

January 2012

DEFENSE HEALTH

Coordinating Authority Needed for Psychological Health and Traumatic Brain Injury Activities

This report was revised on January 27, 2012, to change \$52.5 million to \$52.5 billion, on page 4 (Background), line 4, and some references to annual reports on pages 9 and 26 were clarified.



G A O

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Highlights of [GAO-12-154](#), a report to the Chairman and Ranking Member, Committee on Armed Services, House of Representatives

Why GAO Did This Study

Post-traumatic stress disorder (PTSD), which falls into the broader field of psychological health (PH), and traumatic brain injury (TBI) are recognized as the signature wounds of the wars in Afghanistan and Iraq. In two reports issued in 2011 ([GAO-11-219](#) and [GAO-11-611](#)), GAO cited numerous management weaknesses at the Defense Center of Excellence for PH and TBI (DCOE). For the present report, GAO reviewed (1) funding for DOD's PH and TBI activities in fiscal years 2007 through 2010 and the accuracy of its reporting on these activities to Congress and (2) DOD's ability to coordinate its PH and TBI activities to help ensure that funds are used to support programs of the most benefit to service-members. GAO interviewed DOD officials, reviewed legislation and DOD's annual reports, and obtained relevant documentation.

What GAO Recommends

GAO recommends that DOD direct the Assistant Secretary of Defense for Health Affairs to (1) include expenditure data in annual reports to Congress, as required; (2) establish quality control mechanisms on PH and TBI data; (3) if patient care costs are provided in future annual reports, specify what they include; and (4) revisit DCOE's role as DOD's coordinating authority for issues concerning PH and TBI, as stated in DCOE's campaign plan, and determine whether DCOE or another organization should perform this function. In written comments on a draft of this report, DOD concurred with all four recommendations.

View [GAO-12-154](#) or key components. For more information, contact Brenda S. Farrell at (202) 512-3604 or farrellb@gao.gov.

DEFENSE HEALTH

Coordinating Authority Needed for Psychological Health and Traumatic Brain Injury Activities

What GAO Found

From fiscal year 2007 through fiscal year 2010, DOD activities for the treatment and research of PH and TBI received more than \$2.7 billion. In fiscal year 2007, funding for these activities totaled \$900 million; in fiscal year 2008, it was \$573.8 million; in fiscal year 2009, \$395 million; and in fiscal year 2010, \$838.6 million. GAO found, however, that the reports DOD provided to Congress on these activities did not include expenditures, as required by law, and that the obligations data they contained were unreliable. Governmentwide policies call for agencies to have effective internal controls to assure accurate reporting of obligations and expenditures. However, the Office of the Assistant Secretary of Defense for Health Affairs has not developed quality control mechanisms to help ensure that data on PH and TBI activities are complete and accurate. Further, although DOD listed patient care among reported costs, it did not specify what those costs included, making it difficult for decisionmakers and Congress to fully understand the costs.

No one organization coordinates DOD's PH and TBI activities. The National Defense Authorization Act for Fiscal Year 2008 directed the Secretary of Defense to establish a Center for PTSD and a Center for TBI to, among other things, implement DOD's comprehensive plans for these issues, disseminate best practices, provide guidance, and conduct research. Subsequently, a Senior Oversight Committee established by the Secretaries of Defense and Veterans Affairs reported in its plan to Congress that DOD had created a single Defense Center of Excellence for PH and TBI (DCOE) to lead efforts in practice standards, training, outreach, research, and direct care. The Committee tasked DCOE with acting as an information clearinghouse that would allow servicemembers and their families to navigate the system of care. In its own plan, DCOE stated that it would serve as a coordinating authority for DOD's PH and TBI issues and perform a gap analysis to identify needed programming. GAO found, however, as it had in prior reports, that DCOE's strategic plan did not reflect a clear mission focusing the organization on its statutory responsibilities. Instead, those responsibilities are dispersed among the TRICARE Management Activity, the Army Medical Research and Materiel Command, and others. While the Office of the Assistant Secretary of Defense for Health Affairs has broad oversight for all of DOD's medical missions, its global role prevents it from focusing on PH and TBI activities specifically. As a result, no single organization is devoted to ensuring that accurate and timely data are available on DOD's PH and TBI activities or coordinating these activities. GAO, in conducting this review, had to obtain information from several different sources to compile a comprehensive list of DOD's PH and TBI activities. This finding was echoed in a recent RAND report that also noted that no single source in DOD tracked its PH and TBI programs or had appropriate resources to direct servicemembers to the full array of programs available. Without an entity to coordinate these activities, DOD will remain hampered in its efforts to ensure that resources are used effectively to meet goals, and Congress will be limited in its ability to obtain reliable information to guide decisionmaking.

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Abbreviations

| | |
|-------|--|
| DCOE | Defense Center of Excellence for Psychological Health and Traumatic Brain Injury |
| DOD | Department of Defense |
| O&M | Operation and Maintenance |
| PH | psychological health |
| PTSD | Post-Traumatic Stress Disorder |
| RDT&E | Research, Development, Test and Evaluation |
| TBI | Traumatic Brain Injury |
| TMA | TRICARE Management Activity |

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GAO

Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

January 25, 2012

The Honorable Howard P. McKeon
Chairman
The Honorable Adam Smith
Ranking Member
Committee on Armed Services
House of Representatives

Public concern over health care issues confronting servicemembers returning from the wars in Afghanistan and Iraq has grown considerably over the past several years. Most recently, concerns have centered on two injuries—post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI)—which are referred to as the “signature wounds” of these wars. TBI is defined as a traumatically induced structural injury or physiological disruption of brain function resulting from external force. TBI can vary greatly in terms of severity—from mild cases that might involve a brief change in mental status, such as being dazed or confused, to severe cases that may involve an extended period of unconsciousness or amnesia after the injury. Brain injuries are classified as mild, moderate, severe, or penetrating, based on factors associated with the initial injury, such as the length of time the patient spent in a coma, rather than on the symptoms or long-term effects.

In the wake of the February 2007 disclosure of deficiencies in outpatient services at the Walter Reed Army Medical Center following an investigation by the *Washington Post*,¹ various review groups, task forces, and presidential commissions investigated the care and benefits provided to servicemembers and veterans by the Department of Defense

¹Dana Priest and Anne Hull, “Soldiers Face Neglect, Frustration at Army’s Top Medical Facility,” *Washington Post* (Feb. 18, 2007).

(DOD) and the Department of Veterans Affairs.² In May 2007, Congress passed a supplemental appropriation that included funding for the treatment of PTSD and TBI.³ In the National Defense Authorization Act for Fiscal Year 2008, Congress directed DOD to establish Defense Centers of Excellence for the prevention, diagnosis, mitigation, treatment, and rehabilitation of post-traumatic stress disorder and other mental health conditions, as well as traumatic brain injury.⁴

Consistent with your oversight responsibility, you requested GAO to determine how much funding had been used to support DOD PH and TBI activities in recent years and how those funds had been used. Specifically, you requested that we review the following:

- (1) DOD's funding for PH and TBI activities in fiscal years 2007 through 2010, as well as the accuracy of DOD's reported obligations and expenditures for PH and TBI in its required annual reports to Congress; and
- (2) DOD's ability to coordinate its PH and TBI activities to help ensure that funds are used to support activities of the most benefit to servicemembers.

To determine the amount of appropriated funds that supported activities related to PH and TBI for fiscal years 2007 through 2010, we reviewed DOD appropriations acts and accompanying committee reports from fiscal years 2007 through 2010, and we interviewed and obtained documentation from officials with the Office of the Assistant Secretary of

²The reports include the Independent Review Group, *Rebuilding the Trust: Report on Rehabilitative Care and Administrative Processes at Walter Reed Army Medical Center and National Naval Medical Center* (April 2007); Task Force on Returning Global War on Terror Heroes, *Report to the President* (April 2007); Department of Defense Task Force on Mental Health, *An Achievable Vision: Report of the Department of Defense Task Force on Mental Health* (June 2007); President's Commission on Care for America's Returning Wounded Warriors, *Serve, Support, Simplify* (July 2007); Veterans' Disability Benefits Commission, *Honoring the Call to Duty: Veterans' Disability Benefits in the 21st Century* (October 2007); and Inspectors General, Department of Defense, Department of Veterans Affairs, *DOD/VA Care Transition Process for Service Members Injured in OIF/OEF (Operation Iraqi Freedom/Operation Enduring Freedom)* (June 2008).

³U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007, Pub. L. No. 110-28 (2007), 121 Stat. 134.

⁴Pub. L. No. 110-181 §§ 1621, 1622 (2008).

Defense for Health Affairs; the TRICARE Management Activity's⁵ Office of the Chief Financial Officer, which manages operation and maintenance (O&M) and procurement funds; and the Army Medical Research and Materiel Command, which manages research, development, test and evaluation (RDT&E) funds. To determine how accurately DOD has been reporting obligations and expenditures for PH and TBI in required annual reports to Congress, we reviewed and analyzed DOD's annual reports to Congress on expenditures for these activities for calendar years 2008, 2009, and 2010 and compared information contained in these reports to documentation we obtained from the TRICARE Management Activity, the Army Medical Research and Materiel Command, and the individual military services. Through our assessment of data provided by DOD, as well as the assessments of previous GAO reviews,⁶ we determined that data on reported PH and TBI obligations were unreliable. However, we also determined that, because these data are used by DOD and the military services to manage their operations, it was appropriate to use these data as a starting point for our analysis. Data reliability issues are discussed throughout the report, as applicable. Moreover, our findings and recommendations address the need for DOD to address data reliability weaknesses.

To evaluate DOD's ability to coordinate its PH and TBI activities to help ensure that funds are used to support activities of greatest benefit to servicemembers, we interviewed officials with the Office of the Assistant Secretary of Defense for Health Affairs, which oversees DOD's medical and dental programs; the TRICARE Management Activity; the Defense Center of Excellence for Psychological Health and Traumatic Brain Injury (DCOE); and the Army Medical Research and Materiel Command. In

⁵The TRICARE Management Activity oversees DOD's medical and dental programs and manages and executes the Defense Health Program appropriation. The Director of the TRICARE Management Activity reports to the Assistant Secretary of Defense for Health Affairs. TRICARE Management Activity's associated programs, resources, and functions include the Uniformed Services University of the Health Sciences, the Armed Forces Radiobiology Research Institute, and DCOE.

⁶In conducting prior work in this area, GAO compared Defense Center of Excellence for Psychological Health and Traumatic Brain Injury obligations recorded by TRICARE Management Activity to supporting documentation and found that, while the date and amount of obligations were properly recorded, there were problems at the subobject classification level for fiscal year 2009. See GAO, *Defense Health: Management Weaknesses at Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury Require Attention*, [GAO-11-219](#) (Washington, DC: Feb. 28, 2011).

addition, we reviewed the legislation establishing different organizations with responsibilities for overseeing PH and TBI, i.e., DCOE; the DOD/VA Wounded, Ill, and Injured Senior Oversight Committee; the Joint Executive Committee; and the Armed Services Biomedical Research Evaluation and Management Committee. We analyzed the documents generated by these organizations to provide guidance and oversight of PH and TBI activities.

