OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND READINESS

The Honorable Roger F. Wicker
Chairman
Committee on Armed Services
United States Senate
Washington, DC 20510

JAN 17 2025

Dear Mr. Chairman:

This is a substantive interim response to section 713 of the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 (Public Law 117–263), "Centers of Excellence for Specialty Care in Military Health System."

The enclosed substantive interim report provides the status and plan for designating certain military medical treatment facilities as Centers of Excellence (CoEs) across 10 clinical specialties. This report contains criteria for recommended CoE locations and scope of services at each site. It also details how each specialty CoE will improve quality, outcomes, and readiness using standardized measurement criteria, and outlines a comprehensive plan for staffing, performance monitoring, and supporting patient travel to designated CoEs.

CoE designation and implementation process requires extensive planning, coordination, approvals, and resourcing across various Department of Defense organizations. The Department anticipates providing the final report by August 29, 2025.

Thank you for your continued strong support for the health and well-being of our Service members, veterans, and their families. I am sending a similar letter to the House Armed Services Committee.

Sincerely,

[redacted]

Ashish S. Vazirani
Performing the Duties of the Under Secretary of Defense for Personnel and Readiness

Enclosure:
As stated

cc:
The Honorable Jack Reed
Ranking Member

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND READINESS

The Honorable Mike D. Rogers
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

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Enclosure:
As stated

cc:
The Honorable Adam Smith
Ranking Member

Substantive Interim Report to the Committees on Armed Services of the Senate and the House of Representatives

Centers of Excellence for Specialty Care in Military Health System

January 2025

The estimated cost of this report or study for the Department of Defense (DoD) is approximately $163,000 which includes $42,000 in expenses and $122,000 in DoD labor.
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EXECUTIVE SUMMARY

This substantive interim report is in response to section 713 of the James M. Inhofe National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2023 (Public Law 117–263), "Centers of Excellence for Specialty Care in Military Health System." Section 713 requires that the Secretary of Defense (SecDef) designate certain major medical centers as the regional Centers of Excellence (CoEs) for the provision of specialty care services in 10 clinical areas, and any such other areas of specialty care that the Secretary determines appropriate.

CoEs in civilian healthcare demonstrate improved outcomes and reduced cost through the concentration of specialists and patients at a single location with a highly specialized mix of capabilities and staff to treat specific medical conditions and disease processes. In the Military Health System (MHS), existing CoEs for traumatic brain injury (TBI) and oncology are successfully established. Designating additional CoEs in critical specialties by incorporating best practices from existing MHS CoEs has the potential to improve quality, decrease cost, and increase medical force readiness for the MHS, as well as improve overall military readiness through care provided to patients.

This substantive interim report describes the initial plan towards meeting the requirements in the section 713 of the NDAA for FY 2023 regarding establishing specialty CoEs across the MHS. This report outlines planned capabilities for MHS CoEs across the 10 specialty areas specified by Congress. Preliminary plans to address other components of section 713 are also detailed within the report, including referral of beneficiaries to CoE locations and associated accommodations, recommended alignment of MHS specialty providers to CoE locations, and CoE performance monitoring plans. MHS CoE implementation will continue to be operationalized based on the requirements established by section 713 of the NDAA for FY 2023.

The Department of Defense (DoD) anticipates providing the final report to Congress by August 29, 2025. This additional time provides DoD with a critical extension to complete extensive planning, coordination, approvals, and resourcing across various DoD organizations to officially designate and stand up CoEs for several specialties in accordance with section 713 of the NDAA for FY 2023.

BACKGROUND

The law directs that the SecDef submit a report to the Committees on Armed Services of the House of Representatives and the Senate that sets forth the plan to designate CoEs under 10 U.S.C. § 1073d(b)(4).

Section 713 of the NDAA for FY 2023 requires the SecDef to provide:

> (A) A list of centers of excellence to be designated under section 1073d(b)(4) and the locations of such centers.
> (B) A description of the specialty care services to be provided at each such center and a staffing plan for each such center.
> (C) A description of how each such center shall improve—

(i) The military medical force readiness of the Department and the readiness of the Armed Forces;

(ii) The quality of care received by eligible beneficiaries; and

(iii) The health outcomes of eligible beneficiaries.

(D) A comprehensive plan for the referral of eligible beneficiaries for specialty care services at centers of excellence designated under such section 1073d(b)(4), and appropriate specialty care providers in the private sector.

(E) A plan to assist eligible beneficiaries with travel and lodging, if necessary, in connection with the receipt of specialty care services at centers of excellence designated under such section 1073d(b)(4) or appropriate specialty care providers in the private sector.

(F) A plan to transfer specialty care providers of the Department to centers of excellence designated under such section 1073d(b)(4), in a number as determined by the Secretary to be required to provide specialty care services to eligible beneficiaries at such centers.

(G) A plan to monitor access to care, beneficiary satisfaction, experience of care, and clinical outcomes to understand better the impact of such centers on the health care of eligible beneficiaries.

As directed in the section 713 of the NDAA for FY 2023, this substantive interim report contains plans to establish CoEs for the following medical specialties: Oncology, Burn Injuries and Wound Care, Rehabilitation Medicine (RM), Psychological Health and Traumatic Brain Injury, Amputations and Prosthetics, Neurosurgery, Orthopedic Care, Substance Use Disorder (SUD), Infectious Diseases (ID) and Preventive Medicine, and Cardiothoracic Surgery.

Definition and Purpose of CoEs

Within healthcare, a CoE is generally defined as a shared facility, or entity, that provides high standards of research, leadership, services, or education, and brings innovative mechanisms to promote knowledge and scientific advancements. CoEs bring together high levels of expertise and resources to deliver comprehensive, interdisciplinary care focused on specific area of medicine to deliver the best patient outcomes possible.[1] Different healthcare entities, such as medical insurance agencies, medical professional societies, and Government organizations, apply their own definitions based on broad CoE criteria.[2] Due to the lack of national standards regarding CoEs, it is critical that any organization establishing a CoE understands the delivery model and its benefits before aligning clinical and administrative efforts, to offer the highest value of care available. Essential components to be considered when building a CoE include specialized expertise, innovation, research, leadership, organizational structure, sustainable funding, infrastructure, quality of service, strategy, entrepreneurship, accreditation and standards, and collaboration and partnership.[3]

Conceptually, CoEs offer many potential benefits to patients and the healthcare system as demonstrated in commercial healthcare systems. Comparisons of tumor resection surgical

[1] (Elrod JK, 2017).
[2] (Manyazewal T, 2022).
[3] (Elrod JK, 2017).

outcomes between a cancer CoE and non-CoEs show a lower rate of surgical complication in the cancer CoE.[4,5] Other comparative studies suggest that establishing CoEs has a positive effect on mortality and morbidity and improves patient satisfaction across multiple specialties.[6] The MHS will develop a comprehensive plan for CoEs to execute the intent of section 713 of the NDAA for FY 2023, and capitalize on potential CoE benefits for MHS beneficiaries. Some known potential benefits of MHS CoEs include:

- Improved Quality and Outcomes: The potential to recapture private sector care and triage care from specific specialties to CoEs should result in increased patient volumes at the CoEs, which creates opportunity to improve patient outcomes. High patient volumes, such as those found within a CoE, conclusively result in better patient outcomes, including fewer days spent in the hospital, faster recovery times, and reduced complications. In studies of hospital and physician volume, 71 percent of all studies of hospital volume and 69 percent of studies of physician volume reported statistically significant associations between higher volume and better outcomes.[7] Patients treated by higher volume surgeons also showed a 53 percent lower risk of reoperation, a reduction in serious adverse events (40 percent at 30 days, and 37 percent at 90 days), and a 62 percent reduction in the risk of a prolonged hospital stay.[8]

- Increased potential for treatment breakthroughs: The concentration of specialized clinicians and unique subsets of patients at CoEs promotes increased specialization for the treatment of rare diseases and patients with complex morbidities, some of which are specific to MHS patients. Research breakthroughs at MHS CoEs have the potential to improve patient outcomes and improve medical force readiness.[9]

- Reduced cost: Concentrating patient care for a specialty to a CoE helps build provider expertise, enabling better and more efficient care management.[10] Many of the features of CoEs positively impact financial performance. Centralizing operations and standardization of processes afford opportunities to generate efficiencies, which can result in cost savings.[10] In a study specific to spine patients, care at a CoE prevented more than half of surgeries recommended by non-CoE providers. Among those that did undergo surgery, patients at CoE sites spent 14 percent less time in the hospital, and their likelihood of readmission was 95 percent lower, therefore reducing overall cost.[10] Similar results were found for joint replacement surgery patients.[11] CoE specialists averted unnecessary surgical procedures (20 percent of patients avoided surgery), after determining that several patients would benefit more from conservative treatments, resulting in 32 percent less time spent in the hospital.[1110] According to data from the healthcare analytics platform Clarify Health, orthopedic surgeons with higher surgical volume generated better patient outcomes and lower costs for hip and knee

[4] (Merkow RP, 2013).
[5] (Birkmeyer NJ, 2005).
[6] (Martin RC, 2022).
[7] (Halm, 2002).
[8] (Valsamis EM, 2023).
[9] (Centers of Excellence, 2023).
[10] (Woods, 2019).

replacements.[11] Shorter lengths of stay and quicker discharges that are more common in CoEs also contribute to lower costs.[12,13] All the above studies were performed within civilian healthcare, but similar benefits should apply to the MHS.

- Improved employee experience: CoEs also benefit the staff and providers. For example, CoEs can attract highly specialized providers due to the prestige of the CoEs and the availability of resources. CoEs can be considered learning organizations, whereby institutional members can share knowledge, insights, and experiences to improve understanding and provide care enhancements resulting from lessons learned.[14]

MHS STRATEGY FOR ESTABLISHING COES

The MHS first adopted a central definition of CoE in response to the Senate Report 111–20, pages 50-51, accompanying S. 1054, Supplemental Appropriations for FY 2009. In 2011, the scope of responsibility for the CoE spanned across clinical, educational and research activities, and an initial set of criteria for MHS CoEs was established.[15] The criteria require MHS CoEs to provide the entire clinical spectrum of care for a patient—from the prevention of diseases and treatment of clinical conditions through rehabilitation and transition to civilian life. The TRICARE Operations Manual subsequently defined a CoE as "a center focused on an associated group of clinical conditions that creates value by achieving improvement in outcomes through clinical, educational, and research activities."[16] This definition is consistent with professional society literature. These general definitions and criteria, along with lessons learned from the literature and existing MHS CoEs, were used as a starting point to develop the strategy for standing up the CoEs required by the section 713 of the NDAA for FY 2023.

In July 2023, the Defense Health Agency (DHA) formally chartered a CoE Integrated Product Team (IPT) consisting of representatives from various directorates spanning clinical and business operations, healthcare administration, legal, and manpower. The IPT developed a two-part strategy to nominate existing military medical treatment facility (MTF) specialty care product lines or clinics as CoEs, including: 1) identifying optimal locations based on existing capabilities; and 2) defining the CoE scope and requirements. Similar to establishment of existing DoD CoEs under 10 U.S.C. § 1073d(b), specialty care CoE standup is a resource-intensive process and may require augmentation of existing capabilities to fully meet the intent of section 713 of the NDAA for FY 2023 to establish CoEs for each specialty area.

Identifying CoE Locations

Evaluation of potential MHS CoE locations was conducted in collaboration with clinical experts and MTF representatives. Four criteria, described below, were established to support identification of potential CoE locations, and will be used to evaluate performance of CoE sites.

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[11] (High-Volume Orthopedic Surgeons Generate Beeter Outcomes at Lower Cost, 2023).
[12] (Davies JM, 2017).
[13] (How Centers of Excellence help improve quality and control costs, 2017).
[14] (Elrod JK, 2017).
[15] (Report to Congress on Department of Defense Medical Centers of Excellence 2011).
[16] (TRICARE Reimbursement Manual 6010.58-M, 2015).

These criteria were based on peer-reviewed literature studies, lessons learned from other CoEs, and existing MHS CoE definitions and structure.

