (minimal transport care); MEDEVAC - Medical Evacuation Transport.

Figure 2. Time spent in Field and Role 1 through Role 3 care.

Preparation to manage casualties during large-scale, multi-domain combat operations requires an appreciation of the challenges associated with past conflicts, [8,9,10] current conflicts,[11,12,13]

[5] Leone RM, Remondelli MH, Brill JB, et al. Disguised among the sea: The implications of artificial islands on casualty care in the Indo-Pacific. Military Medicine, 2024

[6] "Gray zone" tactics fall below the threshold of armed conflict. They aim to thwart, destabilize, or weaken an adversary through use of geopolitical, economic, cyber, and information operations.

[7] Defense Health Board. Prolonged Theater Care Part 1. Available at https://www.health.mil/Reference-Center/Presentations/2024/03/05/Prolonged-Theater-Care-Part-One. Accessed July 1, 2024

[8] Eastridge BJ, Mabry RL, Seguin P, et al: Death on the battlefield (2001-2011): Implications for the future of combat casualty care. J Trauma Acute Care Surg 2012; 73(6Suppl 5): S431-7

[9] Suresh MR; Valdez-Delgado KK; VanFosson CA; Trevino JD; Mann-Salinas EA; Shackelford SA; Staudt AM. Anatomic injury patterns in combat casualties treated by forward surgical teams. Journal of Trauma and Acute Care Surgery 89(2S): p S231-S236, August 2020.

[10] Benham DA, Vasquez MC, Kerns J, et al. Injury trends aboard US Navy vessels: A 50-year analysis of mishaps at sea. J Trauma Acute Care Surg. 2023 Aug 1;95(2S Suppl 1)

[11] Rogovskyi VM, Koval B, Lurin IA, Gumeniuk K, Gorobeiko M, Dinets Temporary arterial shunts in combat patient with vascular injuries to extremities wounded in Russian-Ukrainian war: a case report. Int J Surg Case Rep. 2023; 102:107839

[12] Epstein A, Lim R, Johannigman J, et al. Putting medical boots on the ground: Lessons from the war in Ukraine and applications for future conflict with near-peer adversaries. J Am Coll Surg. 2023;237(2):364-373

[13] Hodgetts TJ, Naumann D, Bowley D. Transferable military medical lessons from the Russo-Ukraine war. BMJ Mil Health Published Online First: 03 July 2023.

and evolving threats. These threats include directed energy weapons (e.g., lasers and high-powered microwaves)[14,15,16] and multi-drug resistant organisms.[17,18,19,20,21]

Evidence regarding injuries and time spent in prolonged theater care is accumulating[22,23] and emphasizes the need for proficient combat casualty care teams with training in:

- Trauma surgery
- Hemorrhage control and tourniquet management[24]
- Whole blood transfusion[25]
- Airway management and ventilatory support[26]
- Pain control[27]
- Triage[28]
- Psychological first aid[29]

[14] Congressional Research Service. DoD Directed Energy Weapons: Background and Issues for Congress. July 11, 2024
[15] Space and Defense. Emerging Battlefield Laser Tactics. August 19, 2022. Available at https://spaceanddefense.io/emerging-battlefield-laser-tactics/. Accessed April 22, 2024
[16] Joint Trauma System. Suspected Radio Frequency Electromagnetic Field Overexposure. July 2024. Available at https://jts.health.mil/assets/docs/cpgs/Radio_Frequency_EMF_Overexposure_CPG_12_Jul_2024_ID98.pdf. Accessed August 10, 2024
[17] Kuzin I, Matskov O, Bondar R, et al. Notes from the field: Responding to the wartime spread of antimicrobial-resistant organisms — Ukraine, 2022. MMWR Morb Mortal Wkly Rep 2023; 72:1333–1334
[18] Mc Gann PT, Lebreton F, Jones BT, et al. Six extensively drug-resistant bacteria in an injured Soldier, Ukraine. Emerging Infectious Diseases. 2023;29(8):1692-1695
[19] Pallett SJC, Trompeter A, Basarab M, et al. Multidrug-resistant infections in war victims in Ukraine. Lancet Infectious Disease. 2023;23(8)
[20] Ljungquist O, Nazarchuk O, Kahlmeter G, et al. Highly multidrug-resistant Gram-negative bacterial infections in war victims in Ukraine, 2022. Lancet Infect Dis. 2023
[21] Bennett J. Multidrug-resistant organism surveillance in the Military Health System and a growing threat in the U.S. European Command. Presentation and personal Communication
[22] DeSoucy ES, Shackelford SA, DuBose JJ, Zweben S, Rush SC, Kotwal RS, Montgomery HR, Keenan S. Review of 54 cases of Prolonged Field Care. J Spec Oper Med. 2017 Spring;17(1):121-129.
[23] Cohen AB, Davis M, Herman SEM. Prolonged Field Care research approach and its relevance to civilian medicine. Mil Med. 2021 May 3;186(5-6):123-128
[24] Tactical Combat Casualty Care. Available at https://books.allogy.com/web/tenant/8/books/b729b76a-1a34-4bf7-b76b-66bb2072b2a7/. Accessed August 10, 2024
[25] Joint Trauma System. Whole Blood Transfusion. Available at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://jts.health.mil/assets/docs/cpgs/Whole_Blood_Transfusion_15_May_2018_ID21.pdf. Accessed August 10, 2024
[26] Joint Trauma System. Airway Management in Prolonged Field Care. Available at chrome-https://jts.health.mil/assets/docs/cpgs/Airway_Management_in_Prolonged_Field_Care_01_May_2020_ID80.pdf. Accessed August 10, 2024
[27] Joint Trauma System. Prolonged Casualty Care Guidelines. Available at https://jts.health.mil/assets/docs/cpgs/Prolonged_Casualty_Care_Guidelines_21_Dec_2021_ID91.pdf. Accessed August 10, 2024
[28] Committee on Tactical Combat Casualty Care and Prolonged Casualty Care Working Group Consensus Statement. Available at https://jts.health.mil/assets/docs/cotccc/PCC_Consensus_Statement_Apr_2023.pdf. Accessed August 9, 2024
[29] U.S. Department of Veterans Affairs. Available at https://www.ptsd.va.gov/professional/treat/type/psych_firstaid_manual.asp. Accessed August 9, 2024

- Management of conditions resulting from environmental hazards such as heat and cold exposure,[30] and injuries from indigenous animals[31]
- Care for casualties of, and in environments contaminated by, chemical, biological, and nuclear weapons[32,33]

Disease and other health conditions will also require training related to prolonged theater care but are not addressed in this report which focuses on the training for surgical care of combat wounded Service members.

Training of Military Medical Personnel

The Service Secretaries and the Commander of U.S. Special Operations Command have authority and responsibility under Title 10, U.S. Code, to organize, train, and equip military forces.[34] The military departments have developed checklists of wartime medical skills for most Service-specific medical occupations. Per DoD Instruction 1322.24, *Medical Readiness Training,* medical readiness training metrics identified by the Secretaries of the Military Departments and Combatant Commanders are reported in military department-designated authoritative data sources.[35] Further, the Services are responsible for developing mission essential tasks in support of the Combatant Commanders and are responsible for identifying and correcting readiness deficiencies.[36,37,38]

> The Service Secretaries and the Commander of U.S. Special Operations Command are responsible for reporting on readiness and correcting readiness deficiencies.

Section 708 of Public Law 114-328 (National Defense Authorization Act, Fiscal Year 2017) directs establishment of a Joint Trauma Education and Training Directorate, the responsibilities of which include tracking military-civilian trauma training partnerships and measuring their performance. DoD Instruction 6040.47 *Joint Trauma System*[39] assigns this responsibility to the Director, Defense Health Agency, under the direction, authority, and control of the Under Secretary of Defense for Personnel and Readiness.

[30] Parish TT. Protecting the Warfighter's health and readiness, now and into the future. March 16, 2023. Available at https://www.dvidshub.net/news/440577/protecting-warfighters-health-and-readiness-now-and-into-future. Accessed June 12, 2024

[31] Atlamazoglou S. U.S. Air Force commandos trained to rescue other troops are getting used to a 'way more difficult environment in the Pacific. Business Insider. June 19, 2022

[32] Lopez T. Decade of developments changed DoD's focus on weapons of mass destruction. DoD News. October 19, 2023

[33] Department of Defense Strategy for Countering Weapons of Mass Destruction. 2023

[34] Title 10, United States Code Armed Forces. Available at Title 10, United States Code Armed Forces (As Amended Through January 7, 2011) Volume I Subtitle A, General Military Law Parts I and II (§§101–2000)

[35] DOD Instruction 1322.24 Medical Readiness Training

[36] DOD Instruction 7730.65 Department of Defense Readiness Reporting System (DRRS)

[37] Congressional Research Service. Military readiness: DOD assessment and reporting requirements. October 26, 2022

[38] Directive-type Memorandum 23-002 "Medical Capability Readiness Reporting in the Defense Readiness Reporting System"

[39] DoD Instruction 6040.47 Joint Trauma System

The Uniformed Services University of the Health Sciences has conceptualized the Clinical Readiness Lifecycle. The Lifecycle highlights the importance of sustaining clinical currency across a clinician's career and recognizes that clinical currency accumulates through activities at both military treatment facilities and military-civilian trauma training partner sites (Figure 3).

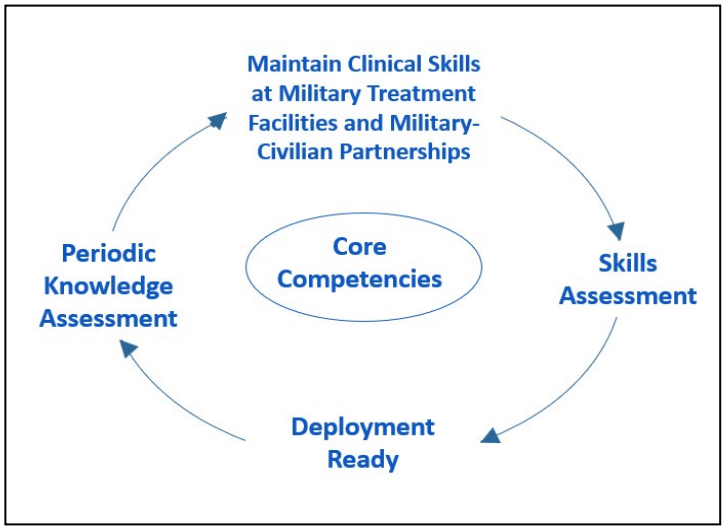


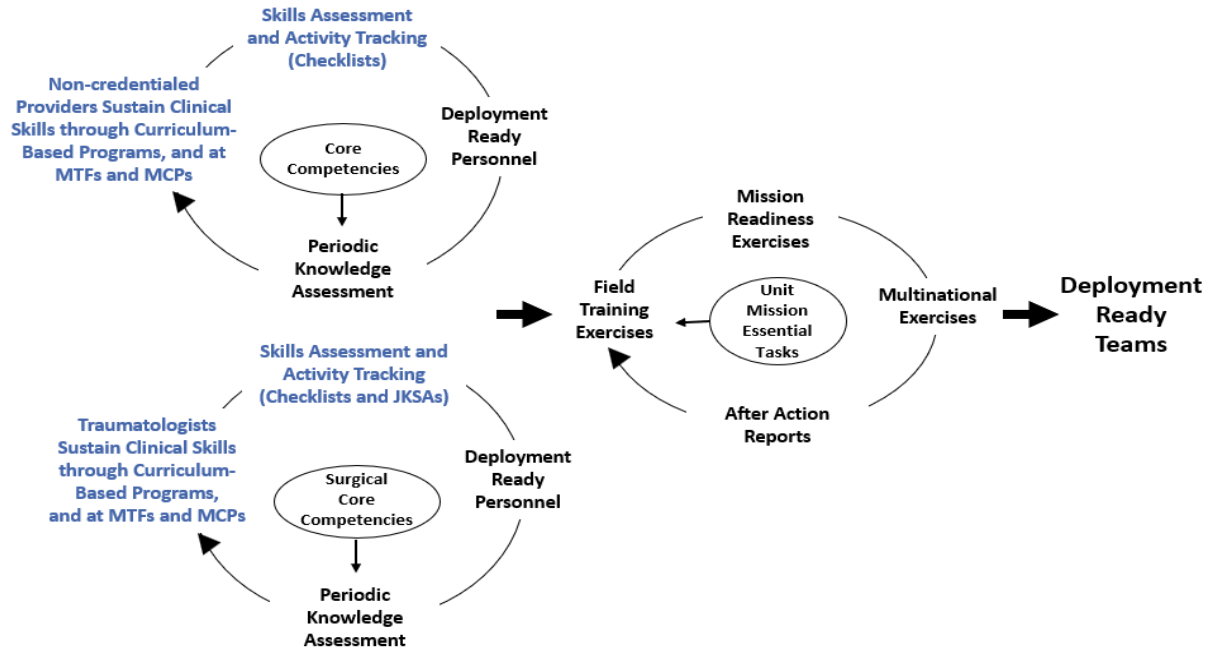
Figure 3. Clinical Readiness Lifecycle.