We conducted this performance audit from June 2010 through January 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. For additional information on our scope and methodology, see appendix I.

Background

Congress typically provides funding for the Defense Health Program appropriation, including funding for PH and TBI activities, in annual defense appropriations. For its fiscal year 2012 budget request, DOD requested \$52.5 billion to provide health care to approximately 9.6 million active-duty servicemembers, reservists, retirees, and their dependents. This funding includes O&M, RDT&E, and procurement.⁷ O&M generally covers the hiring and payment of civilian providers, along with operation costs for running hospitals and other facilities. RDT&E generally covers research and development efforts. Procurement covers acquisition expenses. The Defense Health Program's O&M funds are generally available for obligation for 1 fiscal year, subject to certain exceptions.⁸ RDT&E funds are generally available for obligation for 2 fiscal years, while procurement funds are generally available for obligation for 3 fiscal years.

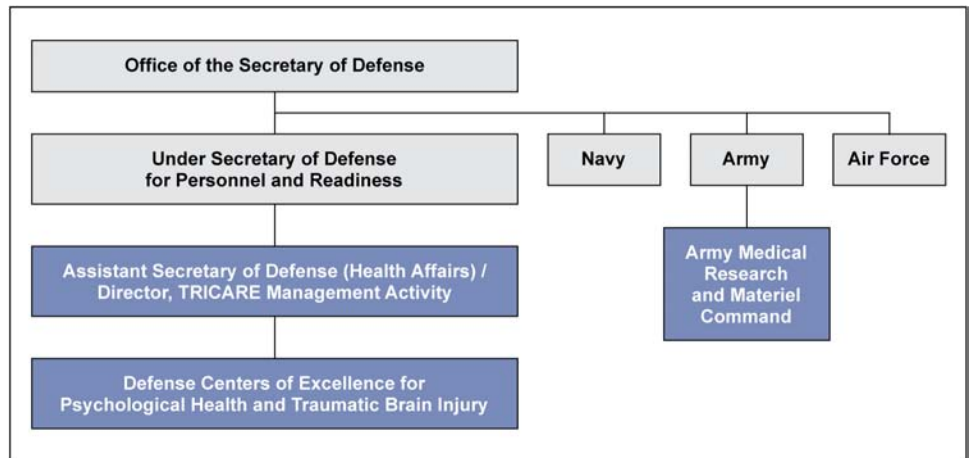
⁷The salaries of military medical personnel are funded through the services' Military Personnel appropriations and are therefore not included in the costs we have calculated in this report related to care for servicemembers with PH- and TBI-related conditions.

⁸For example, certain O&M amounts appropriated for the Defense Health Program by the Department of Defense Appropriations Act of for fiscal year 2010 were made available for obligation for longer than one fiscal year. Pub. L. No. 111-118, 123 Stat. 3424 (2009).

Within DOD, the Office of the Assistant Secretary of Defense for Health Affairs oversees the Military Health System, a global medical network that provides health care to all U.S. military personnel worldwide. The Military Health System comprises over 133,000 military and civilian doctors, nurses, medical educators, researchers, healthcare providers, allied health professionals, and health administration personnel. The Assistant Secretary of Defense for Health Affairs oversees the development of medical policies, analyses, and recommendations to the Secretary of Defense and the Undersecretary for Personnel and Readiness, and issues guidance to DOD components on medical matters. The Assistant Secretary also serves as the principal advisor to the Undersecretary for Personnel and Readiness on matters of chemical, biological, radiological, and nuclear medical defense programs and deployment matters pertaining to force health. Providing broad oversight for PH and TBI matters is only one element among the Assistant Secretary's comprehensive responsibilities. Within the Office of the Assistant Secretary of Defense for Health Affairs, the Office of Force Health Protection and Readiness coordinates and transmits information on PH and TBI activities to Congress on behalf of DOD. The Office of the Assistant Secretary of Defense for Health Affairs also serves as director of the TRICARE Management Activity, which oversees DOD's medical and dental programs and manages and executes the Defense Health Program appropriation. TRICARE Management Activity's associated programs, resources, and functions include the Uniformed Services University of the Health Sciences, the Armed Forces Radiobiology Research Institute, and the Defense Center of Excellence for Psychological Health and Traumatic Brain Injury (DCOE).

Figure 1 presents an organizational chart that shows the current alignment of the organizations involved in managing DOD's PH and TBI activities. The TRICARE Management Activity manages and executes Defense Health Program O&M and procurement funding for PH and TBI; the Army Medical Research and Materiel Command manages and executes the majority of Defense Health Program RDT&E funding for PH and TBI; and each military service also uses Defense Health Program O&M funds distributed to them for PH and TBI activities.

Figure 1: Defense Center of Excellence for Psychological Health and Traumatic Brain Injury Alignment within DOD



Source: GAO analysis of DOD data.

In two reports that we issued in 2011, we cited numerous management weaknesses at DCOE, as well as unreliable reporting of how DOD was obligating Defense Health Program O&M funds for the treatment of and research on servicemembers experiencing PH- and TBI-related problems.⁹ The National Defense Authorization Act for Fiscal Year 2008 required DOD to create centers of excellence for PTSD and other mental health conditions, and for TBI.¹⁰ Congress tasked these centers of excellence with numerous responsibilities, to include providing for the development, testing, and dissemination of best practices within DOD for the treatment of PTSD and TBI. In response, DOD established DCOE as the one entity intended to lead DOD’s effort to develop excellence in its prevention, outreach, and care for those with these conditions.

In our February 2011 report, we discussed challenges facing DCOE as it was being developed. We found that DCOE’s lack of mission clarity hampered its ability to move forward and that its strategic plan had two

⁹GAO, *Defense Health: Management Weaknesses at Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury Require Attention*, [GAO-11-219](#) (Washington, DC: Feb. 28, 2011) and GAO, *Defense Centers of Excellence: Limited Budget and Performance Information on the Center for Psychological Health and Traumatic Brain Injury*, [GAO-11-611](#) (Washington, DC: June 30, 2011).

¹⁰Pub. L. No. 110-181, §§ 1621-1622 (2008).

areas of weakness that did not conform to best practices. Specifically, the plan's management reviews—intended to align activities, resources, and goals—were insufficient to ensure that its daily activities were aligned with its mission and goals; and the plan did not fully describe how meeting its performance measures would help DCOE assess attainment of its goals. We further found that the TRICARE Management Activity, which administered funds allocated to DCOE, had not developed written policies and procedures to ensure the proper recording of obligations and that it had not properly classified most of DCOE's fiscal year 2009 contract obligations. We recommended that DCOE take steps to improve its strategic plan and that the TRICARE Management Activity develop, implement, and maintain written procedures for the proper classification and recording of DCOE obligations. DOD concurred with our recommendations.

In our June 2011 report we reviewed DCOE's budget formulation process and the availability of information about DCOE to Congress. We found that DCOE's role in the DOD budget formulation process was limited to consolidating component centers' budget requests and providing them to the TRICARE Management Activity. Further, these budget requests did not include complete narrative justifications. Like the February report, this one found that DOD had not clearly defined DCOE's mission. This report also found that because DCOE is a relatively small entity funded primarily through the larger Defense Health Program appropriation, it falls below the most detailed level that is presented in congressional budget presentation materials; additionally, DOD is not required to report separately on DCOE. We recommended that the TRICARE Management Activity work with DCOE to develop and use additional narrative in budget justifications and regularly collect and review data on funding and obligations. DOD concurred with these recommendations.

More Than \$2.7
Billion in
Appropriated Funds
Supported DOD
Treatment and
Research Activities
Related to PH and TBI

Funding Totaled More
Than \$2.7 Billion

From fiscal year 2007 through fiscal year 2010, DOD activities relating to the treatment and research of PH and TBI received more than \$2.7 billion. Funding for PH and TBI was derived from specific appropriations and congressionally directed amounts drawn from Defense Health Program O&M; procurement; and RDT&E appropriations.¹¹ During this period, Congress appropriated \$675 million specifically for PH and TBI, and more than \$2 billion was drawn from Defense Health Program accounts for activities related to PH and TBI.¹² In fiscal year 2007, total appropriations of \$900 million supported PH and TBI activities. In fiscal year 2008, total funding was \$573.8 million. In fiscal year 2009, total

¹¹Congressionally directed DOD allocations for PH and TBI were included in explanatory statements and committee reports accompanying the respective public laws. In the case of large programs, funds are sometimes appropriated specifically for the program in question, either directly in the Appropriations Act or through incorporation by reference to sections of the relevant conference report. However, funds for a given program may also be included in a lump sum appropriation rather than being specifically appropriated for that program. Conference reports (and committee reports) often contain program-by-program funding information, but these congressional directions do not ordinarily create a legally binding subdivision of funds unless they have been incorporated by reference into the relevant Appropriation Act. Our totals represent funds specifically appropriated or otherwise designated by the DOD for PH and TBI activities out of lump sum appropriations.

¹²Although the National Defense Authorization Act for Fiscal Year 2008 directed DOD to establish a center of excellence for TBI and a center of excellence for PTSD and other mental health conditions, DOD established one center covering TBI and psychological health, which includes post-traumatic stress disorder. Congress, in fiscal year 2008 expanded the use of funding for post-traumatic stress disorder to include psychological health.

funding was \$395 million. In fiscal year 2010, appropriations totaled \$838.6 million.

DOD-Provided Data in Annual Reports to Congress on PH and TBI Are Incomplete and Unreliable

Annual reports submitted to Congress by DOD on amounts expended on PH and TBI have been incomplete; data on reported obligations are unreliable; and, in calculating the cost of medical care for patients with PH and TBI, DOD has not clearly stated what is and is not included in these figures, making it difficult to arrive at a comprehensive cost for DOD's PH and TBI activities. Section 1634 of the National Defense Authorization Act for Fiscal Year 2008 requires the Secretary of Defense to submit an annual report setting forth the amounts DOD expended during the preceding calendar year on activities relating to the diagnosis, treatment, and rehabilitation of servicemembers with PH (to include PTSD) or TBI concerns.¹³ Section 1634 further directs DOD to submit reports annually through 2013, with the first report being due no later than March 1, 2008. The Office of Force Health Protection and Readiness within the Office of the Assistant Secretary of Defense for Health Affairs coordinates and transmits this report to Congress on behalf of DOD and works in conjunction with the Office of the Chief Financial Officer, TRICARE Management Activity, to obtain the requested amounts. DOD has submitted four of these annual reports thus far. The first report was submitted on May 1, 2008; two reports for calendar year 2009 were submitted, one on June 30, 2009, and one on June 29, 2010; and the report for calendar year 2010 was submitted on May 10, 2011.