1) Accreditation or Verification: Accreditation or verification by national quality or professional society programs is a core requirement to ensure that clinical standards of care have been validated by an external organization. Evidence consistently demonstrates that accreditation programs improve the process of care provided by healthcare systems, and accreditation programs improve clinical outcomes of a wide spectrum of clinical conditions.[17] Such programs include the American College of Surgeons Commission on Cancer (ACS CoC), the Vascular Verification program, or Burn Center Verification program.[18,19] MTF locations with existing accreditation or verification in a specialty were given precedence for CoE designation.

2) Evidence-based Clinical Standards that incorporate Clinical Practice Guidelines (CPGs): The degree of adherence to clinical standards and CPGs at a potential CoE location was used to determine the ability of that site to deliver high-quality healthcare across the scope of services for a given specialty. Clinical standards and CPG adherence improve effectiveness and quality of care, decrease unwarranted variation in clinical practice, and decrease costly and preventable adverse events. Quality improvement initiatives are linked with CPGs, as evidence-informed recommendations form the basis for identifying core outcomes and measurable standards of care.[20]

3) Clinical Outcomes: Data on outcomes that exceed established national benchmarks were used to identify potential locations that are already delivering high-quality care to beneficiaries. The MHS, like most other healthcare organizations, uses nationally established outcome measures across all hospitals and clinics, such as measures defined by The Joint Commission (TJC), the Agency for Healthcare Research and Quality (AHRQ), the National Committee for Quality Assurance (NCQA), and the American College of Surgeons (ACS).[21,22] Outcomes measures include mortality rates, readmissions, complication rates, and healthcare-associated infections.

4) Multidisciplinary Care Capability to Optimize Access: Access to multidisciplinary capabilities is critical to ensure patient care is coordinated. Effective CoEs require interdisciplinary care teams to treat the patient throughout the full spectrum of care pathway. For example, the ability of a location to provide amputation surgery must be coupled with the ability to provide associated supportive services such as rehabilitative physical therapy. Access to care at CoEs will be evaluated through existing access to care metrics.[23]

[17] (Alkhenizan A, 2011).
[18] (Commission on Cancer, 2023).
[19] (Vascular Verification Program, 2023).
[20] (Kredo T, 2016).
[21] (HEDIS Measures and Technical Resources 2023).
[22] (Frequently Asked Questions, 2023).
[23] (Defense Health Care, 2020).

The four criteria above were used to score each potential CoE location across the designated areas of specialty care. The locations with the highest scores across the four criteria for each specialty were considered the best potential candidates for CoE designation. Additional specialty-specific factors that included patient demand assessment, education/training requirements (Graduate Medical Education (GME) programs), research capabilities (e.g., if a location conducts clinical trials in each specialty), geographic private sector care capabilities, and surrounding infrastructure (e.g., proximity to airports, lodging) were also incorporated in the overall CoE assessment. Final decisions on the locations of 10 specialty CoEs, excluding TBI which is already an established CoE, remain ongoing.

Alignment with Section 714 of the NDAA for FY 2023, Maintenance of Core Casualty Receiving Facilities (CCRFs) to Improve Medical Force Readiness

The MHS is also responsible for analyzing and making a recommendation on designation and maintenance of MTFs as CCRFs. CCRFs are defined as Role 4 MTFs intended to serve as a medical hub for receipt and treatment of casualties, including civilian casualties, that may result from combat or from an event the President determines or declares as a natural disaster, mass casualty event, or other national emergency. The MHS is analyzing the operational requirement to designate MTFs as CCRFs to facilitate the United States Transportation Command's (USTRANSCOM) Unified Command Plan designated global aeromedical evacuation mission in conjunction with the establishment of specialty care CoEs. DHA, in coordination with USTRANSCOM and United States Northern Command, are developing scoring criteria to assess inpatient MTF capabilities to be designated as a CCRF to facilitate formal establishment per section 714 of the NDAA for FY 2023.

Defining CoE Scope and Requirements

Once official CoE site designations are determined, each specialty will define the final scope of services for each CoE, the associated requirements, and measures to monitor performance. Recommended CoE scope of services, requirements, and measures are under review to aid in final site recommendations to DHA leadership.

To determine the scope of care for each CoE location, each specialty will define: a) the specific specialty care services to be provided at the CoE; b) patient population subsets to be targeted for referral to the CoE; and c) specific patient eligibility criteria (e.g., what specific conditions warrant a referral to a CoE).

To determine the requirements for each CoE location, each specialty will identify: a) staffing needs; b) new equipment or other resources needed; and c) planned partnerships with external organizations. A staffing plan analysis will be completed to define optimal staffing requirements for each CoE location for both clinical and administrative support. This ideal staffing plan will be compared to the current state to determine the staffing gaps. Each specialty will develop justifications for any staffing adjustment requests, along with relevant literature and studies to support the staffing levels requested. For other resourcing requirements, each location will be evaluated separately to determine what would be required to deliver the full scope of care. This includes a need for new facilities or facility renovations, specific equipment needs (e.g., new

magnetic resonance imaging technologies), new training requirements, need to enroll in a new external quality program, and need to establish new interdisciplinary care teams. For external partnership requirements, each specialty will define and justify (for each location) future partnerships needed to deliver full CoE scope of care (e.g., academic medical center partnerships for training, Veterans Health Administration Medical Center partnerships) and the planned strategy for implementing the partnerships (e.g., Memorandum of Agreement).

To determine the measures for monitoring CoE performance, each specialty will define a governance structure for each location to ensure proper oversight. Each specialty will then identify measures in access to care, patient satisfaction, employee satisfaction, patient care experience, and clinical outcomes to assist the MHS in achieving its mission set with an aim to achieve ready, reliable care.

PROPOSED DESIGNATIONS OF SPECIALTY CARE SERVICES COES

Oncology

Oncology CoEs have four main goals:

1) To provide patient-focused care backed by educational resources and forums.
2) To improve the clinical and emotional outcomes of the patients with oncologic diseases through early detection and prompt, appropriate treatment.
3) To coordinate care to ensure that the best care plan and treatment options are presented to patients; and
4) To create a transparent system of quality management and outcomes of cancer patients.

Oncology CoE Locations: Recommended locations for Oncology CoEs will build upon existing oncology services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

Oncology CoE locations must acquire and maintain the requisite staffing, clinical capabilities, and institutional accreditations to achieve and sustain designation as an Oncology CoE or satellite site.

The scope of cancer services at the CoE will include onsite multidisciplinary cancer services, full range of diagnostic treatment services, postgraduate medical education, and cancer-related research/clinical trial participation. Bone marrow transplant (BMT) is also recommended as a CoE capability, as applicable.

MHS oncology care and research is unique due to the collaboration and co-location of the John P. Murtha Cancer Center (MCC) at Walter Reed National Military Medical Center (WRNMMC) and Uniformed Services University of the Health Sciences in Bethesda, Maryland. MCC is the only established DoD Cancer Center[24] with robust clinical and research capabilities that will continue to provide the foundation for scaling Oncology services across the enterprise.

[24] Walter Reed National Military Medical Center, "Murtha Cancer Center."

Examples of cancer research, trials and treatment scaled from MCC at all CoE Oncology MHS sites are the MCC Biobank study and the APOLLO (Applied Proteogenomics Organizational Learning and Outcomes) study. Additionally, APOLLO uses genomic analysis to identify Service members at high risk of cancer and institute prevention strategies for affected Service members as well as Veterans, retirees, and beneficiaries enrolled in APOLLO.

Specialty Care Services to be Provided: Designated MHS Oncology CoEs will combine multidisciplinary teams of highly trained medical professionals with state-of-the-art therapies and medical equipment to deliver superior-quality, comprehensive and patient-centered cancer care. From early detection of cancer and diagnosis, through treatment and into survivorship, Oncology CoEs will provide evidence-based oncology care for adult and pediatric patients diagnosed with the full spectrum of solid tumors and hematologic malignancies.

Supported by advanced laboratory services, extensive diagnostic imaging, subspecialty trained pathologists, and a robust cancer genetics program, Oncology CoE teams within the MHS will have the expertise and capability to manage rare and very complex oncology cases. Specialized oncology dietitians, behavioral health professionals, palliative care teams, and cancer care coordinators augment the surgical, radiation, and medical therapies to achieve clinical outcomes and patient satisfaction that exceed the standards of national accreditation bodies. When active cancer treatment ends, the expansive survivorship program will continue surveillance for disease recurrence and management for the long-term and late-onset complications of cancer and cancer therapies.

In addition to world-class oncology care, Oncology CoEs will collaborate in national cooperative research groups and advance the field of oncology by participating in industry-sponsored trials and conducting homegrown research projects.

Oncology CoE Staffing Plan: The ideal staffing model for Oncology CoEs will incorporate all levels of multi-disciplinary oncology staffing needed to provide superior-quality, comprehensive, and patient-centered cancer care as outlined in Table 1.

Table 1. Oncology CoE Staffing Model

	Oncology Departments		
	Medical, Pediatric, and Gynecologic Oncology	**Radiation Oncology**	**Surgical Oncology**
Providers	Medical Oncologist Pediatric Oncologist Gynecologic Oncologist Advanced Practice Provider (APP)	Radiation Oncologist	Surgical Oncologist Cardiothoracic Surgeon Orthopedic Surgeon Neurosurgeon Urologist Otolaryngologist APP
Nursing	Registered Nurse (RN) Inpatient chemotherapy RN Outpatient infusion RN Licensed Vocational Nurse (LVN)	Radiation RN	Surgical RN
Department Specific	Bone Marrow Transplant BMT Program Coordinator BMT Assistant Program Coordinator BMT APP BMT Licensed Clinical Social Worker (LCSW) BMT Clinical Health Psychologist BMT Data Manager	Physics Radiation Therapist Physicist Dosimetrist	Surgical Staff Operating Room (OR) Nurse Surgical Technician Certified Nurse Anesthetist (CRNA)
Cross Departmental Core Support			
Pharmacy Oncology Pharmacist Oncology Clinical Pharmacist (BCOP) Pharmacy Technician Point of Care Pharmacist	**Psychosocial** Child Life Specialist LCSW Oncology Social Worker Clinical Health Psychologist	**Administration** Clinic Manager CoE Manager Authorization Personnel MSA/Scheduler Billing Personnel Oncology Informaticist Oncology Information Technology (IT)	
Care Coordination Nurse Navigator Nurse Case Manager	**Nutrition** Oncology Dietitian – Registered Dietician Nutritionist	**Cancer Registry** Certified Tumor Registrar (CTR) CTR Supervisor Non-CTR	
Research Research RN Research Pharmacist Research Data Manager Research Administrator	**Survivorship** Physician APP RN	**Rehabilitation/Prehabilitation** Physical Therapist Occupational Therapist Certified Lymphedema Therapist Physical Therapy Technician Occupation Therapy Technician	

Cross Departmental Capabilities		
Pathology Hematopathologist Bone/Soft Tissue Pathologist Breast Pathologist Gastrointestinal Pathologist Gynecological Pathologist Cytopathologist Neuropathologist Dermatopathologist Pathology Technician Laboratory Technician Cytology Technician Histology Technician Hematology Technician Flow Cytometry Technician Complex Chemistry Technician	**Palliative Care** Palliative Care Physician Physical Medicine and Rehabilitation Palliative Care APP Palliative Care RN Palliative Care LCSW Pain Management Spiritual Care	**Radiology** Diagnostic Radiologist Interventional Radiologist Nuclear Medicine Radiologist Sonographer Mammographer MRI Technologist Nuclear Medicine Technologist Bone Densitometry Technologist Radiologic Technologist Vascular Interventional Technologist
Proceduralists GI Interventionist Pulmonary Interventionist Endoscopy Technician Respiratory Therapist	**Blood Bank/Apheresis** Transfusion Medicine Physician Apheresis RN Cell Therapy Technician Supervisor Cellular Therapy Technician Quality Assurance Technician	**Genetics** Geneticist Genetic Counselor Genetic Counselor Assistant

How MHS Oncology CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: The establishment of Oncology CoEs will empower MHS clinicians to provide dynamic, multidisciplinary, and high-quality cancer care essential to safely and expediently return active duty Service members (ADSMs) to duty and maintain the lifelong health of the Service members. The centralization of oncology services will facilitate participation in clinical trials and streamline knowledge sharing between highly specialized clinicians, allowing ADSMs access to the most innovative cancer therapies. Furthermore, the comprehensive support services available at Oncology CoEs will ensure ADSMs and their families receive the resources to successfully transition from treatment back to active duty.