This is especially important for surgeons who must sustain critical warfighting skills at civilian Level 1 trauma centers due to the low trauma volume and case acuity seen at military hospitals.[40] Other opportunities to gain clinical experience include clinical care associated with Defense Support of Civil Authorities, deployment, and off-duty employment.

The indicators of core competencies of U.S. military medical forces, such as degrees, certification, and maintenance of certification, are monitored in systems like those used by the civilian sector. Clinical activity that contributes to sustainment of military medical skills is tracked using the Service-specific checklists noted above: Army, Individual Critical Task List Readiness Requirements; Air Force, Comprehensive Medical Readiness Program; and Navy, Naval Medical Readiness Criteria. Clinicians who enter diagnosis and procedure codes into the electronic medical record benefit from electronically trackable clinical encounter data. Clinical activity of non-billing medical personnel cannot be easily tracked using clinical encounter data, which presents a challenge to efficient tracking of critical wartime skills for these personnel.

[40] Dalton MK, Remick KN, Mathias M, Trinh QD, Cooper Z, Elster EA, Weissman JS. Analysis of surgical volume in Military Medical Treatment Facilities and clinical combat readiness of US military surgeons. JAMA Surg. 2022 Jan 1;157(1):43-50

The readiness of operational Forces also depends on the readiness of medical capabilities.[41] These capabilities (e.g., surgical, medical evacuation, and public health) include both personnel and equipment and are reported through the Defense Readiness Reporting System. Final assessment of total force clinical readiness occurs at the operational level through unit-level, mission-level, and multi-national exercises (Figure 4).[42]



MTF - Military Treatment Facility; MCP - Military-Civilian Partnership; JKSA - Joint Knowledge, Skills, and Abilities.

Figure 4. Expanded Clinical Readiness Lifecycle.

Military-Civilian Training Partnerships Models

In response to National Defense Authorization Act of 2021, Section 757, the Assistant Secretary of Defense for Health Affairs commissioned the Institute for Defense Analysis (IDA) to assess the capability of military civilian partnerships with large civilian trauma centers to provide military providers with greater exposure to a high volume of patients with critical injuries. IDA developed a taxonomy for military-civilian partnership models, which classifies U.S.-based military-civilian trauma training partnerships in three broad categories:[43]

[41] Military capabilities refer to the overall strength, effectiveness, and capacity of a military force. It includes factors such as weapons systems, tactics, training methods, logistical support, manpower size/skills/resources that determine how well the military can fight and achieve its objectives.

[42] Congressional Research Service. The fundamentals of military readiness. October 2, 2022

[43] Institute for Defense Analysis. Independent study of force mix options and service models to enhance readiness of the medical force. June 2023

- Short-Term Rotational Models: Military personnel rotate through civilian trauma centers on short assignments (generally two to four weeks). Examples include the Army Trauma Training Detachment at the Ryder Trauma Center, Jackson Memorial Hospital, Miami, FL; the Navy Trauma Training Center at the Los Angeles General Medical Center, Los Angeles, CA; and the five Air Force Centers for the Sustainment of Trauma and Readiness Skills partnerships at locations across the U.S.
- Full-time Embedded Sustainment Models: Military personnel are stationed at civilian trauma centers on a full-time basis based on permanent change of station orders (3 to 4 years). These assignments may be made at the individual or team level (i.e., a Role 2 surgical team). For example, Air Force cadre at the Centers for the Sustainment of Trauma and Readiness Skills receive permanent change of station orders to their respective trauma centers.
- Part-Time Sustainment Models: Military personnel are stationed at military treatment facilities and spend part of their clinic time working at the military treatment facility and part at local civilian trauma centers. The degree to which these personnel are integrated or embedded in the civilian facility varies. Examples of partnerships that have medical personnel working at both a military treatment facility and a civilian trauma center include the Las Vegas Military-Civilian Partnership (Nellis Air Force Base's Mike O'Callaghan Military Medical Center partnership with University Medical Center of Southern Nevada) and the partnership between Wright-Patterson Medical Center and Kettering Health in Dayton, OH.

While the Department has not officially adopted language to describe the various types of military-civilian trauma training partnerships, the models utilized by IDA provide a useful way to categorize these partnerships and, during site visits and interviews, IDA terminology was found to be in common use among individuals working in and with military-civilian trauma training partnerships.

Some military-civilian trauma partnerships have multiple programs and model types at a single training site, providing clinical opportunities for individuals, teams, and/or units. These sites frequently offer curriculum-based trauma training courses and simulation-based training (e.g., Prolonged Casualty Care, Advanced Surgical Skills for Exposure in Trauma-Plus). Coursework complements clinical training, and simulation-based training is particularly important for training in low frequency, high risk procedures. Curriculum-based standard coursework has been added to the three training models proposed by the IDA in Table 1.

Table 1. Models of Military-Civilian Partnerships and Curriculum-Based Training (Standard Courses).

Model	Description	Duration	Clinical Experience	Example
Standard Courses	Personnel participate in didactics with cadaver- or non-tissue simulation skills training	< 1 week	No	TCCC PFC PCC ASSET+
Short-Term Rotational	Personnel rotate through civilian trauma centers, completing both didactic work and clinic hours	Typically, < 1 month but up to 9 months	Yes	C-STARS SMART HMTT
Part-time Embedded/ Sustainment	Personnel stationed at a military treatment facility and work part-time at civilian trauma center	2-4 year	Yes	University of Nevada military-civilian partnership
Full-time Embedded/ Sustainment	Personnel are stationed at a civilian trauma center full-time	2-4 year	Yes	AMCT3

TCCC - Tactical Combat Casualty Care; PFC - Prolonged Field Care; PCC - Prolonged Casualty Care; ASSET+ - Advanced Surgical Skills for Exposure in Trauma-Plus; C-STARS - Center for the Sustainment of Trauma and Readiness Skills; SMART - Sustained Medical and Readiness Training; HMTT - Hospital Corpsman Trauma Training; AMCT3 - Army Military-Civilian Trauma Team Training.

Defense Health Board Tasking

On September 28, 2023, the Assistant Secretary of Defense for Health Affairs tasked the Defense Health Board to review military-civilian trauma training partnerships. Tasking objectives included:

- Objective 1: Review the curriculum and experience of current military-civilian trauma training partnerships.
- Objective 2: Provide recommendations to best prepare DoD personnel at military-civilian trauma training partner sites for prolonged [theater] care in near-peer conflicts. Comment on the curriculum, locations, frequency of training, occupational specialties of participating DoD personnel, and best use of selection and performance criteria outlined in the *Blue Book*.[44]
- Objective 3: Provide recommendations to better integrate military-civilian partnerships with attention to military treatment facility staffing and Regional Medical Operations Coordination Centers.

[44] American College of Surgeons. The Blue Book: Military-civilian partnerships for trauma training sustainment, and readiness. 2020.

Given increasing risk of armed conflict around the world,[45,46] the Board considered the tasking urgent and elected to provide preliminary findings and recommendations (Prolonged Theater Care Part 1) in March 2024 and Prolonged Theater Care Part 2 in September 2024. Findings from Prolonged Theater Care Part 1, deliberated and approved by the Board in March 2024, include the following:

1. A registry of military-civilian and Department of Veterans Affairs partnerships has not been fully established or sustained; thus, the existing Joint Trauma System Military-Civilian Training Partnership Registry contains insufficient information to evaluate program performance or readiness skills of military medical personnel training at military-civilian trauma training partnership sites.
2. Current active duty military medical forces may be insufficient to meet the future requirements of large-scale combat operations, and current models used to estimate personnel requirements against casualty estimates may be unreliable.[47]
3. Neither the Services nor the Joint Trauma System military-civilian training partnership registry adequately define, track, or assess wartime medical skills training for enlisted personnel at military-civilian trauma training partnerships.
4. Despite the potential demand for standardized, just-in-time training for Army combat medics, Navy corpsmen, and Air Force medical service specialists during large-scale combat operations, there are no plans in place to develop standardized, just-in-time training for enlisted personnel.
5. The Defense Health Agency does not define readiness gaps that should be filled by military-civilian trauma training partnerships through tracking of the clinical activity relevant to combat casualty of medical personnel at military treatment facilities.
6. The Defense Health Agency and Services do not have a system for tracking the knowledge, skills, or ongoing clinical activity across the clinical readiness life cycle and are unable to aggregate data to provide a composite picture of individual and military medical readiness.

[45] Institute for Economics & Peace. Global Peace Index 2024: Measuring Peace in a Complex World. June 2024. Available at http://visionofhumanity.org/resources. Accessed September 1, 2024

[46] Council on Foreign Relations Center for Preventive Action. Preventive Priorities Survey 2024. Available at https://www.cfr.org/report/conflicts-watch-2024. Accessed September 1, 2024

[47] Testimony from the Commission on the National Defense Strategy on July 30, 2024, emphasized concerns related to Force end strength.

Methods and Organization

It is beyond the scope of this report to address acquisition of core competencies (e.g., competencies gained through graduate medical education, and certification) among military credentialed and non-credentialed medical personnel, evaluate operational clinical readiness, or address military-civilian training partnerships with allies and partners. In addition, while disease and non-battle injury comprises a significant portion of medical conditions encountered during conflict,[48] this report focuses on skill sustainment by credentialed active duty surgeons and active duty credentialed and non-credentialed surgical support staff highlighted in blue in Figure 5. Further, efforts to update the National Disaster Medical System, finalize and implement the Integrated Continental United States Medical Operations Plan, and develop a national and global trauma system, have been considered but are not addressed in this report.

The Board is aware of other efforts aimed at evaluating military-civilian trauma training partnerships, including the Military Health System Strategic Partnership with the American College of Surgeons, DoD Inspector General, and Government Accountability Office. The Board communicated with these groups early in report development to improve awareness of separate efforts while maintaining independence of each organizations work.

A broad sample of military-civilian trauma training partner sites were visited or interviewed. A standardized questionnaire was used to provide interview structure, assess themes, and collect information related to Public Law 114-328 (National Defense Authorization Act for Fiscal Year 2017), which outlines requirements related to military-civilian trauma training partnerships. Among Veterans Health Administration hospitals, there are no State designated or American College of Surgeons verified trauma centers. Therefore, partnerships with Veterans Health Administration Hospitals were not assessed.

The choice of partnerships reviewed was based on recommendations from the Army, Navy, and Air Force Surgeon General offices and Joint Trauma System, as well as literature review by the Trauma and Injury Subcommittee. To understand the full scope of military-civilian trauma training partnerships, both large, well-established partnerships and newer, smaller partnerships were studied.

Peer-reviewed and gray literature, U.S. military instructions and publications, and memoranda (including Stabilizing and Improving the Military Health System, December 2023) [49] and transcripts (e.g., testimony delivered to the House and Senate Armed Services Committees) were considered; public law (e.g., Public Law 114-328[50] and Public Law 116-92[51]) was reviewed;

[48] Congressional Research Service. Trends in Active-Duty Military Deaths From 2006 Through 2021. September 9, 2022
[49] Deputy Secretary of Defense Memorandum *Stabilizing and Improving the Military Health System*. December 6, 2023
[50] Public Law 114-328. National Defense Authorization Act for Fiscal Year 2017
[51] Public Law 116-92. National Defense Authorization Act for Fiscal Year 2020

semi-structured interviews with key stakeholders and military leaders were conducted; and relevant conferences were attended.

Sources for this report include Combatant Command Surgeons; the Joint Staff Surgeon; Uniformed Services University of the Health Sciences; National Center for Disaster Medicine and Public Health; Joint Trauma System; and training site representatives. The findings and recommendations in this report have been developed with attention to independence and objectivity. They are based on the evidence collected and analysis conducted during report development.

Because quantitative data related to training at military-civilian trauma training partnerships is limited, an exploratory sequential approach with a scoping review was performed to identify themes and organize available qualitative information (Figure 5).