Our analysis of all four reports showed that, while the reports included information about reported obligations, they did not include expenditure data—as required by the law. Officials in the Office of the Assistant Secretary of Defense for Health Affairs, who are responsible for compiling and transmitting the reports, said that they had intentionally reported amounts obligated instead of amounts expended for two reasons: first, expenditures are recorded later, and second, obligation figures are more representative of current costs, which they interpreted to be Congress's primary interest. In response to the issues raised by our review, these officials said that in future reports they would provide an explanation of why the only figures reported are amounts obligated. While we recognize DOD's position on this matter, we note that reporting only amounts

¹³Pub. L. No. 110-181 § 1634 (2008).

obligated is not fully consistent with the statute. Furthermore, in the absence of expenditure data, Congress will not have a complete accounting of the cost of PH or TBI activities.

In all four reports, DOD presented general information on activities and associated amounts reported as having been obligated for PH and TBI. DOD also included the estimated number of patients served and the estimated costs for PH and TBI patient diagnosis and care. Beyond that, in responding to its annual reporting requirement, DOD pursued different approaches in its four annual reports. Accordingly, the types of information DOD presented varied each year. In its initial report, DOD identified spending plans and reported obligations for fiscal year 2008 O&M and RDT&E funds as of February 29, 2008. The first report provided general information on reported monthly O&M obligations across the six categories of civilian pay, travel, contracts, supplies, equipment, and other. The report also contained reported monthly obligations of RDT&E funds divided between PH and TBI. In contrast, the second, third, and fourth reports displayed funding data for reported O&M obligations according to the strategic initiatives of access to care, quality of care, resilience, transition, screening and surveillance, and leadership and advocacy. All reported RDT&E obligations were listed under the strategic initiative of research. The second, third, and fourth reports also described progress achieved to date and planned activities in the upcoming year for each strategic initiative. Absent from the third report was any discussion of procurement dollars, even though the summary table showed that \$20 million had been appropriated for Defense Health Program procurement in fiscal year 2009.

We found, however, that the O&M funding data that DOD provided for all four reports on PH and TBI activities are not reliable. As noted earlier, we reported in 2011 that we could not confirm the accuracy of O&M figures for DCOE and that we had unresolved concerns about the reliability of funding and obligations data provided by TRICARE Management Activity.¹⁴ In the present study, we have again found that O&M figures for

¹⁴GAO, *Defense Centers of Excellence: Limited Budget and Performance Information on the Center for Psychological Health and Traumatic Brain Injury*, [GAO-11-611](#) (Washington, DC: June 30, 2011).

DCOE and funding and obligations data provided by TRICARE Management Activity are unreliable.¹⁵

This lack of reliability is attributable to DOD's not having a coordinated mechanism enabling it to confirm the reliability of data maintained by the different databases used in reporting PH- and TBI-related funding. The Assistant Secretary of Defense for Health Affairs does not obtain needed data from one source; rather, in order to comprehensively identify DOD PH and TBI funding and projects, that office must assemble and integrate data obtained from several entities. Officials from the Office of the Secretary of Defense for Health Affairs obtain funding data from various information systems that are maintained by the TRICARE Management Activity, the services, and the Defense Finance and Accounting Service. To track PH and TBI activities funded with O&M dollars, TRICARE Management Activity officials use an internal, Web-based information system that extracts and aggregates funding data from the internal TRICARE Management Activity system as well as the individual service components' systems. TRICARE Management Activity officials said that they could confirm the reliability only of information extracted from their own internal TRICARE Management Activity system and that they rely on the services' PH/TBI program management offices to ensure the completeness and accuracy of the services' data. The TRICARE officials directed us to communicate directly with the respective services' PH/TBI program management offices regarding the completeness and accuracy of the services' data. Service program management and information system management officials in turn told us that their internal data systems were subcomponents of multiple military departmentwide financial management systems. For example, Army officials explained that to track Defense Health Program RDT&E funds, the Army Medical Research and Materiel Command, must rely on three separate servicewide systems—the Standard Army Finance Information System, the Standard Operation and Maintenance Army Research and

¹⁵To determine data reliability, we drafted and distributed a data reliability assessment questionnaire to DOD entities that provided us financial and project information. For additional information, see appendix I.

Development System, and the General Fund Enterprise Business System—to maintain visibility over relevant funding.¹⁶

We have identified internal control¹⁷ as a major part of managing an organization and providing reasonable assurance that an agency will produce reliable financial reporting, such as reports on budget execution, financial statements, and other reports for internal and external use. One of the standards for internal control entails the proper execution of transactions and events, accurate and timely recording of transactions and events, and controls over information processing. This standard includes a process for confirming completeness, accuracy, authorization, and validity of all transactions during processing.

TRICARE Management Activity officials acknowledged having a shortcoming in meeting the internal control standard for confirming completeness and accuracy in data and indicated that the Activity is moving to integrate its financial management systems. Until the Office of the Assistant Secretary of Defense for Health Affairs establishes quality control mechanisms coordinated specifically to address the collection and reporting of data related to PH and TBI activities maintained on DOD's and the services' various financial information management systems, Congress and others cannot be assured when using DOD's annually reported obligation and expenditure data that they are complete and accurate.

In addition, DOD includes in its annual reports the estimated costs of caring for patients with PH and TBI, but it does not clearly inform readers which costs they can expect to find included in these reports. For example, the first report states that the full costs of caring for PH and TBI are contained in multiple appropriations, yet the report includes only the costs from the Defense Health Program's appropriation. As another example, the report states that the scope of psychological health is very broad and includes programs ranging from preclinical to transitional health programs and services, as well as family, leadership, and community education and

¹⁶The Under Secretary of Defense (Comptroller)/Chief Financial Officer has acknowledged that DOD financial management systems do not substantially comply with federal financial management system requirements, U.S. generally accepted accounting principles, and the U.S. Government Standard General Ledger at the transaction level.

¹⁷GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, DC: November 1999).

training. However, DOD does not include the costs for these programs, and DOD's calculation of patient care includes only care for servicemembers who deployed to Afghanistan or Iraq. Also, although DOD states that patient care costs include "direct care and purchased care," it does not define these terms. In particular, it is not clear whether "direct care" includes the salaries of military medical personnel. As a result, it is not clear which patient care costs should be added to reported O&M, RDT&E, and procurement obligations to arrive at a comprehensive cost for DOD's PH and TBI activities. If DOD continues to provide a calculation of patient care costs in its annual reports without a clear explanation of what is and is not included in its calculation, DOD decisionmakers and Congress will not have information needed to enable them to make a complete assessment of how much it costs to provide PH and TBI-related activities.

Small Percentage of PH and TBI Projects Accounted for Preponderance of O&M Funding

In light of the shortcomings of the reported O&M obligation data that TRICARE Management Activity provided to us, we requested obligation information on DOD's O&M- and procurement-related PH and TBI projects directly from the military services' PH/TBI program management offices for the 2 years for which data were available— fiscal years 2009 and 2010.¹⁸ We determined that it was appropriate to use this project information for the purposes of this review because these are the data that DOD and the services use to manage their operations.¹⁹ According to the service program management offices' databases, 177 separate PH and TBI projects were funded with O&M funds in fiscal years 2009 and 2010: 152 in fiscal year 2009 and 133 in fiscal year 2010.²⁰ For both years, a small percentage of these projects accounted for the preponderance of reported obligation funds. For example, according to Army data, the Army undertook 71 and 52 projects in fiscal years 2009 and 2010, respectively. Of those projects, four accounted for more than half of its O&M-funded projects in both fiscal years. The four projects

¹⁸ We were unable to obtain data for fiscal years 2007 and 2008. TRICARE Management Activity distributed supplemental funds appropriated in 2007 as a 2-year appropriation for fiscal years 2007 and 2008. According to service officials, obligations and distributions were thus recorded and tracked as combined fiscal year 2007/2008 transactions, rather than separate fiscal years 2007 and 2008 transactions.

¹⁹ We note, however, that both the DOD Inspector General and GAO have identified weaknesses in these reported obligation data.

²⁰ Of the 177 separate PH and TBI projects, 102 projects spanned both fiscal years 2009 and 2010.

were designed to increase TBI care capabilities at six regional medical centers; to supplement rehabilitation capabilities at 16 facilities with large troop populations; and to hire additional behavioral health practitioners. According to Army data, prior to fiscal year 2007, each mental health practitioner had approximately 6.5 sessions per patient; by fiscal year 2010, each practitioner had an average of 8 sessions per patient. Similarly, 4 of the Navy's 63 projects accounted for more than 50 percent of its reported Defense Health Program O&M-funded obligations in fiscal years 2009 and 2010.²¹ The four projects focused on hiring staff and purchasing equipment and supplies to support timely access to PH and TBI health care; on a family support program to promote family unit cohesion following a servicemember's high-risk deployments; and on developing curriculums for service primary care providers to expand their knowledge of mental health services. Lastly, Air Force data indicate that 3 of its 18 projects accounted for less than 80 percent of its reported obligations for Defense Health Program O&M funding in fiscal years 2009 and 2010. That service's projects entailed the recruitment, qualification, and retention of health care workers at service medical treatment facilities both inside and outside the United States. We could not complete a similar analysis of O&M obligations for fiscal years 2007 and 2008, as the data for those years were unavailable. The services have used procurement funds to purchase computed tomography scanning²² and magnetic resonance imaging equipment to aid in the diagnosis and treatment of servicemembers with traumatic brain injuries.

Army and Defense Health Program RDT&E Funding Evenly Divided Between Clinical and Non-Clinical Projects

The Army Medical Research and Materiel Command, which has visibility over Army and Defense Health Program RDT&E-funded work for PH and TBI, identified 397 projects that were underway during fiscal years 2007 through 2009; data for all of fiscal year 2010 were unavailable at the time of our data request. Sixty-six percent of the 397 projects were Research and Technology Development (nonclinical) projects. These types of studies form the knowledge- and technology-based foundation necessary to establish the initial feasibility and practicality of proposed solutions to problems. The remaining 34 percent of the 397 projects were Clinical

²¹The Department of the Navy includes the Navy and the Marine Corps.

²²Computed tomography scanning is the imaging of anatomical information from a cross-sectional plane of the body, each image generated by a computer synthesis of x-ray transmission data obtained in many different directions in a given plane.

Research and Development—projects that are typically conducted in a clinical setting using human research volunteers (including patients) and are directed at amassing the definitive level of evidence required to inform changes in medical practice or required for licensure of a product regulated by the Food and Drug Administration. Although there were twice as many nonclinical as there were clinical projects, dollars awarded were distributed fairly evenly between these two types. See appendix III for a listing of the 397 RDT&E projects, and see appendix IV for descriptions of three examples the Army highlighted as representative of positive results achieved to date.

