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

PERSONNEL AND
READINESS

The Honorable Susan Collins
Chair
Committee on Appropriations
United States Senate
Washington, DC 20510

JAN 21 2026

Dear Madam Chair:

The Department's response to section 721 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364), "Longitudinal Study on Traumatic Brain Injury Incurred by Members of the Armed Forces in Operation IRAQI FREEDOM and Operation ENDURING FREEDOM," is enclosed. Section 721 requires a report after the 3rd, 7th, 11th, and 15th years of the longitudinal study.

This 15-year update and final report reviews key study findings on traumatic brain injury (TBI) diagnosis, care, and outcomes, while underscoring the unique impacts of TBI on the system of care, caregiver health, and family functioning. TBI symptoms can fluctuate in type and intensity. Service members and veterans may experience varied and prolonged recoveries, while their health care and rehabilitation needs may continue to change and persist over 15 years. Unmet rehabilitation needs are associated with mental health issues, environmental barriers, and health care delivery characteristics. For those impacted, resilience may be a key intervention point.

Thank you for your continued strong support for our Service members, veterans, and their families. I am sending similar letters to the President of the Senate, the Speaker of the House, and the other congressional defense committees.

Sincerely,

[redacted]

Sean O'Keefe
Deputy Under Secretary of War for Personnel
and Readiness

Enclosure:
As stated

cc:
The Honorable Patty Murray
Vice Chair

[redacted]

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

PERSONNEL AND
READINESS

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

JAN 21 2026

Dear Mr. Chairman:

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Sean O'Keefe
Deputy Under Secretary of War for Personnel
and Readiness

Enclosure:
As stated

cc:
The Honorable Rosa L. DeLauro
Ranking Member

[redacted]

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

PERSONNEL AND
READINESS

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

JAN 21 2026

Dear Mr. Chairman:

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[redacted]
Sean O'Keefe
Deputy Under Secretary of War for Personnel
and Readiness

Enclosure:
As stated

cc:
The Honorable Jack Reed
Ranking Member

[redacted]

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

PERSONNEL AND
READINESS

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

JAN 21 2026

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Sincerely,

[redacted]

Sean O'Keefe
Deputy Under Secretary of War for Personnel
and Readiness

Enclosure:
As stated

cc:
The Honorable Adam Smith
Ranking Member

[redacted]

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

PERSONNEL AND
READINESS

The Honorable J.D. Vance
President of the Senate
United States Senate
Washington, DC 20510

JAN 21 2026

Dear Mr. President:

The Department's response to section 721 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364), "Longitudinal Study on Traumatic Brain Injury Incurred by Members of the Armed Forces in Operation IRAQI FREEDOM and Operation ENDURING FREEDOM," is enclosed. Section 721 requires a report after the 3rd, 7th, 11th, and 15th years of the longitudinal study.

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[redacted]

Sean O'Keefe
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and Readiness

Enclosure:
As stated

[redacted]

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

PERSONNEL AND
READINESS

The Honorable Mike Johnson
Speaker of the House
U.S. House of Representatives
H-209, The Capitol
Washington, DC 20515

JAN 21 2026

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[redacted]

Sean O'Keefe
Deputy Under Secretary of War for Personnel
and Readiness

Enclosure:
As stated

[redacted]

Report to Congress

15-Year Update and Final Report: Longitudinal Study on Traumatic Brain Injury Incurred by Members of the Armed Forces in Operation IRAQI FREEDOM and Operation ENDURING FREEDOM

January 2026

The estimated cost of this report for the Department of War (DoW) is approximately $55,000.00 for Fiscal Years 2023–2025. This includes $33,000.00 in expenses and $22,000.00 in DoW labor.
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Introduction

This report is in response to section 721 of the John Warner National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2007 (Public Law 109–364), which requests that the Secretary of Defense "conduct a longitudinal study on the effects of traumatic brain injury [TBI] incurred by members of the Armed Forces serving in Operation IRAQI FREEDOM [OIF] or Operation ENDURING FREEDOM [OEF] on the members who incur such an injury and their families." Congress directed that the study run for 15 years, and that the Department submit reports after the 3rd, 7th, 11th, and 15th years in consultation with the Secretary of Veterans Affairs. In 2009, the then-Secretary of Defense directed the Defense and Veterans Brain Injury Center (DVBIC) to address this congressional mandate. DVBIC is known today as the Traumatic Brain Injury Center of Excellence, a Component of the Defense Health Agency.

