OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
READINESS

AUG 1 2012

The Honorable Daniel K. Inouye
Chairman
Subcommittee on Defense
Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

The enclosed report responds to section 724 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112-81) that requires the Secretary of Defense submit to the congressional defense committees a report on the implementation of the Department of Defense (DoD) policy related to the management of concussion and mild traumatic brain injury (mTBI) in the deployed setting, the effectiveness of such policy with respect to identifying and treating blast-related concussive injuries, and the effect of such policy on operational effectiveness in theater. Activities related to traumatic brain injury fall under my purview, and I am pleased to provide the attached report.

The DoD policy addressing concussion/mTBI management in the deployed setting is Directive-Type Memorandum (DTM) 09-033, "Policy Guidance for the Management of Concussion/Mild Traumatic Brain Injury in the Deployed Setting." DTM 09-033, enclosed with this report, establishes policy and assigns responsibilities and procedures on the management of concussion/mTBI injury for leaders and Service members within DoD. This report provides information on the implementation of DTM 09-033, addresses the effectiveness of the policy with respect to identifying and treating blast-related concussive injuries, and discusses its effect on operational effectiveness in theater.

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A similar letter has been sent to the Chairmen of the congressional defense committees. Thank you for your interest in the health and well-being of our Service members, veterans, and their families.

Sincerely,

Jo Ann Rooney
Principal Deputy

Enclosures:
As stated

cc:
The Honorable Thad Cochran
Vice Chairman

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AUG 1 2012

The Honorable Carl Levin
Chairman
Committee on Armed Services
United States Senate
Washington, DC 20510

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The Honorable John McCain
Ranking Member

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
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AUG 1 2012

The Honorable Howard P. "Buck" McKeon
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

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Principal Deputy

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As stated

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The Honorable Adam Smith
Ranking Member

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
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AUG 1 2012

The Honorable Harold Rogers
Chairman
Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

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Jo Ann Rooney
Principal Deputy

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cc:
The Honorable Norman D. Dicks
Ranking Member

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
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AUG 1 2012

The Honorable Jim Webb
Chairman
Subcommittee on Personnel
Committee on Armed Services
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

The enclosed report responds to section 724 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112-81) that requires the Secretary of Defense submit to the congressional defense committees a report on the implementation of the Department of Defense (DoD) policy related to the management of concussion and mild traumatic brain injury (mTBI) in the deployed setting, the effectiveness of such policy with respect to identifying and treating blast-related concussive injuries, and the effect of such policy on operational effectiveness in theater. Activities related to traumatic brain injury fall under my purview, and I am pleased to provide the attached report.

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The Honorable Lindsey Graham
Ranking Member

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4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
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AUG 1 2012

The Honorable Joe Wilson
Chairman
Subcommittee on Military Personnel
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

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Principal Deputy

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The Honorable Susan A. Davis
Ranking Member

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
READINESS

AUG 1 2012

The Honorable C.W. Bill Young
Chairman
Subcommittee on Defense
Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

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As stated

cc:
The Honorable Norman D. Dicks
Ranking Member

# REPORT TO CONGRESS

## National Defense Authorization Act for Fiscal Year 2012, Section 724 Report on Memorandum Regarding Traumatic Brain Injuries

## July 2012

Preparation of this report/study cost the Department of Defense a total of approximately $6,070 for the 2012 Fiscal Year.
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# Table of Contents

# Purpose

The National Defense Authorization Act for Fiscal Year 2012, section 724, required the Secretary of Defense to submit a report to the congressional defense committees by June 28, 2012, on:

1. The implementation of the policy of the Department of Defense (DoD) related to the management of concussion/mild traumatic brain injury (mTBI) in the deployed setting;
2. The effectiveness of such policy with respect to identifying and treating blast-related concussive injuries;
3. The effect of such policy on operational effectiveness in theater.

# Executive Summary

The Department's policy addressing mTBI/concussion management in the deployed setting is Directive Type Memorandum (DTM) 09-033, "Policy Guidance for the Management of Concussion/Mild Traumatic Brain Injury in the Deployed Setting." DTM 09-033, enclosed with this report, establishes policy and assigns responsibilities and procedures on the management of concussion/mTBI injury for leaders and Service members within DoD. This report provides information on the implementation of DTM 09-033, the development of Service-specific policies to support implementation, the effectiveness of the policy with respect to identifying and treating blast-related concussive injuries, and its effect on operational effectiveness in theater.