Multiple Entities Play Roles in PH and TBI Activities, but None Serves as Coordinating Authority

No one organization coordinates DOD's PH and TBI activities. The National Defense Authorization Act of Fiscal Year 2008 directed the Secretary of Defense to establish a Center of Excellence for PTSD and other mental health conditions and a second Center of Excellence for TBI and directed those Centers to, among other things, implement DOD's comprehensive plans for these issues, disseminate best practices, provide guidance, and conduct research. (For a complete listing of the responsibilities assigned to the Centers in this legislation, see app. II.) Subsequently, a Senior Oversight Committee established by the Secretaries of Defense and Veterans Affairs reported in its comprehensive plan to Congress that DOD had combined these two Centers into one DCOE for PH and TBI to lead efforts in practice standards, training, outreach, research, and direct care. We found, however, as we had in prior reports, that DCOE's strategic plan did not reflect a clear mission that focused the organization on its statutory responsibilities. Instead, responsibilities are dispersed among the TRICARE Management Activity, the Army Medical Research and Materiel Command, and others. While the Office of the Assistant Secretary of Defense for Health Affairs has broad oversight for all of DOD's missions, its global role prevents it from focusing on PH and TBI activities specifically.

Defense Center of Excellence for PH and TBI Was Directed to Implement DOD's Comprehensive Plans for PH and TBI

The National Defense Authorization Act for Fiscal Year 2008 directed the establishment of Defense Centers of Excellence to address the prevention, diagnosis, mitigation, treatment, and rehabilitation of PTSD and TBI and other mental health conditions.²³ In the legislation, Congress enumerated 10 responsibilities for the Center dedicated to PTSD and other mental health conditions and 13 responsibilities for the Center dedicated to TBI. Among other things, Congress directed the Centers to implement DOD's comprehensive plans for these issues, disseminate best practices, provide guidance, and conduct research. The comprehensive plan²⁴ that was issued by the DOD/VA Wounded, Ill, and Injured Senior Oversight Committee²⁵ combined the two Centers into one and reported that DOD had created this Center—DCOE—to lead efforts in PH and TBI practice standards, training, outreach, research, and direct care. The Committee assigned to DCOE the responsibility for acting as an information clearinghouse that would allow any servicemember or family member to navigate the system of care “with a single phone call.” It also assigned DCOE the responsibility for coordinating an overarching program of research that is relevant to the needs of the field, in coordination with other DOD organizations, the Department of Veterans Affairs, the National Institutes of Health, and other partners. In its own plan, DCOE further defined its anticipated mission. DCOE said that it would serve as a coordinating authority for DOD's PH and TBI issues and perform a DOD-wide gap analysis to identify needed programming. DCOE said that it would also provide teams for site visits to evaluate facilities and innovative practices and coordinate initiatives to address research gaps.

²³Pub. L. No. 110-181 §§ 1621-1622 (2008). PTSD was later incorporated into the category of psychological health.

²⁴*Report to Congress in Response to the National Defense Authorization Act for Fiscal Year 2008, Section 1618, Comprehensive Plan on Prevention, Diagnosis, Mitigation, Treatment, and Rehabilitation of, and Research on, Traumatic Brain Injury, Post-Traumatic Stress Disorder, and Other Mental Health Conditions in Members of the Armed Forces* (Oct. 31, 2008).

²⁵ This Committee was established by the Secretaries of Defense and Veterans Affairs in 2007 to make recommendations for existing policies on the coordination and sharing of resources between DOD and the Department of Veterans Affairs.

Multiple Organizations Have Purview over PH and TBI Initiatives

As stated previously, DCOE, in defining its mission, reported that it would serve as DOD's coordinating authority on PH and TBI matters. However, as also stated earlier, we found, as we had in our previous 2011 reports, that DCOE's strategic plan did not reflect a clear mission that focused the organization on its statutory responsibilities. Instead, responsibilities are dispersed among the TRICARE Management Activity, the Army Medical Research and Materiel Command, and others. While the Office of the Assistant Secretary of Defense for Health Affairs has broad oversight for all of DOD's missions, including DCOE, its global role prevents it from focusing on PH and TBI activities specifically.²⁶ At present, to report on DOD Defense Health Program-funded PH and TBI activities, the Office of the Assistant Secretary of Defense for Health Affairs must collect information on activities funded with O&M and procurement funds from the TRICARE Management Activity, while for activities funded with RDT&E funds, it collects the information from the Army Medical Research and Materiel Command and other DOD research activities. It must additionally obtain information directly from the military services, which have been given funds for these purposes. More importantly, no single organization is devoted to ensuring that accurate and timely data are available on DOD's PH and TBI activities, which would help to ensure that DOD-wide efforts are coordinated and do not involve duplication of effort.

Within the Office of the Assistant Secretary of Defense for Health Affairs, the TRICARE Management Activity Program, Budget, and Execution Division manages O&M and procurement funds for PH and TBI. The Office of the Chief Financial Officer is responsible for an internal, Web-based information system used to record and track Defense Health Program-related data on O&M-funded PH and TBI initiatives. The Office of Force Health Protection and Readiness operates and maintains a data management system called ProSight, which contains descriptions of the O&M-funded projects.

Separately, the Army Medical Research and Materiel Command manages the majority of the Defense Health Program's RDT&E funds for PH and TBI. In 2006, Congress directed the Secretary of Defense to designate an

²⁶ According to DOD Directive 5136.01, the Office of the Assistant Secretary of Defense for Health Affairs is responsible for ensuring the effective execution of DOD's medical mission, and, in carrying out that responsibility, is required to exercise authority, direction, and control over funding and other resources, which would include funds used for PH and TBI.

executive agent for coordinating and managing DOD's medical research efforts and programs relating to the prevention, mitigation, and treatment of blast injuries.²⁷ In response, DOD issued a directive in July 2006 designating the Secretary of the Army as the executive agent²⁸ for the purpose specified by Congress. The Secretary of the Army delegated the authority and assigned executive responsibility to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), who delegated authority and assigned program responsibility to the U.S. Army Medical Command. The Blast Injury Coordinating Office was established within and is managed by the Medical Research and Materiel Command, a subcomponent of the Army Medical Command, to assist in coordinating and managing relevant DOD medical research efforts and programs related to the prevention, mitigation, and treatment of blast injuries. According to the directive, a blast injury is defined as an injury that occurs as a result of the detonation of high explosives, including vehicle-borne and person-borne explosive devices, rocket-propelled grenades, and improvised explosive devices. According to a Medical Research and Materiel Command official, medical research on blast injuries is very often applicable to the prevention, mitigation, and treatment of PTSD, PH, and TBI.

To identify DOD's PH and TBI funding and projects, the Office of the Assistant Secretary of Defense for Health Affairs must reach out to several entities, acquire the discrete sets of data needed, and assemble them into a single integrated list. In conducting our review, we, too, had to obtain the information from several different sources, including the TRICARE Management Activity, the Medical Research and Materiel Command, and the individual military services, in order to compile a comprehensive, up-to-date, and reliable list of its PH and TBI activities. The office that provided us with data on obligations and expenditures related to O&M-funded PH and TBI was the TRICARE Management Activity Office of the Chief Financial Officer. The office that provided us descriptions of O&M-funded PH and TBI projects was the Assistant Secretary of Defense for Health Affairs' Force Health Protection and Readiness office. Officials in this office, which maintains the ProSight database, told us this database is solely a tool for monitoring the quantity

²⁷National Defense Authorization Act for Fiscal Year 2006, Pub. L. No. 109-163, § 256 (2006).

²⁸Department of Defense Directive 6025.21E, *Medical Research for Prevention, Mitigation, and Treatment of Blast Injuries* (July 5, 2006).

and type of projects—emphasizing that it is not an authoritative source of information on associated obligations or expenditures. In light of this limitation, as well as our assessment that the reported O&M obligation data TRICARE Management Activity provided us were unreliable, we requested obligation information on DOD’s O&M- and procurement-related PH and TBI projects directly from the military services, as discussed above. To obtain information on RDT&E projects, we requested data from the Army Medical Research and Materiel Command, which has visibility over the majority of Defense Health Program RDT&E appropriations. In a recently issued report, the RAND Corporation similarly found the identification of PH and TBI programs to be “a complex task.” RAND also found that no single source in DOD or any of the branches of service maintains a complete listing of programs, tracks the development of new programs, or has appropriate resources in place to direct servicemembers and their families to the full array of programs that best meet their needs.²⁹

Other Entities Also Play Roles in PH and TBI Matters

By the time DCOE was established in 2007, review groups, task forces, and presidential commissions had already developed more than 400 recommendations on how to improve the care and treatment of wounded warriors. These groups agreed that the Military Health System lacked the fiscal resources and fully trained personnel needed to fulfill its mission to support PH and TBI in peacetime, as well as the enhanced requirements imposed during times of conflict.

For example, to address rising concerns over the care and treatment of wounded warriors from Operations Enduring Freedom and Iraqi Freedom, in May 2007 the Secretaries of Defense and Veterans Affairs created a Senior Oversight Committee composed of officials and service chiefs from DOD, the Department of Veterans Affairs, and the military services. Tasked with initiating the process of reforming the system of care for wounded warriors, the committee dedicated one of its eight lines of action to addressing the issues of PH and TBI. In June 2007, the Office of Force Health Protection and Readiness, in the Office of the Assistant Secretary of Defense for Health Affairs, brought in subject matter experts from each of the services and the Department of Veterans Affairs’ healthcare system to

²⁹RAND, *Programs Addressing Psychological Health and Traumatic Brain Injury Among U.S. Military Servicemembers and Their Families* (Arlington, VA: 2011).

establish the “Red Cell”—a group meant to cut across routine channels to quickly implement changes. The Red Cell was tasked with reviewing the 400 recommendations for improving the care and treatment of wounded warriors and with formulating an action plan, developing proposals for policy changes needed to implement the plan, and serving as liaison with DOD and the Department of Veterans Affairs. DOD officials told us that the Committee remains in existence, although it was originally intended to be temporary. Section 1624 of the National Defense Authorization Act for Fiscal Year 2008 required that a report be submitted to Congress on the establishment of the centers of excellence for PH and TBI, among other things, and the Committee addressed that requirement.³⁰ Section 1618 of the 2008 National Defense Authorization Act also required that the Secretary of Defense, in consultation with the Secretary of Veterans Affairs, submit a comprehensive plan for programs and activities of the Department of Defense to prevent, diagnose, mitigate, treat, research, and otherwise respond to traumatic brain injury, PTSD, and other mental health conditions in members of the armed forces. A report was issued in response to that requirement in October 2008.³¹

When the Senior Oversight Committee was established in 2007, other committees already existed whose responsibilities included oversight of activities for PH and TBI. For example, in 2003 Congress established the Department of Defense-Department of Veterans Affairs Joint Executive Committee, to comprise the Deputy Secretary of Veterans Affairs and DOD’s Under Secretary of Defense for Personnel and Readiness, as well as others designated by the Secretary of Veterans Affairs and the Secretary of Defense.³² This committee was tasked, among other things, with reviewing and making recommendations for existing policies, procedures, and practices relating to the coordination and sharing of resources between DOD and the Department of Veterans Affairs and with identifying changes that would promote mutually beneficial coordination,

³⁰*Report on Establishment of Centers of Excellence: Report to Congress, DoD/VA Wounded, Ill, and Injured Senior Oversight Committee* (Nov. 19, 2008).