In compliance with the then-Secretary of Defense's direction, the Department supported two component studies. The first, the 15-Year Longitudinal TBI Study (also referred to as "the 15-Year Studies"), consisted of three sub-studies: (1) the Natural History of TBI Study; (2) the Caregiver and Family Member (CGFM) Study; and (3) the Archival Studies (described in the 3-Year Update). Each sub-study targeted specific subsets of Service members, veterans, and their families. In 2015, in partnership with the Department of Veterans Affairs (VA), the Department launched the second component study, Improved Understanding of Medical and Psychological Needs in Veterans and Service Members with Chronic TBI (IMAP). Appendix A provides an overview of each of these studies.

The 3-Year Update introduced the methodology for the 15-Year Studies. The 7-Year Update summarized 7 years of the 15-Year Studies and 2 years of IMAP data, with 6 conclusions and 9 recommendations. The 11-Year Update provided 7 conclusions with 25 areas of emphasis to Congress. These conclusions, compiled from relevant and impactful findings, contribute to the body of knowledge on the complexities of TBI outcomes. The 11-Year Update offered data-driven clinical and health policy considerations to continue elevated levels of support for Service members, veterans, their families, and the providers charged with their care. This final report summarizes findings from the Natural History of TBI Study, the IMAP study, and the CGFM Study. These research findings can better inform clinicians and operational leadership about best practices and provide policymakers with data to support warfighters and veterans who have incurred TBI, and their families.

Background

The Department of War (DoW) defines 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 of mental status (e.g., confusion, disorientation, slowed thinking); any loss of memory for events immediately before or after the injury; or any period of loss of or a decreased level of consciousness, observed or self-reported.[1] Since 2000, over half a million Service members have sustained a TBI, of which 82 percent were mild TBI (or concussion).[2] Most individuals who sustain a mild TBI fully recover. However, those with a moderate, severe,

or penetrating TBI, multiple mild TBIs, or co-occurring medical or psychological conditions experience varied and sometimes prolonged recoveries.[3,4]

Over the past 15 years, study investigators have significantly contributed to TBI knowledge, producing 240 peer-reviewed manuscripts (see Appendix B), 311 published abstracts, and 505 conference presentations. Although the study sample used to generate this report does not fully represent the entirety of possible TBI outcomes for military or veteran populations, it does represent a diversity of injury characteristics and individuals in need of ongoing support. A recently published overview of TBI research emerging from this period highlights additional clinical, research, and policy drivers that have advanced the TBI state of the science.[5]

Year 15/Final Study Outcomes

Section 721 of the NDAA for FY 2007 (Public Law 109–364) mandated that the longitudinal study of TBI address four elements: 1) the long-term physical and mental health effects of TBIs incurred by members of the Armed Forces during service in OIF or OEF; 2) the health care, mental health care, and rehabilitation needs of such members for such injuries after the completion of inpatient treatment through the DoW, the VA, or both; 3) the type and availability of long-term care rehabilitation programs and services within and outside the DoW and the VA for such members for such injuries, including community-based programs and services and in-home programs and services; and 4) the effect on family members of a member incurring a TBI. These four elements informed the study design, data collection, and data analysis for the 15-Year Studies. The following sections present research findings relevant to each element.

Element 1: The Long-Term Physical and Mental Health Effects of TBIs Incurred by Members of the Armed Forces During Service in OIF or OEF

Since physical and mental health comorbidities are common and persistent following a TBI, awareness is crucial for clinicians treating Service members and veterans. Therefore, clinicians should continue to monitor patients closely for the potential development of these conditions. DoW and VA medical facilities, in collaboration with operational leadership, remain committed to acknowledging, addressing, and supporting the latent and long-term effects following TBI. Although many symptoms resolve within weeks of injury, some patients in this study experienced lingering symptoms at least 15 years after injury, underscoring the need for ongoing care.

- Research across populations indicated the prevalence of physical or medical comorbidities after TBI increases with time. Participants most often reported chronic pain, sleep disorders, cardiovascular disorders, orthopedic issues, and sexual dysfunction. While this trend may be influenced by factors unrelated to TBI, such as aging (as individuals age, they are more likely to report comorbidities) and recall bias (individuals prompted about a condition are more likely to report it than when unprompted), these co-occurring conditions can alter or magnify perception of other conditions, such as co-occurring psychological health conditions.

