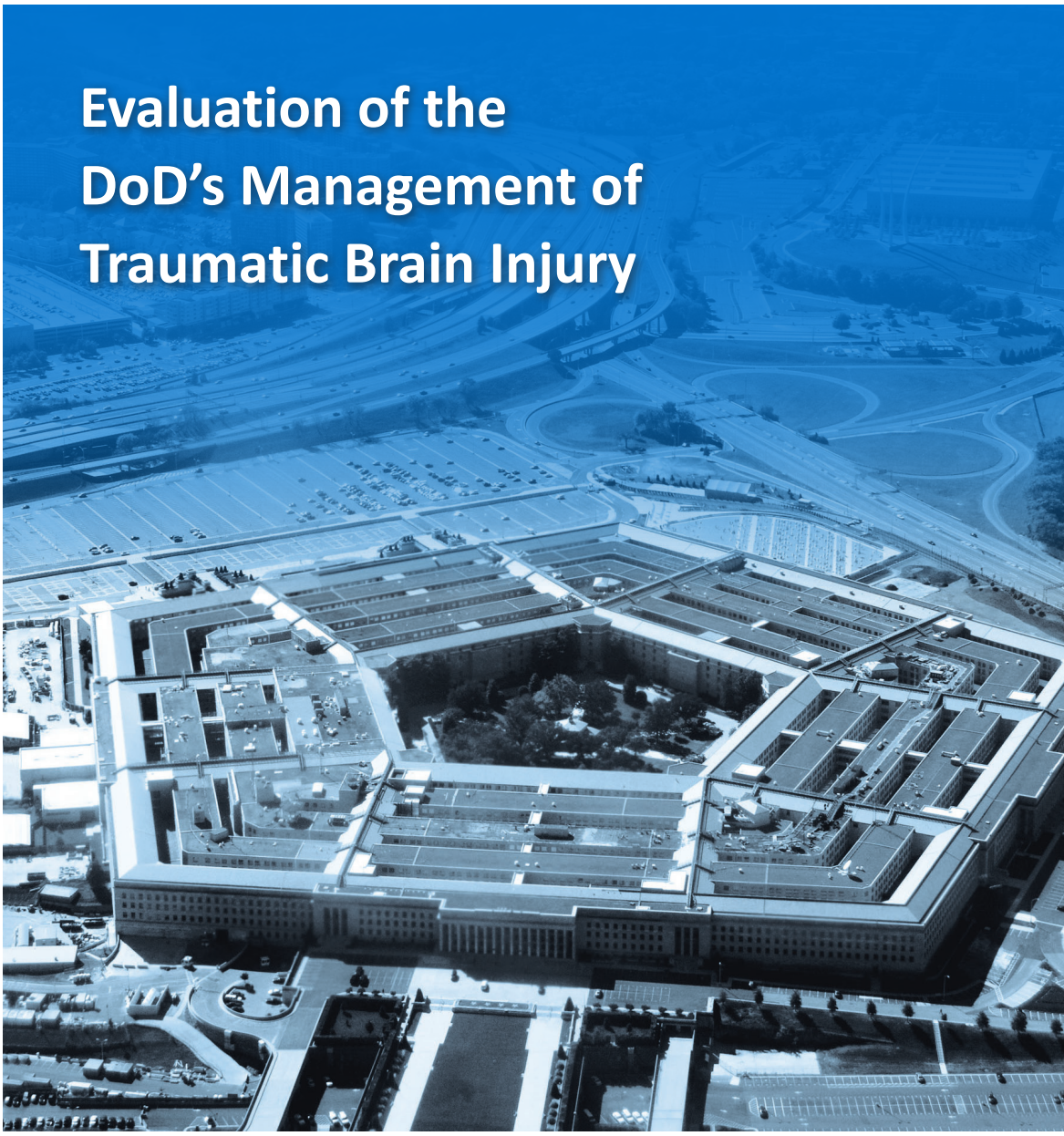
Report No. DODIG-2023-059

INSPECTOR GENERAL

U.S. Department of Defense

MARCH 28, 2023

Evaluation of the DoD's Management of Traumatic Brain Injury



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Results in Brief

Evaluation of the DoD's Management of Traumatic Brain Injury

March 28, 2023

Objective

The objective of this evaluation was to determine the extent to which the Defense Health Agency and Military Service medical departments implemented policies and procedures and provided oversight to ensure that Service members who experienced a traumatic brain injury (TBI) were identified and screened to determine their appropriate level of care. In addition, we determined the extent to which the U.S. Central Command (USCENTCOM) Service Components screened, identified, and documented signs and symptoms of TBIs.

Background

As highlighted in the DoD OIG November 2021 report on traumatic brain injuries in the USCENTCOM area of responsibility, TBIs are one of the invisible wounds of war and one of the signature injuries of troops wounded in Afghanistan and Iraq. From 2000 to 2022, approximately 458,894 Service members were diagnosed with a TBI during training or in combat. Due to the high rate of TBIs, the National Defense Authorization Act for FY 2020 required the DoD to study the effectiveness of the use of routine neuroimaging in diagnosis, treatment, and prevention of brain injury due to blast pressure exposure during combat and training. In a 2020 letter to the DoD Acting Inspector General, the Congressional Brain Injury Task Force emphasized the importance of accurate and transparent reporting of traumatic brain injuries.

Finding

The DoD did not consistently implement policies and procedures to determine the care needed for Service members with TBIs. Specifically:

- Military Health System (MHS) providers did not consistently identify and assess patients with TBIs;
- the DoD did not implement consistent processes for the management of TBI care; and
- the DoD did not implement consistent processes for the disposition of care, including return to duty status for patients diagnosed with a TBI.

Recommendations

We recommend that the Director of the Defense Health Agency review and update Defense Health Agency Procedural Instruction 6490.04. At a minimum, the review and update should:

- establish the timeline associated with 72-hour followup,
- change the 72-hour followup from a recommendation to a requirement, and
- review the applicability and clinical use in its entirety of the Military Acute Concussion Evaluation, Version 2 (MACE 2) tool in Military Treatment Facilities.

We recommend that the Under Secretary of Defense for Personnel and Readiness, in coordination with the Assistant Secretary of Defense (Health Affairs), Director of the Defense Health Agency, Service Surgeons General, and Joint Staff Surgeon, establish an oversight plan for the management of TBI care within the MHS. At a minimum, the oversight plan should:

- include the completion and tracking of required screening tools, including MACE 2;
- include the completion and tracking of the Progressive Return to Activity protocol;

Results in Brief

Evaluation of the DoD's Management of Traumatic Brain Injury

Recommendations (cont'd)

- include the completion and tracking of any required followup processes for Service members diagnosed with a TBI; and
- develop a revised methodology to verify that MHS providers consistently code all Service members diagnosed with a TBI.

We recommend that the Under Secretary of Defense for Personnel and Readiness, in coordination with the Assistant Secretary of Defense (Health Affairs), Director of the Defense Health Agency, Service Surgeons General, and Joint Staff Surgeon, establish a Traumatic Brain Injury Program of Record for traumatic brain injury care within the Military Health System that:

- establishes baseline resource requirements and guidance for personnel, equipment, and staffing and budget modeling; and
- standardizes programming, concept of operations, business practices, staffing, and referral standards.

We recommend that the Under Secretary of Defense for Personnel and Readiness, in coordination with the Assistant Secretary of Defense (Health Affairs), Director of the Defense Health Agency, Service Surgeons General, and Joint Staff Surgeon, establish a process by which MHS providers can access, create, and update Service members' profiles, regardless of their Service Component.

Management Comments and Our Response

The Under Secretary for Personnel and Readiness and the Director of the Defense Health Agency did not respond to the recommendations in the report. Therefore, the recommendations are unresolved. We request they provide comments within 30 days of final report issuance. Please see the Recommendations Table on the next page.

Recommendations Table

Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
Under Secretary of Defense for Personnel and Readiness	2, 3, 4	None	None
Director, Defense Health Agency	1, 2, 3, 4	None	None

Please provide Management Comments by April 28, 2023.

Note: The following categories are used to describe agency management's comments to individual recommendations.