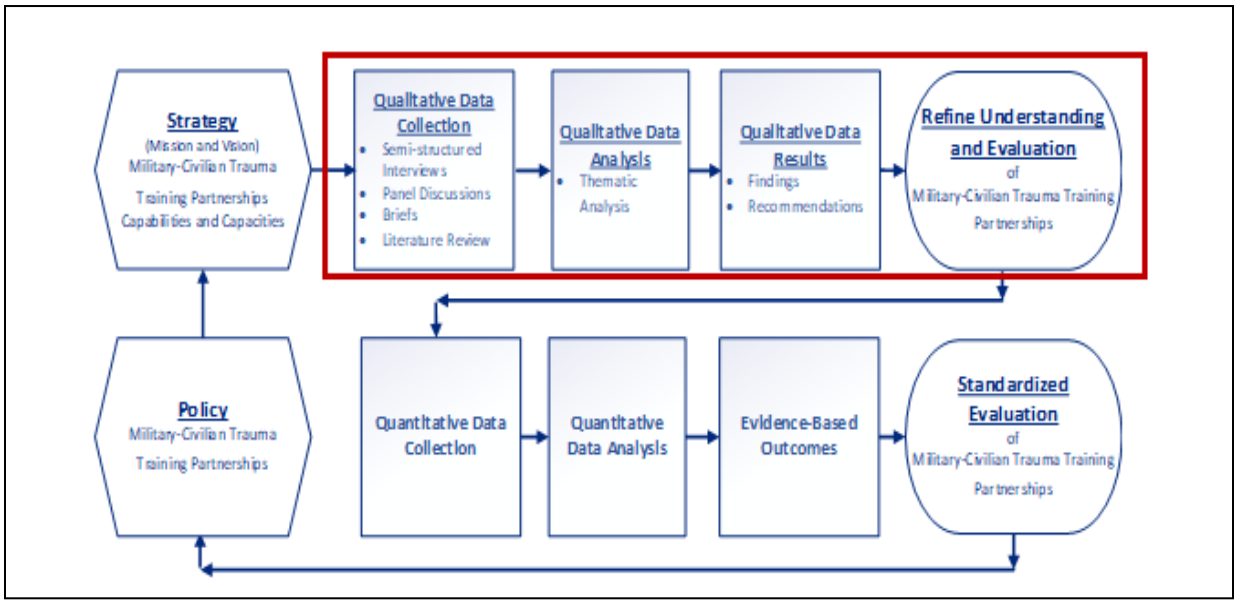


Figure 5. Exploratory Sequential Mixed Methods Research Design for Evaluation of Training at Military-Civilian Trauma Training Partnerships.

TOR Objective 1: Review the curriculum and experience of current military-civilian trauma training partnerships.

Thirty-one military-civilian trauma training partner sites were included in this analysis (10 Air Force, 11 Army, 9 Navy, 1 Joint). Among these, 7 sites were visited in person, 18 were interviewed by phone or online, and 6 were evaluated based on written information alone. All 32 U.S. military hospitals and 31 military-civilian trauma partner sites included in this report are mapped below (Figure 6) and listed in Table 2 and 3, respectively.[52,53]

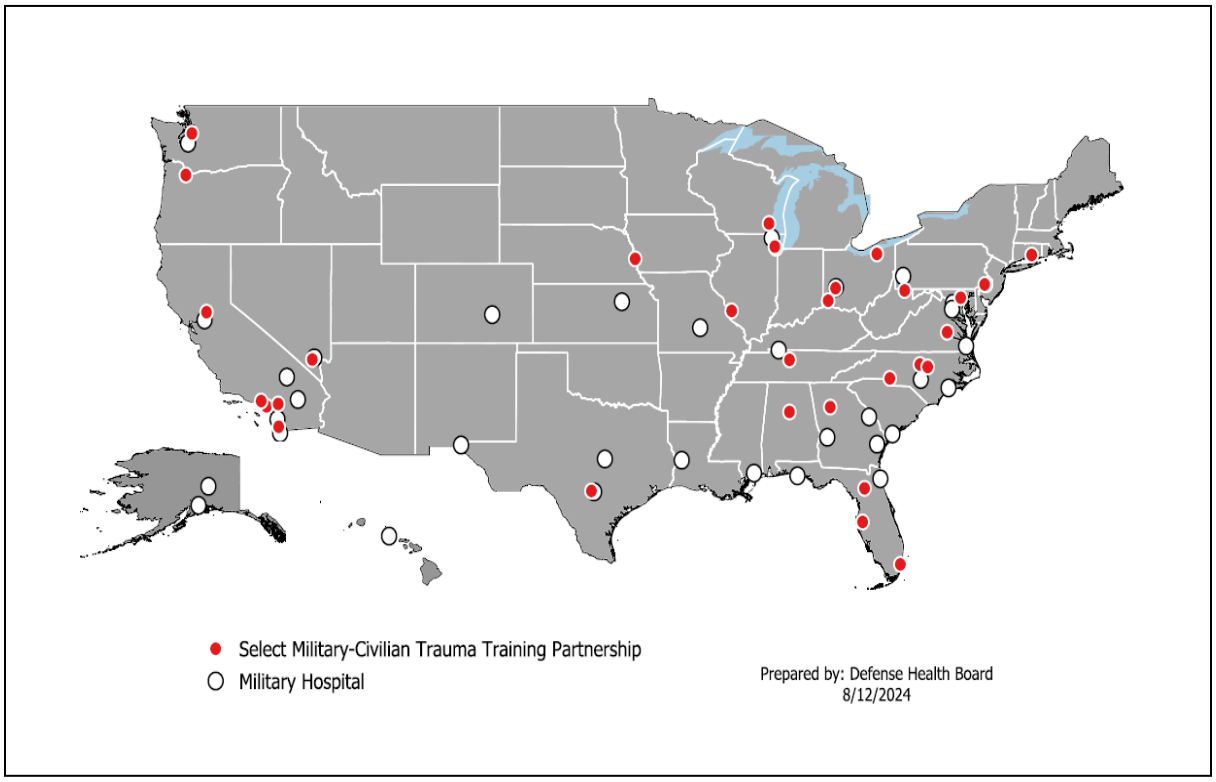


Figure 6. Military Hospitals and Select Military-Civilian Trauma Training Partnerships, Continental United States, and Hawaii.

[52] The National Health Service-Lakenheath Air Force Base partnership in the United Kingdom and Sheikh Shakhbout Medical Center in Abu Dhabi are not included on the map.

[53] The list of military hospitals included here is derived from the official list (as of August 2024), maintained by the Office of the Assistant Secretary of Defense for Health Affairs. Note that only U.S. military hospitals are depicted here rather than the full list of military treatment facilities (which include U.S. military hospitals and clinics).

Table 2. Military Hospitals in the Continental United States, and Hawaii

Hospital	State	Hospital	State
Bassett Army Community Hospital	AK	Bayne-Jones Army Community Hospital	LA
Joint Base Elmendorf-Richardson Hospital	AK	Walter Reed National Military Medical Center	MD
David Grant Air Force Medical Center	CA	Keesler Air Force Medical Center	MS
Naval Hospital Camp Pendleton	CA	Leonard Wood Army Community Hospital	MO
Naval Medical Center San Diego	CA	Mike O'Callaghan Military Medical Center	NV
Robert E Bush Naval Hospital	CA	Keller Army Community Hospital	NY
Evans Army Community Hospital	CO	Womack Army Medical Center	NC
Naval Hospital Jacksonville	FL	Naval Medical Center Camp Lejeune	NC
Eglin Air Force Base Hospital	FL	Wright-Patterson Air Force Base Hospital	OH
Eisenhower Army Medical Center	GA	Naval Hospital Beaufort	SC
Martin Army Community Hospital	GA	Brooke Army Medical Center	TX
Winn Army Community Hospital	GA	William Beaumont Army Medical Center	TX
Tripler Army Medical Center	HI	Carl R Darnall Army Medical Center	TX
James A Lovell Federal Health Care Center	IL	Alexander T Augusta Military Medical Center	VA
Irwin Army Community Hospital	KS	Naval Medical Center Portsmouth	VA
Blanchfield Army Community Hospital	KY	Madigan Army Medical Cen	WA

Table 3. Select Military-Civilian Trauma Training Partnerships.

	Partnership (Year Established)	Location	Mission Zero Act Funding 2023*	Rotational Program	Full-Time Embedded Clinician Program	Part-Time Embedded Clinician Program	Metrics for Measuring Clinical Activity of Non-Billing Medical Personnel	Training for Prolonged Theater Care
AF	University of Alabama (2006)	Birmingham, AL	-	SOCMID	SOST	No	CRMP	Yes
	University of Maryland Medical Center (1996)	Baltimore, MD	$ 124,090.00	C-STARS	C-STARS Cadre	No	CRMP	No
	University Medical Center of Southern Nevada (2002)	Las Vegas NV	$ 215,000.00	C-STARS	C-STARS Cadre	Yes	CRMP	No
	University Cincinnati Medical Center (2001)	Cincinnati, OH	$ 215,000.00	C-STARS, CCAT	C-STARS Cadre	No	CRMP	No
	Kettering Health System/Premier Health System/Wright Patterson Medical Center (2022)	Dayton OH	-	C-STARS, ECCT	C-STARS Cadre	No	CRMP	Unknown
	University Nebraska Medical Center (2021)	Omaha, NE	$ 124,090.00	C-STARS	C-STARS Cadre	No	CRMP	Principles of Biocontainment; Elements of PFC incorporated into training
	Washington University School of Medicine/St. Louis University Medical Center (2003)	St. Louis, MO	$ 215,000.00	C-STARS, Pediatric	C-STARS Cadre	No	CRMP	No
	Tampa General Hospital	Tampa, FL	$ 90,000.00	No	Surgeons Only	No	CRMP	No
	University of California, Davis (1995)	Sacrament, CA	$ 124,090.00	No	Trauma Teams	No	CRMP	No
	National Health Service (2001)	Lakenheath, UK	-	Yes	Trauma Teams	No	CRMP	No
A	Brooke Army Medical Center (2005)	San Antonio TX	-	SMART	Military Treatment Facility	Military Treatment Facility	ICTL	Yes, PFC and PCC
	University of Washington Harborview Medical Center (2021)	Seattle, WA	$ 215,000.00	No	AMCT3	No	ICTL	Yes
	Oregon Health and Sciences University Hospital (2019)	Portland, OR	$ 215,000.00	SMART	AMCT3	No	ICTL	No
	Medical College of Wisconsin (2019)	Milwaukee, WI	$ 124,090.00	PFC; MPT	AMCT3	No	ICTL	Yes

	University of Chicago (2007)	Chicago, IL	$ 215,000.00	Yes	AMCT3	No	ICTL	No
	Vanderbilt University Medical Center (2020)	Nashville, TN	$ 215,000.00	SMART	AMCT3	No	ICTL	Elements of PFC incorporated into training
	University of North Carolina Health (2020)	Chapel Hill, NC	$ 215,000.00	No	AMCT3	No	ICTL	No
	Grady Memorial Hospital (2020)	Atlanta, GA	$ 215,000.00	No	AMCT3	No	ICTL	No
	Cooper University Health Care (2022)	Camden, NJ	$ 215,000.00	SMART	AMCT3	No	ICTL	No
	University of Miami Ryder Trauma Center at Jackson Memorial Hospital and Jackson South Medical Center (2001)	Miami, FL	$ 124,090.00	ATTC	No	No	ICTL	Elements of PFC incorporated into training
	West Virginia University (2019)	Morgantown, WV	-	SOCM, SOIDC, SFMS	No	No	ICTL	No
N	John H. Stroger, Cook County Health (2014)	Great Lakes, IL	-	HMTT	No	No	NMRCC	Elements of PFC incorporated into training
	University of Florida Health Shands Hospital (2001)	Jacksonville, FL	$ 90,000.00	HMTT	No	No	NMRCC	Elements of PFC incorporated into training
	Wake Medical Hospital (2021)	Raleigh, NC	-	HMTT	No	No	NMRCC	No
	University Hospitals Cleveland Medical Center (2019)	Cleveland, OH	$ 124,090.00	HMTT	Yes	No	NMRCC	No
	University of Pennsylvania/Penn Presbyterian Medical Center/Navy Strategic Health Alliance - Readiness Performance (2021)	Philadelphia, PA	$ 124,090.00	None	Yes	No	NMRCC	No
	University of California, Irvine (2021)	Irvine, CA	$ 124,090.00	Trauma Teams	No	No	NMRCC	No
	Navy Trauma Training Center at Los Angeles General/University of Southern California (2002)	Los Angeles, CA	$ 124,090.00	HMTT; NTTC	Yes	No	NMRCC	No
	Virginia Commonwealth University (2023)	Richmond, VA	-	FAM2T	No	No	NMRCC	No

	Riverside Regional Medical Center (2023)	Newport News, VA	$ 90,000.00	Trauma Teams	Yes	No	NMRCC	No
A, N, AF	Sheikh Shakhbout Medical City (2019)	Abu Dhabi, UAE	-	No	Yes	No	NMRCC	No

A – Army; N- Navy; AF – Air Force; SOCMID - Special Operations Center for Medical Integration and Development; SOST - Special Operations Surgical Team; CRMP - Clinical Readiness Metric Program; C-STARS - Center for the Sustainment of Trauma and Readiness Skills; CCAT - Critical Care Air Transport Team; ECCT - Expeditionary Critical Care Team; SMART - Sustained Medical and Readiness Training; ICTL - Individual Critical Task List; PFC - Prolonged Field Care; PCC - Prolonged Casualty Care; AMCT3 - Army Military-Civilian Trauma Team Training; MPT - Medical Proficiency Training; ATTC - Army Trauma Training Course; SOCM - Special Operations Combat Medic; SOIDC - Special Operations Independent Duty Course; SFMS - Special Forces Medical Sergeant Training; HMTT - Hospital Corpsman Trauma Training; NMRC - Naval Medical Research Command Criteria; NTTC – Navy Trauma Training Center; FAM2T - Fundamentals of Assessment and Management of Military Trauma

Description of Select Partnerships

Military-civilian trauma training partnerships are widely heterogeneous as illustrated by the following partnerships.