³¹*Report to Congress in Response to the National Defense Authorization Act for Fiscal Year 2008, Section 1618, Comprehensive Plan on Prevention, Diagnosis, Mitigation, Treatment, and Rehabilitation of, and Research on, Traumatic Brain Injury, Post-Traumatic Stress Disorder, and other Mental Health Conditions in Members of the Armed Forces* (Oct. 31, 2008).

³²National Defense Authorization Act for Fiscal Year 2004, Pub. L. No. 108-136 § 583 (Nov. 24, 2003), codified at 38 U.S.C. § 320.

use, or exchange of services and resources of the two Departments. Additionally, the law requires the committee to submit an annual report to the Secretaries, recommending strategic direction for joint coordination and sharing efforts between and within the two Departments, under 38 U.S.C. § 8111, and to oversee implementation of those efforts. The Joint Executive Committee subsequently issued a *Joint Strategic Plan for 2010-2012* to provide direction on DOD's and the Department of Veterans Affairs' joint efforts to coordinate and share resources. Under Goal 2, High Quality Health Care, this plan included various initiatives involving PH, TBI, and the Centers of Excellence. The Committee also created a subgroup to oversee these issues: the Health Executive Council's Psychological Health/Traumatic Brain Injury Working Group.

In 2002, a committee was established by DOD to provide guidance and oversight of all military health system programs: the Senior Military Medical Advisory Council, chaired by the Assistant Secretary of Defense for Health Affairs and made up of the services' surgeons general. The task of this council is to make recommendations concerning the military health system. In 2011, one of this council's initiatives was to create a Center of Excellence Advisory Board, which will have responsibility for reviewing all centers of excellence, including DCOE, with a view toward eliminating any duplication of efforts or unnecessary services.

As early as 1980, DOD had also established a committee to coordinate the efforts undertaken by the offices of the Under Secretary of Defense for Acquisition, Technology, and Logistics and the Assistant Secretary of Defense for Health Affairs. In that year, DOD created the Armed Services Biomedical Research Evaluation and Management Committee to be co-chaired by the Director of Defense Research and Engineering under the Under Secretary of Defense for Acquisition, Technology, and Logistics and the Assistant Secretary of Defense for Health Affairs. The purpose of this committee was to facilitate coordination within DOD biomedical research and development. (See table 1 for a listing of the organizations that play roles in addressing PH and TBI matters.)

Table 1: Defense Components with Roles Addressing PH and TBI

| Number | Defense component | Duties |
|---------------|---|--|
| 1 | Office of the Assistant Secretary of Defense for Health Affairs | Oversees the Military Health System, a global medical network that provides health care to all U.S. military personnel worldwide |
| | TRICARE Management Activity | Manages and executes O&M and procurement funding for PH and TBI, including funding for the Defense Center of Excellence |
| | Office of Force Health Protection and Readiness | Coordinates and transmits the annual report required by section 1634 of the National Defense Authorization Act for Fiscal Year 2008 to Congress on behalf of DOD and works in conjunction with the Office of the Chief Financial Officer, TRICARE Management Activity, to obtain the requested amounts Operates and maintains a data management system called ProSight, which contains descriptions of the O&M-funded projects. |
| | Defense Center of Excellence for PH and TBI | Established in 2007 to lead DOD's effort to develop excellence in its prevention of, outreach to, and care for those suffering from these conditions |
| 2 | Army Medical Research and Materiel Command | Manages and executes the majority of Defense Health Program RDT&E funding for PH and TBI |
| 3 | Joint DOD/Veterans Affairs Wounded, Ill, and Injured Senior Oversight Committee | Established in 2007 and tasked with initiating reform of the system of care for wounded warriors; one of its eight lines of action addresses the issues of PH and TBI |
| 4 | Joint Executive Committee (Undersecretary of Defense for Personnel and Readiness and Deputy Secretary for Veterans Affairs) | Established in 2003 and tasked with reviewing and making recommendations regarding policies, procedures, and practices relating to the coordination and sharing of resources between DOD and the Department of Veterans Affairs |
| | Health Executive Council's Psychological Health / Traumatic Brain Injury Working Group | Subgroup created by the Joint Executive Committee to oversee PH and TBI issues |
| 5 | Senior Military Medical Advisory Council | Established in 2002 and tasked with making recommendations concerning the military health system; recently created the Center of Excellence Advisory Board |
| | Center of Excellence Advisory Board | Established in 2011 and tasked with reviewing all centers of excellence, including DCOE, so as to avert any duplication of efforts or unnecessary services |
| 6 | Armed Services Biomedical Research Evaluation and Management Committee | Established in 1980 and tasked with facilitating coordination within DOD for biomedical research and development |

Source: Compiled by GAO based on DOD information.

While these DOD and Veterans Affairs' organizations may each serve a unique purpose, the organization responsible for addressing reform efforts needed for PH and TBI (the DOD/VA Wounded, Ill, and Injured Senior Oversight Committee) intended DCOE to be the information clearinghouse and coordinator of an overarching program of research for PH and TBI matters. DCOE did not ultimately grow into that role. Also, though the Office of the Assistant Secretary of Defense for Health Affairs provides broad oversight for all of DOD's missions, its global role

prevents it from focusing on PH and TBI activities specifically. Until a single organization is tasked with coordinating DOD's PH and TBI activities, DOD's ability to manage these activities will remain fragmented, and duplication of effort remains a possibility.

Conclusions

Despite the heightened significance of PH and TBI matters, the attention drawn to them by numerous studies, and the more than \$2.7 billion of appropriated funds that supported related programs, DOD is not currently in a position to readily report in a reliable manner on how funds are being used to provide benefits to servicemembers. While DOD has undertaken a number of initiatives, the information that it has been reporting has been incomplete and based on data that are unreliable. Further, DOD's visibility of PH and TBI activities remains limited because it must collect information from many entities—the TRICARE Management Activity, the Assistant Secretary of Defense for Health Affairs' Force Health Protection and Readiness Office, the Army Medical Research and Materiel Command, and the individual military services. At present, there is no entity tasked with maintaining up-to-date and comprehensive information on DOD's PH and TBI activities and, more importantly, no entity coordinates DOD's PH and TBI activities. As a result, DOD is hampered in its efforts to ensure that resources are used effectively to meet goals; and Congress and entities with oversight responsibility will be limited in their ability to obtain reliable information to guide their decisionmaking.

Recommendations for Executive Action

To increase visibility over how DOD is spending appropriated funds to address PH and TBI conditions, we recommend that the Secretary of Defense direct the Assistant Secretary of Defense for Health Affairs to take the following four actions:

- (1) include expenditures for PH and TBI activities in annual reports to Congress as directed by Section 1634 of the National Defense Authorization Act for Fiscal Year 2008;
- (2) develop, maintain, and coordinate quality control mechanisms that help ensure that the obligation and expenditure data they report on PH and TBI projects and research are complete and accurate;
- (3) if patient costs are provided in future annual reports, clearly show what is included and not included for all patient costs; and

-
- (4) revisit DCOE's role as DOD's coordinating authority for issues concerning PH and TBI, as stated in its own plan, and determine whether it or another organization should perform this function.

Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD concurred with all four of our recommendations (see app. V). In concurring with our first recommendation, which addresses the need to include expenditures in DOD's annual reports, DOD stated that it will include available expenditure data in the next annual report but noted that expenditure data often lag behind the end of the fiscal year by several months. We agree, but since the upcoming annual report is the fifth report, expenditure data would be available for the preceding years.

In commenting on our second recommendation, which concerns quality control mechanisms to help ensure the completeness and accuracy of data, DOD stated that the DOD accounting structure does not allow for a single system of assembling and reporting fiscal data but that the Office of the Assistant Secretary of Defense for Health Affairs and TRICARE Management Activity will take steps to improve the accuracy and reliability of the data. While we commend DOD's efforts to improve the accuracy of its data, we did not recommend that it maintain a single data system; we believe that multiple systems can be coordinated to provide accurate and reliable data if appropriate internal controls are in place.

In concurring with our third recommendation—to clearly show in annual reports what is included and what is not included in the calculation of patient costs, if such costs are to be provided in future annual reports—DOD stated it will omit this information in future reports, as it is confusing. While DOD's report is not explicitly required to include the cost of patient care, we believe that DOD's inclusion of the cost of patient care in its annual reports, if clearly presented, would provide a more complete picture of overall TBI and PH costs.

Lastly, in concurring with our fourth recommendation, to revisit DCOE's role as DOD's coordinating authority for issues concerning PH and TBI and determine whether DCOE or another organization should perform this function, DOD stated that a "revisit" of DCOE's role is currently underway. DOD stated that the Center of Excellence Advisory Board, part of the Military Health System's governance structure, is overseeing the development of a revised and detailed concept of operations for DCOE. DOD also stated that its Cost Assessment and Program Evaluation Office has requested that DCOE assume a larger role in the evaluation of

psychological health and traumatic brain injury programs. We commend DOD for undertaking a revisit of DCOE's role, especially in having DCOE evaluate current programs. Such evaluations should provide DOD with valuable information that will help decisionmakers determine how to maximize resources to ensure that funds are spent as efficiently as possible.

The Office of the Assistant Secretary of Defense for Health Affairs and the Department of the Army provided technical comments as well, which we have addressed in the report text, where applicable.

We are sending copies of this report to the Secretary of Defense, the Assistant Secretary of Defense for Health Affairs, appropriate congressional committees, and other interested parties. This report will also be available at no charge on GAO's Web site at <http://www.gao.gov>.

If you or your staff have questions about this report, please contact me at (202) 512-3604 or farrellb@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.



Brenda S. Farrell
Director, Defense Capabilities
and Management

Appendix I: Scope and Methodology

In the course of our review, we obtained information from or interviewed officials with the Office of the Secretary of Defense, in Falls Church, Virginia; TRICARE Management Activity, in Falls Church, Virginia; Army Medical Command, in Joint Base San Antonio, Texas; Army Medical Research and Materiel Command, in Fort Detrick, Maryland; Navy Bureau of Medicine, in Washington, D.C.; and Air Force Medical Service, in Joint Base San Antonio, Texas.