While discussion of policy implementation is relatively robust, the discussion reflecting policy effectiveness in both identifying and treating concussive injuries and the operational impact on processes or programs is limited due to the comparatively recent implementation of the policy. DTM 09-033 requires medical and exposure documentation close to the point of injury and across the operational and medical communities. The policy has become a catalyst for DoD efforts to improve TBI surveillance capability and the accuracy of documentation in patient records. The early data reflect compliance with DTM 09-033 data-tracking requirements;

screening and treatment recommendations reflect an improved culture of awareness and proactive management for concussion in the deployed setting.

Prior to publishing the DTM 09-033, Service members usually were evacuated from theater for concussion/mTBI evaluation, resulting in personnel losses to operational line units. Consequently, when DTM 09-033 was proposed, with its mandatory requirement for testing and rest for those exposed to concussive events, line leaders were pleased with the guidance for managing Service members with possible concussions, but expressed concern that they might lose large numbers of other Service members who were near the event, thereby diminishing their operational capabilities. However, with the implementation of the 24-hour rest period and local evaluation outlined in DTM 09-033, Service members' return-to-duty rates have risen, so operational capabilities have not diminished. Consequently, DTM 09-033 has been well received by both the line and medical communities. Management of concussion/mTBI across the deployment cycle remains a top priority in our delivery of care and treatment to our Service members.

## Introduction

The DoD policy referred to in the legislative language is Directive-Type Memorandum (DTM) 09-033, "Policy Guidance for the Management of Concussion/Mild Traumatic Brain Injury in the Deployed Setting," published June 21, 2010 (Enclosure 1). DTM 09-033 established policy, assigned responsibilities, and provided procedures on the medical management of mild traumatic brain injury (mTBI), otherwise known as concussion, in the deployed setting for all leaders, Service members, and medical personnel.

In September 2009, senior DoD military leaders and the military medical community developed a prescriptive approach for the early identification and detection of concussion/mTBI. Although assessment tools and clinical guidelines were in place, we recognized our limited ability to diagnose potentially concussive events close to the point of injury and were reliant upon self-reported information from Service members regarding their exposures. To address this limitation, DoD published DTM 09-033, which included event-driven protocols for line leaders and revised screening and clinical algorithms for military medical personnel, requiring

evaluations proximate to potentially concussive events for all Service members within an operational environment.

The policy included a process outline for reporting mandatory event details and data on Service member outcomes. In July 2010, U.S. Central Command (USCENTCOM) issued a Fragmentary Order (FRAGO) outlining the new policy requirements, including operational, medical, and reporting responsibilities. Data collection and reporting began in July 2010, ahead of automated capabilities, and revealed early indications of a need to refine and expand the format, criteria, and reporting instructions within the DoD policy. USCENTCOM released another FRAGO in December 2010, which provided clarifying language regarding reporting and instruction on using a newly developed automated blast exposure module.

Although the processes directed by the DTM have been in effect for approximately two years and the in-theater data are becoming more robust, the data are immature and it is comparatively early to begin making causal or relational inferences to change current practices and operational procedures. Much of the military Service and DoD agency efforts have focused on full implementation of the policy, with short-term evaluation of current implementation processes, rather than complex review and analyses of policy effectiveness. We anticipate that as the implementation progresses, data quality (e.g., statistically significant data sets, surveillance trends) will improve and help inform our decision-making regarding best practices for medical care.

## Methodology

To prepare the report, DoD assigned the military Services, Joint Staff, the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE), and the Joint Trauma Analysis and Prevention in Combat (JTAPIC) Program Office the responsibility of submitting answers to a series of questions designed to elicit key information based on the intent of the legislation. Their responses to the following questions covered the spectrum of mTBI care including identifying, screening, evaluating, treating, reporting, and tracking individuals exposed to the mandatory events as outlined within DTM 09-033. We placed their summarized responses into the report based on their relevance to the congressional language.

1. Service or agency-specific policies and procedures developed to implement DTM 09-033 and metrics used to measure policy or process compliance. Examples include: Army FRAGO; Air Force Instruction; or Marine Corps/Navy Administrative Message;
2. Current Service training plans related to the implementation of the policy. Examples include current algorithms or training courses;
3. Current risk communication plans related to implementation of the policy;
4. The effectiveness of such policy with respect to identifying and treating blast-related concussive injuries; and
5. The effect of such policy on operational effectiveness in theater.