Brooke Army Medical Center, located on Joint Base San Antonio-Fort Sam Houston, is unique among the sites reviewed in that it is a military hospital rather than a military-civilian trauma training partnership. Brooke Army Medical Center is an American College of Surgeons verified Level I trauma center and accepts civilian patients under the Secretarial Designee Program.

Military medical personnel work full-time at Brooke. Further, Brooke is an American Burn Association-verified burn center, with the Army's only critical care transport (the Burn Flight Team), as well as a rehabilitation facility (the Center for the Intrepid) adjacent to the hospital. Brooke hosts professional society courses in Advanced Trauma Life Support, Advanced Surgical Skills for Exposure in Trauma Plus, and other programs pertinent to prolonged theater care.

Brooke Army Medical Center is fully integrated into the Southwest Texas Regional Advisory Council and is a voting member on the Council. The Council is a 501(c)(3) non-profit, tax-exempt member organization designated by the Texas Department of State Health Services to maintain a regional trauma and emergency health care system for 22 counties in southwest Texas. By operating as a fulltime emergency management system rather than a center activated in response to an emergency, Southwest Texas Regional Advisory Council is uniquely prepared for mass casualty management.

The Navy Trauma Training Center is affiliated with Los Angeles General Medical Center. Los Angeles General Medical Center is one of the largest public hospitals in the United States. It is an American College of Surgeons verified Level I trauma center and serves as a major teaching hospital for the University of Southern California. Eleven military clinicians, including surgeons, are embedded within the trauma center at Los Angeles General Medical Center. Navy trauma teams rotate at the Navy Trauma Training Center and work together as a team during simulation training and during clinical rotations. The military assumes primary responsibility for the trauma service at Los Angeles General Medical Center one day per week.

The Las Vegas Military-Civilian Training Partnership, located at University Medical Center of Southern Nevada, an American College of Surgeons verified Level I trauma center, is the largest military-civilian partnership in the U.S. Forty-five physicians, 11 nurses, and 20 Air Force medical technicians are integrated into the trauma center and hospital. The partnership includes a Center for Sustainment of Trauma and Readiness Skills and 4 Special Operations Surgical teams with 6 members each. Air Force medical personnel from Nellis Air Force Base, located less than 10 miles from University Medical Center, rotate through the medical center.

The Mike O'Callaghan Military Medical Center, located on Nellis Air Force Base, is a Level 3 trauma center that accepts civilian patients. Personnel stationed at Nellis have ready access to

the Center for the Sustainment of Trauma and Readiness Skills program at University Medical Center. Three hundred Airmen from across the Air Force complete the program annually.

The Air Force established an Office of Military Medicine at University Medical Center. This office is credited with maintaining seamless program integration. The partnership participates in combat casualty care research through the Regional Clinical Investigation Program at the Mike O'Callaghan Military Medical Center. University Medical Center recently received a grant to work with the Institute for Defense Analysis to assess the cost and benefits of partnerships at 4 locations. An additional research project is focused on improving the accuracy and efficiency of the Air Force Comprehensive Medical Readiness Program checklist.

University of Nebraska Medical Center is a public state university in Omaha and an American College of Surgeons verified Level 1 trauma center. Its Center for Sustainment of Trauma and Readiness Skills was established in 2018 following the 2014-2016 Ebola outbreak in West Africa.

Embedded Air Force staff at the University of Nebraska Medical Center include 2 infectious disease physicians, an anesthesiologist, a pulmonary critical care physician, a trauma surgeon, 2 emergency and trauma nurses, a public health technician, and an infection prevention nurse. These personnel support the Center for Sustainment of Trauma and Readiness Skills (short-term rotational) program with a Principles of Biocontainment Care course. The program emphasizes skills that prepare military medical personnel to manage high-consequence pathogens and infection with highly resistant organisms.

Since 2016, **West Virginia University** has had a gratuitous (no cost) agreement with the U.S. Army Special Operations Command, Fort Liberty, North Carolina, to provide medical proficiency training through observational and hands-on clinical learning experiences. In addition, West Virginia University conducts research to improve skills tracking during hands-on work with cadavers.

West Virginia University hosts the 18 Delta Special Operations Combat Medic Course. This 36-week, short-term program includes rotations through emergency medicine, urgent care, intensive care, anesthesia, ophthalmology, oral and maxillo-facial surgery, family medicine, pediatrics, and other medical specialties. It also includes a veterinary clinic experience.

West Virginia University offers a large-animal module for special operators to gain familiarity with farm animals, better understand animal behavior, and learn how to maneuver around and among animals. West Virginia University also has a medic mentorship program in which faculty mentor special operators interested in entering medical school or other health care professions.

Hartford Hospital has a long history of training military personnel including Navy Undersea Medical Officers, Independent Duty Corpsmen, Army National Guard medics, and Air Force Reserve personnel at its Center for Education, Simulation, and Innovation. The Center for Education, Simulation, and Innovation is staffed with civilian faculty who can deliver standard

professional society and military trauma training courses, as well as create customized training with military-specific clinical scenarios.

Defining Military-Civilian Trauma Training Partnerships

It is important to define trauma training partnerships to distinguish them from other types of partnerships, and for assigning responsibilities and oversight. However, the Board found that the terms "military-civilian training partnership" (used to describe a larger, integrated military-civilian health care delivery system) and "military-civilian trauma training partnership" (a subset of military-civilian training partnerships) are often conflated.

Section 706 of Public Law 114-328 (2017) directs creation of an integrated military-civilian health delivery system through establishment of partnerships with other health systems. The purpose of these partnerships is to improve access to health care for covered beneficiaries, enhance beneficiary experience of care, improve health outcomes, share resources between the DoD and the private sector, and provide members of the Armed Forces with additional training opportunities to maintain readiness skills.[54] **DoD Instruction 6000.19** *Military Medical Treatment Facility Support of Medical Readiness Skills of Health Care Providers,* identifies the responsibility of the Defense Health Agency to maintain a registry of relevant partnerships.

Section 708 of Public Law 114-328 (2017) directs establishment of a Joint Trauma Education and Training Directorate, the duties of which include establishing and coordinating partnerships for Armed Forces traumatologists[55] and associated clinical support teams so that they can rapidly deploy in support of armed conflict. **DoD Instruction 6040.47** *Joint Trauma System* implements Section 708 of Public Law 114-328 and assigns responsibility for establishing the goals of the partnerships, metrics for measuring performance, methods of data collection, and registry of a DoD military-civilian trauma partnerships to the Director, Defense Health Agency.

Section 743 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law 116–92), requires that the Secretary of Defense conduct a study on the use of military-civilian integrated health delivery systems and examine, among other things, "Locations where health care providers of the DoD may be able to attain critical wartime readiness skills in a local integrated military–civilian integrated health delivery system." The report provided by the Department does not differentiate between training affiliations aimed at providing training for critical wartime skills and affiliations established to improve access to health care for covered

[54] Public law 114-328. National Defense Authorization Act for Fiscal Year 2017
[55] The National Defense Authorization Act for Fiscal Year 2017 does not define the term "traumatologist."

beneficiaries, enhance beneficiary experience of care, improve health outcomes, share resources or for other purposes.[56]

Definitions that clearly differentiate military-civilian partnerships from military-civilian trauma training partnerships are needed. They are necessary for systematic evaluation of military-civilian partnerships and future standardization related to selection and evaluation of partnerships. Clear definitions would also allow the Joint Trauma System to clearly outline those partnerships for which it has responsibility related to establishing goals, maintaining a registry, and creating and tracking metrics – significant responsibilities that are separate from the responsibility to track partnerships established for other purposes. Standardized taxonomy related to military-civilian partnership models should be included in future versions of DoD Instruction 6000.19 *Military Medical Treatment Facility Support of Medical Readiness Skills of Health Care Providers* and DoD Instruction 6040.47 *Joint Trauma System.*

Military Health System Definition of a Military-Civilian Partnership: An agreement between the DoD and a civilian medical institution for the purposes of training and sustaining individual and team expeditionary (combat casualty care) scope of practice. (Note that the Military Health System does not differentiate training programs from trauma training programs.)

Suggested Definition of a Military-Civilian Trauma Training Partnership: A structured collaborative agreement between military and civilian organizations that provides training to enhance the trauma clinical readiness of military medical personnel and exchange best trauma clinical practices. This training occurs after military occupational specialty requirements are met.

Tracking and Assessing Military-Civilian Training and Trauma Training Partnerships

In Prolonged Theater Care Part 1, the Board found that a registry of military-civilian and Department of Veterans Affairs partnerships had not been fully established or sustained despite Public Law 114-328 (2017), DoD requirements,[57] and Government Accountability Office recommendations .[58] While efforts have been made to reconstitute the Joint Trauma System registry working group, to date, the DoD has not developed a registry or inventory of military-civilian trauma training partnerships. Neither has the DoD established minimum criteria and goals for such partnerships, tracked partnership performance with metrics, or developed a process to identify opportunities to streamline or add military-civilian training partnerships.

[56] Under Secretary of Defense. Report to the Committees on Armed Services of the Senate and the House of Representatives: Section 743 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law 116–92), "Study and Plan on the Use of Military-Civilian Integrated Health Delivery Systems." September 2022

[57] This requirement is outlined in DoD Instruction 6040.47 Joint Trauma System

[58] Government Accountability Office. Defense Health Care: Actions needed to define and sustain wartime medical skills for enlisted personnel. June 17, 2021. Available at https://www.gao.gov/products/gao. Accessed February 2, 2024

DoD Instruction 6040.47 assigns responsibility for establishing and coordinating partnerships for Armed Forces traumatologists to the Defense Health Agency, but these partnerships are largely established and managed by the Military Departments, not the Defense Health Agency. Some leaders at the Defense Health Agency have suggested that Defense Health Agency responsibility for military-civilian trauma training partnerships should be limited to maintaining a list of military-civilian trauma training partnerships in support of Service selection, management, and evaluation of such partnerships.[59]

Lack of clear definitions, and continued ambiguities related to the Defense Health Agency's role in military-civilian trauma training partnerships has resulted in failure of the DoD to take full responsibility for and full advantage of military-civilian trauma training partnerships. Reconciling authorities, responsibilities, and procedures related to these partnerships could be accomplished through the Military Health System Executive Review Board, chaired by the Under Secretary of Defense for Personnel and Readiness, and the highest-level body of Military Health System governance.[60]

Finding 1

Persistent ambiguities related to the Defense Health Agency's role in establishing military-civilian trauma training partnerships have resulted in failure to identify a single entity within the DoD that has awareness and oversight of military-civilian trauma training partnerships.

Recommendation 1

The Assistant Secretary of Defense for Health Affairs should resolve ambiguities and clarify responsibilities pertaining to oversight, selection, development, and evaluation of military-civilian trauma training partnerships.

Current Methods Utilized to Assess Military-Civilian Trauma Training Partnerships

Current attempts to measure the value of military-civilian trauma partnerships focus less on program evaluation (Figure 7) than on the individual evaluation of military health care professionals.

The Defense Health Agency Joint Knowledge, Skills, and Abilities Program Management Office utilizes a clinical readiness metric based on clinical encounter data from military treatment facility and partner site electronic medical records. A clinician's activity is compared against a threshold above which a health care professional is considered competent to deliver

[59] Personal communication, Defense Health Leadership. June 12, 2024

[60] The Military Health System Executive Review Board includes Service four-star generals and admirals and the Chairman of the Joint Chiefs of Staff.

operationally relevant care. A 2021 proof of concept study demonstrated that the metric was reliable for orthopedic and general surgeons.[61]

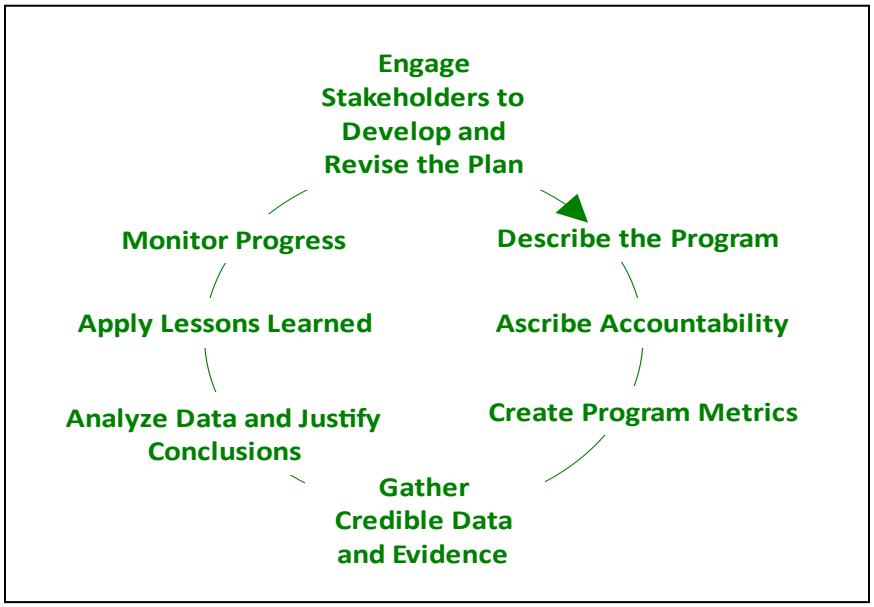


Figure 7. Example Program Planning and Operations Cycle.