- **Unresolved** – Management has not agreed to implement the recommendation or has not proposed actions that will address the recommendation.
- **Resolved** – Management agreed to implement the recommendation or has proposed actions that will address the underlying finding that generated the recommendation.
- **Closed** – DoD OIG verified that the agreed upon corrective actions were implemented.


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4800 MARK CENTER DRIVE
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March 28, 2023

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR PERSONNEL AND READINESS
ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS)
DIRECTOR, DEFENSE HEALTH AGENCY
SURGEON GENERAL, DEPARTMENT OF THE ARMY
SURGEON GENERAL, DEPARTMENT OF THE NAVY
SURGEON GENERAL, DEPARTMENT OF THE AIR FORCE
JOINT STAFF SURGEON

SUBJECT: Evaluation of the DoD's Management of Traumatic Brain Injury (Report No. DODIG-2023-059)

This final report provides the results of the DoD Office of Inspector General's Evaluation of the DoD's Management of Traumatic Brain Injury. We previously provided copies of the draft report and requested written comments on the recommendations. We considered management's comments on the draft report when preparing the final report.

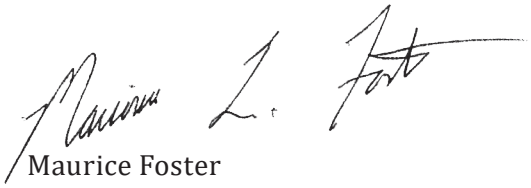
This report contains recommendations that are considered unresolved because the Under Secretary of Defense for Personnel and Readiness and the Director of the Defense Health Agency did not provide a response to the report.

Therefore, as discussed in the Recommendations, Management Comments, and Our Response section of this report, the recommendations remain open. We will track these recommendations until an agreement is reached on the actions that you will take to address the recommendations and you have submitted adequate documentation showing that all agreed-upon actions are completed.

DoD Instruction 7650.03 requires that recommendations be resolved promptly. Therefore, within 30 days please provide us your response concerning specific actions in process or alternative corrective actions proposed on the recommendations. Send your response to [redacted] if unclassified. If you arrange to send classified comments electronically, you must send them over the SECRET Internet Protocol Router Network (SIPRNET). Copies of your comments must have the actual signature of the authorizing official for your organization.

If you have any questions, please contact [redacted]

FOR THE INSPECTOR GENERAL:



Maurice Foster
Acting Assistant Inspector General for Evaluations
Programs, Combatant Commands,
and Overseas Contingency Operations

Contents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Introduction

Objective

The objective of this evaluation was to determine the extent to which the Defense Health Agency (DHA) and Military Service medical departments implemented policies and procedures and provided oversight to ensure that Service members who sustained a traumatic brain injury (TBI) were identified and screened to determine their appropriate level of care. We also determined whether the U.S. Central Command (USCENTCOM) Service Components screened, identified, and documented signs and symptoms of TBIs.

Background

As highlighted in our November 2021 report on traumatic brain injuries in the USCENTCOM area of responsibility, TBIs are one of the invisible wounds of war and one of the signature injuries of troops wounded in Afghanistan and Iraq.[1] From 2000 to 2022, approximately 458,894 Service members were diagnosed with a TBI during training or in combat. Due to the high rate of TBIs, the National Defense Authorization Act for FY 2020 required the DoD to study the effectiveness of the use of routine neuroimaging in diagnosis, treatment, and prevention of brain injury due to blast pressure exposure during combat and training. In a 2020 letter to the DoD Acting Inspector General, the Congressional Brain Injury Task Force emphasized the importance of accurate and transparent reporting of TBIs.[2]

A TBI can cause temporary or permanent memory loss and can lead to a Service member's absence from training, deployment, and combat. Effects of a TBI can be short- or long-term and include impaired thinking, memory, movement, vision, and hearing. A TBI can also impair emotional functioning, resulting in or contributing to personality changes or depression. In some cases, a TBI can be fatal.

There are four categories of TBIs: mild (concussion), moderate, severe, and penetrating (the terms mild TBI and concussion are used interchangeably). The DoD defines a TBI as:

> a traumatically induced structural injury or physiological disruption of brain function, as a result of an external force, that is indicated by new onset or worsening of at least one of the following clinical signs immediately following the event:
>
> - any alteration in mental status (for example, confusion, disorientation, or slowed thinking);

[1] DoD OIG Report No. DODIG-2022-006, "Evaluation of Traumatic Brain Injuries in the U.S. Central Command Area of Responsibility," November 1, 2021.

[2] Congress of the United States Letter to the Acting Inspector General, "Requesting TBI Screening and Reporting Responses," February 4, 2020.

- any loss of memory for events immediately before or after the injury; or
- any period of loss of or a decreased level of consciousness either observed by another person or self-reported.[3]

Policies for Evaluating and Treating TBIs

There are two DoD Instructions (DoDI), one Defense Health Agency Procedural Instruction (DHA-PI), and two Clinical Practice Guidelines (CPG) referenced in this report. DoDI 6490.11 is the primary policy for managing mild TBIs in the deployed environment.[4] DHA-PI 6490.04 is the primary policy for managing mild TBIs in non-deployed settings.[5]

The Department of Veterans Affairs (VA) and the DoD CPG for the Management and Rehabilitation of Post-Acute Mild Traumatic Brain Injury provides health care providers with a framework to evaluate, treat, and manage individuals with a history of mild TBI. The Joint Trauma System Clinical Practice Guidelines for TBI Management in Prolonged Field Environments provides evidence-based guidance to medical professionals who encounter TBI when evacuation to a higher level of care is not available. The Military Acute Concussion Evaluation, Version 2 (MACE 2), and the Progressive Return to Activity (PRA) protocol are clinical tools and procedures for the assessment, management, and rehabilitation of all patients with mild TBIs.[6]

DoD Policy Guidance for Management of Mild TBI in a Deployed Setting

DoDI 6490.11 provides unified guidelines to the Services for the management of mild TBI in a deployed setting. DoDI 6490.11 established a requirement for the reporting of potentially concussive events (PCE) and medical evaluation or assessment following a PCE. A PCE is an event or incident that can, but does not always, result in a TBI. A PCE requires mandatory rest periods, medical evaluation, and reporting of exposure of all involved personnel. Using event-based protocols, such as blast-event reporting, maximizes the chances of identifying a PCE or actual TBI.

[3] Assistant Secretary of Defense (Health Affairs) Memorandum, "Traumatic Brain Injury: Updated Definition and Reporting," April 6, 2015.

[4] DoDI 6490.11, "DoD Policy for Management of Mild Traumatic Brain Injury/Concussion in the Deployed Setting," September 18, 2012 (Incorporating Change 3, Effective October 1, 2021).

[5] DHA-PI 6490.04, "Required Clinical Tools and Procedures for the Assessment and Clinical Management of Mild Traumatic Brain Injury (mTBI)/Concussion in Non-Deployed Setting," April 26, 2021.

[6] MACE 2 is a screening tool that assists providers in the assessment and diagnosis of mild TBI.

According to DoDI 6490.11, the combatant commands and the Services must submit monthly tracking reports of all PCEs and all Service members involved to the Joint Trauma Analysis and Prevention of Injury in Combat (JTAPIC) Program Office, regardless of whether a TBI was experienced. DoDI 6490.11 states that, at a minimum, a PCE includes the following:

- involvement in a vehicle blast event, collision, or rollover;
- presence within 50 meters of a blast;
- a direct blow to the head or witnessed loss of consciousness; or
- exposure to more than one blast event.

Clinical Tools and Procedures for Assessment and Management of Mild TBI in a Non-Deployed Setting

MACE 2 and the PRA protocol are DHA-PI 6490.04 required tools and procedures for the assessment, management, and rehabilitation of all patients with mild TBI.

According to DHA-PI 6490.04, the Deputy Assistant Director for Medical Affairs must provide oversight and support execution of requirements and monitor and track measures to assess TBI screening and compliance with procedures. DHA-PI 6490.04 requires that medical personnel who assess and care for patients immediately after a PCE perform the following:

> [a] complete MACE 2 at initial evaluation of mild TBI, [b] initiate a PRA protocol at followup and continue to monitor and assess the patient regularly until an exertional test is successfully completed and the patient is cleared for return to full duty or normal activity, as applicable, and [c] track and document required mTBI [mild TBI] patient reported outcome measures using the Neurobehavioral Symptom Inventory (NSI) and other recommended tools as outlined by the DoD Traumatic Brain Injury Advisory Committee (TAC) to ensure patient outcomes are improving with treatment.