   Additionally, the treatment of complex cancer cases at CoEs promotes military medical force readiness at all levels of care, from physicians to nurses to technicians. Complex cancer cases are a key and necessary component of maintaining knowledge, skills, and abilities (KSAs) and improving force generation for all specialties of medicine.

2) Quality of Care: The potential impact of oncology CoEs on the quality of patient care cannot be overstated. Concentrating specialty providers, essential oncology capabilities, and key support services at CoEs and satellite sites will enable the MHS to deliver a full-spectrum of high quality, patient-centered cancer care. CoEs will foster an environment of learning, innovation, and continuous clinical advancement within the MHS oncology community, leading to consistent, evidenced-based improvements in oncologic care across all disciplines. Beneficiaries and their families will receive holistic support

throughout treatment, with on-site access to services ranging from genetic counseling to child-life specialists to oncology-specific nutrition. As ACS CoC accredited facilities, CoEs and most of satellite sites will contribute to the consortium of professional organizations "dedicated to improving survival and quality of life for cancer patients through standard-setting, prevention, research, education, and monitoring of comprehensive quality care."[25]

3) Health Outcomes: Research continually demonstrates that access to a universal, comprehensive healthcare system improves patient outcomes across multiple disciplines.[26,27] By offering a full range of oncology services onsite, CoEs will further reduce barriers to care and improve health care access for all MHS beneficiaries. As part of the ACS CoC, CoEs and most of satellite sites will report data to, and receive feedback from, the National Cancer Database, enabling these centers to assess performance against nationally recognized quality measures, identify variations in care, and implement improvements to continually advance oncology care within the MHS.

Burn Injuries and Wound Care

Burn Injury CoE(s) will provide services for TRICARE eligible beneficiaries, as well as Veterans and civilian emergency patients, in accordance with applicable law, DoD regulations, and policy. Designated site(s) will provide comprehensive care for patients with severe burns, inhalation injury, or other illnesses and injuries generally treated at a burn center.

Burn Injury CoE Locations: Recommended locations for Burn Injury CoE(s) will build upon existing Burn Injury and Wound Care services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

Specialty Care Services to be provided: Burn Injuries and Wound Care specialty care services to be provided at CoE location(s) will include the following:

- Rehabilitation (Physical and Occupational)
- Burn Surgery/OR
- Intensive Care
- Social Work
- Behavioral Health
- Nutrition
- Pharmacy
- Respiratory Therapy
- Palliative Care
- Central Materiel Service
- Chaplain Support

[25] (Optimal Resources for Cancer Care – 2020 Standards, 2021).
[26] (Lin J, 2021).
[27] (Lin J, 2020).

- Credentialing
- Laboratory Support to include Blood Bank
- Medical Logistics
- Patient Representatives
- Radiology Services
- Risk Management

CoE Staffing Plan: Burn Injury CoE(s) will be staffed by interdisciplinary teams comprised of professionals and paraprofessionals from multiple disciplines as shown in Table 2.

Table 2. Burn Injuries and Wound Care CoE Ideal Staffing Model

Staff Category
Burn Director
Surgeons (Burn/Trauma)
Plastic Surgeon
Intensivists
Anesthesiologists
Physical Therapists
Occupational Therapists
Physical and Occupational Therapy Technicians
Physician Assistants (PA)
Respiratory Therapists
Clinical Nurse Specialists
Critical Care Nurses
Progressive Care Nurses/Medical/Surgical
Perioperative Nurses
LPNs/LVNs
OR Technicians
Dietician
Pharmacist
Behavioral Health Provider
Licensed Social Workers (Case Management)
Burn Program/Registry
GME Coordinator
Clinical Research and Performance Improvement

How the MHS Burn CoE will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: Burn Injury CoE personnel will be dedicated to optimizing combat casualty care through the daily application of evidence-based clinical care integrated with scientific research. Burn Injury CoE staff will simultaneously ensure the ability and capacity to provide care of both military burn casualties and civilian emergency patients, while enhancing individual and team readiness through training and education and maintenance of technical knowledge and skills.

2) Quality of care: The American Burn Association (ABA) validates clinical standards of care for burn centers. Verification is an indicator that the burn center provides high quality patient care to burn patients from the time of injury through rehabilitation. ABA verification procedures promote patient safety, cost containment, regional education and outreach, injury prevention, innovation and research, and patient advocacy. Quality of care for the Burn Injuries and Wound Care CoEs will be measured by using ABA Benchmark Reports, which include case volume, case mix, length of stay, and mortality measures.

   All patients and/or their immediate family members or surrogate(s) will be interviewed and counseled extensively by the attending physician, fellow and/or resident, and nursing team leader caring for the patient. During these interviews and counseling sessions, patients will be assessed not only for their medical needs, but their social, learning, emotional, recovery, and rehabilitation needs. Issues identified will either be resolved or referred to the appropriate service for resolution.

3) Health outcomes: Burn Injury CoE medical staff will be board-certified or board-eligible in their specialties. Burn Injury CoE leadership will plan, direct, coordinate, and improve the services provided for all patients from preoperative, operative, to postoperative care to improve patient outcomes.

RM

A RM CoE is a specialized facility that incorporates all aspects of neuromusculoskeletal rehabilitative services through comprehensive multidisciplinary care. Leveraging established expertise and resources, RM CoEs offer innovative and evidence-based clinical and therapeutic interventions within an interdisciplinary framework to ensure a holistic and personalized treatment strategy. The primary objective of the RM CoE is to optimize functional patient outcomes by delivering exceptional care that addresses the complexities of each individual's condition and rehabilitation journey.

RM CoE Locations: Recommended locations for RM CoEs will build upon existing RM services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

To tailor to the unique clinical composition of a RM CoE, an alternate set of scoring criteria was developed that aligns conceptually to the primary proposed CoE criteria. Specifically, given the wide range of specialty services encompassed within RM, there are no existing accreditations or verifications which cover all rehabilitation services as a single entity. All CoE sites are required to be accredited. The need for RM CoEs to obtain additional disease-specific care certifications offered by the accrediting organization will be determined further in the development process. Each rehabilitation specialty within the RM CoE follows a strict set of national clinical standards and evidence-based processes pertaining to their respective specialty services.

The selection of the RM CoEs will be based on the overarching CoE criteria, in addition to the following five criteria specific to RM:

1) Rehabilitation Services Offered: Scope of rehabilitation services at the CoE will include inpatient rehabilitation services, outpatient rehabilitation services, and a full range of diagnostic, surgical, and therapeutic specialty care services on-site. A total of 14 RM specialty services were identified across MTFs in addition to on-site surgical services, including Orthopedic Surgery, Neurosurgery, and Plastic Surgery.

2) Research: Recommended RM CoEs will score highly on research criterion, employing all five of the elements/levels of research involvement: industry sponsored trials, intramural research funding, extramural research funding, investigator-initiated trials, and Institutional Review Board.

3) Infrastructure to House Patients: Recommended RM CoEs will offer comprehensive housing or dormitories for ADSMs, active duty family members, other beneficiaries, and other beneficiaries' family members.

4) Training: A center's involvement in GME/graduate-level clinical training and engagement in rehabilitation-related research and clinical trials is pivotal in the implementation of evidence-based practices, incorporating the latest advancements in rehabilitative medical interventions. RM CoEs will provide residency and graduate-level training programs in most of the identified RM specialty services, which are each accredited by their respective governing bodies.

5) Alignment with Other CoEs: All proposed RM CoE locations will be co-located with CoEs in related specialties, as the nature of RM necessitates referrals originating from other primary medical and surgical services. Beyond this, alignment and co-location with other CoEs improves coordination of care, consistency within care plans, and ease of interdisciplinary collaboration, with the additional crucial benefits of convenience and time saved for the patient.

RM outcome measures are still in development but will be monitored closely using data and outcome tracking systems such as the Clinical Assessment Management Portal (CAMP) Survey Tracker. Outcome measures currently under consideration include total number of visits, duration of care from evaluation to discharge/length of stay, deployment readiness, Patient-Reported Outcomes Measurement Information System Scale, and patient-specific goals.

RM Specialty Care Services to be provided: Each RM CoE will provide comprehensive rehabilitative services on-site, including all the medical and specialty care services listed below. Specialty care services to be provided at satellite sites have yet to be determined.

- Inpatient Rehabilitation
- Surgical Services (Orthopedic Surgery, Neurosurgery, and Plastic Surgery)
- Neurology
- Physical Medicine and Rehabilitation

- Sports Medicine
- Pain Management
- Physical Therapy
- Occupational Therapy (OT)
- Speech-Language Pathology
- Behavioral Health
- Audiology
- Nutrition
- Wound Care
- Orthotics and Prosthetics

Patient Population Subsets Targeted for Referral:

- Acquired Brain Injury
- Polytrauma
- Burn Injuries
- Amputation
- Spinal Cord Injury
- Complex Orthopedic Surgeries
- Cardiothoracic Surgery
- Complex Vestibular Rehabilitation
- Complex Neurological and Musculoskeletal Conditions

Referral to a RM CoE must be of a level of complexity agreed upon by both a specialty care physician and rehabilitative provider.

RM CoE Staffing Plan: Ideal staffing at each RM CoE by site will include, at minimum:

- Physical Medicine and Rehabilitation Physician
- Pain Management Physician
- Neurologist
- Physical Therapists, inpatient and outpatient
- Occupational Therapists, inpatient and outpatient
- Speech-Language Pathologists, inpatient and outpatient
- Behavioral Health Providers, inpatient and outpatient
- Registered Dietician/Nutritionist, inpatient and outpatient
- Wound Care Providers, inpatient and outpatient
- Orthotist/Prosthetist, outpatient
- Audiologist, outpatient

RM CoE sites will staff additional services to support the RM CoE and mission. These resources may be shared with other specialties or service lines and include:

- Access to surgical specialties (Neurosurgery, Orthopedic Surgery, and Plastic Surgery)

- Case Management/Social Work, inpatient and outpatient
- Administrative support staff, inpatient and outpatient
- Nursing staff, inpatient

How RM CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: The RM CoEs will play a vital role in enhancing the readiness of military medical forces by providing effective treatment to accelerate recovery of injured or ailing military personnel, expediting their return to active duty and/or activities of daily living. Comprehensive, multidisciplinary rehabilitative care at a CoE facilitates a smoother and more timely rehabilitation process, minimizing the downtime for military personnel and optimizing their readiness levels. A CoE's emphasis on evidence-based practices and holistic recovery not only improves patient outcomes, but also bolsters the overall health and readiness of the military force.

2) Quality of care: RM CoEs are poised to become models of best practices for RM, setting a benchmark for potential satellite sites and MTFs to follow. RM CoEs will actively engage in research and clinical trials to drive advancements and improve patient outcomes. RM CoEs will offer exceptional GME and graduate-level clinical training, encompassing a broad spectrum of specialty RM services. This approach aims to disseminate knowledge about best practices, enabling these skilled physicians and clinicians to eventually spread their expertise throughout the MHS. Access to highly specialized rehabilitative care plays a pivotal role in shortening hospital length of stays, promoting functional independence, and improving patient quality of life.

3) Health outcomes: Treatment at a RM CoE ensures that patients receive comprehensive support from various specialized rehabilitation professionals, addressing the physical, psychological, and emotional aspects of recovery. This holistic approach to care enhances overall well-being, improves patient buy-in and participation in their own recovery process, and increases patient satisfaction with the care they receive. When coupled with innovative, evidence-based rehabilitation processes and interventions, patients can promote earlier functional independence. Furthermore, the infrastructure in place at RM CoEs will help patients to seamlessly transition between different phases of care, from hospital to home or community, and ensures that the recovery process remains uninterrupted. Overall patient outcomes will be improved for several surgical and medical specialties through the co-location of the RM CoE with other CoEs, including but not limited to Orthopedics, Neurosurgery, TBI, Burn Injuries and Wound Care, Amputation, and Cardiothoracic Surgery.