The Joint Knowledge, Skills, and Abilities Program and the clinical readiness metric, however, have not been fully implemented. The 7-year roll-out of the Military Health System's new electronic medical record, MHS GENESIS (completed in March 2024), has resulted in incomplete capture of data and using data from MHS GENESIS continues to be challenging. It has also been difficult to collect data from civilian partner sites.[62]

In 2019, the Government Accountability Office evaluated the clinical readiness metric and found the method to be unreliable, incomplete, and not tied to desired outcomes.[63] This office also found the initiative to be expensive: DOD spent approximately $1.7 million on the initiative through fiscal year 2018 and budgeted about $4 million through fiscal year 2021. In February 2019, the Government Accountability Office recommended that the Assistant Secretary of Defense for Health Affairs identify and mitigate limitations associated with the clinical readiness metric. To date, the DoD has not responded to this recommendation.

The Joint Knowledge, Skills, and Abilities Program Management Office displays results of Joint Knowledge, Skills and Ability thresholds on a dashboard. The most recent performance

[61] Holt DB, Hueman MT, Jaffin J, Sanchez M, Hamilton MA, Mabry CD, Bailey JA, Elster EA. Clinical Readiness Program: refocusing the Military Health System. Mil Med. 2021 Jan 25;186(Suppl 1):32-39
[62] Challenges include a temporary lapse in contract support for collecting data from partner sites. Personal Communication. Joint Knowledge, Skills, and Abilities Program Management Office. June 26, 2024
[63] Government Accountability Office. actions needed to determine the required size and readiness of operational medical and dental forces. February 2019

summary shows that 47% of surgeons sampled were below the threshold for competency during the time interval between October 2022 and September 2023 (Table 4).[64]

Table 4. Joint Knowledge, Skills, and Abilities Competency Scores, 2022-2023.

Specialty	Provider Count	Provider Above Threshold Count	Percent Provider Above Threshold
Critical Care	114	16	14%
General Surgery	225	67	30%
Orthopedic Surgery	277	172	62%
Emergency Medicine	475	355	75%
Trauma Surgery	71	32	45%
Ophthalmology	115	60	52%
Cardiothoracic	15	2	13%
Plastic Surgery	31	18	58%
Urology	68	58	85%
Neurosurgery	35	0	0%
Vascular Surgery	37	2	5%
ENT	122	108	89%
TOTAL	**1695**	**899**	**53%**

Given recognized challenges with data, it is unclear how to interpret these results. It is also unclear how the Services would utilize this information, even if the data quality was good, given that they have their own readiness reporting methods, or how this information would be reported using the Defense Readiness Reporting System. Also note that, utilizing a military medicine professional count of 1,695 (above) and a Force End Strength of 93,137,[65] only 2% percent of military medical professionals are being tracked through the Joint Knowledge, Skills, and Abilities program.

Finding 2

Current metrics used to assess the performance of military-civilian trauma training partnerships do not measure program performance, and the purpose of the Joint Knowledge, Skills, and Abilities Program Management Office clinical readiness metric is unclear.

[64] Joint Knowledge, Skills, and Abilities Facility Performance. Available at https://info.health.mil/hco/JKSA/_layouts/15/WopiFrame.aspx?sourcedoc={ED15C58D-4C2A-4E2C-8C18-FE0141D5FAE5}&file=JKSA%20Summary_Facility%20Performance_OCT%202022-SEP%202023.xlsx&action=default. Accessed August 14, 2024

[65] DoD. Health Manpower Personnel Data System Fiscal Year Statistics 2023. Available at https://dwp.dmdc.osd.mil/dwp/app/dod-data-reports/workforce-reports. Accessed January 10, 2024

Recommendation 2

The Assistant Secretary of Defense for Health Affairs, along with the Services and Joint Staff, should:

- Identify and address limitations in individual and team clinical readiness metrics.
- Estimate the cost and benefits of implementing the clinical readiness metrics.
- Develop military-civilian trauma training partnership performance metrics in alignment with emerging combat-related threats.[66]

TOR Objective 2: Provide recommendations to best prepare DoD personnel at military-civilian trauma training partner sites for prolonged theater care in near-peer conflict. Comment on the curriculum, locations, frequency of training, the occupational specialties of participating DoD personnel, and best use of selection and performance criteria outlined in the *Blue Book*.

A Systems Approach to Military-Civilian Trauma Training Partnerships

Literature on the value of using an integrated systems approach to health care is plentiful. Having nodes within a system is associated with greater agility through decentralization, resiliency through redundancy, increased personal engagement and morale through ownership, and enhanced innovation and problem-solving through experimentation and sharing of information and insight.[67,68,69,70,71]

The 2016 National Academies of Science, Engineering, and Medicine Report, *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury*, highlights the importance of a trauma system that operates as a learning health system, and emphasizes the importance of military-civilian collaboration to create such a system. Moving from a disconnected to an integrated system of military-civilian trauma training partnerships is consistent with recommendation 11 from the Academies' report, which states, "The Secretary of Defense should direct the Military Health System to pursue the

[66] Government Accountability Office. Defense Health Care: actions needed to determine the required size and readiness of operational medical and dental forces. February 21, 2019. Available at https://www.gao.gov/products/gao-19-206. Accessed January 9, 2024
[67] Gavin D. Building and learning organization. Harvard Business Review. 71(4), 78-91. July-August 1993
[68] Lipsitz LA. Understanding health care as a complex system: the foundation for unintended consequences. JAMA. 2012 Jul 18;308(3):243-4
[69] Peters DH. The application of systems thinking in health: why use systems thinking? Health Res Policy Syst. 2014 Aug 26; 12:51
[70] Clarkson J, Dean J, Ward J, Komashie A, Bashford T. A systems approach to healthcare: from thinking to -practice. Future Healthc J. 2018 Oct;5(3):151-155.
[71] DoD Instruction 5010.43 Implementation and management of the DoD-wide continuous process improvement/Lean Six Sigma Program. July 17, 2009

development of integrated, permanent joint civilian and military trauma system training platforms to create and sustain an expert trauma workforce."[72]

The Las Vegas Military-Civilian Partnership provides an example of a highly integrated military-civilian partnership. The Office of Military Medicine, established and funded by the Air Force, has contributed to an innovative partnership that is highly valued by both the Air Force and the University of Nevada. While not currently operating as a node within a DoD-wide system, the Office of Military Medicine captures the desired functions of a node and represents a potential component of a coordinated system of military-civilian trauma training partnerships.

A Systems Approach to Implementing Training in Prolonged Theater Care

DoD clinical readiness training is fragmented, and the Department has not developed a strategic plan or systematic approach to implementing training in prolonged theater care. Failure to adopt a systematic approach is based, in part, on lack of joint clinical readiness doctrine, and independently developed, Service-specific medical training requirements. The last column of Table 1 ("Training for Prolonged Theater Care") shows that 24 of the 31 sites reviewed lack evidence of training in prolonged theater care. Further, the ability of the DoD to rapidly train trauma personnel at military-civilian trauma training partnerships during large-scale combat operations, when availability of trauma-trained personnel will quickly exceed demand, has not been addressed.

Recognizing the value of a systems approach, the American College of Surgeons has established a network of interconnected simulation centers, called accredited education institutes. This network has standards for optimal training resources and processes, shares best practices, and aggregates program performance metrics. This approach anticipates evolving national surgical skills training needs, adapts training accordingly and can serve as a model for a network of military trauma training partnerships.[73]

Military-civilian trauma training partnerships should provide training in the context of prolonged theater care, to include tourniquet conversion, protracted airway management, prolonged pain control, extended psychological first aid, and longer intensive care. Managing military-civilian trauma training partnerships as a system would enable standardization of such training and rapid updates to programs of instruction based on emerging operational requirements. Further, military-civilian trauma training partnership programs of instruction should consider the important role that simulation plays in skills training for high risk/low frequency conditions encountered during conflict.

[72] 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. Washington, DC: The National Academies Press. 2016

[73] American College of Surgeons. Setting the Standard of Excellence and Innovation. Available at https://www.facs.org/for-medical-professionals/education/programs/accredited-education-institutes/. Accessed May 20, 2024

Finding 3

The DoD has not established or managed military-civilian trauma training partnerships as a training network.

Recommendation 3

The Assistant Secretary of Defense for Health Affairs should urgently develop a strategic plan for the creation of a network of military-civilian trauma training partnerships and include contingencies for expansion of training capacity.

Best Use of Selection and Performance Criteria Outlined in the American College of Surgeons *Blue Book*

The *American College of Surgeons 2020 Blue Book* provides guidelines for selection and evaluation of institutions that wish to participate in military-civilian trauma training partnerships. These guidelines seek to overcome challenges with fidelity between civilian trauma and combat casualty care through demonstration of institutional commitment; a well-established plan for governance; key personnel; physical resources (including trauma patient volume of 1,200 admissions/year with 10% sustaining penetrating injuries, sufficient volume for in-depth exposure to patients with an Injury Severity Score of 15 or greater in 20% of patients); educational opportunities; and compliance with evaluation criteria.

The criteria proposed by the American College of Surgeons are comprehensive are sound but have not been adopted by the DoD and it is unclear how they have been used, if at all. There is no program of military-civilian trauma training partnership verification based on *Blue Book* standards. Representatives from the interviewed partnerships were uniformly unaware of how the *Blue Book* informed site selection.

The Military Health System Strategic Partnership with the American College of Surgeons has initiated voluntary site visits to review military-civilian trauma training partnerships based on *Blue Book* criteria. To the Boards knowledge, only two sites (the Las Vegas Military-Civilian Partnership, and the Navy Trauma Training Center) have submitting program information based on *Blue Book* criteria to the Military Health System Strategic Partnership with the American College of Surgeons.

The Board joined the Military Health System Strategic Partnership team during a visit to the Las Vegas Military-Civilian Partnership. Additional site visits are planned by the Military Health System Strategic Partnership team, and a publication is anticipated. This will provide additional information about how *Blue Book* criteria might be used in the future.

TOR Objective 3: Provide recommendations to better integrate military-civilian partnerships with attention to direct care military treatment facility staffing and regional medical operations centers.

Military Health System Direct Care Staffing and Clinical Readiness

Increasing patient volume and complexity at military treatment facilities is fundamental to ensuring sustainment of clinical readiness for medical forces. On Dec. 6, 2023, the Deputy Secretary of Defense directed stabilization of the Military Health System.[74] The directive requires the Military Health System to add capacity at military treatment facilities to re-attract patients and beneficiaries to the direct care system. In keeping with this directive, the Military Health System Strategic Plan for Fiscal Years 2024-2029 seeks to increase the capacity of military treatment facilities to deliver care.

Reconciling the staffing needs of the military direct care system with the need to expose military medical personnel to a high volume of high acuity trauma patients at Level 1 trauma centers presents an opportunity to reconsider how and where military medical personnel should train. The direct care system and military-system trauma training partnerships can be seen as competing for medical personnel but should be recognized as complementary opportunities for readiness training. Strategies for ensuring direct care staffing while sustaining the readiness of military clinicians through military-civilian trauma training partnerships include:

- Optimizing the duration of embedded and rotational assignments.
- Considering the needs of civilian partners to foster strong partner relations resilient to deployment and other military requirements.
- Using civilian contractors to free up military medical personnel for trauma training.
- Prioritizing training of deployable teams for assignment at military-civilian trauma training sites.
- Using predictive analytics to identify periods of low demand at military treatment facilities so that short-term rotations can be scheduled accordingly.
- Utilizing the “digital front door” to triage patients to partner locations where military personnel are working.
- Using digital platforms to create secure forums for sharing trauma case management in real-time across military and civilian facilities.
- Seeking legislative support that allows military medical personnel to engage in their full scope of practice at both military and civilian partner sites.