# Discussion

**1. Implementation of the policy of the DoD related to the management of concussion/mTBI in the deployed setting.**

Each military Service has developed specific policies to support the implementation of DTM 09-033. USCENTCOM issued specific in-theater guidance under USCENTCOM FRAGO 09-1656, MOD 1, which directed components to identify, screen, evaluate, treat, and report individuals exposed to the mandatory events as outlined in DTM 09-033. Leaders were instructed in the use of the Combined Information Data Network Exchange (CIDNE) and its Blast Exposure and Concussive Incident Report (BECIR) module to track individuals exposed to potentially concussive events. The FRAGO delegates training to components and Joint Task Forces to ensure documentation occurs as outlined in DTM 09-033. Compliance is measured with automated tracking as part of the CIDNE BECIR module.

To further examine theater implications of DTM 09-033, the Chairman of the Joint Chiefs of Staff (CJCS) organized Gray Team IV, an individually selected group of experts representing each of the Service Chiefs, the Combatant Commands, and the CJCS on matters regarding the "invisible wounds of war," to investigate and develop a plan to accelerate

improvements in the care of Service members with combat and operational stress, post-traumatic stress, or other deployment-related psychiatric conditions. The team was tasked to review the current state of traumatic brain injury (TBI) care within the context of DTM 09-033 and provide recommendations for process improvement. Gray Teams are driven by the line leadership's desire for action while maintaining the medical traditions of quality improvement cycles; their use is a unique mechanism for accelerating positive change aligning line and medical efforts toward actions across the spectrum of injury.

The Navy released Naval Medical Command Policy 11-004, which requires training for all medical providers at military medical treatment facilities in support of DTM 09-033. Specific guidance regarding implementation of DTM 09-033 and training of the force was formalized within the Marine Corps via the release of U.S. Marine Corps Central Command FRAGO 28, MOD 1, to Operation Order 08-001, which translates details of DTM 09-033 to the operational/tactical setting, to include the stringent management of recurrent concussions, with tracking information submitted to both CIDNE BECIR and the Commander, United States Marine Forces, Central Command.

Air Force Central Command FRAGO F10-038, "Management of Mild Traumatic Brain Injury," (November 3, 2010) along with Air Force Guidance Memorandum 44-01, "Deployment Related Concussion Management," (issued February 16, 2011; renewed August 16, 2011, and February 15, 2012) each delineate Service-specific implementation guidance for the management of concussion based on DTM 09-033.

The Army issued All Army Activities 193/2010-Headquarters Department of the Army Execute Order 253-10, "Management of Concussion/Mild Traumatic Brain Injury in the Deployed Setting," 260416Z Jun 10, which describes a concussion management program for the deployed setting with the stated intent of aggressive and consistent application of the DTM standards to drive a cultural change in the force focused on fighter management. The end state was treatment parity for every Service member to minimize concussive injury and maximize recovery. Additionally, all Army leaders were directed to educate, train, and discipline their formations to provide early recognition, treatment, and tracking of concussive injuries in support of DTM 09-033.

As the military Services worked to implement specific elements of the DTM 09-033, they each launched awareness and training campaigns aimed at operational leaders, medical providers, Service members, and their families. These campaigns highlight health care along the full spectrum of TBI to include early identification, symptom management, and referrals to appropriate resources to facilitate full recovery from concussive events. DoD considers training an enduring pre-deployment requirement and believes these efforts are crucial in reducing the stigma of seeking and receiving TBI care. All military Services worked in conjunction with the Defense and Veterans Brain Injury Center (DVBIC) and DCoE to develop educational and training materials for their Service members.

The Army has developed a series of educational videos that are used for standardized TBI education throughout the Army and have been adopted by the other Services. The Army funded and developed "TBI 101" for the Army, Navy, Air Force, and Marines, and many other TBI educational modules currently available on the Military Health System electronic learning network (MHS Learn), Army Training Network, and via DVD through the Office of the Army Surgeon General, Rehabilitation and Reintegration Division. These videos are delivered in conjunction with a live discussion facilitated by slides (available on the Army Training Network). The Army led consensus panels to develop the Acute Concussion Brochure that is now published by DVBIC; this brochure has been disseminated worldwide to standardize acute concussion education and is an essential component to DTM 09-033 clinical algorithms of care.

TBI education has been promulgated throughout the Air Force. A TBI module was added to Self-Aid Buddy Care, a periodic training requirement for all airmen. The "TBI 101" course, as mentioned above, features Air Force senior leaders and highlights the importance of early recognition, evaluation, and treatment of TBI; it is used in various training platforms and posted on the Air Force TBI Website. A section on TBI has been added to the Airmen's Guide for Assisting Personnel in Distress. Leadership training on recognition of potentially concussive events, symptoms of concussion, and leadership actions has been added to pre-deployment Group Commander's course, Explosive Ordnance

Disposal Combat Battlefield Ready Airman training, and is required for all airmen in the rank of E5 and above non-standard forces, including individual augmentees.