TBI

The MHS first established a CoE to support TBI and other mental health concerns at WRNMMC in 2010 in response to the NDAA for FY 2008. This CoE, now known as the National Intrepid Center of Excellence (NICoE), forms the hub of the Defense Intrepid Network (DIN), consisting of several satellite sites across the United States that specialize in TBI and brain health. The DIN

is recognized as DHA's program of record for TBI and Brain Health as of 2021[28]. To improve clinical practice, these CoEs will primarily focus on improving outcomes for moderate to severe TBIs, with additional efforts aligned to developing innovative treatment and prevention methods for TBI and associated psychological health.

TBI CoE Locations: The primary CoE location for TBI specialty care will be WRNMMC (NICoE). Satellite CoE locations include the Intrepid Spirit Center (ISC) at Joint Base Lewis-McChord, ISC Eglin Air Force Base (AFB), ISC Camp Lejeune, ISC Camp Pendleton, ISC Fort Belvoir, ISC Fort Liberty, ISC Fort Campbell, ISC Fort Cavazos, ISC Fort Carson, Landstuhl Regional Medical Center TBI Program, and Joint Base Elmendorf-Richardson TBI Clinic. These satellite CoEs are all located on military bases that also have an associated hospital or medical center (e.g., Joint Base Lewis-McChord is where Madigan Army Medical Center is located).

The above sites have already distinguished themselves as TBI treatment centers and are part of the DIN. The headquarters (HQ) element of the Intrepid Network will be co-located with NICoE in Bethesda, Maryland.

Specialty Care Services to be Provided at TBI CoEs: At the core of the DIN is a holistic, patient-centered interdisciplinary model of care. This includes traditional rehabilitation, medical, neurological, and behavioral health services combined with integrative health interventions and skills-based training. Critical to this model is a co-located team at each site which expedites diagnostic evaluations and delivers a collaborative individualized treatment plan.

The primary CoE location, NICoE, provides inpatient and outpatient care, supporting innovation of assessment for the full spectrum of TBI severity (mild, moderate, severe, penetrating), treatment including inpatient and outpatient rehabilitation, and outcomes across the MHS and greater brain health community. Satellite CoEs will provide inpatient and outpatient care for mild and moderate TBI, including outpatient rehabilitation. The DIN clinical programs will include:

1) TBI Outpatient Program: A program that provides diagnostic evaluation, treatment, diagnoses, and follow-up care for TBI of all severities. All DIN sites will offer this clinical program.

2) Intensive Outpatient Program: A multi-week program for TBI patients with tailored treatment plans that focus on the mind, body, and spirit. DIN satellite sites residing in the same DHA Network as the primary CoE may not offer an intensive outpatient program.

3) TBI Inpatient Consultation: Inpatient consultation for medical evacuation and acquired brain injury. All DIN sites may not offer these clinical programs.

4) Other Programs: Other programs that support the MTF include, but are not limited to: Acute Concussion Care, Sleep Clinic, Pain Clinic, Anomalous Health Incidents,

[28] Director, DHA Memorandum, "Defense Intrepid Network for Traumatic Brain Injury and Brain Health Formalization and Standardization Initiative," November 21, 2021.

Automated Neuropsychological Assessment Metric Support, Arts in Health Programs, and Mind-Body Wellness Programs. All DIN sites may not offer these clinical programs.

All TBI CoEs will offer five clinical services to support the clinical programs, regardless of which programs they offer. The specialties available in each clinical service will vary from site to site. These clinical services include the following:

1) Behavioral Health Services: Psychiatry, Psychology, and Social Work.

2) Medical Services: Neurology, Neuro-optometry, Physiatry, Primary Care, Sleep Medicine, and Sports Medicine.

3) Rehabilitation Services: Audiology, Occupational Therapy, Physical Therapy, Pain Management, and Speech-Language Pathology.

4) Integrative Health Services: Animal Assisted Therapy, Creative Arts Therapies, Mind-Body Wellness, Nutrition, and Spiritual Wellness.

5) Clinical Support Services: Advanced Diagnostics & Testing, Cognitive Rehabilitation/Brain Fitness Center, Nursing, Case Management, Referral Management, Medical Support, TBI Portal for Clinical Care Management, and TBI Education and Training.

Patients appropriate for referral to a TBI CoE (primary or satellite) include:

1) Patients diagnosed with TBI with continuing symptoms which have not resolved and whose conditions are limiting their ability to function at work, home, or both.

2) Patients with a history of complex and co-existing conditions such as post-concussive symptoms, behavioral health symptoms, pain and/or other related comorbidities.

3) Patients requiring TBI assessment and/or under the care and responsibility of the DHA Network.

Clinical factors that will be considered regarding patient referral to the CoEs include history of TBI and comorbid psychological health diagnoses; substance use disorder history; severity and duration of symptoms; complexity of co-morbidities; combat and mission-related injuries; confounding social, occupational, and spiritual stressors; ability to independently perform activities of daily living; and capacity to engage safely in an intensive outpatient clinical environment.

DIN Program referral criteria will be reviewed and updated as needed through the DIN Board of Directors (BOD) and the Warfighter Brain Health Initiative. All DIN processes and procedures will be coordinated with the MHS.

TBI CoE Staffing Plan: The recommended staffing, non-standard deductions, and Clinical Full-Time Equivalent (FTE) for each CoE Type 1 and 2 providers are shown in Table 3 below. Current NICoE site personnel/manning will be utilized to the maximum extent possible for the HQ positions. Some NICoE site leaders and staff may support both the DIN overall and the NICoE site. They may also perform multiple roles (i.e., leader and clinician) at their site.

Table 3. TBI CoE Ideal Staffing Plan

Intrepid Network Staff Category
TBI Specialist – DIN clinician who treats TBI patients using the holistic, patient-centered, interdisciplinary approach to clinical care
TBI Specialist with Enhanced Research Responsibility – TBI Specialist with additional duties performing research as part of a Study Team
TBI Social Worker – TBI Specialist with additional duties in the interdisciplinary care team
TBI Sleep Lab Director – TBI Specialist with additional duties as the Sleep Lab Director
TBI Coordinator – TBI Specialist with additional duties as the lead of the interdisciplinary care team.
TBI Researcher – TBI Specialist with additional duties leading TBI research activities and initiatives

Other types of providers at NICoE and DIN include:

- Acupuncture
- Art Therapist
- Chiropractor
- Clinical Pharmacist
- Clinical Psychiatrist
- Creative Arts Therapist
- Create Dance/Movement Therapist
- Creative Music Therapist
- Medical Informatics
- Music Therapist
- Neuropsychiatrist
- Neurologist
- Neuropsychologist
- Nurse
- Nurse Practitioner (NP)
- Nutritionist

- Occupational Therapist
- Optometrist
- Physical Medical & Rehab Physician
- Physical Therapist
- PA
- Psychologist
- Psychometrist
- Radiologist
- Speech-Language Pathologist
- Sports Medicine

How the TBI CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: Education and training of providers and associated staff in centers that see high volumes of the most complex TBI and PH patients will increase the ability of the medical force overall to prevent, detect, and treat TBI in military populations.

2) Health Outcomes: Patient outcomes will be continuously improved through a standard set of clinical and research metrics. The standard clinical metrics will be developed, implemented, and updated as needed, through the DIN Program BOD in coordination with MHS. These metrics will be based on the National Institute of Neurological Disorders and Stroke Common Data Elements for TBI outcomes. Outcome measures that specifically track patient-reported outcomes include patient experience survey questions that evaluate skills learned, safety of program environment, goals addressed, feeling a central part of the team, discovery of other problems not previously recognized, and suggestions for other offerings or issues not covered. Patient surveys given at 1, 3, 6, 9, 12, 18, and 24 months after intensive outpatient program discharge include:

   - Activities-Specific Balance Confidence Scale (ABC)
   - Alcohol Use Disorders Identification Test (AUDIT-C)
   - Dizziness Handicap Inventory Questionnaire (DHI)
   - Defense and Veterans Pain Rating Scale, V2 (DVPRS2)
   - Epworth Sleepiness Scale (Epworth)
   - Generalized Anxiety Disorder 7-items (GAD-7)
   - Headache Impact Test (HIT-6)
   - Neurobehavioral Symptoms Inventory (NSI)
   - Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5)
   - Patient Health Questionnaire (PHQ-8)
   - Pittsburgh Sleep Quality Index (PSQI)
   - Satisfaction With Life Scale (SWLS)
   - The DIN Research Focus Area will work to partner with clinical leaders to ensure evidence-based care, build research partnerships across the TBI and Brain Health Community, and create a network-wide platform to systematically surveil TBI research initiatives, evaluate research outcomes that might influence clinical best

practices, and identify research findings that may lead to engagement with definitive clinical trials.
- The existing National Intrepid Centers have a proven history of high patient satisfaction and have launched dozens of innovative and tailored clinical programs to target TBI symptoms such as reading issues, environmental triggers, or mental capacity which have improved patient outcomes and overall quality of life.

3) Quality of Care: Continuous patient, family, and provider education as well as dedicated quality improvement initiatives within each CoE will improve the quality of care for eligible beneficiaries. Health care quality metrics include the following structural and process measures:

   - TBI Portal for Clinical Care Management – the system of record for patients with brain injury.
   - MHS GENESIS Discern Reporting Portal – a front end user tool for directors, managers, and supervisor-level personnel to create reports and access productivity and metrics within the Electronic Health Record.

Amputations and Prosthetics

Military beneficiaries with limb loss, limb difference, or severe limb dysfunction, especially combat casualties with amputation or threatened amputation, require holistic interdisciplinary care, including access to specialized prosthetic care embedded within an individualized rehabilitation program. These patients often experience multiple co-occurring injuries or illnesses and require highly focused interdisciplinary care.

Amputations and Prosthetics CoE Locations: Recommended locations for Amputations and Prosthetics CoEs will build upon existing services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

Scoring for Amputation and Prosthetic CoEs is based on the four standard CoE evaluation criteria; and utilization of the Denver Logistics Center (DLC) for prosthetic procurement.

1) Accreditation for Amputation and Prosthetics CoEs will consist of certification of individual prosthetists and orthotists in addition to accreditation of the Orthotics and Prosthetics (O&P) clinical setting. O&P clinician certification and O&P facility accreditation is through the American Board for Certification in Orthotics, Prosthetics, and Pedorthics, or the Board of Certification/Accreditation. For physical medicine and rehabilitation physicians, certification through the American Board of Physical Medicine and Rehabilitation is the standard. The MTFs proposed as Amputation and Prosthetics Clinical CoEs will maintain or actively seek TJC disease-specific certification in Amputee Rehabilitation.[29]

[29] (Disease-Specific Care Certification, 2023).

2) Clinical standards scoring includes adherence to current Department of Veterans Affairs (VA)/DoD CPGs;[30,31] compliance with these standards includes adherence to consensus driven clinical protocols that support best practices where there is insufficient evidence for inclusion in the CPGs.[32]

3) Amputation and Prosthetic CoEs will use standardized clinical outcome measures housed on the common use digital platform (the current DHA solution is the CAMP). The 30 selected outcome measures under the Extremity Trauma and Amputation Center of Excellence Clinical Community have strong psychometrics, are recommended through the CPGs, and allow clinician, clinic, and facility programmatic evaluation of clinical results.

4) The full range of interdisciplinary care is essential for the integrated care described in the VA/DoD CPGs and shown to improve outcomes in clinical research.[33,34] The number of primary staff and ancillary staff are scaled by patient load, adapted from "The Care of the Combat Amputee" and substantiated through work done in the VA's Amputation System of Care.[35,36,37]

5) The last criteria for scoring as an Amputations and Prosthetics CoE is utilization of best practice procurement for prosthetic componentry and associated supplies through the DLC. Amputations and Prosthetics CoEs will have staff trained, enrolled, and actively utilizing the VA's DLC to standardize purchasing for low volume, high-cost items.