Military Acute Concussion Evaluation, Version 2

When a Service member experiences a PCE, medical personnel use the MACE 2 tool to screen, assess, and evaluate for a TBI. MACE 2 provides guided questions to determine whether a mild TBI occurred and whether further assessment and treatment are required. If the MACE 2 reveals that the Service member in a deployed environment did not experience a TBI, the Service member may return to duty after 24 hours of mandatory rest and normal evaluation upon followup. If the MACE 2 reveals that further assessment and treatment are required, the operational commander is required to refer the Service member for medical evaluation with a medical care provider, in accordance with DoDI 6490.11.

According to MACE 2 guidance, medical personnel are required to document and report the results of the MACE 2 screening in the Service member's electronic health record (EHR), regardless of symptoms. According to the Fundamentals of Military Medicine, documenting the history of the event is critical, "not only for documentation within the health record, but also for the Service member's records, as he or she transitions from active duty service."[7]

International Classification of Diseases Codes

The International Classification of Diseases (ICD) is a set of alphanumeric codes used by health care providers and other stakeholders (such as health information managers, insurers, and patient organizations) to record and report health conditions. The ICD, which is published by the World Health Organization, allows health care providers around the world to compare and share data—between hospitals, regions, countries, and over periods of time—in a consistent and standard way.

Progressive Return to Activity

The PRA protocol is a gradual, evidence-based, six-stage process that facilitates return to duty for Service members who experienced a mild TBI. The earliest a Service member can progress through all six stages and return to full duty is 7 days after a mild TBI.

[7] U.S. Army Medical Center of Excellence, Borden Institute, "Fundamentals of Military Medicine," Chapter 38, "Traumatic Brain Injury in the Military," 2019.

Finding

The DoD Did Not Consistently Implement Policies and Procedures to Determine the Care Needed for Service Members with TBIs

The DoD did not implement policies and procedures to ensure that Service members who experienced a PCE were identified and screened to determine their appropriate level of care, as required by DoDI 6490.11 and DHA PI 6490.04. Specifically, we determined that:

- Military Health System (MHS) providers did not consistently identify and assess Service members for TBIs.
- The DoD did not implement consistent processes for the management of TBI care.
- The DoD did not consistently manage processes for the disposition of care, including return to duty status for Service members diagnosed with TBIs.

We determined that MHS providers did not consistently identify and assess patients for a TBI, as required by DoDI 6490.11 and DHA-PI 6490.04, because the DoD did not monitor and track whether Military Treatment Facility (MTF) providers complied with the MACE 2 screening requirement outlined in DoDI 6490.11 and DHA-PI 6490.04. For example, senior officials at 10 out of 14 MTFs that we surveyed told us that they do not use the MACE 2 as required by DoDI 6490.11 and DHA-PI 6490.04. We found that 4 out of the 10 are not completing the MACE 2 in its entirety; and 6 of the 10 are not completing the MACE 2 immediately after a PCE, but use it later in the care process.[8] Based on our analysis of information received during our site visit interviews, we determined that the providers are not using the MACE 2 because the screening is too lengthy and lacks value added outside of a provider's clinical judgment. For example, a senior official at a regional MTF told us the use of the MACE 2 falls to the wayside because it is not useful and takes too long to complete.

Additionally, MHS providers did not consistently document TBI patient encounters in the patient's EHR to enable accurate reporting of TBI cases by the TBI Center of Excellence (TBICoE). This occurred because TBI coding is inconsistent across the MHS. The DHA provides MHS providers with a set of ICD-9-CM and ICD-10-CM codes to use when screening for or treating TBI; however, these codes do not always

[8] Among the 4 MTFs not completing the MACE 2 in its entirety, 1 is not completing a portion of the MACE 2 screening and 3 are not completing a MACE 2 screening at all.

identify the actual injury or illness, thereby causing providers to use other codes. For example, a senior Armed Forces Health Surveillance Division (AFHSD) official told us that ICD-9 and ICD-10 codes for TBIs are provider-dependent and are not standard across all providers. Another senior MTF official stated that its coding office uses a wide variety of ICD codes that are not standard.

We further determined that the DoD did not implement consistent processes for the management of TBI care. According to data provided by the TBICoE, we found that MHS providers did not provide 72-hour followup appointments for approximately 41 percent of patients diagnosed with a mild TBI, as recommended in DHA-PI 6490.04. Furthermore, the DoD did not establish referral processes for Service members needing care for TBI-related symptoms. The DoD did not implement consistent processes for the management of TBI care because DHA-PI 6490.04 does not clearly define 72-hour followup requirements. For example, according to data provided by the TBICoE, from January to December 2021, only 33 percent of mild TBI patients received a followup appointment within 3 days of their initial diagnosis.

Lastly, we determined that the DoD did not consistently manage processes for the disposition of care for Service members diagnosed with TBIs. This occurred because the DoD did not enforce the use of the PRA protocol to determine return to duty status and because each Service has its own profile standard. Although DoDI 6490.11 and DHA-PI 6490.04 require that providers use the PRA protocol, the providers we interviewed chose to use other clinical tools instead of the PRA protocol. We found that 5 out of 14 MTFs surveyed use different clinical tools to determine return to duty status. According to a senior official at a regional MTF, the PRA protocol does not provide an adequate assessment and the staff chose to use alternative tools, such as the Buffalo Concussion Treadmill Test, instead.[9] We also found that each Service has its own profile standard with differences in how profiles are written, which creates difficulty when writing profiles on Service members in Joint Service environments.[10]

As a result, the MHS is unable to accurately identify, treat, and track the number of TBIs across the DoD. Failure to identify and treat Service members with a TBI can impair the DoD's ability to address the health care needs of Service members with chronic TBI symptoms and can affect Service members' readiness for deployment, job performance, and quality of life. TBI protocols must be followed by individual Service members and the Military Services to ensure that the reporting systems work effectively and efficiently to strengthen military resiliency.

[9] The Buffalo Concussion Treadmill Test identifies the heart-rate threshold of exercise tolerance in concussed patients.

[10] A profile is a written document that communicates to commanders the individual medical restrictions for Service members.

The DoD Did Not Consistently Implement Policies and Procedures to Determine the Care Needed for Service Members with TBIs

The DoD did not consistently implement policies and procedures to ensure that Service members who experienced a PCE were identified and screened to determine their appropriate level of care, as required by Federal and DoD guidance. Based on our evaluation, we determined that only 2 of the 14 MTFs that we sampled followed the guidance established by DoDI 6490.11 and DHA-PI 6490.04.

MHS Providers Did Not Consistently Identify and Assess Patients with TBIs

We determined that MHS providers did not consistently identify and assess for TBIs because the DoD did not provide oversight of the MACE 2 screening or TBI diagnostic coding in accordance with DoDI 6490.11 and DHA-PI 6490.04.

DoDI 6490.11 establishes policy, assigns responsibilities, and provides procedures on the management of mild TBI, also known as concussion in the deployed setting. DoDI 6490.11 outlines the following.

- The DoD must identify, track, and ensure the appropriate evaluation and treatment of Service members exposed to PCEs, such as blast events.
- Service members exposed to a PCE must be medically assessed as close to the time of injury as possible.
- Medically documented mTBI [mild TBI] in Service members must be clinically evaluated, treated, and managed according to the most current DoD clinical practice guidance for the deployed environment found in the TBICoE guidance, "Provider Resources."
- PCEs, results of concussion screening, and diagnosed concussions must be appropriately documented, to the maximum extent possible, in the Service member's EHR.

DHA-PI 6490.04 establishes the Defense Health Agency's (DHA) required clinical tools and procedures for management of mild TBI/concussion, specifically, the use of the Military Acute Concussion Evaluation, Version 2 (MACE 2), and the Progressive Return to Activity (PRA) framework for the assessment, management, and rehabilitation of all patients with mild TBI/concussion.