To determine how much funding was received by activities related to PH and TBI for fiscal years 2007 through 2010, we reviewed DOD appropriations acts and accompanying committee reports from fiscal years 2007 through 2010, and we interviewed and obtained documentation from officials with the TRICARE Management Activity. To assess how accurately DOD has been in reporting obligations and expenditures for PH and TBI in its required annual reports to Congress, we reviewed section 1634 of the 2008 National Defense Authorization Act mandating the annual reports and analyzed DOD's annual reports to Congress on expenditures for activities on PH and TBI for calendar years 2008, 2009, and 2010. In addition, we interviewed officials with the Office of the Assistant Secretary of Defense for Health Affairs and the TRICARE Management Activity regarding the methodology used to develop each of the four annual reports. To determine the PH and TBI activities for which O&M and procurement funds had been obligated, we obtained documentation from and conducted interviews with officials at the TRICARE Management Activity. To determine activities for which RDT&E funds had been obligated, we obtained documentation from and conducted interviews with officials from the Army Medical Research and Materiel Command. To assess and verify the reliability of the obligation data received from these DOD entities, we drafted and distributed a data reliability assessment questionnaire to DOD entities that provided us financial and project information. From the officials' responses, we received information on the purpose of, the collection processes, and the internal quality controls used by the respective entity's financial information system. In addition, we interviewed officials with the TRICARE Management Activity and the military departments about their policies and internal control procedures used to ensure the accuracy and reliability of information entered into DOD's information and financial management systems. We and the DOD Inspector General have reported on the unreliability of DOD's financial transactions data, including

accounting for obligations.¹ However, because these data are the only data available describing how PH/TBI funds are used and they are the data used by DOD and the military services to manage their operations, we determined that it is appropriate to use these data for the purpose of our report. Although we requested and received expenditure data from DOD, we identified several inconsistencies and determined the data were unreliable. As a result, we excluded that information and reported only on those PH and TBI activities for which funds had been obligated.

To evaluate DOD's ability to coordinate all PH and TBI activities to help ensure that funds are used to support programs of the most benefit to servicemembers, we interviewed officials with the Office of the Assistant Secretary of Defense for Health Affairs, TRICARE Management Activity, Defense Center of Excellence for Psychological Health and Traumatic Brain Injury, and Army Medical Research and Materiel Command.

In addition, we reviewed the legislation establishing the Defense Centers of Excellence. We also reviewed the Senior Oversight Committee's 2008 report to Congress outlining its strategy for transforming and expanding PH and TBI services and providing protection, prevention, diagnosis, treatment, recovery, and care transition to military members. We also reviewed section 583 of the National Defense Authorization Act for 2004 that established the Joint Executive Committee, which was tasked with, among other things, reviewing policies, procedures, and practices relating to the coordination and sharing of resources between the Department of Veterans Affairs and DOD and making related recommendations. We reviewed the Joint Executive Council's *Joint Strategic Plan for 2010-2012*, which provided direction on DOD's and the Department of Veterans Affairs' joint efforts to coordinate and share resources and described a

¹In conducting prior work in this area, the GAO team tested DCOE obligations recorded by TMA for DCOE to supporting documentation and found that while the date and amount of obligations were properly recorded, there were problems at the subobject classification level for fiscal year 2009. See *Defense Health: Management Weaknesses at Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury Require Attention*, [GAO-11-219](#) (Washington, DC: Feb. 28, 2011). See also GAO, *DOD Financial Management: Weaknesses in Controls over the Use of Public Funds and Related Improper Payments*, [GAO-11-950T](#) (Washington, DC: Sept. 22, 2011) and *DOD Financial Management: Improvements Are Needed in Antideficiency Act Controls and Investigations*, [GAO-08-1063](#) (Washington, DC: Sept. 26, 2008) and Department of Defense Office of Inspector General, *Independent Auditor's Report on the DOD Agency wide FY 2010 and 2009 Basic Financial Statements*, Report D-2011-013 (Arlington, VA: Nov. 15, 2010).

subgroup formed to oversee PH and TBI issues, the Health Executive Council's Psychological Health/Traumatic Brain Injury Working Group. In addition, we reviewed documents describing the role of a committee established by DOD in 2002 to provide guidance and oversight of all military health system programs: the Senior Military Medical Advisory Committee, chaired by the Assistant Secretary of Defense for Health Affairs and made up of the services' surgeons general. Finally, we reviewed DOD's guidance on the Armed Services Biomedical Research Evaluation and Management Committee to coordinate efforts undertaken by the offices of the Under Secretary of Defense for Acquisition, Technology and Logistics and the Assistant Secretary of Defense for Health Affairs.

We conducted this performance audit from July 2010 through January 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Responsibilities for the Defense Centers of Excellence as Detailed in the National Defense Authorization Act for Fiscal Year 2008

In sections 1621 and 1622 of the National Defense Authorization Act for Fiscal Year 2008, Pub. L. No. 110-181 (2008), Congress directed the Department of Defense to establish Defense Centers of Excellence for Traumatic Brain Injury (TBI) and for Post-Traumatic Stress Disorder (PTSD) and other mental health conditions.

Section 1621 states that the Center of Excellence for TBI shall have the following responsibilities:

1. To implement the comprehensive plan and strategy for the Department of Defense, required by section 1618 of this Act, for the prevention, diagnosis, mitigation, treatment, and rehabilitation of traumatic brain injury, including research on gender and ethnic group-specific health needs related to traumatic brain injury.
2. To provide for the development, testing, and dissemination within the Department of best practices for the treatment of traumatic brain injury.
3. To provide guidance for the mental health system of the Department in determining the mental health and neurological health personnel required to provide quality mental health care for members of the Armed Forces with traumatic brain injury.
4. To establish, implement, and oversee a comprehensive program to train mental health and neurological health professionals of the Department in the treatment of traumatic brain injury.
5. To facilitate advancements in the study of the short-term and long-term psychological effects of traumatic brain injury.
6. To disseminate within the military medical treatment facilities of the Department best practices for training mental health professionals, including neurological health professionals, with respect to traumatic brain injury.
7. To conduct basic science and translational research on traumatic brain injury for the purposes of understanding the etiology of traumatic brain injury and developing preventive interventions and new treatments.
8. To develop programs and outreach strategies for families of members of the Armed Forces with traumatic brain injury in order to mitigate the negative impacts of traumatic brain injury on such family members and to support the recovery of such members from traumatic brain injury.

9. To conduct research on the mental health needs of families of members of the Armed Forces with traumatic brain injury and develop protocols to address any needs identified through such research.
10. To conduct longitudinal studies (using imaging technology and other proven research methods) on members of the Armed Forces with traumatic brain injury to identify early signs of Alzheimer's disease, Parkinson's disease, or other manifestations of neurodegeneration, as well as epilepsy, in such members, in coordination with the studies authorized by section 721 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109-364; 120 Stat. 2294) and other studies of the Department of Defense and the Department of Veterans Affairs that address the connection between exposure to combat and the development of Alzheimer's disease, Parkinson's disease, and other neurodegenerative disorders, as well as epilepsy.
11. To develop and oversee a long-term plan to increase the number of mental health and neurological health professionals within the Department in order to facilitate the meeting by the Department of the needs of members of the Armed Forces with traumatic brain injury until their transition to care and treatment from the Department of Veterans Affairs.
12. To develop a program on comprehensive pain management, including management of acute and chronic pain, to utilize current and develop new treatments for pain, and to identify and disseminate best practices on pain management related to traumatic brain injury.
13. Such other responsibilities as the Secretary shall specify.

Section 1622 states that the Center of Excellence for PTSD and Other Mental Health Conditions shall have the following responsibilities:

1. To implement the comprehensive plan and strategy for the Department of Defense, required by section 1618 of this Act, for the prevention, diagnosis, mitigation, treatment, and rehabilitation of post-traumatic stress disorder and other mental health conditions, including research on gender and ethnic group-specific health needs related to post-traumatic stress disorder and other mental health conditions.
2. To provide for the development, testing, and dissemination within the Department of best practices for the treatment of post-traumatic stress disorder and other mental health conditions.

3. To provide guidance for the mental health system of the Department in determining the mental health and neurological health personnel required to provide quality mental health care for members of the Armed Forces with post-traumatic stress disorder and other mental health conditions.
4. To establish, implement, and oversee a comprehensive program to train mental health and neurological health professionals of the Department in the treatment of post-traumatic stress disorder and other mental health conditions.
5. To facilitate advancements in the study of the short-term and long-term psychological effects of post-traumatic stress disorder and other mental health conditions.
6. To disseminate within the military medical treatment facilities of the Department best practices for training mental health professionals, including neurological health professionals, with respect to post-traumatic stress disorder and other mental health conditions.
7. To conduct basic science and translational research on post-traumatic stress disorder and other mental health conditions for the purposes of understanding the etiology of post-traumatic stress disorder, and developing preventive interventions and new treatments.
8. To develop programs and outreach strategies for families of members of the Armed Forces with post-traumatic stress disorder and other mental health conditions in order to mitigate the negative impacts of post-traumatic stress disorder and other mental health conditions on such family members and to support the recovery of such members from post-traumatic stress disorder and other mental health conditions.
9. To conduct research on the mental health needs of families of members of the Armed Forces with post-traumatic stress disorder and other mental health conditions and develop protocols to address any needs identified through such research.
10. To develop and oversee a long-term plan to increase the number of mental health and neurological health professionals within the Department in order to facilitate the meeting by the Department of the needs of members of the Armed Forces with post-traumatic stress disorder and other mental health conditions until their transition to care and treatment from the Department of Veterans Affairs.

Appendix III: RDT&E-Funded Projects

The Army Medical Research and Materiel Command, which has visibility over RDT&E-funded work for PH and TBI, identified 397 projects that were underway during fiscal years 2007 through 2009; data for all of fiscal year 2010 were unavailable at the time of our data request. Sixty-six percent of the 397 projects were Research and Technology Development (nonclinical) projects. These types of studies form the knowledge- and technology-based foundation necessary to establish the initial feasibility and practicality of proposed solutions to problems. The remaining 34 percent of the 397 projects were Clinical Research and Development—projects that are typically conducted in a clinical setting using human research volunteers (including patients) and are directed at amassing the definitive level of evidence required to inform changes in medical practice or required for licensure of a product regulated by the Food and Drug Administration. Although there were twice as many nonclinical as there were clinical projects, dollars awarded were distributed fairly evenly between these two types.