Amputations and Prosthetics Specialty Care Services to be provided: Scope of Amputation and Prosthetic services at the CoE will include onsite comprehensive multidisciplinary care in both inpatient and outpatient care services, including orthopedic, plastic and vascular surgery, behavioral health, physical medicine and rehabilitation, prosthetic and orthotic fabrication, fitting, assembly and training, physical and occupational therapy, recreational therapy, adaptive sports, 3D printing, assistive technology, the full range of diagnostic treatment services, postgraduate medical education, certified peer visitor programs, and limb trauma and amputation related research/clinical trial participation. The focus is on return to work, return to duty, and reintegration into the community of choice.[38,39] In order to achieve these results, the following is required:[40,41,42,43]

[30] (VA/DoD Clinical Practice Guideline for the Management of Individuals with Lower Limb Amputation, 2017).
[31] (VA/DoD Clinical Practice Guideline for the Management of Upper Limb Amputation Rehabilitation, 2022).
[32] (Gailey R, 2020).
[33] (Sobti N, 2021).
[34] (Keszler MS, 2020).
[35] (Textbooks of Military Medicine - Care of the Combat Amputee, n.d.).
[36] (Webster JB, 2019).
[37] (Webster JB, 2014).
[38] (Amputee Coalition Releases Limb Loss Community Needs Survey Findings, 2022).
[39] (Committee on the Assessment of the Readjustment Needs of Military Personnel, 2013).
[40](The Promise of Assistive Technology to Enhance Activity and Work Participation, 2017).
[41] (Gunterstockman BM, 2022).
[42] (Duncan JC, 2020).
[43] (Sheehan RC, 2020).

- Continuity of Care: Evidence suggests that early access to highly specialized medical, surgical, rehabilitative, and behavioral health care, reduces complications and hospital lengths of stay, promotes earlier mobility and functional independence, and improves outcomes and quality of life. Therefore, each CoE must have the staffing, experience, and capabilities to provide these comprehensive services for inpatients and outpatients. Critical specialty services include surgery and surgical subspecialities, medicine and medical subspecialties, pain specialists, specialized nursing behavioral health and a full complement of rehabilitation specialists as well as specialists in Orthotics and Prosthetics care for upper and lower limb, spine, neck, and skull trauma.

- Scope and Capacity of Care: Each designated CoE must be appropriately staffed, must have OR capacity, and must have 8-10 co-located acute rehabilitation beds. For the outpatient space, services associated with the manpower chart below are required, to include gait and motion analysis lab, virtual reality training/therapy platforms, service dog training and pairing capabilities, adaptive sports, creative arts, integrated health, and pool/aquatic facilities. In addition, each CoE must have a system in place to effectively collect and track patient outcomes, constantly improve quality and safety of care, and appropriate logistical and resource management support to ensure the appropriate stewardship of government expenditures.

Amputations and Prosthetics CoE Staffing Plan: The following staff composition is recommended for optimal performance of an Amputations and Prosthetics CoE:[33]

- Orthopedics
- Plastic Surgery
- Urology
- Behavioral Health
- Physical Medicine and Rehabilitation
- Pain Management Specialist (MD) (outpatient clinic only)
- PA
- Physical Therapy
- Physical Therapy Assistant
- OT
- Certified OT Assistant
- Speech Language Pathologist
- Prosthetist
- Orthotist
- Prosthetic and Orthotic Technician
- Recreational Therapy
- Nursing (RN) (Rehabilitation)
- Nursing (LPN) (inpatient ward only)
- Primary Care Provider (MD, PA, NP) (outpatient clinic only)
- Social Worker
- Case Management
- Administrative Assistant

- Wound Care Specialist
- Neuropsychologist
- Nurse (Psychology) (outpatient clinic only)
- Firearms Training Instructor (outpatient clinic only)
- Virtual Reality Operator (outpatient clinic only)
- Caregiver Liaison
- Therapy Dog (outpatient clinic only)
- Adaptive Sports Specialist (outpatient clinic only)
- Assistive Technology Specialist
- Database Manager
- Education Coordinator
- Research Coordinator
- Logistician

How the Amputations and Prosthetics CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: The Amputations and Prosthetics CoEs will directly support military medical readiness by caring for DoD's most severely traumatized beneficiaries in an inter-disciplinary model. Amputations and Prosthetics CoEs will play a significant role in the return of ADSMs to duty. The retention rate of ADSMs with amputations increased from 2.3 percent in the 1980s to 16.5 percent in the early phases of Operation ENDURING FREEDOM and Operation IRAQI FREEDOM.[44, 45, 46] Longer-term studies have found similar retention rates (approximately 14 percent) of Service members with amputations.[47] Also, more than 80 ADSMs were fit to deploy into a theater of operation following upper and/or lower limb amputation and within the Special Operations community, the number of Special Operators who redeployed following amputation was nearly 50 percent.[48, 49] Therefore, by improving outcomes following amputation, Amputations and Prosthetics CoEs have the potential to increase the number of ADSMs that return to duty post-amputation. MHS practitioners also significantly contribute to the management of civilian mass casualty situations in the United States and work to improve care of those experiencing amputations. Thus, military expertise in amputation care enhances not only the health and readiness of the U.S. Armed Forces, but also the health and well-being of civilians injured both in the U.S. and around the world.[50]

2) Quality of Care: MHS, in partnership with the VA, has set an international standard in amputation care. A systematic review of international CPGs identified the 2014 Upper Extremity Amputation Rehabilitation CPG (later updated in 2022) and the 2017 Lower Limb Rehabilitation CPG, both developed through DoD and VA collaboration, as the

[44] (Kift SH, 2017).
[45] (Wilson JB, 2021).
[46] (Stinner DJ, 2010).
[47] (Etchegaray JM, 2019).
[48] (Hurley RK, 2015).
[49] (Krueger CA, 2014).

only high-quality CPGs to set international standards for the multi-disciplinary team.[50] The MHS has also led the development of advanced clinical competencies in amputation care for occupational and physical therapy, orthotists, prosthetists and physical medicine and rehabilitation.[51] While there are few other published standards, emerging research reflects the improved outcomes in patients undergoing integrated evidence-based healthcare. Research conducted on MHS beneficiaries and Veterans also supports these improved outcomes.[52, 53, 54, 55, 56, 57]

CoEs will revolutionize amputation rehabilitation by aggressively integrating it early in the overall care process. Rather than beginning rehabilitation after fitting a prosthetic, or even earlier after surgical procedures are complete, rehabilitation principles are now incorporated by the multidisciplinary care teams at the earliest stages of acute medical and surgical care.[58] This early incorporation of rehabilitation minimizes the negative effects of deconditioning after injury as well as the negative psychological and recovery effects of impaired mobility and lack of independence.[55] The peer environment at the Amputations and Prosthetics CoEs will enhance the rehabilitation experience, where patients with amputation can observe peers who are further along in the process performing activities that they hope to achieve within the recovery process.[50]

3) Health Outcomes**:** MHS is developing outcome measure platforms, processes and guidelines that directly impact amputation care. Through continuous collection of outcome data, clinical and systems research, and programmatic evaluation, best practices will be identified and employed throughout the system.[59]

Neurosurgery

Neurosurgery is a highly specialized area of medicine requiring significant training and experience. Neurosurgery, including specific surgeries that treat injuries resulting from trauma, is a critical specialty and maintaining the readiness of surgeons is crucial for the health of the force. Identifying and designating a Neurosurgery CoE within MHS will enable the system to concentrate specialists and patients in a single location to provide optimal care to ADSMs and other DoD beneficiaries, and improve medical force readiness.

Neurosurgery CoE Locations: Neurosurgery services within MHS are only offered at a small number of MTFs. These locations typically feature extensive multidisciplinary care capabilities, excellent clinical outcomes, and existing multi-disciplinary care pathways for neurosurgery

[50] (Kwah LK, 2019).
[51] (Crunkhorn AE, 2023).
[52] (Resnik L, 2021).
[53] (Mahon CE, 2019).
[54] (Jarvis HL, 2017).
[55] (Cancio JM, 2019).
[56] (Melcer T, 2017).
[57] (Woodruff S, 2017).
[58] (Highsmith MJ, 2016).
[59] (Pasquina PF, 2010).

patients. There is no existing standard for neurosurgery accreditation or certification within healthcare other than board certification for neurosurgeons.

Recommended locations for Neurosurgery CoEs will build upon existing services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

Many neurosurgery patients are received by Trauma Centers and require immediate care; such patients generally are not suitable for transfer over long distances. Therefore, most patient referrals to a Neurosurgery CoE will likely originate from elective cranial procedures such as those resulting from tumors or vascular conditions. Rerouting of patients to increase Neurosurgery CoE volume will require optimal staffing of support team/functions that includes OR/Medical-Surgical/Intensive Care Unit (ICU) nurses, technicians, anesthesiologists, and facilities availability. It is critical that any Neurosurgery CoE be co-located with Oncology CoE(s) and CCRF(s) to maintain proximity to potential cases requiring collaboration.

Specialty Care Services to be provided at the Neurosurgery CoE: Neurosurgery CoEs will generally provide the following services: complex spine surgeries, cerebrovascular surgeries, neurosurgical oncology, peripheral nerve surgeries, and pediatric neurosurgeries. Conditions treated will include traumatic injury, cancers, cerebrovascular disorders, TBI, fractures, congenital malformations, spine diseases and disorders, and nerve disorders.

Neurosurgery CoE Staffing Plan: The ideal staffing at Neurosurgery CoE(s) will include, at minimum, the following team members:

- Neurosurgeon Program Lead
- Neurosurgeons
- Neuro-anesthesiologist
- Spine specialist physical therapist
- Neuro OR nurses
- Neuro ward and post-anesthesia care unit nurses
- Neuro ICU Nurses

How the Neurosurgery CoE will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: The Neurosurgery CoE will result in improved KSAs for MHS neurosurgeons and trainees and allow the MHS to treat the unique trauma injuries experienced more often among the military population. The higher volume of surgeries in a CoE will better prepare neurosurgeons by increasing repetitions and overall KSAs. A nationwide neurosurgery study found that higher-volume providers demonstrate superior outcomes after surgical resection of malignant intracranial tumors, and that this reduction was maintained despite adjustment for case mix.[60] Current neurosurgery departments within the MHS tend to lose patients to Private Sector Care due to multiple factors, including patients choosing

[60] (Cowan, JA, 2003).

higher volume civilian hospitals and lack of OR capacity/staffing at some facilities. Therefore, establishing MHS Neurosurgery CoE(s) and redirecting patients and resources accordingly has the potential to greatly increase medical force readiness within neurosurgery.

2) Quality of Care and Health Outcomes: Quality of care and outcomes for neurosurgery cases will be improved through the co-location of the Neurosurgery CoE with other CoEs, including ID, Rehab, Oncology, and TBI. Increased complexity of case mix and volume also leads to better outcomes along with sub-specialists who have completed additional training in certain areas. Concentration of neurosurgery resources at a CoE will: a) enable the best of each discipline to deliver optimal care to patients that require neurosurgery services; b) improve access to care of patients, allowing them to come to one location to receive exceptional care across all required disciplines; and c) improve collaboration between the different specialties involved in the patient's care. Neurosurgery CoEs in civilian healthcare have also shown superior outcomes. In a Spine Surgery CoE research study, researchers found that standardization from centralized organization improves communication between providers, decreases errors resulting from variability among providers, and streamlines the surgery process.[61] In a different research study, a case control study focused on comparing spine surgery outcomes in spine CoEs versus undesignated hospitals found statistically significant improvements in surgical care at the CoE.[62]

Orthopedic Care

Orthopedic Care CoEs will support global combat casualty care and the full complement of orthopedic subspecialties. To improve medical force readiness, health outcomes, and quality of care, Orthopedic Care CoEs will offer a high volume of cases and KSAs, and substantial GME programs. The Orthopedic Care CoEs will benefit the direct care system by maximizing clinical and operative throughput and minimizing loss of potential surgical cases to the private sector system, which will positively impact KSA development and maintenance among MHS care teams. These CoEs will serve as the regional, national, and international referral center(s) for complex orthopedic cases, supporting regional MTFs and the Combatant Commands.