According to DoDI 6490.11, all deployed medical personnel must use the most current clinical practice guidance for the deployed environment when possible. The most current guidance on screening and initial evaluation for TBIs is located on the TBICoE's website under "Provider Resources" and includes the MACE 2,

PRA, recurrent concussion card, and ICD-10 coding guidance for TBI.[11] A senior leader from the TBICoE stated that although DoDI 6490.11 provides guidance for the deployed setting and DHA-PI 6490.04 provides guidance for the non-deployed setting, the assessment tools are the same for TBI assessment.

MHS Providers Did Not Consistently Use MACE 2, as Required by DoD Guidance and DHA Policy

We found that the Services all use different methodologies for identifying a TBI. We also found that providers did not consistently use the MACE 2 screening tool and document screenings. For example, U.S. Army Central Command (USARCENT) personnel stated that there is no consistent way of tracking compliance to ensure that providers are documenting MACE 2 screenings. USARCENT personnel also stated that electronic documentation is a challenge for on-the-scene, point-of-injury documentation, especially for Role 1 facilities or areas that do not have access to a scanner.[12] Additionally, providers do not always have sufficient time to properly screen for TBIs. Defense Health Agency–Interim Procedures Memorandum (DHA-IPM) 18-001 authorizes three appointment time lengths: (1) 20 minutes, (2) 40 minutes for complex patients, and (3) 60 minutes for training purposes.[13] A senior official at one MTF stated that a MACE 2 screening can take up to 1 hour, but that appointments are usually scheduled for 20 minutes.

During our interviews with senior officials from MTFs across the Services, we found inconsistencies in MHS providers' use and documentation of the MACE 2 screening tool. MTF providers told us the screening takes too long or they found other screening tools to be more useful, such as the SCAT-5, PHA, SLUMS, DoD/VA CPGs, and Buffalo Concussion Treadmill Test.[14] For example, senior officials from one Air Force MTF stated that providers are doing MACE screenings inconsistently. Those officials stated that MACE 2 is time consuming and is not fully effective in qualifying or characterizing TBIs; while MACE 2 can be useful in the field, it is less useful in the emergency department, where quick assessments are needed. As a result, providers at the MTF use the Glasgow Coma Scale to

[11] Traumatic Brain Injury Center of Excellence, Provider Resources, https://health.mil/Military-Health-Topics/Centers-of-Excellence/Traumatic-Brain-Injury-Center-of-Excellence/Provider-Resources, accessed December 1, 2022.

[12] Role 1 care is the first medical care a Service member receives and may also be referred to as unit-level medical care. Major emphasis is placed on those measures necessary for the patient to return to duty or to stabilize and allow for the patient's evacuation to the next role of care.

[13] DHA-IPM 18-001, "Standard Appointing Processes, Procedures, Hours of Operation, Productivity, Performance Measures and Appointment Types in Primary, Specialty, and Behavioral Health Care in Medical Treatment Facilities (MTFs)," January 26, 2018. In 2019, the DoD issued a memorandum extending the effective date of DHA-IPM 18-001 to 2019 and the DoD uses both versions.

[14] SCAT-5: Sport Concussion Assessment Tool-5. PHA: Periodic Health Assessment. SLUMS: The Saint Louis University Mental Status.

assess patients in the emergency department.[15] Senior officials at a Naval MTF stated that they do not currently use MACE 2 to screen for TBIs because, from the staff's perspective, it does not provide any additional clinical information outside of what a board-certified provider could determine. Senior officials from one Army MTF stated that MACE 2 is the preferred diagnostic tool for TBIs, but that it is not used all the time, mainly due to time constraints. Additionally, a senior leader from an MTF in a deployed location stated that the Vestibular Ocular Motor Screening portion of MACE 2 is not used due to a lack of provider training.

The DoD Did Not Provide Oversight of TBI Diagnostic Coding

We found that the MHS experienced challenges with coding for TBIs, and a senior official from the office of the DHA Deputy Assistant Director for Medical Affairs stated that one of the biggest challenges for the MHS is coding for TBIs. Senior officials from 6 of 14 MTFs acknowledged that TBI data across the MHS are inaccurate due to coding inconsistencies. A senior official from the Joint Trauma Analysis and Prevention of Injury in Combat (JTAPIC) Program Office stated that there are numerous challenges with TBI documentation in theater, including TBI coding. A senior leader from an MTF in a deployed location stated that records are not coded in theater and, therefore, do not populate in TBI surveillance reports.

Senior officials from 10 of 14 MTFs experienced challenges with TBI coding. For example, senior officials from a Navy MTF stated that the emergency department might not correctly code for TBI because coding for the primary symptom is the norm. The senior officials also stated that the coding office at their MTF uses a wide variety of ICD and Current Procedural Terminology (CPT) codes that are not necessarily standard. Senior officials from an Army MTF stated that receiving the correct diagnosis is complicated, as there are more than 30 ICD-10 diagnosis codes. Even with training on the diagnosis codes, providers are not using the same codes to provide an accurate measurement of TBI diagnoses. Senior officials from an Air Force MTF stated that coding is physician-led at their facility. The senior officials also stated that the physicians do not know how to code and that coding is not the focus of the patient visit; therefore, physicians have to prioritize between updating the patient encounter note and coding the encounter accurately.

[15] The Glasgow Coma Scale is used to objectively describe the extent of impaired consciousness in all types of acute medical and trauma patients.

The DoD Did Not Implement Consistent Processes for the Management of TBI Care

We determined that the DoD did not implement consistent processes for the management of TBI care because the DoD did not clearly define followup requirements for Service members experiencing a TBI, and the MHS did not establish referral processes for Service members needing care for TBI-related symptoms. We also found that the DoD does not have a program of record for TBIs.

MHS Providers Did Not Consistently Provide 72-Hour Followup Appointments for Patients Diagnosed with a Mild TBI

DHA-PI 6490.04 requires that the DHA Director facilitate implementation and monitoring of TBI clinical tools at all facilities to ensure that all clinical staff are aware of the 72-hour followup recommendation for patients with a mild TBI.

However, DHA-PI 6490.04 does not specify 72 consecutive hours or 3 business days, resulting in various interpretations of the time frame. For example, senior representatives from one MTF stated that they interpret the guidance as 3 business days. An Air Force family medicine provider stated that personnel interpret the 72-hour followup as 72 business hours, post-concussion. Conversely, a senior leader from a Naval MTF stated that personnel interpret the 72-hour requirement as needing to be contacted by an Intrepid Spirit Center within 72 hours, or 3 days. This senior leader stated that one TBI patient was seen outside of the 72-hour window, and the weekend was part of the issue. A DHA Medical Affairs senior official stated that 72-hour followup is defined as 3 calendar days; however the official did not specify when that time period begins.

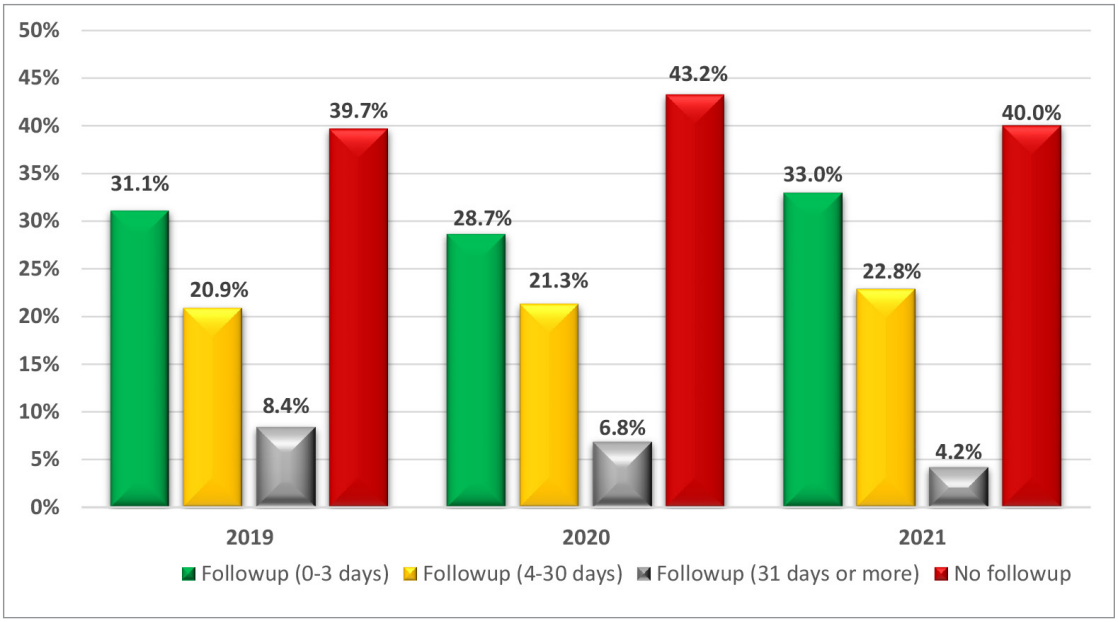
We also found that MHS providers did not consistently provide 72-hour followup appointments for patients diagnosed with a mild TBI, as recommended in DHA-PI 6490.04, for a variety of reasons. First, we found that providers do not have a clear understanding of the 72-hour followup recommendation. For example, senior leaders from the emergency department at a Naval MTF told us that patients are instructed to follow up with their primary care manager within 72 hours or be referred to a Sports Medicine appointment for a followup screening in 72 hours.