- Posttraumatic stress disorder (PTSD), low resilience, and sleep disturbance are common sequelae of TBI and may serve as clinical indicators for Service members and veterans at greater risk for poor long-term outcomes. Therefore, screening patients with TBI of any severity for these risk factors is critical to determining appropriate treatment needs.[6]

- Post-concussion symptoms are neither specific nor unique to mild TBI, requiring cautious interpretation when reported many years after injury. These symptoms should not be uncritically assumed to solely reflect persistent TBI symptomatology or be directly attributable to the consequences of the brain injury itself. In many cases, individuals report "post-concussion-like" symptoms many months or years following injury that could be explained by other medical or psychological conditions (e.g., depression due to a death in the family, fatigue due to iron deficiency, poor sleep due to back pain).[7] Continuously improving our understanding of the variability in post-concussion symptom reporting over time, and disseminating related information, will enhance support to the Military Health System (MHS), the Veterans Health Administration (VHA), and community clinicians and researchers who work with this population.

- Clinicians may consider additional screening during TBI-related visits using disability rating scales for cognitive, physical, and emotional functioning, and social support scales. TBI history and severity, combined with these screening results, will help identify at-risk patients requiring additional support.

As part of ongoing 15-Year Study efforts, the DoW stored blood samples for analyses of genetic and proteomic markers of clinical states and associated outcomes. Blood-based biomarkers — molecular indicators of biological and pathological processes in blood — are of particular interest in this sample of Service members and veterans.

- The specific clinical value of these findings varies with TBI severity, measured outcomes, and phase of TBI recovery. In a small sample of participants with TBI of all severity levels, blood-based biomarkers collected within 1 year of injury were related to worse self-reported neurobehavioral outcomes two or more years after injury.[8–10] This research builds on prior biomarker findings, which primarily focused on TBI recovery days to weeks after injury, extending the potential clinical use of biomarkers.

- A panel of blood-based biomarkers — such as tau, NfL, GFAP, and UCH-L1 — measured within days or weeks following TBI or measured within the first year after injury, may be a useful tool for predicting future cognitive decline and poor neurobehavioral outcomes. Identification of those at risk for poor outcomes, immediately after and up to 1 year after TBI, will allow for improved and targeted monitoring and treatment.[8–10]

The Natural History of TBI Study, initiated in 2010, reflected the military and scientific communities' focus on understanding the lifetime effects of blast exposures from Improvised Explosive Devices. The study assessed blast related outcomes in Service members and veterans with TBI by asking a single question about the number of times the participant "felt the blast wave" over their lifetime. While this study revealed an association between lifetime blast

exposure and self-reported outcomes, particularly PTSD and post concussive symptoms reported many years after a TBI, no link was found to objective outcome measures such as biomarkers or cognitive tests. Researchers and operational leaders continue to investigate this discrepancy, particularly the potential role of PTSD.

Since then, efforts to understand blast injury have evolved toward the effects of repeated blast overpressure (BOP) exposure during training. As the Department's understanding of blast-related brain health outcomes progressed, this research expanded to include new measures quantifying blast events, including exposure to one's own weapon systems. With collaborators, the Natural History of TBI Study investigators continue to pursue research to improve measurement of BOP exposure effects in the military.

Study findings indicate that TBI outcomes can vary based on individual differences (e.g., resilience, brain chemistry), TBI history (number and severity), comorbidities, and treatment responsiveness. Comorbidities, especially PTSD and sleep disturbances, play a critical role in these outcomes. These study findings support the current VA/DoW Clinical Practice Guidelines for treating post-TBI symptoms.

Element 2: The Health Care, Mental Health Care, and Rehabilitation Needs of Such Members for Such Injuries After the Completion of Inpatient Treatment through the DoW, the VA, or Both

Most TBI patients do not require inpatient rehabilitation. Since 2000, 82 percent of military TBIs have been classified as mild (mild TBI or concussion).[2] Most individuals who sustain mild TBI will recover fully over several weeks following the recommended return to duty guidelines.[3] Using a survey tool, study investigators queried participants over many years about health care services they identified as a need (e.g., physical therapy for chronic disability, mental health care treatment, cognitive rehabilitation program) that were received and health care services they identified as a need that were not pursued, completed, or received. If services were self-identified as a need but not pursued, completed, or received over the course of the study, these activities were categorized as "rehabilitation needs."