Orthopedic Care CoE Locations: Recommended locations for Orthopedic Care CoEs will build upon existing services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

Orthopedic Care CoEs will be considered at sites meeting the following criteria to maintain a high volume of beneficiary care across the multidisciplinary team:

- MTF maintains or has potential to secure CCRF designation to receive high volume of combat casualties.
- Orthopedic GME program.

[61] (Sheha ED, 2019).
[62] (Mehrotra A, 2013).

- Significant research portfolio in orthopedics.
- Co-located at MTF with trauma center, specialized surgical, medical, rehabilitation, and ancillary support services.

Specialty Care Services to be provided at Orthopedic Care CoEs: Orthopedic specialty care services to be provided at these locations will include the following:

- Adult reconstruction (hip and knee replacement)
- Foot and ankle
- Hand
- Oncology
- Pediatrics
- Shoulder and elbow
- Spine
- Sports and trauma

Staffing Plan for Orthopedic Care CoEs: An Orthopedic Care CoE will require the following staff types:

- Orthopedic Surgeons
- PAs
- Nurses
- Medical Assistants
- OR Technicians
- Anesthesiologists
- CRNAs
- Physical Therapists
- Physical Therapy Assistants
- Occupational Therapists
- OT Assistants
- Radiology Technicians
- Echocardiography Technicians
- Sterile Processing Department Technicians
- Military Orthopedics Tracking Injuries and Outcomes Network (MOTION) Research Coordinators
- Nurse Case Managers
- Orthopedic Technicians
- OR Master schedulers

How the Orthopedic Care CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: Military medical force readiness is highly dependent on receiving appropriate opportunities for training, which stems from high case volume. The designated Orthopedic Care CoEs will

demonstrate high KSA clinical readiness scores and superior Case Mix Indices resulting from co-location at sites with high surgical volume and GME training footprint.

2) Quality of Care: Quality of care for orthopedic cases at the designated CoEs is contingent upon adequate clinical staffing and support services to treat complex orthopedic patients, injuries and diseases across the spectrum of care, including rehabilitation (plastics and reconstructive surgery, neurosurgery, physical medicine and rehabilitation, physical therapy, occupational therapy, orthotics/prosthetics and behavioral health). Access to an entire spectrum of care, including rehabilitation, at one location will increase the speed at which patients will receive care and will also improve communication between all members of the care team, thus benefiting the beneficiary.

3) Health Outcomes: High case volume and training programs at Orthopedic Care CoE sites will improve the health outcomes of beneficiaries. Additionally, Orthopedic Care CoEs will demonstrate risk-adjusted National Surgical Quality Improvement Program (NSQIP) outcomes to monitor performance. Sites will actively participate in and demonstrate superior risk-adjusted clinical outcomes via MOTION.

SUD

SUD CoEs have five main goals:

1) To provide patient-focused care backed by educational resources and published treatment guidelines and standards.
2) To improve the short- and long-term outcomes from SUD and co-morbid psychological and medical conditions through early detection and prompt, appropriate treatment.
3) To develop educational materials to address psychological, cultural, and administrative factors contributing to the development of SUD and acting as obstacles to seeking care.
4) To coordinate care and provide resources for aftercare/recovery support to ensure that the best care plan and treatment options are presented to patients.
5) To create a transparent system of quality management and monitoring of short- and long-term outcomes of service members with SUD.

SUD CoE Locations: Recommended locations for SUD CoE(s) will build upon existing services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

SUD CoE(s) should meet the following criteria:

- TJC accredited; American Society of Addiction Medicine (ASAM) certification highly recommended.
- Existing inpatient residential treatment facility (RTF) capability, with potential to maintain or expand existing bed capacity.
- Stepdown levels of care to include an addictions medicine intensive outpatient program, outpatient SUD clinical care co-located with the outpatient behavioral care clinics and prevention/aftercare services located on the installation.

Scoring for SUD CoE(s) will be based on accreditation, participation in medical education, level of care certification to provide continuum of care for SUD, treatment in accordance with clinical guidelines (e.g., VA/DoD CPG, Substance Abuse and Mental Health Services Administration and ASAM treatment standards), multidisciplinary infrastructure, self-reported outcome measures and research. SUD CoE(s) will be re-evaluated every 12 months based on CoE matrix criteria and patient outcomes. Scope of services at the CoE will include acute detoxification and medical stabilization (through the medical services at the MTF), onsite residential and outpatient SUD treatment, full range of diagnostic and treatment services including common medical co-morbidities, postgraduate medical education, and SUD research/clinical trial participation.

Specialty Care Services to be Provided at SUD CoE: Due to the predominance of alcohol as a substance of abuse, existing MTF SUD facilities are primarily designed and staffed to treat alcohol use disorder. Education and training will be a vital component of the SUD CoE development, with training focused on opioid use disorder, emerging substances of abuse, and behavioral addictions.

SUD CoE(s) will have the ability to support the ADSM by providing behavioral health care for co-existing mental health conditions, to include posttraumatic stress disorder, while still addressing the primary SUD diagnosis. SUD CoE(s) also provide clinical support services to include case management, continuity of care across the direct care continuum of care, and medical support from the MTF.

SUD CoE Staffing Plan: SUD CoE(s) will require the following clinical and non-clinical staff types; precise staffing estimates are still being determined. Fellows and Residents will be embedded into the model as appropriate, and staffing may need to be scaled to CoE bed capacity and patient volume.

- Medical Director
- Clinical Director
- Chief Nurse Officer in Charge
- Noncommissioned Officer in Charge/Assistant Noncommissioned Officer in Charge
- Psychiatrist (MD, DO)
- Psychiatric NP
- PA or NP
- Psychologist
- LCSW/Licensed Marriage and Family Therapist/Licensed Professional Counselor
- Admission/Transition Coordinator
- Recreational Therapist
- Creative Arts Therapist
- Nurse Case Manager
- Nurse Educator
- RN (number per shift scaled to bed capacity)
- Chaplain
- Psychometrist
- Behavioral Health Technician (number per shift scaled to bed capacity)
- Dietician

How MHS SUD CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: Alcohol remains the primary substance of abuse among ADSMs, and the chronic use of alcohol negatively impacts force readiness through decreased work performance and increased attrition. On average, over 43,000 ADSMs are diagnosed every year with a SUD, primarily alcohol use disorder (37,000). Of those, the average number of ADSMs admitted across the six SUD RTFs in Direct Care was 522, which is less than half of the 1,249 ADSMs on average admitted to a Private Sector Care SUD RTF annually with an average cost of $25,000 per admission. The SUD CoE will decrease the chronic misuse of substances through a combination of targeted education efforts, early comprehensive acute care to allow the ADSM to safely achieve sobriety, and the development of aftercare networks and protocols to allow ADSMs the best opportunity to sustain sobriety and remain on active duty status. SUD CoE(s) will recapture the care of the target RTF population (ADSMs), as well as funds spent in the private sector.

2) Quality of Care: SUD treatment programs for ADSMs in facilities outside the MHS are associated with lower retention rates and worse outcomes. SUD CoEs will partner with the DoD Office of Drug Demand Reduction to determine emerging drugs of abuse in use in the DoD and develop effective educational programs targeting these drugs, treatment protocols for their effective cessation, and distribute these products to MTFs to promote effective treatments.

3) Health Outcomes: SUD CoEs will allow for an increase in both short term and long-term abstinence as well as developing increased expertise in the military system for the treatment of emerging drugs. Effective treatment of SUD will decrease rates of numerous mental, physical, and social disorders associated with the chronic use of substances.

4) Retention of the military force: Education is a key component of substance use prevention through identification of emerging drugs of abuse and the creation of educational materials tailored to decrease use in vulnerable populations. Direct Care treatment of a greater number of drugs of abuse, rather than referral to private sector, will lead to higher ADSM retention post-treatment.

ID and Preventive Medicine (PM)

ID and PM CoEs locations will support global casualty care, GME programs, and interdisciplinary care coordination with other disciplines and CoEs. Healthcare delivery will be the primary mission for the ID and PM CoE sites, with a concurrent plan to expand clinical and other scientific research to support innovations in the specialty.

ID CoE Locations: Recommended locations for ID CoE(s) will build upon existing services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

The CoEs will focus on decreasing risk for chronic wound infections with multi-drug resistant organisms (MDRO). ID CoEs are recommended to acquire and maintain CoE designation by Infectious Diseases Society of America (IDSA) for antibiotic stewardship to achieve and/or maintain designation as a CoE. Scoring for ID CoEs was based on the following set of criteria: co-location with relevant specialty CoEs (e.g., amputation/prosthetics, orthopedic care and burn injuries); multi-disciplinary capability with required medical/surgical subspecialties; IDSA CoE designation; clinical standards/excellence; and GME fellowship training.

Most ID CoE referrals will originate from surgical, trauma, and burn injury patients. Therefore, co-location of the ID CoE with other CoEs and CCRFs will be a critical factor in determining ID CoE locations. ID CoE locations will also have extensive multi-disciplinary capabilities and subspecialties that are often required for co-management of complicated infections, including general surgery, plastic surgery, and wound care. ID CoEs will demonstrate clinical standards that outperform other MTFs specifically in antibiotic stewardship program. Only 163 programs nationwide have received IDSA designation for antibiotic stewardship program since 2017. This CoE designation program by IDSA aligns closely with the Centers for Disease Control and Prevention (CDC) guideline with the goal to improve antimicrobial use and reduce antimicrobial resistance.

ID CoE sites will also function as the primary locations for training and GME fellowship for military clinicians in the ID specialty. GME trainee staff may augment ID CoE staffing support at times of potential surge in capacity while taking into consideration required FTE deductions required by the Accreditation Council for Graduate Medical Education (ACGME).

In the future, the MHS may consider additional primary or satellite CoE locations. As additional specialty CoEs are designated, additional ID CoE or satellite locations may be established if patient demand in a specific Network or region merits CoE standup, if significant care could be recaptured from the private sector through CoE establishment, or if an additional facility is required to maintain a ready medical force.

Specialty Care Services to be provided at ID CoEs: The goal of the ID CoEs is to provide comprehensive care for patients with complex wounds and infectious complications related to surgeries, combat, and trauma. ID CoEs will also serve as the source of expert consultation to preventive medicine/training units in the MHS to optimize force health protection and trainee health.

Patients referred to ID CoEs will mainly originate from other specialty care CoEs in the same locations in the clinical areas of amputation/prosthetics, burn injuries, and orthopedic care. Considerations for referral to an ID CoE will include patients with complex, chronic infections with non-resolving MDRO. Based on review of network referrals, there is a potential for recapture of complex clinical cases with intent of the CoE to focus on infections that are chronic and related to surgical complications.

ID CoEs will also focus on appropriate antibiotic use and stewardship, as well as managing antibiotic resistance. All three proposed CoE locations have standard policies and procedures in place for antibiotic stewardship that include institutional guidance for specific infections

(e.g., pneumonia, skin infections) and incorporate current evidence-based CPGs that include use of criteria for broad spectrum antimicrobials and formulary restrictions for antimicrobials to decrease risk of MDRO.

Inpatient and outpatient use of antimicrobials and incidence of MDRO is already reviewed as part of the DoD plan to reduce antibiotic resistance. MHS also participates in the CDC's National Healthcare Safety Network to track healthcare associated infections with data such as the Standardized Antimicrobial Administration Ratios (SAARS) and Standardized Infection Ratio (SIR). These data and metrics will be used to monitor performance of the ID CoEs in addition to other measures of patient outcomes, satisfaction, and access. Currently, all three proposed ID CoE locations perform at or statistically better than the national benchmark for all SIR and SAARS measures. DHA is also preparing to analyze appropriate use of antibiotics by specific clinical conditions which will further inform clinical practice and improvement.

ID CoE Staffing Plan: Optimal staffing at each proposed ID CoE site will be determined in accordance with ACGME guidelines to maintain the training platform at each site, in addition to other considerations. Staffing at each ID CoE will include several multidisciplinary members collaborating to provide holistic ID and complex wound care. ID CoE staffing by site will include, at minimum:

- ID Physician(s)
- ID Pharmacist(s), inpatient and outpatient
- ID GME Program Director and Program Coordinator
- Microbiologist
- Microbiology technician
- Wound care nurse
- Infection prevention and control staff

Each ID CoE site will also feature a host of allied services and capabilities to support the ID CoE and complex wound care mission. These resources may be shared with other specialties, clinics, or service lines, and will include:

- Radiology
- Hyperbaric capability
- Rehabilitation
- Physical Therapy
- Access to surgical subspecialties
- Nurse case managers, inpatient and outpatient

The exact mix of staff and allied services may vary by ID CoE site, depending on local manning and capabilities.