Only 5 of the 14 MTFs we reviewed provided direct information on the 72-hour initial followup appointment. A senior leader at a Naval Medical Center stated that, due to the lack of training, the MTF misses follow ups for patients diagnosed in the field.

Finally, according to a senior official from the Joint Staff Surgeon's Office, challenges exist with the deployable medical record and the delayed roll-out of Military Health System GENESIS, resulting in paper documentation, which creates challenges with seamless and integrated TBI identification and followup care.[16]

The TBICoE provided us the number of Service members with an initial diagnosis of acute mild TBI between April 1, 2019, and December 21, 2021, as well as data regarding their followup status. As shown in Figure 1, over the date range, an average of 52.6 percent of patients received care within 30 days after diagnosis. However, during this same period, an average of 41.0 percent of patients did not receive any followup care.

*Figure 1. Percentage of Service Members with an Initial Diagnosis of Acute Mild TBI Receiving Followup Care, April 1, 2019–December 21, 2021**



* Percentages add up to more than 100 due to rounding.
Source: The DHA TBICoE.

The DoD Did Not Establish Referral Processes for Service Members Needing Care for TBI-Related Symptoms

The DoD did not establish referral processes for Service members needing care for TBI-related symptoms. According to TBICoE leaders, there is no policy pertaining to when and how a provider should elevate care; the medical decision is based on clinical decision-making and the tools available through clinical practice recommendations.

[16] MHS GENESIS is the DoD's new electronic health record. When fully deployed. MHS GENESIS will provide the DoD's 9.6 million beneficiaries and 205,000 medical providers with a single, integrated health record across the continuum of care–deployed and at home.

Additionally, TBICoE leaders stated that referrals are managed at the clinic level based on clinic-specific determinations. At some TBI clinics we visited, the pathway of care is provider-to-provider referral, while some facilities allow for self-referral. According to leaders at one MTF, providers in multidisciplinary meetings determine the level of care needed for TBI patients—there is no written guidance. Intrepid Spirit Center leaders at a Navy MTF stated that they are working to develop guidance on referral processes.

TBI and Concussion Care Clinics provide primary services such as integrated care, physical medicine, physical therapy, and occupational therapy. However, there are differences among the clinics. For example, the Tripler Army Medical Center Brain Injury Center accepts consultations from providers and the Service member can self-refer, whereas the Landstuhl Regional Medical Center TBI Clinic offers telehealth appointments, when available, to facilitate care for patients coming from outside the local area. Additionally, the Fort Belvoir Community Hospital TBI Clinic is the only one that lists acupuncture as a treatment option.

The DHA Drafted a TBI Care Program of Record (Defense Intrepid Network for Brain Health)

The absence of a program of record impedes the DoD's oversight of TBI care.[17] Having a program of record would ensure that TBI resources, such as funding, staffing, and equipment, are equally maintained and standardized across the MHS.[18]

Secretary of Defense Memorandum "Comprehensive Strategy and Action Plan for Warfighter Brain Health," October 1, 2018, directed the Under Secretary of Defense for Personnel and Readiness to develop a comprehensive strategy and plan of action focused on promoting Service members' brain health and countering TBIs. In November 2021, the DHA instructed the National Intrepid Center of Excellence and the Intrepid Spirit Center Directors to establish the Defense Intrepid Network for TBI and Brain Health (the Intrepid Network) as an official program of record. As of October 2022, the "Defense Intrepid Network for TBI and Brain Health Concept of Operations Draft Version 3 February 2022" was being routed for comments and recommendations within the DHA. A TBI care program of record could provide budgeted funding specific to its program. According to NICoE staff, the Defense Intrepid Network program of record is designed to include all interdisciplinary TBI programs, also known as DHA Category 1 and 2 TBI Programs.

[17] A program of record is an acquisition program which is a directed, funded effort that provides a new, improved, or continuing materiel, weapon, or information system or service capability in response to an approved need.

[18] According to NICoE staff, a TBI program of record would ensure that TBI clinical care and metrics are standardized, resulting in consistent outcomes.

The Defense Intrepid Network will also support all DHA Category 3 and 4 TBI Program sites by coordinating standardized clinical practice guidelines, clinical outcomes and productivity metrics, and administrative processes and procedures.

The DoD Does Not Have Consistent Resourcing, Processes, and Procedures for TBI Care

Resourcing (equipment, funding, and staffing), processes, and procedures related to TBI care are inconsistent across the MHS. These differences present challenges that could potentially affect medical care for TBI patients.

Based on our analysis, we determined that medical equipment used during TBI care is not equally maintained or standardized across the MHS. For example, some equipment is sophisticated (see Figure 2) while other equipment is handmade (see Figure 3). A senior official from one MTF stated that the equipment at that MTF was at the end of, or beyond, its service life. A senior official from another MTF stated that the need for additional resources could present challenges in providing medical care, particularly if the military operations tempo increases.

Figure 2. The PROPRIO 5000 Reactive Balance Training System at a Regional Intrepid Spirit Center
Source: The DoD OIG.

Figure 3. A Handmade Vestibular Training Machine at a Regional MTF
Source: The DoD OIG.

The MHS also lacks funds earmarked for TBI care. We found that 2 of the 14 MTFs have special or fenced-in funding for their TBI program. We found that 10 of the 14 MTFs fund their TBI program from their overall MTF budget.[19] For example, a senior official stated that the MTF has no distinct TBI funds to support activities, making it difficult to acquire equipment, and that the money comes from the Defense Health Program and belongs to the overall funding for the entire MTF. One Intrepid Spirit Center senior official stated that the facility lacks funds to support the full TBI mission.

Senior officials from an Air Force MTF stated that they do not have the means or the staffing to review the standard of care provided to TBI patients within the civilian market. Specifically, the MTF is without vestibular therapy-trained physical therapists and do not have ancillary support. Based on our analysis and information obtained during the interviews, we found that increased operations would require increased funding, staffing, and equipment to maintain current services.

Finally, the Intrepid Spirit Centers function as satellites to the National Intrepid Center of Excellence to provide care for Service members experiencing the effects of TBI and post-traumatic stress. However, during our interviews we found that each Intrepid Spirit Center functions in a different manner. For example, the National Intrepid Center of Excellence uses a 4-week timeline, whereas the timeline at a Naval MTF intensive outpatient program is 5 weeks. One Intrepid Spirit Center is the only center with an interventional pain suite and dedicated chaplain to address spiritual healing.

The DoD Did Not Implement Consistent Processes for the Disposition of Care, Including Return to Duty Status for Patients Diagnosed with a TBI

We determined that the DoD did not implement consistent processes for the disposition of care, including return to duty status for patients diagnosed with a mild TBI, because the DHA did not provide oversight of MHS providers' disposition of care processes. We also found that MHS providers did not use the PRA protocol, as required by DoDI 6490.11 and DHA-PI 6490.04.