- Service members and veterans who have moderate, severe, or penetrating TBI; multiple mild TBIs; and/or co-occurring medical or psychological conditions may experience varied and sometimes prolonged recoveries requiring inpatient TBI rehabilitation, either at the time of injury or, sometimes, at the end of their military career. For this subset of TBI patients requiring prolonged recoveries, study findings reveal that rehabilitation and healthcare needs change over time with patient improvement or decline. Therefore, healthcare and rehabilitation services should continue to support the Service member or veteran at each stage of recovery.

- Over the 15 years following a TBI, more than 60 percent of participants reported needing help with cognitive complaints. Among these, a large proportion requested additional support (39 percent at 5 years; 46 percent at 10–15 years).[11–13]

- Rehabilitation needs persisted throughout the chronic stages of TBI recovery. Study participants reported an average of 8 rehabilitation needs (+/- 6 needs) when queried at 5, 10, and 15 years after TBI, demonstrating the ongoing nature of these needs. Moreover, their rehabilitation needs evolved and changed over time.[14–17]

Service members and veterans hospitalized for TBI consistently reported other needs, such as coordinating and accessing services and managing daily stressors and problems.

- While Service members and veterans needed help coordinating and accessing medical, psychological, and rehabilitation services at both 5 years (48 percent, 40 percent, and 42 percent, respectively) and 10–15 years (47 percent, 42 percent, and 42 percent) post-TBI, a considerable proportion of these needs remained unmet. Specifically, these services remained unmet for up to 20 percent of those hospitalized 5 years post-TBI, with findings demonstrating an increasing trend to 22–24 percent at 10–15 years post-TBI.

- About half of those hospitalized with TBI reported daily stress management needs, while half of those who reported these needs also reported them as unmet (24–26 percent of the study sample). At 10–15 years post-TBI, slightly more than half of the study sample (51–54 percent) reported daily stress management needs, among which an estimated one-third of this group (33–34 percent) also reported their need as unmet.[12,13]

Examining risk factors for unmet needs is critical to determine which Service members and veterans will have long-term needs or benefit most from targeted interventions. Environmental barriers, such as perceived physical and policy barriers (e.g., appointment availability outside business hours and staffing), play an important role. Examining these environmental barriers can help identify populations at greater risk of having their healthcare needs unmet, as those with TBI who perceive greater barriers are more likely to experience unmet needs due to lack of care.

Family involvement and support are integral to successful rehabilitation and encompass a range of critical components. These include family education and training on TBI and on caring for Service members and veterans with physical, cognitive, and behavioral challenges after injury.

- Most families are satisfied with the health information provided by medical staff after injury. In the first 5 years, 69 percent of families reported this need as met, while 65 percent reported this need as met at 10–15 years. For the cases when information needs were met, families reported that medical providers provided clear explanations, used plain language, responded honestly, and demonstrated respect for patient and family wishes.[18]

- At 10–15 years after TBI, the role of the family member as primary caregiver can impact experiences. Specifically, spouses (compared to parents) of Service members and veterans with TBI and urban-dwelling families (compared to suburban families) are more likely to report unmet needs.[19]

This research found that rehabilitation needs persist after TBI, care needs change over time, and ongoing rehabilitation needs are associated with worse outcomes. Among the most critical needs identified were improving memory and managing physical and mental health, including mood/stress. Cognitive disability was the most reported barrier to effective healthcare access

and use. Finally, findings indicate that family involvement and support are integral to successful rehabilitation.

Element 3: The Type and Availability of Long-Term Care Rehabilitation Programs and Services Within and Outside the DoW and the VA for Such Members for Such Injuries, Including Community-Based Programs and Services and In-Home Programs and Services

The MHS and VHA collaborate with community-based organizations to implement programs that support treatment, rehabilitation, and long-term care of Service members and veterans with TBI. These programs also support transition from the MHS to the VHA and into home and community-based programs.

- Delaying critical care following TBI has lasting repercussions to the Service member or veteran and places an additional cost burden on the health care system. In an outpatient VA setting, chronic TBI and greater disability levels impacted cost.[20,21]

- Based on these findings, the DoW continues ongoing collaborations and building new partnerships to execute policies effectively.

- The VA continues to provide coordinated, interdisciplinary clinical services and case management, while promoting telehealth to enhance access to rehabilitation specialists with TBI training and experience across the system.