How the ID CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: Training of military physicians and pharmacists in the complex management and prevention of

multidrug resistant infections is critical to maintain force health readiness. The MHS will continue robust, historical research programs into military relevant IDs for force health protection and combat casualty management with the goal of returning ADSMs to duty after complicated infections. CoEs will also interface with health personnel at basic and advanced military training sites to optimize prevention and treatment of IDs that can have significant impacts in these populations.

2) Quality of Care: Multidrug resistant and other difficult to treat infections have been highlighted as a threat to public health and national security for over a decade. Antimicrobial stewardship programs with ID physician consultation improve outcomes of patients with these infections. CoEs will also create scalable plans for ID management and prevention to deploy at MTFs with a less significant ID footprint.

3) Health Outcomes: ID consultation is associated with decreased mortality in patients with severe infections. Health outcomes will be improved by the continuous development of innovative programs at the CoEs, to include the development of standardized treatment protocols.

Cardiothoracic Surgery

Patients impacted by cardiothoracic complications often need specialized care and expertise to achieve the best health outcomes possible. Supported by advanced laboratory services, extensive diagnostic imaging, subspecialty trained cardiothoracic surgeons, and co-location with other specialty teams, the cardiothoracic CoE teams will have the expertise and capability to manage complex thoracic surgery cases that meet the standards of national accreditation bodies such as the ACS CoC, and the American Board of Thoracic Surgery. Most of the cardiothoracic surgeries performed at MTFs are related to thoracic, non-cardiac surgery, which includes benign and malignant diseases of the chest along with thoracic trauma.

Cardiothoracic Surgery CoE Locations: Recommended locations for Cardiothoracic Surgery CoE(s) will build upon existing services across the MTFs. Designation of specific sites will need to consider current MTF/clinic capabilities and potential capacity to scale up services to additional beneficiaries.

Cardiothoracic Surgery CoE site locations will be prioritized for co-location with Oncology CoEs, which will be the source of most referrals to the Cardiothoracic Surgery CoEs. Cardiothoracic Surgery CoEs are also recommended for co-location at sites with surgical GME programs to train resident surgeons.

Specialty Care Services to be provided at the Cardiothoracic Surgery CoEs: Specialty care services to be provided at these locations will include the following:

- Thoracic Surgery
- Thoracic Trauma
- Oncology
- Pulmonology

- Laboratory Services to include Blood Bank
- Respiratory Therapy
- Palliative Care
- Chaplain Support
- Diagnostic Imaging
- Radiology

Cardiothoracic Surgery CoE Staffing Plan: Staffing estimates for Cardiothoracic Surgery CoEs will be determined in conjunction with the requirements defined from other CoEs in the same locations. The ideal staffing for Cardiothoracic Surgery CoEs will include the following team members:

- Surgical Oncologist
- Thoracic Surgeon
- Cardiologist
- APP
- Surgical RN
- Surgical Staff
- OR Nurse
- Surgical Technician
- CRNA
- Cardiologist
- Intensivist
- Hospitalist
- Medical Oncologist
- ID Physician
- Rehabilitation Services

How the Cardiothoracic Surgery CoEs will improve the following:

1) Military Medical Force Readiness and the Readiness of the Armed Forces: Education and training of providers and associated staff in centers that see high volumes of the most complex thoracic patients will increase the ability of the medical force overall to treat thoracic issues and provide the highest care possible. There is a direct correlation between volume of cases that a cardiac or thoracic surgeon performs and overall patient survival. Focusing high complexity thoracic surgery to high volume CoEs will preserve and assist with retention of a ready force of surgeons. Co-locating thoracic surgeons where there is already a robust oncology program will offer thoracic providers with the highest volume of critical cases to support force readiness.

2) Quality of Care: Quality of care will be improved through continuous patient, family, and provider education. Increasing the volume of patients through the CoE designation will allow providers to gain repetition and skill, which contributes to increased quality of care. Additionally, co-location of Cardiothoracic Surgery CoEs with other relevant specialties will allow for more efficient care by a multi-disciplinary team of providers.

3) Health Outcomes: By offering a full range of cardiothoracic and oncology services onsite, the establishment of CoEs will further reduce barriers to care and improve health care access for all MHS beneficiaries.

MHS PLAN TO REFER BENEFICIARIES TO COES

Referral of eligible beneficiaries to CoEs will be managed by Integrated Referral Management and Appointing Centers (IRMACs), which serve as the points of contact for beneficiaries seeking health care in the MHS. The purpose of the IRMAC model is to standardize referrals to MHS Direct Care and Private Sector Care and to centralize and standardize patient-facing processes to support a ready medical force. Regionalization supports Force Generation, Force Sustainment, Casualty Reception and beneficiary transitions of care and optimization of direct care through IRMAC integration, evidence-based assessment of supply, demand and utilization and integration of virtual health, capabilities locally, regionally, and globally.

The IRMAC will incorporate new eligibility criteria for the CoEs that are defined by clinician leaders into the existing referral process, with the goal of optimizing the use of the CoEs by ensuring that referrals are appointed for the beneficiaries. The overall process will be streamlined, allowing for a seamless transition and improved efficiency in the CoE referral process.

MHS PLAN TO PROVIDE BENEFICIARY TRAVEL ACCOMMODATIONS

Each specialty will have specific criteria that define when a patient is referred to a CoE. Current travel reimbursement programs differ by duty status and Military Service affiliation, with specific limits based on the distance the patient must travel from their primary care manager (PCM). Medical travel for ADSMs is considered a temporary duty assignment, which necessitates per diem pay reimbursement of lodging and meals.

For non-ADSM patients, travel reimbursement is administered through the TRICARE Prime Travel Benefit program. The statutory Travel Benefit set forth at 10 U.S.C. § 1074i is currently limited to TRICARE Prime beneficiaries by 32 CFR § 199.17(n)(5)[63] and clarifying guidance set forth in DHA Procedural Instruction 6000.05, "TRICARE Prime Travel Benefit Program (PTB) and Combat-Related Disability Travel (CRDT) Program," April 21, 2021; TRICARE Reimbursement Manual Chapter 1 Section 30; and Joint Travel Regulation 033007.[64] Prime Travel reimburses reasonable travel and other associated expenses (e.g., lodging, meals, mileage) incurred when the non-ADSM member is required to travel more than 100 miles from their PCM's office for non-emergency medically necessary specialty care if there is no other suitable TRICARE-authorized provider within 100 miles. For patients who qualify for the Prime Travel Benefit, if the PCM deems it medically necessary, travel orders and reimbursement may be authorized for one non-medical attendant (NMA) to accompany a non-ADSM patient referred for applicable specialty care. The NMA must be a parent, an adult family member, a legal guardian, or a companion who has been delegated a medical Power of Attorney by the patient or legally responsible party.

[63] (Code of Federal Regulations, 2023).
[64] (Travel Reimbursement for Specialty Care, 2023).

In the case of specialty care CoE establishment, there is a possibility that beneficiaries could be referred to a CoE-identified facility over 100 miles from their PCM's office, while bypassing suitable authorized providers within a 100-mile radius. Thus, the travel program necessary to support CoEs is fundamentally different from the existing Prime Travel program as currently implemented, as travel for CoE care intends to provide an exceptional level of quality and address complex cases regardless of any distance restrictions and availability of suitable providers, and to all covered beneficiaries, not just TRICARE Prime enrollees. While there is separate statutory authority under 10 U.S.C. § 1105 (Specialized treatment facility program) to cover certain travel for specialty care, that authority has yet to be implemented by required rulemaking. DHA is assessing the need for additional requirements to supplement the Prime Travel Program and ADSM travel policies to enable reimbursement for patient travel and accommodations for CoE care regardless of whether there is a suitable provider within 100 miles of the PCM or TRICARE Prime enrollee status.

To that end, MHS is conducting a gap analysis between current and future requirements along with a business case analysis. This analysis includes two fundamental components:

1) Analyze need for additional programs. Current travel programs, such as the Prime Travel Benefit, will not be sufficient to support patient and family travel to CoEs. Therefore, MHS is also analyzing what programs can be established or expanded to support travel to CoEs in the future.

2) Analyze the cost and determine budget. Once all CoE locations and referral criteria are determined, MHS will conduct a comprehensive assessment of the anticipated travel and accommodation costs based on the anticipated number of patients for each CoE. MHS will also analyze the potential costs saved from any facility consolidation, potential improved outcomes, and potential reduced costs anticipated from CoE standup. In addition, MHS will incorporate costs associated with potential recapture of patients from private sector care. From these analyses, MHS will determine: (1) how much the additional travel will cost; and (2) potential sources for any additional required funds.

As noted under TRICARE travel reimbursement policy, current travel benefits may be restricted to locations outside of 100 miles of the PCM and do not allow for the patient to bypass local specialty care providers.[65] For many beneficiaries, receiving care at a MHS CoE may require them to travel more than 100 miles while bypassing local specialty providers. DHA is exploring options to support the travel benefits required by CoEs, including the possibility of funded travel for non-ADSM patients to obtain care at CoEs which is separate from the Prime Travel Benefit program, and thus not subject to the restrictions regarding distance and availability of suitable providers.

The plan to support travel and accommodations for beneficiaries using CoE care is contingent on these ongoing analyses. Additional considerations with individual specialty referral criteria and locations will also impact patient demand and cost analysis.

[65] (Travel Reimbursement for Specialty Care, 2023).

MHS PLAN FOR TRANSFERRING SPECIALTY CARE PROVIDERS TO COES

Appropriate staffing at each CoE location will be critical to optimize patient outcomes and provider/beneficiary satisfaction. A workforce model is being developed to balance existing resources with cost to support readiness skills sustainment and effective healthcare delivery at each designated CoE location. The MHS is refining a comprehensive staffing model to establish appropriate staffing required to meet current and potential recapture demand requirements at MTFs, including the designated CoEs. This model will be utilized to inform the transfer of specialty care providers to CoEs to support the delivery of specialty care services at those sites, consistent with the provisions of section 713 of the NDAA for FY 2023.

The MHS staffing model is a systematic approach, integrating both quantitative and qualitative planning factors to generate standard requirements for each CoE specialty. Baseline requirements are established utilizing historical workload measured in Relative Value Units (RVUs) as a manner of quantifying the demand expected to be met by the CoE. The baseline is then divided by the RVU workload targets established for one FTE to generate the total number of providers required to meet the workload requirements. From the baseline, additional methodologies are developed to capture requirements established by civilian professional organizations, and support staff ratios are applied to generate the total staffing requirement. Various other considerations, such as geographical demand, support staff workload, MTF capabilities and infrastructure, medical education/training requirements, provider skill sustainment, and TRICARE network capabilities are also factored into the model. This approach utilizes agile and scalable methodologies to account for the complexities of staffing MTFs/clinics with a joint workforce in support of the MHS's complimentary readiness and healthcare delivery missions. This process, and its integration with CoE staffing plans, support the goal outlined in the FY 2023-2028 DHA Strategic Plan to, "make key MTFs the preferred location for MILDEPs to assign active-duty personnel to gain the currency and workload to support a ready medical force."[66]

Manpower gap analyses and business case analyses (BCAs) will be coordinated between appropriate MTF and Network clinical subject matter experts and DHA directorates to review the inventory of active-duty providers and validate gaps in staffing relevant to CoE specialties. Following determination of workforce requirements for CoEs, staffing recommendations will be coordinated between DHA and the Military Departments to ensure the optimal staffing mix is achieved to meet baseline care delivery requirements at each CoE location. Active duty specialty care providers and staff may be geographically realigned to provide specialty care services to eligible beneficiaries as consistent with the identification of CoEs within this report.