The DoD Did Not Provide Oversight of MHS Providers' Disposition of Care Processes

The DoD did not implement consistent processes for the disposition of care for patients diagnosed with a mild TBI because the DoD did not provide oversight of MHS providers' disposition of care processes. We found that each Service has its

[19] Two of 14 MTFs reviewed did not mention, or have challenges, with TBI funding.

own profile standard, with differences in how profiles are written. For example, the Army has DA Form 3349, Physical Profile; the Navy has NAVMED Form 6110/4, Physical Fitness Assessment Medical Clearance/Waiver; and the Air Force has AF469, Duty Limiting Condition Report. The lack of consistency creates difficulties when entering profiles on Service members in Joint Service environments. A senior leader from an MTF in a deployed location stated that the different profile systems present a challenge when documenting that a Service member has been placed on a profile. The facility currently has personnel who can document profiles in the Air Force and Army systems but does not have personnel who can document profiles in the Navy system.

MHS Providers Did Not Use the PRA Protocol as Required by DoDI 6490.11 and DHA-PI 6490.04

We found that 5 of the 14 MTFs we reviewed did not use the PRA protocol to determine return to duty status, as required by DoDI 6490.11 and DHA-PI 6490.04. These MTFs chose to use different clinical tools for return to duty determination, such as provider assessment, the fit for service algorithm, the Buffalo Concussion Treadmill Test, and the medical standards application. According to a senior leader at an Army MTF, the PRA protocol is not used because it is not appropriate for that MTF's population; instead, the facility uses the Buffalo Concussion Treadmill Test. Additionally, a senior leader at an Air Force MTF told us that the primary care manager and a medical standards application are the methods that MTF uses to determine return to duty status. A senior leader from another Air Force MTF stated that military readiness standards differ with each Service; therefore, there is no clear uniform standard used for return to duty.

In a 2021 DoD OIG evaluation, we found that return to duty documentation was not consistent in Service members' electronic health records (EHRs), as required by DoDI 6490.11.[20] In that evaluation, we reviewed a sample of 20 EHRs for Service members known to have been involved in a PCE or who had experienced a TBI, to determine whether the U.S. Central Command (USCENTCOM) adequately documented potential or actual concussive events. We chose those records because USCENTCOM relied on the EHRs to track Service members involved in potential or actual concussive events. Specifically, in our sample, we reviewed the EHRs for screening documentation, including a documented TBI followup

[20] DoD OIG Report No. DODIG-2022-006, "Evaluation of Traumatic Brain Injuries in the U.S. Central Command Area of Responsibility," November 1, 2021.

appointment, and a return to duty date following completion of TBI treatment. We determined that EHRs were missing TBI screening and treatment information. Specifically, we determined that:

- 2 of the 20 Service members' medical records we reviewed did not contain data showing the Service member followed up with medical professionals, as required, following the initial TBI diagnosis; and
- 3 of the 20 Service members' medical records we reviewed did not document that the Service member received approval to return to duty.

We also determined that MHS providers did not consistently use the PRA protocol for return to duty determination, as required by DoDI 6490.11 and DHA-PI 6490.04. DoDI 6490.11 states that all deployed medical personnel must use the most clinical practice guidance for the deployed environment when possible. The most current guidance on screening and initial evaluation for TBIs is located on the TBICoE's website under "Provider Resources."[21] One of the resources currently listed under provider resources is the Progressive Return to Activity. DHA-PI 6490.04 requires that medical personal initiate the PRA protocol at followup and continue to monitor and assess the patient regularly, until a physical exertional test is successfully completed and the patient is cleared for return to full duty or normal activity.

During our review, we found that MTFs had varying methods for determining a patient's return to duty status. For example, 5 out of 14 MTFs evaluated used methods such as a provider assessment, the Buffalo Concussion Treadmill Test, and medical standards applications. A Concussion Care Clinic director told us that clinic staff chose to use the Buffalo Concussion Treadmill Test because the PRA protocol does not provide an adequate assessment for returning patients to full duty. Also, an MHS provider told us that personnel chose to use the Buffalo Concussion Treadmill Test because it provides more information than the PRA protocol to a caregiver providing ongoing care for a TBI.

TBI Care for Service Members May Be Impaired

The DoD's lack of oversight and consistent processes for the management of TBI care may impair the MHS's ability to accurately track and provide health care to Service members with a TBI, as required by DoD guidance. Specifically, documentation and coding processes are inconsistent across the MHS, resulting in inaccurate data reporting as well as the potential for not rendering the proper continuation of care to TBI patients. Therefore, the Armed Forces Health Surveillance Division cannot accurately track the number of TBIs that Service members have experienced due to

[21] Traumatic Brain Injury Center of Excellence, Provider Resources, https://health.mil/Military-Health-Topics/Centers-of-Excellence/Traumatic-Brain-Injury-Center-of-Excellence/Provider-Resources, accessed December 1, 2022.

inconsistencies with provider coding. As a result, the MHS is unable to accurately track the number of TBIs across the DoD. According to the Centers for Disease Control, Service members are at a greater risk of dying from a TBI or experiencing long-term health problems after the injury. Additionally, Service members who sustained a TBI may have ongoing symptoms or experience co-occurring health conditions, such as post-traumatic stress disorder and depression. Failure to identify Service members with a TBI can impair the ability of the DoD to address the health care needs of Service members with ongoing TBI symptoms, which can affect Service members' readiness for deployment, job performance, and quality of life.

Recommendations, Management Comments, and Our Response

Recommendation 1

We recommend that the Director of the Defense Health Agency review and update Defense Health Agency Procedural Instruction 6490.04. At a minimum, the review and update should:

a. **Establish the timeline associated with 72-hour followup.**
b. **Change the 72-hour followup from a recommendation to a requirement.**
c. **Review the applicability and clinical use in its entirety of the Military Acute Concussion Evaluation, Version 2 tool within the Military Treatment Facilities.**

Management Comments Required

The Director of the Defense Health Agency did not respond to the recommendation. Therefore, the recommendation is unresolved. We request that the Director of the Defense Health Agency provide comments on the final report within 30 days of report issuance.

Recommendation 2

We recommend that the Under Secretary for Personnel and Readiness, in coordination with the Assistant Secretary of Defense (Health Affairs), the Director of the Defense Health Agency, the Service Surgeons General, and the Joint Staff Surgeon, establish an oversight plan for the management of traumatic brain injury care within the Military Health System. At a minimum, the oversight plan should:

a. **Include the completion and tracking of required screening tools, including Military Acute Concussion Evaluation, Version 2.**

b. Include the completion and tracking of the Progressive Return to Activity protocol.

c. Include the completion and tracking of any required followup processes for Service members diagnosed with a traumatic brain injury.

d. Develop a revised methodology to verify that Military Heath System providers consistently code all Service members diagnosed with a traumatic brain injury.

Recommendation 3

We recommend that the Under Secretary for Personnel and Readiness, in coordination with the Assistant Secretary of Defense (Health Affairs), the Director of the Defense Health Agency, the Service Surgeons General, and the Joint Staff Surgeon, establish a Traumatic Brain Injury Program of Record for traumatic brain injury care within the Military Health System that:

a. Establishes baseline resource requirements and guidance for personnel, equipment, and staffing and budget modeling.

b. Standardizes programming, concept of operations, business practices, staffing, and referral standards.

Recommendation 4

We recommend that the Under Secretary for Personnel and Readiness, in coordination with the Assistant Secretary of Defense (Health Affairs), the Director of the Defense Health Agency, the Service Surgeons General, and the Joint Staff Surgeon, establish a process by which Military Health System providers can access, create, and update Service members' profiles, regardless of their Service Component.

Management Comments Required

The Under Secretary for Personnel and Readiness did not respond to the recommendations. Therefore, the recommendation is unresolved. We request that the Under Secretary for Personnel and Readiness provide comments on the final report within 30 days of report issuance.

Appendix A

Scope and Methodology

We conducted this evaluation from October 2021 through November 2022 in accordance with the "Quality Standards for Inspection and Evaluation," published in January 2012 by the Council of the Inspectors General on Integrity and Efficiency. Those standards require that we adequately plan the evaluation to ensure that objectives are met and that we perform the evaluation to obtain sufficient, competent, and relevant evidence to support the findings, conclusions, and recommendations. We believe that the evidence obtained was sufficient, competent, and relevant to lead a reasonable person to sustain the findings, conclusions, and recommendations.