[74] Deputy Secretary of Defense Memorandum: Stabilizing and Improving the Military Health System. December 6, 2023

Geographic Integration Balances Staffing and Training Needs

Successful partnerships demonstrate that proximity of civilian partner sites to military hospitals is ideal for equipoise between the direct care and trauma readiness missions. Prioritization of civilian trauma center partner sites that are close to military hospitals allows medical personnel to maintain their skills and treat beneficiaries at the military hospitals while still being able to provide clinical care at high acuity civilian trauma centers. The National Defense Authorization Act for Fiscal Year 2017 called for development of military-civilian trauma training partnerships and verification of military hospitals as trauma centers as two paths to promote clinical readiness. Figure 10 shows the locations of the eight verified military trauma centers in the U.S. (Appendix 3 lists all U.S. military trauma centers by verification/designation level). Brooke Army Medical Center has a sizeable volume of trauma patients supported by integration with the Southwest Texas Regional Advisory Council trauma system. Trauma experience at the other military trauma centers is limited.

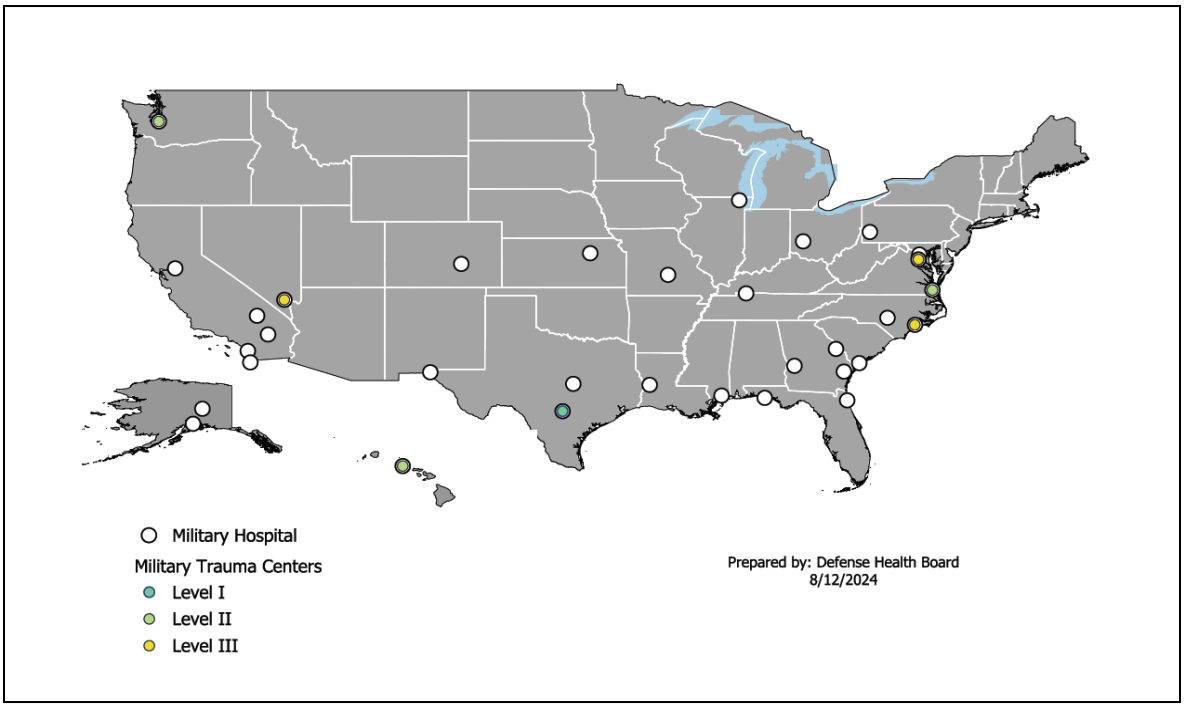


Figure 8. Military Hospitals and Military Trauma Centers, Continental United States, and Hawaii.

Geographic Integration to Enhance Training and Disaster Response

Regional Medical Operations Coordination Centers[75] serve as the coordination hubs during large-scale emergencies and disasters and include all trauma centers, hospitals, health care systems, emergency medical services, emergency management, and public health organizations within a specific region. They are responsible for managing the distribution of medical

[75] Per the Agency for Strategic Preparedness and Response, medical operations coordination centers manage trauma and other transfers, and act as a single point of contact for transfer requests, information, and capacity coordination (load balancing). They can be stood up on an emergency basis, but function best when they instantiated in a region and are used on a daily basis.

resources, coordinating patient transfers with limited delays, and load-balancing patients at trauma centers and hospitals across the region for optimal trauma care. They are essential for organizing medical response efforts during disasters and play an important part in plans to manage the high volume of casualties anticipated from near-peer conflict which would overwhelm individual hospitals and trauma centers. The Southwest Texas Regional Advisory Council in San Antonio, TX, is an example of a continuously functioning Regional Medical Operations Coordination Center. Additional examples can be found in the Medical Operations Coordination Centers Toolkit.[76]

Associating military-civilian trauma training partnerships with Regional Medical Operations Coordination Centers could facilitate the coordination of casualty movement and care across civilian and military hospitals for large-scale combat operations casualty reception in the U.S. and response to regional disasters. Some civilian trauma centers are reliant on military clinicians assigned to the trauma center through the military-civilian partnership for consistent delivery of trauma care: situational awareness through Regional Medical Operations Coordination Centers might facilitate regional trauma center backfill when military clinicians deploy quickly for large-scale combat operations.

Figure 9 demonstrates the geographic dispersion of U.S. military hospitals, military-civilian

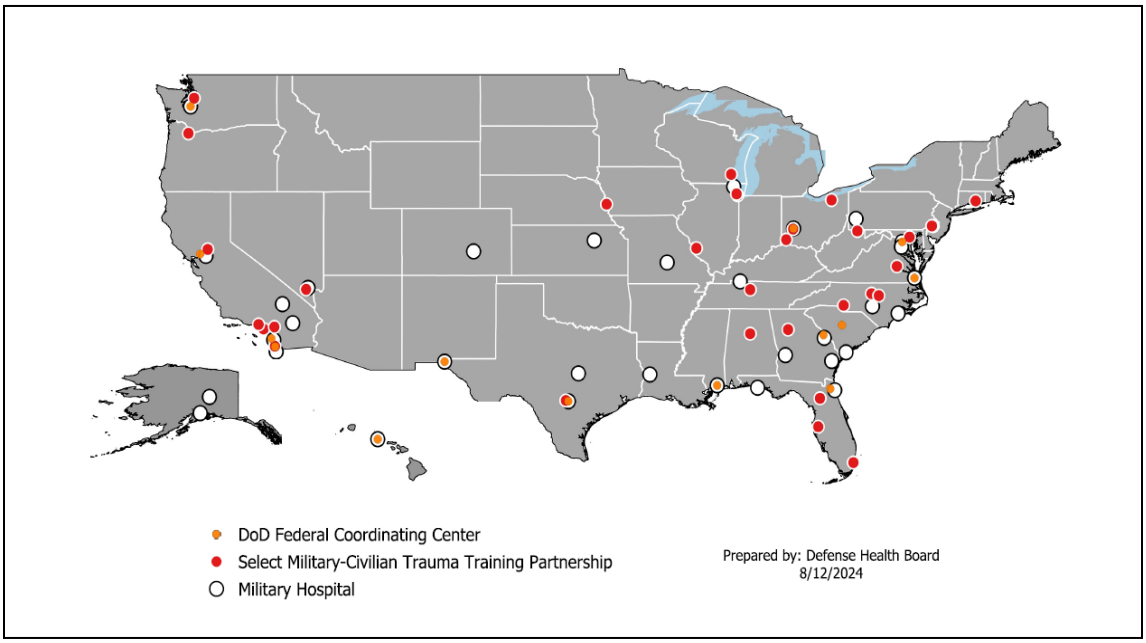


Figure 9. DoD Federal Coordinating Centers, Military Hospitals, and Select Military-Civilian Trauma Training Partnerships, Continental United States, and Hawaii.

[76] Technical Resources, Assistance Center, and Information Exchange (TRACIE). *Medical Operations Coordination Centers Toolkit*. Available at https://files.asprtracie.hhs.gov/documents/fema-mocc-toolkit.pdf. Accessed 12, 2024

trauma training partnerships, and current Army, Navy, Air Force, and Defense Health Agency Federal Coordinating Centers (Veterans Administration Hospital Federal Coordinating Centers not shown).

Thoughtful selection of civilian trauma center partner sites in close geographic location or communication with Regional Medical Operations Coordination Centers could assist with the disposition of casualties from large-scale combat operations.

Finding 4

Geographic considerations related to military-civilian trauma training partnerships have implications for optimizing training and preparing civilian hospitals for the care of high volumes of casualties from large-scale combat operations.

Recommendation 4

The DoD should prioritize geographic proximity in selection and renewal of military-civilian trauma training partner sites to:

- Optimize medical resources at military treatment facilities while sustaining local readiness training.
- Integrate with Regional Medical Operations Coordination Centers.

Summary of Findings and Recommendations

Finding 1

Persistent ambiguities related to the Defense Health Agency's role in establishing military-civilian trauma training partnerships have resulted in failure to identify a single entity within the DoD that has awareness and oversight of military-civilian trauma training partnerships.

Recommendation 1

The Assistant Secretary of Defense for Health Affairs should resolve ambiguities and clarify responsibilities pertaining to oversight, selection, development, and evaluation of military-civilian trauma training partnerships.

Finding 2

Current metrics used to assess the performance of military-civilian trauma training partnerships do not measure program performance, and the purpose of the Joint Knowledge, Skills, and Abilities Program Management Office clinical readiness metric is unclear.

Recommendation 2

The Assistant Secretary of Defense for Health Affairs, along with the Services and Joint Staff, should:

- Identify and address limitations in individual and team clinical readiness metrics.
- Estimate the cost and benefits of implementing the clinical readiness metrics.
- Develop military-civilian trauma training partnership performance metrics in alignment with emerging combat conditions.

Finding 3

The DoD has not established or managed military-civilian trauma training partnerships as a training network.

Recommendation 3

The Assistant Secretary of Defense for Health Affairs should urgently develop a strategic plan for creation of a network of military-civilian trauma training partnerships and include contingencies for expansion of training capacity.

Finding 4

Geographic considerations related to military-civilian trauma training partnerships have implications for optimizing training and preparing civilian hospitals for the care of high volumes of casualties from large-scale combat operations.

Recommendation 4

The DoD should prioritize geographic proximity in selection and renewal of military-civilian trauma training partner sites to:

- Optimize medical resources at military treatment facilities while sustaining local readiness training.
- Integrate with Regional Medical Operations Coordination Centers.

Appendix A: Acronyms

AMCT3	Army Military-Civilian Trauma Team Training
ASSEST+	Advanced Surgical Skills for Exposure in Trauma - Plus
ATTC	Army Trauma Training Course
C-STARS	Center for the Sustainment of Trauma and Readiness Skills
CCAT	Critical Care Air Transport Team
CRMP	Clinical Readiness Metric Program
ECCT	Expeditionary Critical Care Team
FAM2T	Fundamentals of Assessment and Management of Military Trauma
HMTT	Hospital Corpsman Trauma Training
ICTL	Individual Critical Task List
MPT	Medical Proficiency Training
NMRC	Naval Medical Research Command
NTTC	Navy Trauma Training Center
PCC	Prolonged Casualty Care
PFC	Prolonged Field Care
SFMS	Special Forces Medical Sergeant Training
SMART	Sustained Medical and Readiness Training
SOCM	Special Operations Combat Medic
SOCMID	Special Operations Center for Medical Integration and Development
SOIDC	Special Operations Independent Duty Course
SOST	Special Operations Surgical Team
TCCC	Tactical Combat Casualty Care

Appendix B: Glossary

Advanced Surgical Skills for Exposure in Trauma Plus – A 2-day cadaver course covering 30 trauma operative skills, organized as sequential formative and summative evaluations using an objective checklist.

Army Military-Civilian Trauma Team Training (AMCT3) - Medical personnel are embedded at designated Level 1 trauma centers and work alongside civilian medical professionals. The program provides direct clinical experience in managing complex trauma cases, surgical interventions, and critical care situations. It ensures that Army medical personnel are up to date with the latest trauma care practices and technologies.

Army Trauma Training Course (ATTC) - A two-week course designed to provide surgical teams with skills to improve teamwork and prepare them for treating casualties that are typical in a deployed environment.

Center for the Sustainment of Trauma and Readiness Skills (C-STARS) - A U.S. Air Force program that provides military medical personnel with hands-on trauma care training in civilian trauma centers, ensuring their readiness for combat and emergency situations.

Critical Care Air Transport Teams (CCAT) - Specialized U.S. Air Force medical teams responsible for providing advanced critical care during the aerial transport of severely injured or ill patients from the battlefield or other remote locations to higher-level medical facilities.

Clinical Readiness Metric Program (CRMP) - A program that measures the clinical activity and readiness of non-billing medical personnel, ensuring they maintain essential clinical skills for operational roles.