Table 2: RDT&E-funded Projects Addressing PH and TBI

| Clinical Research and Development (award titles) | Number of projects funded under title |
|---|---------------------------------------|
| A Comprehensive Approach in Dissemination of Evidence-Based Care for Post-Traumatic Stress Disorder (PTSD) | 1 |
| A Double Blind Trial of Divalproex Sodium for Affective Liability and Alcohol Use Following Traumatic Brain Injury (TBI) | 1 |
| A Placebo-Controlled Augmentation Trial of Prazosin for Combat Trauma PTSD | 1 |
| A Randomized Clinical Trial of Ganaxolone for the Treatment of Severe Traumatic Brain Injury | 2 |
| A Randomized Controlled Study of Mind-Body Skills Groups for Treatment of War-Zone Stress in Military and Veteran Populations | 1 |
| A Randomized Controlled Trial of Medical Therapies for Chronic Post-Traumatic Headaches | 1 |
| A Randomized Effectiveness Trial of a Systems-Level Approach to Stepped Care for War-Related PTSD | 3 |
| A Randomized, Placebo-Controlled Trial of the Dopamine Beta Hydroxylase (DBH) Inhibitor, Nopicastat, for the Treatment of PTSD in Operation Iraqi Freedom (OIF)/Operation Enduring Freedom (OEF) Veterans | 1 |
| A Randomized, Placebo-Controlled Trial of the Dopamine-?-Hydroxylase (DBH) Inhibitor, Nopicastat for the Treatment of PTSD in OIF/OEF Veterans | 1 |
| Acupuncture as a Novel Technique for Treating Insomnia in the Outpatient Traumatic Brain Injury Population: A Randomized Controlled Trial | 1 |
| Acupuncture for Combat-Related Post-Traumatic Stress Disorder | 1 |
| Acupuncture for the Treatment of Trauma-Induced Spectrum Disorder: A Three-Armed Randomized Pilot Study | 1 |
| Adaptive Disclosure: A Combat-Specific PTSD Treatment | 3 |
| Addressing the Needs of Children and Families of Combat Injured | 1 |
| Advanced Restoration Therapies in Spinal Cord Injury | 2 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|--|--|
| An Evaluation of Cognitive Processing Therapy to Treat Veterans in a PTSD Residential Rehabilitation Program | 1 |
| Biomarker Assessment for Neurotrauma Diagnosis and Improved Triage System (BANDITS) with Modification-assessment of biomarkers of concussion and acute TBI | 2 |
| Biomarkers for PTSD | 1 |
| Building Infrastructure to Accelerate Transfer of Basic Research in Spinal Cord Injury (SCI) to Clinical Practice: North American Clinical Trials Network (NACTN) for Treatment of Spinal Cord Injury | 1 |
| Building Neurocognitive Resilience with Attention Training in a Military Cohort | 1 |
| Burr Hole Creation Simulation-Based Training System | 1 |
| Cognitive Behavioral Therapy (CBT) for TRICARE Management Activities in OEF/OIF Veterans | 1 |
| Clinical Phase II B Trial of Oxycyte Perfluorocarbon in Severe Human Traumatic Brain Injury | 1 |
| Clinical Phase II- B Trial of Oxycyte Perfluorocarbon in Severe Human Traumatic Brain Injury | 1 |
| Cognitive Behavioral Social Rhythm Therapy (CBSRT) for Sleep and Mood Disturbances in Veterans with PTSD | 1 |
| Combat Stress Casualty Reduction: Predeployment Stress Inoculation Training | 1 |
| Combat, Sexual Assault, and Post-Traumatic Stress in OIF/OEF Military Women | 1 |
| Comparing Internet and In-Person Brief Cognitive Behavioral Therapy of Insomnia | 1 |
| Comparing Virtual Reality Exposure Therapy to Prolonged Exposure in the Treatment of Soldiers with PTSD | 1 |
| Computer-Guided Prolonged Exposure Therapy for PTSD | 1 |
| Day-to-Day Mindfulness Skills for Improving Veterans' Quality of Life and Wellness in Health Care Mental Health Settings | 1 |
| Development and Pilot of an Intervention for Military Personnel and Their Families | 1 |
| Development and Validation of a PTSD-Related Impairment Scale | 1 |
| Discovery and Validation of Peripheral Biomarkers of Traumatic Brain Injury | 1 |
| Dissemination of Evidence-Based CBT Intervention Components: Online Self-Administered Training for Providers Treating Military Deployment-Related PTSD | 2 |
| Does Integrating Primary Care and Mental Health Services Improve Mental Health Services Utilization, Symptoms, and Functioning Among OEF/OIF Veterans? | 1 |
| Effectiveness of Cognitive Exposure and Skills Group Manualized Treatments in OIF/OEF Female Veterans | 2 |
| Enhancing Emotion Regulation during Driving in OEF/OIF Veterans | 1 |
| Enhancing Exposure Therapy for PTSD: Virtual Reality and Imaginal Exposure with Cognitive Enhancer | 1 |
| Evaluating PTSD on Reproductive Outcomes: Women Deployed in Iraq and Afghanistan | 1 |
| Evaluation and Impact of mCare, a Cell Phone Based Bi-Directional Messaging System, on the Case Management Care of Traumatic Brain Injury Patients Assigned to Community Based Warrior in Transition Units | 1 |
| Evaluation of a Yoga Intervention for PTSD | 2 |
| Evaluation of an Acute Ribonucleic Acid (RNA)-Mediated Therapeutic for Visual Dysfunction Associated with Traumatic Brain Injury | 1 |
| Evaluation of the Tripler Army Medical Center (TAMC) Integrative Pain Management Center (IPMC) | 2 |
| Evidence Based Multimodal Neurodiagnostic Imaging of Traumatic Brain Injury and PTSD at SANIC | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|--|--|
| Evidence-Based Multimodal Neurodiagnostic Imaging of Traumatic Brain Injury and Post-Traumatic Stress Disorder at SANIC | 2 |
| Family Functioning and Soldier PTSD: Correlates of Treatment Engagement and Military Job Satisfaction | 1 |
| Family-Based Intervention With Traumatized Service Members and Their Young Children | 1 |
| Families Overcoming and Coping With Stress – Combat Injured (FOCUS-CI): A Preventive Intervention With Children and Families of the Combat Injured | 1 |
| Fiscal Year 2008 Deployment Related Medical Research Program (DRMRP) Clinical Trial: Strengthening Pathways to PTSD Recovery Using Systems-Level Intervention | 1 |
| Homecoming Line: Telephone Support for Veterans | 1 |
| Hyperbaric Oxygen Therapy in the Treatment of Chronic Mild-Moderate Blast-Induced Traumatic Brain Injury Post-Concussion Syndrome (PCS) and Post-Traumatic Stress Disorder | 1 |
| Identification of and At-Risk Interventions for Predeployment Psychophysiological Predictors of Postdeployment Mental Health Outcomes | 1 |
| Importance of Virtual Reality in the Treatment of PTSD: Comparison of Virtual Reality to a Controlled Stimulus | 1 |
| Improving PTSD Outcomes in OIF/OEF Returnees: A Randomized Clinical Trial of Hydrocortisone Augmentation of Prolonged Exposure Therapy | 1 |
| Initial Randomized Controlled Trial of Acceptance and Commitment Therapy (ACT) for Distress and Impairment in OEF/OIF Veterans | 2 |
| Innovative Service Delivery for Secondary Prevention of PTSD in At-Risk OIF-OEF Service Men and Women | 1 |
| Integrating Mental Health and Primary Care Services for OEF/OIF Combat Veterans With PTSD and Comorbid Disorders: Assessing the Evidence | 1 |
| Interhemispheric Information Transfer: A New Diagnostic Method for Mild Traumatic Brain Injury | 1 |
| Military to Civilian: Randomized Controlled Trial (RCT) of an intervention to promote post-deployment reintegration. | 1 |
| Military, Family, and Community Networks Helping with Reintegration | 1 |
| Mindfulness and Self-Compassion Meditation for Combat Post-Traumatic Stress Disorder: Randomized Controlled Trial and Mechanistic Study | 1 |
| Mission Connect Mild TBI Translational Research Consortium | 3 |
| Mortuary Affairs Soldiers: Early Intervention and Altering Barriers to Care for Traumatic Stress and PTSD | 1 |
| Motivating Treatment Seeking and Behavior Change by Untreated Military Personnel Abusing Alcohol or Drugs | 1 |
| Non-invasive Monitoring of Cerebral Venous Saturation in Patients with Traumatic Brain Injury | 1 |
| Objective Methods to Test Visual Dysfunction in the Presence of Cognitive Impairment | 1 |
| Oculomotor reflexes as a test of visual dysfunctions in cognitively impaired observers | 1 |
| Operation Brain Trauma Therapy (OBTT) | 1 |
| Optimizing Delivery of Mindfulness-Based Military Training Interventions in Army Infantry Platoons | 1 |
| Phase II Clinical Trial of NNZ-2566 in Traumatic Brain Injury | 3 |
| Pilot Trial of Inpatient Cognitive Therapy for the Prevention of Suicide in Military Personnel With Acute Stress Disorder or Posttraumatic Stress Disorder | 1 |
| Prazosin for Treatment of Patients With PTSD and Comorbid Alcohol Dependence | 1 |
| PTSD and Substance Abuse | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|---|--|
| PTSD Biomarker Studies (Army Research Office) | 1 |
| PTSD, Comorbid Disorders, and Service Utilization in Women Veterans | 1 |
| PTSD/TBI Clinical Consortium Coordinating Center | 2 |
| Randomized Controlled Equivalence Trial Comparing Videoconference and Face-to-Face Delivery of Cognitive Processing Therapy for PTSD | 1 |
| Real-Time EEG Monitoring System (R-TEEMS) for Acute Traumatic Brain Injury | 1 |
| Reintegration: The Role of Spouse Telephone Battlemind | 2 |
| Reintegration: The Role of Spouse Telephone BATTLEMIND and Developing a Family/Community BATTLEMIND Curriculum | 2 |
| Restoration of Life Role Participation Through Integrated Cognitive and Motor Training for Individuals with TBI | 1 |
| Seeking Safety Therapy for PTSD, TBI, and Substance Use Disorder | 1 |
| Special Warrior Wellness Action Team (SWWAT) Program at Camp LeJeune | 1 |
| Strength at Home: Veteran's Program | 1 |
| Suicide Research Alliance | 2 |
| Systems Biology Efforts in PTSD | 1 |
| Telemedicine for Improved Delivery of Psychosocial Treatments for Post-Traumatic Stress Disorder | 1 |
| Telemental Health and Cognitive Processing Therapy for Female Combat Veterans with Military-Related PTSD | 1 |
| Telemental Health and Cognitive Processing Therapy for Rural Combat Veterans with PTSD | 2 |
| Telerehabilitation for OIF/OEF Returnees with Combat Related Traumatic Brain Injury | 1 |
| Telerehabilitation for OIF/OEF Returnees with Combat-Related Traumatic Brain Injury | 1 |
| The Impact of Meditation on Veterans with Post-Traumatic Stress Disorder | 1 |
| The Impact of Supported Employment Versus Standard Vocational Rehabilitation in Veterans With PTSD | 1 |
| The STRONG STAR Multidisciplinary PTSD Research Consortium | 9 |
| The Use of Psychiatric Service Dogs in the Treatment of Veterans with PTSD | 1 |
| To Support Institute of Creative Technologies (ICT) contract W911NF-04-D-0005 | 1 |
| Treatment of Traumatic Brain Injury Using NNZ-2566: Clinical Trials | 1 |
| Using Functional Magnetic Resonance Imaging (fMRI) to Measure Brain Response to Exposure-Based Psychotherapy in Individuals with Combat-Related PTSD | 1 |
| Using Propranolol to Block Memory Reconsolidation in Female Veterans with PTSD | 1 |
| Validation of the Military Acute Concussion Evaluation (MACE) for In-Theater Evaluation of Combat-Related Traumatic Brain Injury | 1 |
| Validation of the Peritraumatic Behavior Questionnaire-Observer Rated (PBQ-OR), an Instrument for Embedded Medical Personnel to Assess In-Theater Risk for PTSD | 1 |
| Virtual Reality and Cellular Phones as a Complementary Intervention for Veterans with PTSD and Substance Use Disorders | 1 |