- DoW and VA continue to translate research findings to inform the implementation (e.g., Improving Health Care Access and Engagement for Veterans and Service Members with TBI Morbidity [I-HEAL Study]),[22] enhancement (e.g., Defense Intrepid Network's Family Wellness Program),[23] and evaluation of clinical programs and initiatives (e.g., Post-traumatic Headache Clinical Recommendation Evaluation Study)[24] to ensure they proactively address latent and chronic problems related to TBI care.

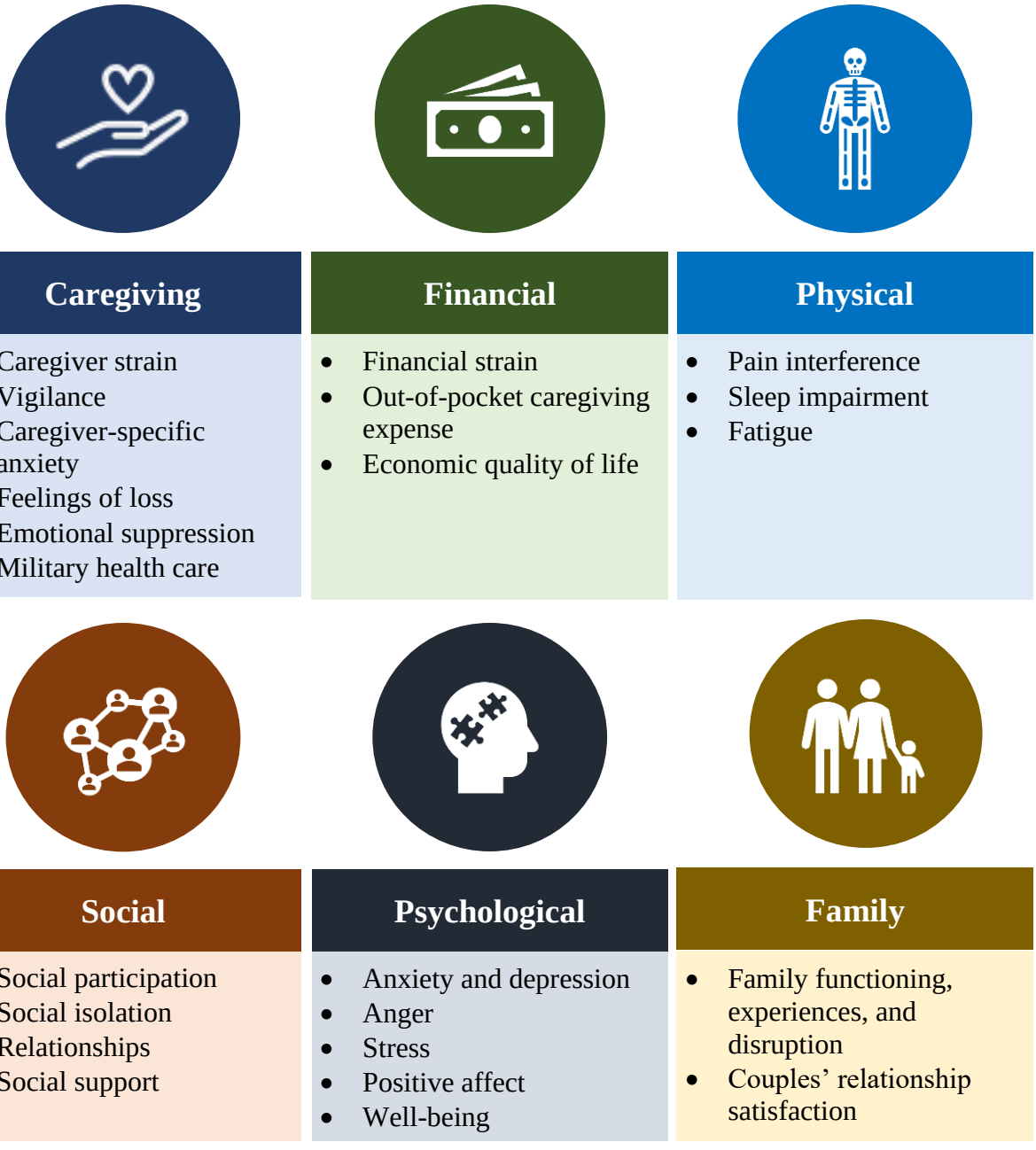
TBI has system-level impacts from acute through long-term care needs. Disability level, length of acute care stay, delayed care, and age impact cost. Study findings show Service members and veterans prefer multidisciplinary care models within their system of care. Additionally, study findings suggest that facilitators and barriers to care may be best understood through implementation science studies for TBI services.