DHA will coordinate with the Military Departments to request transfer of active-duty medical assets to designated CoE locations to provide ample multidisciplinary staffing and fill gaps. If requested gaps cannot be filled using existing active-duty providers and staff due to competing readiness or operational requirements, further BCAs will be conducted to assess the feasibility of additional manning (i.e., civilian and contractor) to close any remaining staffing gaps for full CoE functionality.

[66] (DHA Strategic Plan, 2023).

MHS PLAN FOR MONITORING PERFORMANCE

To monitor CoE effectiveness and support the MHS in accomplishing its mission, the MHS will conduct regular reviews of all specialty care CoEs at full operating capacity using a standard set of measures to optimize access to care, beneficiary satisfaction, patient care experience, and clinical outcomes/quality as detailed below.

Access to Care

Access to care will continue to be a top priority of the MHS with the establishment of specialty care CoEs. Access to care for CoEs will be monitored using the following two metrics, with minor adaptation:

- Average days from appointment being created to appointment date for "SPEC" appointment types (Days to SPEC)
- Ambulatory Specialty Care Leakage (SC Leakage)

Days to SPEC measures the duration between when an appointment was scheduled and when that appointment occurred for initial specialty care visits. Follow-up specialty care visits are not always recommended or needed right away and are not included in the measure. This measure is also used to monitor access to care standards outlined in DoD Instruction 6000.14, "DoD Patient Bill of Rights and Responsibilities in the Military Health System (MHS)."

SC Leakage monitors the percentage of care that is seen within the Managed Care Support Contractor network for beneficiaries with a primary care manager at an MTF. This measure is used to monitor the amount of care that can be retained within the MHS. For CoEs, this measure will assess how KSAs of CoE staff can be promoted, and how CoE value can be maximized to the regional population. Additionally, SC Leakage should decrease with CoE implementation, with the intent of retaining high complexity cases within the Direct Care network.

Both Days to SPEC and SC Leakage will be restricted to the medical/surgical specialties of the CoE. For example, monitoring access for the Oncology CoE will only include oncology results in the metrics. These two metrics will help the MHS monitor the accessibility of appointments and minimize leakage outside of the MHS.

Beneficiary Satisfaction and Patient Care Experience

CoE establishment for specialty care requires monitoring beneficiary satisfaction through the analysis of satisfaction measures to identify whether MHS CoEs meet patient expectations of satisfaction/excellence. Established MHS patient satisfaction surveys are utilized for this effort. Metrics that will be used to monitor patient satisfaction of MHS specialty care CoEs include:

- Joint Outpatient Experience Satisfaction Survey (JOES)
- TRICARE Inpatient Satisfaction Survey (TRISS)
- MHS Inpatient Survey Questions

JOES is an event-based patient satisfaction survey for eligible TRICARE beneficiaries that kept an outpatient appointment in an MHS MTF. JOES is sent via mail, email, or text 24-48 hours after an outpatient visit, and measures patient satisfaction with healthcare received during the visit.

JOES Consumer Assessment of Health Care Providers and Systems (CAHPS) [JOES-C] is randomly fielded one-time monthly to eligible TRICARE beneficiaries. JOES-C is an "apples to apples" comparison with civilian CAHPS patient satisfaction surveys and is compliant with TJC requirements for accreditation.

Both outpatient focused JOES and JOES-C patient satisfaction measures will be compared to baseline measures and targets. Furthermore, based on the expertise of the Patient Experience Branch at DHA, a focused review of the following three core sets of outpatient JOES measures is recommended.

1) "Satisfied with healthcare received on this visit: and "Recommend facility to family member or friend"
2) "I am able to see my provider when needed"
3) "Told to call back…"

The TRISS is another tool to measure patient satisfaction and will be conducted bi-monthly. The TRISS survey instrument will act as an "apples to apples" comparison with civilian sector inpatient satisfaction surveys that use the Hospital Consumer Assessment of Healthcare Providers and Systems questions; and is compliant with TJC requirement for accreditation. A representative sample of TRICARE beneficiaries seen at specialty care CoEs will be selected to be contacted and asked to participate in TRISS. This sample will consist of adult respondents that recently received inpatient care from a specialty care CoE. Surveys will be sent to eligible beneficiaries four to six weeks after discharge. Also included on the TRISS are survey questions developed by the MHS to measure MHS MTFs satisfaction with inpatient care. DHA Health Care Operations will monitor/analyze/report CoE measures and data trends and patient comments to gain insight to CoE successes and challenges in patient satisfaction and patient experience.

Healthcare Outcomes and Quality

The healthcare outcome measures used to monitor each CoE's performance will vary by specialty. Each specialty will be required to identify specific outcome and quality measures during the establishment of each CoE and will use a variety of metrics that already exist within MHS to measure performance. Common measure sets, all of which are currently available for MHS facilities, and may be a resource for consideration by a specialty include:

- Healthcare Effectiveness Data and Information Set (HEDIS): This set of measures, managed by NCQA, measures performance on important dimensions of care and service. Example measures include readmissions, acute hospital utilization, and hospitalization for potentially preventable complications.

- NSQIP: This set of measures is managed by the ACS and is a nationally validated, risk-adjusted, outcomes-based program intended to measure and improve the quality of surgical care. Example measures include post-surgery mortality, surgical site infection rates, and post-surgery complication rates.

- ORYX® Measures: The ORYX® measure set provides broad performance measurement. These measures are managed by TJC and are required as part of their accreditation services. Example measures include hospital-acquired venous thromboembolism, safe use of opioids, and alcohol use intervention.

- Patient Safety Indicators (PSI): PSIs provide information on potentially avoidable safety events that represent opportunities for improvement in the delivery of care. This measure set is published by the AHRQ. Example measures include postoperative sepsis rate, postoperative hemorrhage rate, and death rate in low-mortality patients.

In addition to the potential measure sets described above, each specialty will also consider additional specialty specific measures that define patient outcomes within their scope of care. For example, Oncology CoEs will review existing data in the Cancer Registry to evaluate survival rates, whereas Ocular Trauma CoEs may evaluate improvement in visual acuity as an outcome measure. Each specialty CoE will review existing national benchmarks to identify high impact outcome measures to improve both quantity and quality of life years gained.

CoE Performance

All specialty care CoEs will be reviewed by the DHA Healthcare Integration Board (HCIB) using a standard set of measures described above. HCIB is responsible for overseeing and advising on the full spectrum of health care delivery across the MHS to include integration of healthcare delivery under direct and private sector care.

As needed, the HCIB will advocate for changes in resourcing at the CoEs to better align with MHS priorities and provide clinical and healthcare operations input into business transformation, standardization of processes and policies, and the integration of direct and private sector care into an integrated healthcare delivery system. The HCIB will provide input on clinical initiatives, clinical standardization requirements, and other clinical operations and healthcare service delivery to inform decision-making by DHA leadership and coordination with relevant stakeholders (e.g., Military Departments) on issues of mutual impact.

CONCLUSION

Specialty care CoE designations of the ten required specialties identified in section 713 of the NDAA for FY 2023 remain a top priority for the MHS. While CoE site designation by specialty remains in process, CoE recommendations will be scoped to build upon existing capacity and staffing across the MTFs. Final designations will also be determined based on the locations of beneficiaries in specific geographic areas, thereby capitalizing on existing services while minimizing need for and cost of patient travel.

MHS is committed to establishing specialty care CoEs by working with impacted clinical specialists, Network and MTF leadership, and other key stakeholders across the MHS. Key future milestones will include finalizing DHA and DoD leadership approved CoE locations along with the execution of staffing and resource plans. The DoD expects to submit the final report to Congress by August 30, 2025. This additional time provides DoD with a critical extension to complete extensive planning, coordination, approvals, and resourcing across various DoD organizations to officially designate and stand up CoEs for several specialties in accordance with section 713 of the NDAA for FY 2023. By directing expertise and resources to CoEs, the MHS will be further modernized to provide a ready military medical force, improved health outcomes, and increased quality care.

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DEFINITIONS

Center of Excellence: A shared facility, or entity, that provides high standards of research, leadership, services, or education, and brings innovative mechanisms to promote knowledge and scientific advancements.[1,2,3,4]

Core Casualty Receiving Facilities: Role 4 MTFs that are intended to serve as a medical hub for receipt and treatment of casualties, including civilian casualties, that may result from combat or from an event the President determines or declares as a natural disaster, mass casualty event, or other national emergency.

Intrepid Spirit Center: Health care satellite sites created to support the NICoE to focus on supporting ADSMs suffering from TBI and Post Traumatic Stress. These centers are currently located at Joint Base Lewis-McChord, Eglin AFB, Camp Lejeune, Camp Pendleton, Fort Belvoir, Fort Liberty, Fort Campbell, Fort Cavazos, Fort Carson, Joint Base Elmendorf-Richardson, and Landstuhl Regional Medical Center.

National Intrepid Center of Excellence: CoE established in 2010 to support TBI and other mental health concerns in response to the NDAA for FY 2008.

Prehabilitation: The process of improving a patients' functional capacity prior to surgery to improve health and surgical outcomes.

Role 4 MTF: MTF that provides the full range of comprehensive care including preventative, acute, and rehabilitative.

Type 1 Providers: Health care providers who are acting as individuals.

Type 2 Providers: Health care providers who are incorporated into an organization.

ACRONYMS

ABA	American Burn Association
ACGME	Accreditation Council for Graduate Medical Education
ACS	American College of Surgeons
ACS CoC	American College of Surgeons Commission on Cancer
ADSM	active duty Service member
AFB	Air Force Base
AHRQ	Agency for Healthcare Research and Quality
APP	Advanced Practice Provider
ASAM	American Society of Addiction Medicine
BCA	business case anaylsis
BMT	bone marrow transplant
BOD	Board of Directors
CAHPS	Consumer Assessment of Health Care Providers and Systems
CAMP	Clinical Assessment Management Portal
CCRF	Core Casualty Receiving Facility
CDC	Centers for Disease Control and Prevention
CoE	Center of Excellence
CPGs	Clinical Practice Guidelines
CRNA	Certified Nurse Anesthetist
CTR	Certified Tumor Registrar
DHA	Defense Health Agency
DIN	Defense Intrepid Network
DoD	Department of Defense
DLC	Denver Logistics Center
FTE	Full-Time Equivalent
FY	Fiscal Year
GME	Graduate Medical Education
HCIB	Healthcare Integration Board
HEDIS	Healthcare Effectiveness Data and Information Set
HQ	headquarters
ICU	Intensive Care Unit
ID	Infectious Disease
IDSA	Infectious Diseases Society of America
IPT	Integrated Product Team
IRMAC	Integrated Referral Management and Appointing Center
ISC	Intrepid Spirit Center
IT	Information Technology
JOES	Joint Outpatient Experience Satisfaction Survey
JOES-C	JOES Consumer Assessment of Health Care Providers and Systems
KSA	knowledge, skills, and abilities
LCSW	Licensed Clinical Social Worker
LVN	Licensed Vocational Nurse
MCC	John P. Murtha Cancer Center

MDRO	multi-drug resistant organisms
MHS	Military Health System
MOTION	Military Orthopedics Tracking Injuries and Outcomes Network
MTF	military medical treatment facility
NCQA	National Committee for Quality Assurance
NDAA	National Defense Authorization Act
NICoE	National Intrepid Center of Excellence
NMA	non-medical attendant
NP	Nurse Practitioner
NSQIP	National Surgical Quality Improvement Program
O&P	Orthotics and Prosthetics
OR	Operating Room
OT	Occupational Therapy
PA	Physician Assistant
PCM	primary care manager
PM	Preventive Medicine
PSI	Patient Safety Indicator
RM	Rehabilitation Medicine
RN	Registered Nurse
RTF	residential treatment facility
RVU	Relative Value Unit
SAARS	Standardized Antimicrobial Administration Ratios
SecDef	Secretary of Defense
SIR	Standardized Infection Ratio
SUD	Substance Use Disorder
TBI	traumatic brain injury
TJC	The Joint Commission
TRISS	TRICARE Inpatient Satisfaction Survey
USTRANSCOM	United States Transportation Command
VA	Department of Veterans Affairs
WRNMMC	Walter Reed National Military Medical Center