Computer-based pre-deployment training on management of concussion/mTBI in the deployed setting, including use of the Military Acute Concussion Evaluation and Clinical Algorithms, is required for all clinic medics. Interactive training has been added to Expeditionary Medical Support course and Combat Casualty Care Course. Several Air Force medics have attended the Army's TBI for Deploying Providers course and DVBIC's Annual TBI Summit. In addition, references, including the TBI Pocket Guide and the Department of Veterans Affairs /DoD Clinical Practice Guidelines for Management of Concussion/mTBI, were distributed to providers throughout the Air Force Medical Service.

The Navy and Marine Corps have developed an aggressive, operationally relevant training plan based on DTM 09-033. The Marines Corps, through Headquarters Marine Corps Training and Education Command, continues to enhance TBI training with the goal of integrating TBI training throughout all applicable courses and schools, with additional emphasis on pre-deployment training. Specifically, the Marine Corps has worked with Navy Bureau of Medicine to translate the Military Acute Concussion Evaluation/Clinical Practice Guideline training for corpsmen and providers to a train-the-trainer program throughout the Corps. In addition, the Marine Corps has fielded curricula and training for line leaders regarding roles and responsibilities in the management of concussion.

The Navy has supported and participated in pre-deployment training for both corpsman and medical providers through the Uniformed Services University of the Health Sciences Center for Deployment Psychology and the Army's "TBI for Deploying Providers Course." The Army's 2-day course is executed with instructors from all Services, with two training cycles completed. The course serves as additional pre-deployment preparation for both the Navy and the Marine Corps medical providers deploying to the North Atlantic Treaty Organization Hospital at Kandahar Airfield and Camp Leatherneck, both in Afghanistan.

DCoE, in accordance with DTM 09-033, has coordinated data analysis and promoted data sharing with the Assistant Secretary of Defense for Research and Engineering, the Director of the Joint Improvised Explosive Device Defeat Organization, and the Secretary of the Army (in his capacity as DoD Executive Agent for Medical Research for Prevention, Mitigation and Treatment of Blast Injuries). This was accomplished by conducting comprehensive, retrospective analyses of relevant, event-triggered concussion data and documentation the Services and combatant commanders submitted from theater. In addition, DCoE has coordinated with the JTAPIC program office on blast-specific data analyses, which included aspects of correlating medical record encounters and concussion diagnosis.

Field exposure data entered into the CIDNE by line commanders is systematically compiled on a monthly basis by USCENTCOM personnel and routed to DCoE for data management (i.e., data deduplication) using a standard blast exposure and concussion incident surveillance and analysis protocol. The resultant data set represents the monthly exposure report and event-specific monitoring summary that is distributed to the Services, Commanders of the Combatant Commands, and the Assistant Secretary of Defense for Health Affairs. The data are routed to JTAPIC and to the Armed Forces Health Surveillance Center for a review of the electronic medical record for correlation with a documented medical encounter and/or clinical diagnosis of concussion. The data set summaries include potentially concussive event elements such as the Date of Mandatory Event, Type of Mandatory Event triggering evaluation, Significant Activity Report number (if applicable), Personal identifier (Social Security Number or Battle Roster Number), Unit, Combatant Command in which the event occurred, Service member's distance from a blast, and Disposition of any mandated medical evaluation (e.g., return-to-duty after 24 hours). These data are reviewed and analyzed for their implications for clinical concussion care and revision of clinical algorithms.

**2. Effectiveness of such policy with respect to identifying and treating blast-related concussive injuries.**

DTM 09-033 requires medical and exposure documentation close to the point of injury and across the operational and medical communities. The policy has become a

catalyst for DoD efforts to improve TBI surveillance capability and the accuracy of documentation in patient records. The early data reflect compliance with DTM 09-033 data-tracking requirements; screening and treatment recommendations reflect an improved culture of awareness and proactive management for concussion in the deployed setting.

The number of Service members who have been identified as exposed to potentially concussive events and who have a medical record entry post-event has steadily increased. Specifically, the data submitted by USCENTCOM demonstrated the percentage of Service members exposed to potentially concussive events linked to an electronic medical record entry was 61% in August 2010, but increased to 90% by December 2011. Similarly, event record data has increased in quality allowing for better matching of Service members exposed to potentially concussive events to their medical records for concussion determination, decreasing the number of Service member exposure incidents that were not associated with an electronic medical encounter.

The percentage of Service members with documented medical encounters on the same day as their potentially concussive event increased from 34.6% in August 2010 to 45.5% in September 2011 (the most recent data available). Similarly, the percentage of Service members with medical encounters within one day of an event increased from 20.6% in August 2010 to 27.5% in September 2011. During the same 60-day period, there was an increase from 70.9% to 91.6% of Service members with medical encounters within 5 days from the date of event.