Expeditionary Critical Care Team (ECCT) - A specialized military medical team designed to provide critical care in deployed or expeditionary environments. These teams are composed of highly trained medical professionals who can deliver advanced life-saving care in situations where resources are limited.

Fundamentals of Assessment and Management of Military Trauma (FAM2T) - A training program that provides foundational knowledge and skills for managing military trauma, emphasizing the unique aspects of trauma care in a military context.

Hospital Corpsman Trauma Training (HMTT) - 7-week program that includes a mix of didactic training, practical skills assessments, and clinical rotations at Level 1 trauma centers. Participants work alongside civilian trauma teams in hospitals, focusing on skills such as trauma resuscitation, surgical procedures, and patient stabilization. The program often includes rotations in emergency departments and intensive care units to broaden clinical exposure.

Individual Critical Task List (ICTL) - A list of essential tasks and competencies that military personnel must be proficient in to ensure mission readiness and effectiveness in their specific roles.

Medical Proficiency Training (MPT) - Training programs aimed at maintaining and enhancing the clinical skills of military medical personnel, ensuring their ability to provide high-quality care in various settings, including combat and deployment scenarios.

Naval Medical Research Command (NMRC) - A U.S. Navy organization focused on conducting medical research to enhance the health, safety, and performance of military personnel, with an emphasis on operational environments.

Prolonged Casualty Care (PCC) - Clinical practice guidelines for conventional forces responsible for direct casualty management over a prolonged period in austere, remote, or expeditionary settings, and/or during long-distance movements.

Prolonged Field Care (PFC) - The Prolonged Field Care training program is designed to equip Special Operations Forces military medical personnel with the skills necessary to provide extended care to casualties in remote or austere environments where immediate evacuation is not possible. The training covers advanced medical procedures, patient stabilization, monitoring, and extended care management. It emphasizes improvisation, resource management, and the ability to maintain patient care over an extended period, often exceeding 24 hours, until the patient can be evacuated to a higher level of care.

Special Forces Medical Sergeant Training (SFMS) - The Special Forces Medical Sergeant Training or the 18D program is a 42-week course consisting of formal classroom training and practice exercise designed to equip U.S. Army Special Forces medics with advanced medical skills. It includes extensive classroom instruction on medical subjects such as anatomy, physiology, and emergency medicine, coupled with rigorous field training that simulates combat scenarios. Additionally, participants undergo clinical rotations in civilian medical facilities to gain hands-on experience. The program emphasizes trauma care, prolonged field care, and advanced medical procedures, ensuring medics are prepared for diverse operational settings.

Sustained Medical and Readiness Training (SMART) - A 2-4-week rotational skill sustainment program at civilian health care facilities to enhance the clinical skills of military medical personnel through realistic, hands-on training scenarios and simulations.

Special Operations Combat Medic (SOCM) - A 36-week program trains Navy corpsmen and other enlisted service members to manage trauma patients, provide basic medical care, and prepare patients for evacuation. The course covers combat trauma management, tactical combat casualty care, and other topics. It also includes an Emergency Medical Technician block

that can prepare candidates with little to no medical experience to become certified national registry Emergency Medical Technician in 25 days.

Special Operations Center for Medical Integration and Development (SOCMID) - A facility/program focused on the integration and advancement of medical practices within special operations forces, ensuring that medical personnel are equipped with the latest knowledge and skills to support special operations missions.

Special Operations Independent Duty Course (SOIDC) - A 24-week course designed to train Navy Corpsmen to provide advanced, independent medical care in austere and operational environments for Special Operations Forces. The course equips them with skills in trauma management, advanced medical procedures, and prolonged field care under challenging conditions.

Special Operations Surgical Teams (SOST) - The Special Operations Surgical Team program trains small, highly mobile surgical teams that can deploy rapidly to provide surgical support to special operations forces in austere environments. Members undergo rigorous training that includes advanced trauma care, surgical procedures, and field medicine. The training prepares them to operate in diverse and challenging conditions, often with limited resources. SOST teams are designed to be self-sufficient and capable of providing life-saving care close to the point of injury.

Tactical Combat Casualty Care (TCCC) - Tactical Combat Casualty Care is required for all Service members. It teaches first responders to treat casualties in the proper order, treating the most critical patients first. Training is conducted in 3 phases: Care under fire, tactical field care, and tactical evacuation care.

- Tactical Combat Casualty Care-ASM – Tier 1: 7-hour course for all service members.
- Tactical Combat Casualty Care-CLS – Tier 2: 40-hour course for non-medical military personnel deploying in support of combat operations.
- Tactical Combat Casualty Care-CMC – Tier 3: 63-hour course for military medical personnel including medics, corpsmen and pararescue personnel deploying in support of combat operations.

Appendix C: NDAA Military-Civilian Partnership Requirements

Public Law 114-328 (National Defense Authorization Act for Fiscal Year 2017)

Section 706. ESTABLISHMENT OF HIGH-PERFORMANCE MILITARY-CIVILIAN INTEGRATED HEALTH DELIVERY SYSTEMS

(a) IN GENERAL. Not later than January 1, 2018, the Secretary of Defense shall establish military-civilian integrated health delivery systems through partnerships with other health systems, including local or regional health systems in the private sector—

(1) to improve access to health care for covered beneficiaries.

(2) to enhance the experience of covered beneficiaries in receiving health care.

(3) to improve health outcomes for covered beneficiaries.

(4) to share resources between the Department of Defense and the private sector, including such staff, equipment, and training assets as may be required to carry out such integrated health delivery systems.

(5) to 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.

(6) to provide members of the Armed Forces with additional training opportunities to maintain such readiness skills.

(b) ELEMENTS OF SYSTEMS. Each military-civilian integrated health delivery system established under subsection (a) shall—

(1) deliver high quality health care as measured by leading national health quality measurement organizations.

(2) achieve greater efficiency in the delivery of health care by identifying and implementing within each such system improvement opportunities that guide patients through the entire continuum of care, thereby reducing variations in the delivery of health care and preventing medical errors and duplication of medical services.

(3) improve population-based health outcomes by using a team approach to deliver case management, prevention, and wellness services to high-need and high-cost patients.

(4) focus on preventive care that emphasizes—

(A) early detection and timely treatment of disease.

(B) periodic health screenings.

(C) education regarding healthy lifestyle behaviors.

(5) coordinate and integrate health care across the continuum of care, connecting all aspects of the health care received by the patient, including the patient's health care team.

(6) facilitate access to health care providers, including—

(A) after-hours care.

(B) urgent care.

(C) through telehealth appointments, when appropriate.

(7) encourage patients to participate in making health care decisions

(8) use evidence-based treatment protocols that improve the consistency of health care and eliminate ineffective, wasteful health care practices.

(9) improve coordination of behavioral health services with primary health care.

(c) AGREEMENTS. —

(1) IN GENERAL. In establishing military-civilian integrated health delivery systems through partnerships under subsection (a), the Secretary shall seek to enter into memoranda of understanding or contracts between military treatment facilities and health maintenance organizations, health care centers of excellence, public or private academic medical institutions, regional health organizations, integrated health systems, accountable care organizations, and such other health systems as the Secretary considers appropriate.

(2) PRIVATE SECTOR CARE. Memoranda of understanding and contracts entered into under paragraph (1) shall ensure that covered beneficiaries are eligible to enroll in and receive medical services under the private sector components of military-civilian integrated health delivery systems established under subsection (a).

(3) VALUE-BASED REIMBURSEMENT METHODOLOGIES. —The Secretary shall incorporate value-based reimbursement methodologies, such as capitated payments, bundled payments, or pay for performance, into memoranda of understanding and contracts entered into under paragraph (1) to reimburse entities for medical services provided to covered beneficiaries under such memoranda of understanding and contracts.

(4) QUALITY OF CARE. Each memorandum of understanding or contract entered into under paragraph (1) shall ensure that the quality of services received by covered beneficiaries through a military-civilian integrated health delivery system under such

memorandum of understanding or contract is at least comparable to the quality of services received by covered beneficiaries from a military treatment facility.

(d) COVERED BENEFICIARY DEFINED. —In this section, the term ‘‘covered beneficiary’’ has the meaning given that term in section 1072 of title 10, United States Code.

SEC. 707. JOINT TRAUMA SYSTEM

(a) PLAN. —

(1) IN GENERAL. Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall submit to the Committees on Armed Services of the House of Representatives and the Senate an implementation plan to establish a Joint Trauma System within the Defense Health Agency that promotes improved trauma care to members of the Armed Forces and other individuals who are eligible to be treated for trauma at a military medical treatment facility.

(2) IMPLEMENTATION. The Secretary shall implement the plan under paragraph (1) after a 90-day period has elapsed following the date on which the Comptroller General of the United States is required to submit to the Committees on Armed Services of the House of Representatives and the Senate the review under subsection (c). In implementing such plan, the Secretary shall take into account any recommendation made by the Comptroller General under such review.

(b) ELEMENTS. The Joint Trauma System described in subsection (a)(1) shall include the following elements:

(1) Serve as the reference body for all trauma care provided across the military health system.

(2) Establish standards of care for trauma services provided at military medical treatment facilities.

(3) Coordinate the translation of research from the centers of excellence of the Department of Defense into standards of clinical trauma care.

(4) Coordinate the incorporation of lessons learned from the trauma education and training partnerships pursuant to section 708 into clinical practice.

(c) REVIEW. Not later than 180 days after the date on which the Secretary submits to the Committees on Armed Services of the House of Representatives and the Senate the implementation plan under subsection (a)(1), the Comptroller General of the United States shall submit to such committees a review of such plan to determine if each element under subsection (b) is included in such plan.

(d) REVIEW OF MILITARY TRAUMA SYSTEM. —In establishing a Joint Trauma System, the Secretary of Defense may seek to enter into an agreement with a non-governmental entity with subject matter experts to—

(1) conduct a system-wide review of the military trauma system, including a comprehensive review of combat casualty care and wartime trauma systems during the period beginning on January 1, 2001, and ending on the date of the review, including an assessment of lessons learned to improve combat casualty care in future conflicts.

(2) make publicly available a report containing such review and recommendations to establish a comprehensive trauma system for the Armed Forces.

SEC. 708. JOINT TRAUMA EDUCATION AND TRAINING DIRECTORATE

(a) ESTABLISHMENT. The Secretary of Defense shall establish a Joint Trauma Education and Training Directorate (in this section referred to as the ''Directorate'') to ensure that the traumatologists of the Armed Forces maintain readiness and are able to be rapidly deployed for future armed conflicts. The Secretary shall carry out this section in collaboration with the Secretaries of the military departments.

(b) DUTIES. —The duties of the Directorate are as follows:

(1) To enter into and coordinate the partnerships under subsection (c).

(2) To establish the goals of such partnerships necessary for trauma teams led by traumatologists to maintain professional competency in trauma care.

(3) To establish metrics for measuring the performance of such partnerships in achieving such goals.

(4) To develop methods of data collection and analysis for carrying out paragraph (3).

(5) To communicate and coordinate lessons learned from such partnerships with the Joint Trauma System established under section 707.

(6) To develop standardized combat casualty care instruction for all members of the Armed Forces, including the use of standardized trauma training platforms.

(7) To develop a comprehensive trauma care registry to compile relevant data from point of injury through rehabilitation of members of the Armed Forces.

(8) To develop quality of care outcome measures for combat casualty care.

(9) To direct the conduct of research on the leading causes of morbidity and mortality of members of the Armed Forces in combat.

(c) PARTNERSHIPS. —

(1) IN GENERAL. —The Secretary may enter into partnerships with civilian academic medical centers and large metropolitan teaching hospitals that have level I civilian trauma centers to provide integrated combat trauma teams, including forward surgical teams, with maximum exposure to a high volume of patients with critical injuries.

(2) TRAUMA TEAMS. Under the partnerships entered into with civilian academic medical centers and large metropolitan teaching hospitals under paragraph (1), trauma teams of the Armed Forces led by traumatologists of the Armed Forces shall embed within the trauma centers of the medical centers and hospitals on an enduring basis.

(3) SELECTION. The Secretary shall select civilian academic medical centers and large metropolitan teaching hospitals to enter into partnerships under paragraph (1) based on patient volume, acuity, and other factors the Secretary determines necessary to ensure that the traumatologists of the Armed Forces and the associated clinical support teams have adequate and continuous exposure to critically injured patients.

(4) CONSIDERATION. In entering into partnerships under paragraph (1), the Secretary may consider the experiences and lessons learned by the military departments that have entered into memoranda of understanding with civilian medical centers for trauma care.

(d) PERSONNEL MANAGEMENT PLAN. —

(1) PLAN. The Secretary shall establish a personnel management plan for the following wartime medical specialties:

(A) Emergency medical services and prehospital care.

(B) Trauma surgery.

(C) Critical care.

(D) Anesthesiology.

(E) Emergency medicine.

(F) Other wartime medical specialties the Secretary determines appropriate for purposes of the plan.