Element 4: The Effect on Family Members of a Member Incurring a TBI

Understanding of family caregivers and the impact of TBI on the families of Service members and veterans has evolved. Initially, the CGFM Study only enrolled caregivers of Service members and veterans with moderate to severe TBI, where the care primarily involved medical support for activities of daily living (ADL), such as bathing, dressing, and toileting.[25] However, as more Service members and veterans with mild TBI (also known as concussion) reported caregiver assistance with nontraditional ADL (e.g., emotional problems, pain management, legal advocacy, health care navigation), the study expanded to include caregivers for Service members and veterans with mild TBI. This change was driven by the documented impact of mild TBI and its comorbidities (PTSD, depression, pain, headaches, substance abuse, sleep, hearing), illustrated by the Natural History of TBI Study.

Families of Service members and veterans with TBI and comorbidity reported significant impairment in several domains of functioning. The CGFM study used the Health-Related Quality of Life (HRQoL) tool to assess physical, psychological, social, and caregiving domains and outcomes (Figure 1).[26] In addition to HRQoL, the study assessed levels of distress in the family environment, family relationships (including parent reports of impact to children), and financial stability for many years after the TBI.

Figure 1. Health-Related Quality of Life Domains and Their Outcomes



- Family members caring for a Service member or veteran with a mild TBI reported worse HRQoL than those caring for one with a moderate to severe TBI. Given that the majority of mild TBIs were from an injury sustained on average five and a half years ago, caregiving for persistent adjustment-related neurobehavioral symptoms was likely related to the comorbid conditions present (e.g., PTSD, depression, pain, and headache).[27]

- The CGFM study found that military TBI affects the whole family — caregiver health and family functioning impact Service member and veteran recovery from TBI, just as Service member and veteran recovery impact caregiver health and family functioning. This study found resilience may be an important intervention point for both family and the warfighter after TBI.

- Emotional health declined for many children following their parent's TBI and was impacted by Service member or veteran neurobehavioral symptoms, poor intimate partner HRQoL, and unhealthy family functioning.[28]

- Factors such as military and medical status (TBI severity, comorbid conditions, combat deployments), intimate partner caregiving duration (hours caregiving, years caregiving), child-specific demographics (as reported by a parent, i.e., age, sex, biological child, living with both parents), and economic factors were *not* consistently associated with parent perception of pediatric HRQoL.[28]

Family members providing care and support to a Service member or veteran after TBI could benefit from ongoing clinical services to help adapt to and cope with caregiver demands. Continuing to equip family members with the knowledge, skills, and resources to support those with TBI and comorbidities early in the recovery trajectory may help family members adapt to and cope with acute and long-term caregiving stressors. Children in these households may require long-term intervention and monitoring. Early screening and intervention may also be required to evaluate children who may not meet clinical thresholds for a current diagnosis but are on a worsening trajectory.[29]

Conclusions

The DoW and VA continue to prioritize TBI patient care through scientific advances and translation of research findings into practice in military medical treatment facilities, veterans' hospitals, and on the battlefield. Over the course of 15 years, the section 721 research findings provided strong scientific evidence in several key areas of impact for the DoW, including:

- Ongoing clinical assessment of depression, sleep, and PTSD, ensuring appropriate screening for these conditions in TBI patient care settings.

- Strengthened empirical data supporting the ongoing need for multidisciplinary care settings to treat TBI acutely and long-term, such as DoW's continued engagement with the VA Polytrauma/TBI Centers of Excellence and U.S. Special Operations Command pilot research.

- Improved understanding of the bidirectional impact of family functioning on warfighter health and outcomes after TBI and warfighter TBI health/outcomes on the family, as well as the need for family engagement in rehabilitation.

- Synthesized data across several publications that directly informed the 2021 VA/DoW Clinical Practice Guideline for the Management and Rehabilitation of Post-Acute Mild TBI; clinical support tool updates (e.g., Cognitive Rehabilitation, Neurocognitive Assessment Testing); subject matter expertise on the Sleep Disturbances after TBI Clinical Recommendation Expert Working Group; the original development of the Military Acute Concussion Evaluation; and the July 2021 update to the DoW TBI Caregiver Guide.