Data have shown a shift in the types of potentially concussive events. Service members exposed to vehicle-related potentially concussive events increased from 56.9% during 4$^{th}$ quarter (QTR) fiscal year (FY) 2010 to 66.5% by 1$^{st}$ QTR FY 2012, with vehicle-related events accounting for 76.5% of exposures in December 2011 alone. In contrast, blast-related Service member exposures declined as a source of exposure from 41.7% during 4$^{th}$ QTR FY 2010 to 30.3% by 1$^{st}$ QTR FY 2012. This shift was noted with Service member exposures that resulted in concussions, as vehicle-related events accounted for 62% of Service member concussions following exposure during 4$^{th}$ QTR FY 2010 and

increased to 73% during 1st QTR FY 2012. During that same period, blast events accounted for 35 and 24% of concussions, respectively.

The Department's improved ability to identify Service members who are potentially concussed increases our ability to treat, document, and follow Service members along their course of care. DoD's concussion management policies have improved the screening and inclusion of blast-related injuries. The effectiveness of the policy regarding identifying and treating blast-related injuries is the subject of ongoing analyses by DCoE and JTAPIC. In addition, several unique systems of care have evolved through Concussion Care Centers, Concussion Specialty Care Centers, and Concussion Restoration Care Centers that have shed light on some of the best concussion care practices. The Services are evaluating these emerging best practices as models to review and enhance concussion management throughout garrison care in tandem with the deployed setting. Specifically, concussion care centers in theater are reporting a return-to-duty rate of more than 90% along with a significant decrease in the medical evacuation rate for concussion since the implementation of DTM 09-033 and subsequent concussion management guidance.

**3. The effect of such policy on operational effectiveness in theater.**

Data on the effect of DTM 09-033 on operational effectiveness are somewhat limited due to the comparatively recent implementation of the policy. However, the data have yielded marked increases in the return-to-duty rates. According to the data tracked manually and in the BECIR, the Air Force reported 126 exposures to potentially concussive events in Iraq and Afghanistan between August 1, 2010 and August 31, 2011. Of those, medical records confirm 19 diagnosed concussions (15.1%). This is proportional to the 15.4% diagnosed concussions from the total force exposures to potentially concussive events for this same period, which includes blast events, motor vehicle accidents, and direct blows to the head. This data suggest the implementation of DTM 09-033 has been effective in identifying Service members involved in blast-related and other potentially concussive events. In accordance with the policy, identified Service members are assessed for TBI and allowed a minimum 24-hour rest period, regardless of the diagnostic outcome. The relatively low

number of confirmed concussions resulting from these exposures suggests the policy is cautious, setting a low threshold for assessing for TBI.

Prior to the implementation of DTM 09-033, line leaders feared that they might lose large numbers of Service members due to mandatory evaluations. Instead, the clear and specific guidance has been well received by both the line and medical communities. Finally, the data have revealed that most Concussion Care Centers report a greater than 90% return-to-duty rate, resulting in line leaders getting their Service members back; particularly beneficial to units that experience high rates of blast exposure. Effectively, the more Service members who can be quickly identified, treated, and returned to duty, the less operational impact there will be on the unit and mission.

## Appendix - Acronyms

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| AFHSC | Armed Forces Health Surveillance Center |
| BECIR | Blast Exposure and Concussion Incident Report |
| BUMED | Bureau of Medicine and Surgery |
| CCC | Concussion Care Center |
| CDP | Center for Deployment Psychology |
| CIDNE | Combined Information Data Network Exchange |
| CPG | Clinical Practice Guideline |
| CSCC | Concussion Specialty Care Centers |
| CRCC | Concussion Restoration Care Center |
| DCOE | Defense Center of Excellence for Psychological Health and Traumatic Brain Injury |
| DDR&E | Director, Defense Research and Engineering |
| DTMS | Digital Training Management System |
| DVBIC | Defense and Veteran Brain Injury Center |
| EMR | Electronic Medical Record |
| JIEDDO | Joint Improvised Explosive Device Defeat Organization |
| JTAPIC | Joint Trauma Analysis and Prevention in Combat |
| MACE | Military Acute Concussion Evaluation |
| MEF | Marine Expeditionary Force |
| mTBI | Mild Traumatic Brain Injury |
| SIGACT | Significant Activity Report |
| TBI | Traumatic Brain Injury |
| USUHS | Uniformed Services University of the Health Sciences |