(2) ELEMENTS. —The elements of the plan established under paragraph (1) shall include, at a minimum, the following:

(A) An accession plan for the number of qualified medical personnel to maintain wartime medical specialties on an annual basis in order to maintain the required number of trauma teams as determined by the Secretary.

(B) The number of positions required in each such medical specialty.

(C) Crucial organizational and operational assignments for personnel in each such medical specialty.

(D) Career pathways for personnel in each such medical specialty.

(3) IMPLEMENTATION. —The Secretaries of the military

departments shall carry out the plan established under paragraph (1).

(e) IMPLEMENTATION PLAN. —Not later than July 1, 2017, the Secretary of Defense shall submit to the Committees on Armed Services of the House of Representatives and the Senate an implementation plan for establishing the Joint Trauma Education and Training Directorate under subsection (a), entering into partnerships under subsection (c), and establishing the plan under subsection (d).

(f) LEVEL I CIVILIAN TRAUMA CENTER DEFINED. —In this section, the term ‘‘level I civilian trauma center’’ means a comprehensive regional resource that is a tertiary care facility central to the trauma system and is capable of providing total care for every aspect of injury from prevention through rehabilitation.

Appendix D: Designated and Verified Military Trauma Centers

American College of Surgeons Verified Level I Trauma Center

Brooke Army Medical Center, San Antonio, TX

American College of Surgeons Verified Level II Trauma Centers

Landstuhl Regional Medical Center, GE

Tripler Army Medical Center, Honolulu, HI

American College of Surgeons Verified Level III Trauma Centers

Alexander T. Augusta Military Medical Center, Fort Belvoir, VA

Womack Army Medical Center, Ft. Liberty, NC

Michael O'Callaghan Military Medical Center, Nellis AFB, NV

Naval Medical Center Camp Lejeune, Camp Lejeune, NC

State-designated Level II Trauma Centers

Madigan Army Medical Center, Joint Base Lewis-McChord, WA

Naval Medical Center Portsmouth, Norfolk, VA

Appendix E: Terms of Reference

THE ASSISTANT SECRETARY OF DEFENSE
1200 DEFENSE PENTAGON
WASHINGTON, DC 20301-1200

HEALTH AFFAIRS

September 28, 2023

MEMORANDUM FOR PRESIDENT, DEFENSE HEALTH BOARD

SUBJECT: Defense Health Board Review -- Prolonged Field Care

Pursuant to the attached Terms of Reference (TOR) on "Prolonged Field Care," I direct that the Defense Health Board (DHB), working through its Trauma and Injury Subcommittee, provide recommendations to best prepare Department of Defense (DoD) personnel at military-civilian trauma training partner sites for prolonged field care in near-peer conflicts. The DHB should recommend guidance on better integrating military-civilian partnerships with attention to Direct Care Military Treatment Facilities staffing and Regional Medical Operations Centers, commenting on curriculum, locations, frequency of training, and the occupational specialties of participating DoD personnel.

The TOR for this review provides a detailed description and scope of the tasking. The point of contact for this action is the Defense Health Board Designated Federal Officer/Executive Director CAPT Shawn Clausen. She may be reached at (703) 275-6060 or shawn.s.clausen.mil@health.mil. Thank you for your support and commitment to optimizing the health and force-readiness of the military.

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Date: 2023.09.28 08:52:43 -04'00'

Lester Martínez-López, M.D., M.P.H.

Attachment:
As stated

cc:
Group Federal Officer
Advisory Committee Management Officer
Defense Health Board Designated Federal Officer

Defense Health Board
Prolonged Field Care
TERMS OF REFERENCE

These Terms of Reference (ToR) establish the objectives for the Defense Health Board (DHB) to review, through its Trauma and Injury Subcommittee ("the Subcommittee"), the DoD's trauma care strategy for prolonged field care.

Mission Statement: The mission of the DHB is to provide independent advice and recommendations to maximize the safety and quality of, as well as access to, health care for Department of Defense (DoD) health care beneficiaries.

Issue Statement: The U.S. military trauma care system is designed to enhance survivability among injured Service members. Lessons learned in Operation Iraqi Freedom and Operation Enduring Freedom (OIF/OEF) informed adaptations to the trauma care delivery system and resulted in higher survival rates. However, trauma care delivery during the OIF/OEF conflicts depended on uncontested air superiority. Evacuation by sea, although rarely used in recent conflicts, remained available due to uncontested sea superiority. Medical units were able to transport casualties, which occurred in lower numbers than in U.S. conflicts of the 20th century, to higher echelons of care in a short period of time – a major contribution to the high survival rate.[1,2] One analysis of all U.S. military casualties from 2001-2017 attributed rapid prehospital transport (less than 60 minutes), along with wider use of tourniquets, and availability of blood product transfusions to a 44% reduction in mortality among critically injured casualties compared to those who did not receive any of these three key interventions.[3]

Future conflicts are likely to occur with 'near-peers' capable of contesting the U.S. in the air and at sea -- delaying evacuation of casualties. A near-peer conflict also brings risk of increased numbers of casualties.[1,2] These elements require strategies for personnel, training, logistics, and casualty evaluation, treatment, and evacuation different from those used in recent conflicts.

Wartime expertise in trauma management is difficult to maintain during peacetime.[4] Military trauma centers, which includes only one Level I center, do not care for sufficient volumes of trauma patients for military medical personnel to maintain readiness.[7] DoD has established partnerships with leading U.S. civilian trauma centers to offer trauma management opportunities and training for military teams. Although guided by the American College of Surgeons' (ACS) "Blue Book," these partnerships still do not provide enough opportunities to develop and maintain critical wartime skills.[5,6] The trauma management experience these civilian-military partners provide may not match current wartime practice (e.g. less focus on open surgical procedures) and may not have a curriculum oriented towards a near-peer conflict and the need for prolonged field care by both surgical and medical teams.

The DoD has begun retooling training for uniformed personnel at the undergraduate, graduate, and continuing medical education level to prepare for prolonged field care. These build upon the Knowledge, Skills, and Abilities (KSA) program, participation in the American College of Surgeons (ACS) Trauma Improvement process, and changes to TRICARE network agreements to encourage retention by the direct-care system of beneficiaries in need of surgical procedures.

The training provided by military-civilian partnerships also requires re-tooling to best prepare military teams to provide casualty care for a prolonged time in the field.

Objectives and Scope:

- Review the curriculum and experience of current military-civilian trauma training partnerships.
- Provide recommendations to best prepare DoD personnel at military-civilian trauma training partner sites for prolonged field care in near-peer conflicts. Comment on the curriculum, locations, frequency of training, the occupational specialties of participating DoD personnel, and best use of selection and performance criteria outline in the Blue Book.
- Provide recommendations to better integrate military-civilian partnerships with attention to Direct Care MTF staffing and Regional Medical Operations Centers.

Methodology:

1. The Trauma and Injury Subcommittee may conduct interviews and site visits as appropriate.
2. The Trauma and Injury Subcommittee may seek input from other sources with pertinent knowledge or experience.
3. In accordance with the November 26, 2018, Deputy Secretary of Defense memo, "Advisory Committee Management," the Trauma and Injury Subcommittee shall receive full and timely cooperation of each office of the Secretary of Defense or DoD Component Head in providing analyses, briefings and other DoD information or data necessary for the fulfillment of its responsibilities as provided for by this TOR. All requests shall be consistent with applicable laws; applicable security classifications; DoD Instruction 5105.04, "Department of Defense Federal Advisory Committee Management Program"; and this ToR.
4. Material provided to the DHB becomes a permanent part of the DHB's record. Components are reminded that all data/information provided is subject to public inspection unless the originating Component office properly marks the data/information with the appropriate classification and Freedom of Information Act exemption categories before the data/information is released to the DHB. The DHB has physical and electronic storage and communications capability on unclassified networks to support receipt of material up to the Controlled Unclassified Information level. Each Component should remember that DHB members, as special government employee members of a DoD Federal advisory committee, will not be given any access to the DoD network, to include DoD email systems.

Compliance:

The DHB and the Subcommittee will operate in conformity with and pursuant to the DHB's charter, chapter 10 of title 5, U.S. Code (commonly known as the "Federal Advisory Committee Act"), section 552b(c) of title 5, U.S. Code (commonly known as the "Government in the Sunshine Act"), and other applicable Federal statutes, regulations, and policy. Individual DHB and Subcommittee members, as well as the Subcommittee, do not have the authority to make decisions or recommendations on behalf of the DHB nor report directly to any Federal representative. The members of the DHB and Subcommittee are subject to certain Federal ethics

Appendix F: Meetings and Presentations

May 8, 2024: Trauma and Injury Subcommittee Site Visit
University of Maryland/Baltimore Shock Trauma, Baltimore, MD

The Subcommittee, represented by Captain Shawn Clausen, Executive Director, Defense Health Board, met with representatives of the University of Maryland military-civilian trauma training partnership to discuss the Centers for the Sustainment of Trauma and Readiness Skills program at the University of Maryland.

May 15, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met virtually and Colonel Jennifer Gurney, Director of the Joint Trauma System. Colonel Gurney provided an overview of the Joint Trauma System. The members reviewed and discussed the report outline.

May 22-24, 2024: Trauma and Injury Subcommittee Site Visit
Hartford Hospital, Hartford, CT

The Subcommittee, represented by Dr. Lenworth Jacobs and Captain Shawn Clausen, visited, toured, and attended Grand Rounds presented by Ukrainian trainees at Hartford Hospital. A rapid, just-in-time training program based on sequential simulation, cadaver, and clinical training was demonstrated.

May 29, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met virtually with Colonel Alan Chambers, Command Surgeon, U.S. European Command; and Captain Jeffrey Bitterman, Command Surgeon, U.S. Indo-Pacific Command to discuss Command Surgeons' perspectives on military-civilian trauma training partnerships and military readiness.

June 4, 2024: Defense Health Board Meeting
Virtual

Dr. John Armstrong, Trauma and Injury Subcommittee Chair, gave an overview of the report, Prolonged Theater Care, Part 2, noting the intent to deliberate in September 2024.

June 12, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met virtually with Ms. Cynthia Barrigan, Director of Army military-civilian partnerships; Mr. Thomas Bickett, Project Manager, DoD Office of the Inspector General; Ms. Lori Atkinson, Assistant Director, Government Accountability Office; and Dr. Brian Eastridge, Chair in Trauma Research, University of Texas Health, San Antonio and Medical Director, Military Health Systems Strategic Partnership with the American College of Surgeons to discuss the different organizations' approach to evaluating military-civilian trauma training partnerships,

June 26, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met virtually and received a briefing by Mr. Richard Kollar and the Joint Knowledge, Skills, and Abilities Project Management Office team. The team presented an overview and demonstration of the Joint Knowledge, Skills, and Abilities dashboard, which provides baseline clinical readiness data for military medical providers.

July 1-2, 2024: Trauma and Injury Subcommittee Site Visit
Brooke Army Medical Center, Fort Sam Houston, TX; Navy Trauma Training Center, Los Angeles, CA

The Subcommittee visited and toured Brooke Army Medical Center and Southwest Texas Regional Advisory Council (TX); and the Navy Trauma Training Center (CA). Key features of each facility were discussed.

July 10, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met with Colonel Jennifer Gurney, Chief of the Joint Trauma System. Colonel Gurney briefed the Subcommittee on the American College of Surgeons Blue Book. Dr Gurney was followed by Dr. Paul Cordts, Chief Medical Officer, Defense Health Agency, led a discussion on Military Health System stabilization.

July 12, 2024: Trauma and Injury Subcommittee Site Visit
West Virginia University, Morgantown, WV

The Subcommittee, represented by Captain Shawn Clausen, was briefed on and toured the West Virginia University Critical Care and Trauma Institute, and the University's military-civilian trauma training partnership.

July 17, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met with Maj Gen (Dr.) John DeGoes, Acting Surgeon General/Deputy Surgeon General, U.S. Air Force and Dr. Michael McGinnis, Executive Director of the Bureau of Medicine and Surgery, U.S Navy briefed the Subcommittee on the necessity of military-civilian partnerships due to the insufficient patient volume and complexity at Medical Treatment Facilities to maintain proficiency in critical skills.

July 31, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met virtually with Dr. Jeff Kerby, Chair of the Committee on Trauma for American College of Surgeons to discuss his perspective on military-civilian trauma training partnerships. Dr. Warren Dorlac, Surgeon General (Ret.), U.S. Air Force briefed the committee on the Medical Capabilities Program.

August 7, 2024: Trauma and Injury Subcommittee Meeting
Virtual

The Subcommittee met virtually and discussed the report, including findings and recommendations.

August 15, 2024: Trauma and Injury Site Visit
University of Las Vegas, Nevada Military-Civilian Partnership, Las Vegas, NV

The Subcommittee visited and toured the University of Las Vegas military-civilian trauma training partnership at University Medical Center, Southern Nevada.