We focused this evaluation on TBI data, processes, policies, and resources for Service members who have experienced a TBI. Our scope included:

- DoD offices, activities, officials, and guidance related to TBI management for active component Service members; and
- Public laws, directives, instructions, charters, strategic plans, implementation plans, and documents related to TBI management for active component Service members.

To obtain sufficient evidence to analyze and develop the findings on the management of TBI care, we conducted 22 site visits and interviewed more than 170 officials from the following entities.

- Office of the Under Secretary of Defense for Personnel and Readiness
- OASD(HA)
- DHA
- Office of the Army Surgeon General
- Office of the Navy Surgeon General
- Office of the Air Force Surgeon General
- Office of the Joint Staff Surgeon
- 14 installation-level offices, corresponding to the Service offices:
    - Walter Reed National Military Medical Center
    - Fort Belvoir Community Hospital
    - Landstuhl Regional Medical Center
    - Brian D. Allgood Army Community Hospital
    - Brooke Army Medical Center

- Tripler Army Medical Center
- Womack Army Medical Center
- Naval Hospital Camp Pendleton
- Naval Medical Center Camp Lejeune
- San Diego Naval Hospital
- Eglin AFB Hospital
- David Grant USAF Medical Center
- U.S. Military Hospital - Kuwait
- 379th Expeditionary Medical Group

Criteria for Traumatic Brain Injury of Service Members

We reviewed the following criteria and policies.

- DoD Instruction 6490.11, "DoD Policy Guidance for Management of Mild Traumatic Brain Injury/Concussion in the Deployed Setting," September 18, 2012 (as amended, October 1, 2021)
- DoD Instruction 6490.13, "Comprehensive Policy on Traumatic Brain Injury-Related Neurocognitive Assessments by the Military Services," September 11, 2015 (as amended, March 31, 2017)
- DHA Procedural Instruction 6490.04, "Required Clinical Tools and Procedures for the Assessment and Clinical Management of Mild Traumatic Brain Injury (mTBI)/Concussion in Non-Deployed Setting," April 26, 2021

Use of Computer-Processed Data

This evaluation used computer-processed data. We requested a list of active duty Service members screened or diagnosed with a TBI. In response, the TBICoE and the MTFs used the MHS Data Repository to provide us with lists of Service members.[22]

We determined that the data provided a reasonable basis for our analysis based on the following factors:

- The MHS Data Repository contains records on all health care events paid for by MHS, regardless of the setting, and is the most comprehensive source of data available.[23] It is generally considered the most reliable source for MHS data.

[22] The MHS Data Repository is the centralized data repository that captures, archives, validates, integrates, and distributes DHA corporate health care data worldwide.

[23] OASD(HA), "Guide for DoD Researchers on Using MHS Data," October 10, 2012.

- The MHS Data Repository contains records of all health care events (that are required to be reported) paid for by the MHS, regardless of setting. This includes direct and purchased care, MTF accounting, beneficiary, clinical, and staffing data.
- Although we could not determine whether the TBICoE data were reliable, an electronic health care review of sampled patient data suggested that the TBICoE is tracking TBI patients correctly.

Prior Coverage

During the last 5 years, the Government Accountability Office (GAO) and the DoD OIG issued two reports discussing TBIs.

Unrestricted GAO reports can be accessed at http://www.gao.gov. Unrestricted DoD OIG reports can be accessed at http://www.dodig.mil/reports.html/.

GAO

GAO-17-260, "DOD HEALTH: Actions Needed to Ensure Post-Traumatic Stress Disorder and Traumatic Brain Injury Are Considered in Misconduct Separations," May 2017

The GAO examined the extent to which the DoD, the Army, and the Marine Corps monitored adherence to policies to address the impact of PTSD and TBIs on the separation of Service members for misconduct. The report stated that the Air Force and Navy's pre-separation screening and training policies were inconsistent with DoD policy and that the Army and Marine Corps may not have always adhered to or monitored compliance with their own policies. The GAO recommended that policy inconsistencies between the DoD and the Services be resolved and routine monitoring be undertaken to ensure adherence and avoid increased risk that Service members may inappropriately be separated for misconduct without adequate consideration of the conditions' effects on behavior, separation characterization, or eligibility for VA benefits and services.

DoD OIG

Report No. DODIG-2022-006, "Evaluation of Traumatic Brain Injuries in the U.S. Central Command Area of Responsibility," November 1, 2021

The DoD OIG found that USCENTCOM and its Service Component Commands did not track or report PCEs or DoD Service members involved in PCEs, as required by DoDI 6490.11. This occurred because the Service Components thought the requirements in USCENTCOM Regulation 40-1 were unclear and because USCENTCOM relied on the electronic health records to identify and track DoD Service members involved in PCEs.

Appendix B

Additional Background

Joint Trauma System Clinical Practice Guideline for TBI Management in Prolonged Field Care

The Joint Trauma System CPG provides evidence-based guidance to medical professionals who encounter a TBI when evacuation to a higher level of care is not available.

VA/DoD Clinical Practice Guideline for the Management and Rehabilitation of Post-Acute Mild TBI

The VA/DoD CPG provides an evidence-based framework for the management and rehabilitation of patients with symptoms attributed to mild TBI. The VA/DoD CPG is designed to provide information and assist in decision making. The CPG is not intended to define a standard of care or prescribe an exclusive course of management.

Roles and Responsibilities for TBI Management

DoDI 6490.11 and DHA-PI 6490.04 establish roles and responsibilities for DoD organizations' management of mild TBIs.

Office of the Assistant Secretary of Defense (Health Affairs)

DoDI 6490.11 requires the OASD(HA) to advise the Under Secretary of Defense for Personnel and Readiness on training standards for the management of mild TBI. The OASD(HA) is also responsible for planning, programing, budgeting, developing, and fielding new technologies and programs.

Secretaries of the Military Departments

DoDI 6490.11 requires the Secretaries of the Military Departments to:

- develop Service-level mild TBI or concussion policies and procedures,
- program and budget for manpower and resources,
- develop and support training plans,
- develop Service reporting guidelines for PCEs,
- ensure monthly tracking reports are submitted to the JTAPIC Program Office, and
- support medical management, event tracking, and followup medical care for Service members.

DoDI 6490.13 requires the Secretaries, in collaboration with the Army as the Military Health System (MHS) Lead Service, to maintain adequate Service-level environments that enable the capability for testing across the military deployment cycle. The testing includes, at a minimum, performing a pre-deployment baseline neurocognitive assessment within 12 months of deployment, performing a neurocognitive assessment following a diagnosed mild TBI, comparing pre-deployment and post injury assessments, and referring post-deployment Service members for further evaluation as determined by responses on the post-deployment health assessment.

Chairman of the Joint Chiefs of Staff

DoDI 6490.11 requires the Chairman of the Joint Chiefs of Staff to incorporate this Instruction into relevant Joint doctrine, training, and plans; monitor the execution of the Instruction; and monitor compliance for tracking and reporting of Service members involved in a PCE.

Surgeons General

Service Surgeons General are appointed by the President. The nominees are selected from officers on the active duty list of the respective Service Medical Department.

The Surgeons General of the Army, Navy, and Air Force:

- serve as chief medical advisors to the DHA Director on matters pertaining to military health readiness requirements and safety of members;
- are the principal advisors to their respective Service's Secretary and the Chief of Staff or the Chief of Operations on all health and medical matters, including strategic planning and policy development relating to such matters; and
- acting under the authority, direction, and control of the Secretary of their respective Service, are responsible for recruiting, organizing, training, and equipping the medical personnel of that Service.

The Joint Staff Surgeon:

- provides medical advice to the Chairman of the Joint Chiefs of Staff, the Joint Staff, and the combatant commanders; and
- coordinates all issues related to health services, including operational medicine, force health protection, and readiness among the combatant commands, the Office of the Secretary of Defense, and the Services.

The Joint Staff Surgeon is also responsible for monitoring TBIs within the combatant commands.