- A shift toward implementation science assessment and intervention of system-level facilitators and barriers to care.

The Departments are grateful for the thousands of Service members, veterans, family members, clinicians, and leaders in the field who participated in this study. Findings from congressionally mandated studies and ongoing advances in the broader scientific community continue to bring attention to evidence-based outcomes relevant to Service members, veterans, families, TBI care providers, the operational community, and policy experts to further optimize TBI standards of care. The DoW continues to keep its partners apprised of relevant findings with regular dialogue on approaches for incorporating mature research findings into a particular system of care.

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Appendix A: Overview of TBI Studies

The Natural History of TBI Study

The Natural History of TBI Study examined the impact of TBI on Service members' and veterans' physical, mental, and cognitive health. This study recruited participants from military hospitals and clinics and through community outreach, such as social media and military-relevant events. This collection is the largest existing dataset of detailed clinical examinations of Service members across the spectrum of TBI severity and compared with injured and non-injured control subjects. The Natural History of TBI Study enrolled 1,836 participants, of which 90 percent were male, ranging in age from 18 to 65 years (average age was 36 years old); 68 percent were white; and 72 percent were Service members on active duty. The Natural History of TBI Study contributes to Elements 1–3 of the mandate from an outpatient perspective.

The Caregiver and Family Member Study

The CGFM Study explored the impact of Service members' and veterans' TBI on family members providing their care. This study recruited caregivers [family members and friends] from military hospitals and clinics and through community outreach, such as military events and social media. In total, 574 family members and friends provided insight into their experiences. Element 4 addresses these domains and the measures developed over the course of this study.

Improved Understanding of Medical and Psychological Needs in Veterans and Service Members with Chronic TBI

The IMAP study explores Elements 1–3 of the congressional mandate from an inpatient perspective. IMAP leveraged the VA TBI Model Systems Program lifetime study to examine the rehabilitation and health care needs of Service members and veterans with TBI. This study recruited participants from consecutive admissions to VA Polytrauma Rehabilitation Centers (PRCs), which provide the highest level of care in the VA Polytrauma System of Care, an integrated and coordinated continuum of programs and services developed and implemented at the height of OIF/OEF for eligible veterans and Service members with polytrauma and TBI. The five PRCs house VA Polytrauma/TBI Centers of Excellence within the VA Polytrauma System of Care and provide specialized rehabilitation programs for eligible veterans and Service members recovering from TBI, while serving as hubs for education and clinical research related to polytrauma and TBI.

Of the two main section 721 longitudinal TBI studies, different recruitment and study design methods allowed researchers to survey unique populations. The IMAP study enrolled active duty Service members and veterans from inpatient medical settings at the five VA PRCs. The Natural History of TBI Study enrolled most participants from outpatient settings at military medical treatment facilities across the MHS, also inclusive of active duty personnel, veterans, and Service members in transition.

The IMAP and 15-Year Longitudinal TBI Study investigators recruited populations intended to represent the diversity of TBIs incurred during OIF/OEF across the entire fighting force. There

are nuances and even some discrepancies across findings that are further explained in the publications listed in Appendix B. Study outcomes may diverge due to various participant, study, and injury characteristics. It is important to consider the context of the injuries, the individual, and the care system when drawing conclusions and understanding long-term outcomes.

Appendix B: List of Manuscripts and Select Presentations

Allan AC, Edmed SL, Sullivan KA, Karlsson LJ, Lange RT, Smith SS. Actigraphically-measured sleep-wake behaviour after mild traumatic brain injury: a case-control study. *J Head Trauma Rehabil*. 2017;32(2):E35-E45. https://doi.org/10.1097/HTR.0000000000000222

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Appendix C: Acronyms

ADL	activities of daily living
BOP	blast overpressure
CGFM	Caregiver and Family Member (Study)
DoW	Department of War
DVBIC	Defense and Veterans Brain Injury Center
FY	Fiscal Year
HRQoL	Health-Related Quality of Life
IMAP	Improved Understanding of Medical and Psychological Needs in Veterans and Service Members with Chronic TBI (Study)
MHS	Military Health System
NDAA	National Defense Authorization Act
OEF	Operation ENDURING FREEDOM
OIF	Operation IRAQI FREEDOM
PRC	Polytrauma Rehabilitation Center
PTSD	posttraumatic stress disorder
TBI	traumatic brain injury
VA	Department of Veterans Affairs
VHA	Veterans Health Administration