Defense Health Agency

The DHA is a combat support agency that enables the military medical services to provide a medically ready force to the combatant commands and an integrated system of medical training and readiness. The DHA supports the delivery of integrated, affordable, and high-quality health services, and is responsible for driving greater integration of clinical and business processes across the MHS. The DHA is also responsible for ensuring that the TBICoE executes its responsibilities in accordance with DoDI 6490.11.

Traumatic Brain Injury Center of Excellence

According to its website, the TBICoE is a congressionally mandated collaboration between the DoD and the VA to conduct research and provide education regarding TBI-related clinical innovation, research, and care—from PCE, through medical evaluation, rehabilitation, and return to duty—to prevent and mitigate the consequences of TBIs.[24]

The TBICoE is responsible for coordinating PCE and TBI surveillance, conducting data analysis, and developing event-specific PCE and TBI monitoring summaries in coordination with the Services and the combatant commands.

Additionally, the TBICoE is responsible for generating comprehensive, retrospective, analytical summary reports of TBI data and activities of the Services and combatant commands and recommending modifications to policy based on those summary reports. The TBICoE also conducts coordinated blast-specific data analyses with the JTAPIC Program Office and provides the results to the combatant commands, Military Department Secretaries, Service Chiefs, and the Under Secretary of Defense for Research and Engineering.

Armed Forces Health Surveillance Division

The DHA Armed Forces Health Surveillance Division (AFHSD) is the central epidemiological resource for the U.S. Armed Forces and is responsible for conducting medical surveillance to protect Service members and allies.[25] The AFHSD is responsible for providing timely, relevant, actionable, and comprehensive health surveillance information (including TBI surveillance information) to promote, maintain, and enhance the health of Service members through AFHSD critical functions. These critical functions include analyzing and disseminating information; recommending evidence-based policy; and developing, refining, and improving health surveillance methods.

[24] The TBICoE operates within the DHA.

[25] Medical surveillance is the regular or repeated collection, analysis, and dissemination of uniform health information for monitoring the health of a population and intervening in a timely manner when necessary.

Joint Trauma Analysis and Prevention of Injury in Combat Program Office

The JTAPIC Program Office is responsible for collecting, integrating, analyzing, and storing operations, intelligence, materiel, and medical data to inform solutions and decisions that prevent or mitigate injury during the full range of military operations. The JTAPIC Program Office also conducts research to inform recommendations that may prevent or mitigate injuries to Service members in the deployed environment, including recommendations to update tactics, techniques, procedures, equipment, and policies.

Additionally, DoDI 6490.11 requires the JTAPIC Program Office to receive monthly PCE tracking reports from the combatant commands and the Services. The purpose of the monthly PCE tracking reports is to conduct actionable analyses that provide data to the DoD to help inform solutions and decisions for identifying vulnerabilities in operational tactics, vehicles, and protective equipment. The JTAPIC Program Office also correlates the monthly PCE tracking reports with EHRs to verify whether Service members involved in PCEs were adequately screened and treated. Finally, the JTAPIC Program Office generates blast-specific data analyses and, in coordination with the DHA, generates comprehensive, retrospective analytical reports of PCE and TBI data and activities of the Services and the combatant commanders.

Military Treatment Facilities

A Military Treatment Facility (MTF) is any fixed facility, outside of a deployed environment, used primarily for health care (including dental care), or any other location used for the purpose of providing health care services as designated by the Under Secretary of Defense for Personnel and Readiness. DHA-PI 6490.04 requires that:

- the MTF director monitor and track measures to assess MTF standardization, processes, and compliance with the delivery of mild TBI services and ensure that adequate resources are available for the effective and efficient implementation of the guidance; and
- the MTF Chief Medical Officer or Chief of Staff implement policy and guidance and ensure that required training on TBI clinical tools is provided to all relevant MTF medical personnel.

Intrepid Spirit Centers

The National Intrepid Center of Excellence is the headquarters of the Defense Intrepid Network for TBI and Brain Health (Intrepid Network). Ten Intrepid Spirit Centers, located throughout the MHS, function as satellites to the National Intrepid Center of

Excellence and provide care for TBI as well as associated conditions. The centers use an interdisciplinary model of care developed by the National Intrepid Center of Excellence to address an array of medical issues through 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 care team at each site, which expedites diagnostic evaluations and delivers a collaborative individualized treatment plan.

Concussion Care Clinics

A Concussion Care Clinic provides outpatient services to evaluate and treat patients who have experienced a traumatic brain injury. A Concussion Care Clinic provides integrated care, such as physical medicine, physical therapy, and occupational therapy.

Military Health System Providers

MHS providers are members of the Armed Forces, civilian employees of the DoD, or personal services contract employees under section 1091, title 10, United States Code, authorized by the DoD to perform health care functions within the MHS.

Acronyms and Abbreviations

CPG	Clinical Practice Guideline
DHA	Defense Health Agency
DoDI	Department of Defense Instruction
EHR	Electronic Health Record
ICD	International Classification of Diseases
JTAPIC	Joint Trauma Analysis and Prevention of Injuries in Combat
MACE 2	Military Acute Concussion Evaluation, Version 2
MHS	Military Health System
MTF	Military Medical Treatment Facility
OASD(HA)	Office of the Assistant Secretary of Defense (Health Affairs)
PRA	Progressive Return to Activity
TBI	Traumatic Brain Injury
TBICoE	Traumatic Brain Injury Center of Excellence
USD(P&R)	Under Secretary of Defense for Personnel and Readiness

Glossary

Clinical practice guidelines (CPG). Statements and recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options.

Deployed. All troop movement of Active Component and Reserve Component personnel resulting from a Joint Chief of Staff or unified command deployment for more than 30 continuous days to a location outside the United States that does not have a permanent Military Treatment Facility (funded by the Defense Health Program). This includes Naval personnel afloat who might be subjected to concussive injuries.

Health care provider. Any member of the Armed Forces, civilian employee of the DoD, or personal services contract employee under section 1091, title 10, United States Code authorized by the DoD to perform health care functions. Also called "DoD health care provider."

Medical evaluation or assessment. A meeting between a Service member and a person with medical training, such as medic or corpsman, physician assistant, physician, or nurse, to ensure the health and well-being of the Service member. Components of the medical evaluation include reviewing the individual's medical history, events surrounding the injury, review of symptoms, a physical examination, and a review of the treatment plan with the Service member.

Military Health System (MHS). The DoD medical and dental programs, personnel, facilities, and other assets operating pursuant to chapter 55, title 10, United States Code, by which the DoD provides health care services and support to the Military Services during the range of military operations, as well as health care services and support to members of the Military Services, their family members, and others entitled to DoD medical care.

Military Treatment Facility (MTF). Any fixed facility outside of a deployed environment used primarily for health care (including dental care), and any other location used for the purposes of providing health care services as designated by the Under Secretary of Defense for Personnel and Readiness.

Mild TBI. A traumatically induced structural injury or physiological disruption of brain functions, as a result of an external force that is indicated by new onset or worsening of at least one of the following clinical signs immediately following the event:

- Any alteration in mental status (for example, confusion, disorientation, and slowed thinking).

- Any loss of memory for events immediately before or after the injury.
- Any period of loss of or a decreased level of consciousness, observed or self-reported.

Neurocognitive assessment. A standardized cognitive and behavioral evaluation using validated and normed testing performed in a formal environment. Testing uses specifically designated tasks to measure cognitive function known to be linked to a particular brain structure or pathway. Aspects of cognitive functioning that are assessed typically include intellectual functioning, attention, new-learning or memory, intelligence, processing speed, and executive functioning.

Non-Deployed. Represents working and training to maintain personal and unit readiness at the Service member's home-base in their home country.

Potentially concussive event (PCE). Events or incidents that may result in an individual experiencing a mild TBI. Events requiring mandatory rest periods and medical evaluations and reporting of exposure of all involved personnel include, but are not limited to:

- Involvement in a vehicle blast event, collision, or rollover.
- Presence within 50 meters of a blast (inside or outside).
- A direct blow to the head or witnessed loss of consciousness.
- Exposure to more than one blast event (the Service member's commander must direct a medical evaluation).

Traumatic Brain Injury Advisory Committee (TAC). A DHA subcommittee responsible for providing a collaborative and transparent advisory body supporting enterprise-wide coordination of the DoD TBI Pathway of Care during wartime and peacetime.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