Appendix III: RDT&E-Funded Projects

| Research and Technology Development (award titles) | Number of projects funded under award title |
|---|--|
| A Behavioral Treatment for Traumatic Brain Injury--Associated Visual Dysfunction Based on Adult Cortical Plasticity | 1 |
| A Blast Model of Traumatic Brain Injury in Swine | 1 |
| A Brain-Machine-Brain Interface for Rewiring of Cortical Circuitry after Traumatic Brain Injury | 2 |
| A Brief Intervention to Reduce Suicide Risk in Military Service Members and Veterans | 1 |
| A Longitudinal Study of the Impact of Combat Deployments on Military Personnel and Their Families | 1 |
| A Multifunctional Blood Substitute (MBS) for Field Resuscitation of Polytrauma Combat Casualties with Brain Injury and Concomitant Hemorrhagic Shock | 1 |
| A Novel Application of Ceftriaxone to Enhance Glutamate Transport after Traumatic Brain Injury | 1 |
| A Pilot Study to Identify Barriers to Treatment in OIF/OEF Veterans with PTSD and Low Back Pain in Establishing Transdisciplinary Complementary Interventions | 1 |
| A randomized control trial of a community mental health intervention for military personnel | 3 |
| Advanced Magnetic Resonance Imaging (MRI) in Acute Military TBI | 1 |
| Advanced MRI in Blast-Related TBI | 1 |
| Advanced Sensors for TBI | 2 |
| American Institute for Medical and Biological Engineering (AIMBE) - Military Collaboration: Bioengineering Challenges of Brain Trauma Conference | 1 |
| An fMRI Study of TBI Associated with Blast Injury | 1 |
| Antidepressants and the Risk of Self-Harm and Unintentional Injury Among Younger Veterans | 1 |
| Application of Repetitive Transcranial Magnetic Stimulation (rTMS) to Reverse the Molecular Epileptogenic Changes Following Post-Traumatic Brain Injury | 1 |
| Are Blast Brain Injuries Fundamentally Different than Traditional Experimental Models of TBI? | 1 |
| Assessment of Acute Concussion in a Combat Environment: Concurrent Validity, Sensitivity, and Specificity of the Automated Neuropsychological Assessment Metrics (ANAM) | 2 |
| Adenosine Triphosphate (ATP)-Sensitive Potassium Channels for Neuroprotection from Blast-Induced TBI | 1 |
| Auditory, Vestibular, and Cognitive Effects from Repeated Blast | 1 |
| Auditory, Vestibular, and Cognitive Effects Due to Repeated Blast Exposure on the Warfighter | 1 |
| BANDITS with Modification-assessment of biomarkers of concussion and acute TBI | 1 |
| Basic Training and Mental Fitness Study: Enhancing Performance and Mental Health | 1 |
| Bioluminescence Imaging in Traumatic Brain Injury: Implications for Pharmacotherapy | 1 |
| Biomarkers: Evaluating and Treating Acute and Chronic TBI | 1 |
| Blister Packaging Medication to Increase Treatment for Adherence and Clinical Response: Impact on Suicide-related Morbidity and Mortality | 1 |
| Blockade of Nociceptin Signaling Reduces Biochemical, Structural, and Cognitive Deficits After Traumatic Brain Injury | 1 |
| Brain Injury Biomarkers and Behavioral Characterization of mild TBI (mTBI) in Soldiers Following Repeated, Low-Level Blast Exposure | 2 |
| Brain Injury Biomarkers and Therapy | 1 |
| Brain Tissue Regeneration After Traumatic Brain Injury | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|---|--|
| Brain Vulnerability to Repeated Blast Overpressure and Polytrauma | 1 |
| Battlefield Research Accelerating Virtual Environments for Military Individual Neuro Disorders (BRAVEMIND): Advancing the Virtual Iraq/Afghanistan PTSD Exposure Therapy System | 1 |
| Breacher Injury Survey II: Prevalence of the Bio-Effects of Repeated Low-Level Blast Exposure | 2 |
| Brief Cognitive Behavioral Therapy for Military Populations | 1 |
| Catecholamines in Posttraumatic Stress Disorder | 1 |
| Catechol-O-Methyltransferase, Impulsivity, and Substance Abuse Treatment | 1 |
| Cerebrovascular Injury in Blast Loading | 1 |
| Characterizing the Relationship between Blast Exposure and Mild TBI with Dynamic Modeling and Testing in a New Mouse Model | 1 |
| Child Adjustment to Parental Combat Deployment: Risk and Resilience Models | 1 |
| Children of Military Fathers with Post Traumatic Stress Disorder | 1 |
| Combat Exposure, PTSD, and Misconduct: Direct and Indirect Behavioral Impacts of War | 1 |
| Combat Operational Stress Stigma Reduction Intervention | 1 |
| Combat Stress Intervention Program (Year 3) | 1 |
| Comprehensive 3-D Model of Shock Wave-Brain Interactions in Blast-Induced Traumatic Brain | 1 |
| Computational Modeling of Causal Mechanisms of Blast Wave-Induced Traumatic Brain Injury: A Potential Tool for Injury Prevention | 1 |
| Conditioned Fear Extinction and Generalization in Post-Traumatic Stress Disorder | 1 |
| Conference support for W81XWH-05-2-0094 "Physical and Neuropsychiatric Trauma Wound Healing and Tissue Prevention" | 1 |
| Corticosterone Administration to Promote Fear Memory Forgetting in an Animal Model of PTSD | 1 |
| Data Modeling Approaches for Biomarkers in Clinical Traumatic Brain Injury | 1 |
| Deep Brain Stimulation of Treatment of Traumatic Brain Injury | 1 |
| Deployment Family Stress: Child Neglect and Maltreatment in U.S. Army Families | 1 |
| Deployment, PTSD Symptoms, and Comorbid Mental Health Conditions in the Active Force and Reserve Components | 1 |
| Deployment-Related Mild Traumatic Brain Injury (mTBI): Incidence, Natural History, and Predictors of Recovery in Soldiers Returning from OIF/OEF | 1 |
| Design of Effective Therapeutic Interventions for Mild TBI/PTSD Using Interactive Virtual World Environments | 1 |
| Design of Virtual Reality-Based Therapy to Restore the Whole Body Coordination Deficits Following Deployment-Acquired Traumatic Brain Injury | 1 |
| Developing Memory Reconsolidation Blockers as Novel PTSD Treatments | 1 |
| Development of a Novel Lab-on-a-Tube for Multimodal Monitoring in the Injured Warrior | 1 |
| Development of a PTSD Population Registry | 2 |
| Development of a Vision Assistive Device for Veterans with TBI-Associated Visual Dysfunctions | 1 |
| Development of an Intervention for Soldiers and Veterans with Co-Occurring Traumatic Brain Injury and Substance Abuse Disorders | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|---|--|
| Development of F-18-Labeled Radiotracers for Positron Emission Tomography (PET) Imaging of Brain Alpha-1 Noradrenergic Receptors: Potential PTSD Vulnerability and/or Diagnostic Biomarkers | 1 |
| Differentiating the severity of Mild and Moderate Traumatic Brain Injury | 1 |
| Disequilibrium after Traumatic Brain Injury: Vestibular Mechanisms | 1 |
| Do Undetected or Untreated Sleep Disorders Predict PTSD Psychotherapy Outcomes? | 1 |
| Docosahexaenoic Acid (DHA) versus Placebo in a Special Operations Unit with a High Rate of Blast Exposures | 1 |
| Drug Related Overdoses Among a Military Population | 1 |
| Drug-Encapsulated Immunonanoparticles, Neuron-Targeted Delivery System | 1 |
| Early Post-Traumatic Seizures in Military Personnel Result in Long-Term Disability | 1 |
| Effect of a Hypocretin/Orexin Antagonist on Neurocognitive Performance | 2 |
| Effects of Repeated Traumatic Brain Injuries in a Combat Setting | 1 |
| Electrical Stimulation of the Midbrain to Promote Recovery from Traumatic Forebrain Injury | 1 |
| Enduring Effects of Traumatic Stress on Brain Neuropeptide Y (NPY) and Corticotropin-Releasing Factor (CRF) Systems: Molecular and Neuropharmacologic Studies | 1 |
| Epidemiological Study of Mild Traumatic Brain Injury Sequelae Caused by Blast Exposure During Operations Iraqi Freedom and Enduring Freedom | 1 |
| Epigenetic Patterns of PTSD: Deoxyribonucleic Acid (DNA) Methylation in Serum of OIF/OEF Service Members | 1 |
| Epigenetic Patterns of TBI: DNA Methylation in Serum of OIF/OEF Service Members | 1 |
| Etiology of Sleep Disorders in PTSD: Potential Role of Inflammatory Cytokines | 1 |
| Evaluation of a New Screening Approach to Identify Soldiers at High Risk for Substance Abuse | 1 |
| Evaluation of Prospective Biomarkers for TBI in the Presence of Hemorrhagic Shock | 1 |
| Eye-Tracking Rapid Attention Computation | 2 |
| Fabrication and Testing of a Blast Concussion Burst Sensor | 1 |
| Fear Conditioning Effects on Sensitivity to Drug Reward | 1 |
| Fibrin Matrix-Supported Mesenchymal Stem Cell Treatment for Traumatic Brain Injury | 1 |
| Genetic Screen for PTSD-Prone Soldiers | 1 |
| Glutamate Transmission Enhancement for Treatment of PTSD | 1 |
| Glyburide - Novel Prophylaxis and Effective Treatment for Traumatic Brain Injury | 1 |
| Health Status and Performance of United States Air Force Airmen Following Mild Traumatic Brain Injury | 1 |
| Helmet Integrated Nanosensors, Signal Processing and Wireless Real Time Data Communication for Monitoring Blast Exposure to Battlefield Personnel | 1 |
| Helmet Mounted Sensor Recorded Blast Data in Combat | 1 |
| Helmet Sensor- Transfer Function and Model Development | 1 |
| High Resolution Diffusion Tensor Imaging of Cortical-Subcortical White Matter Tracts in TBI | 1 |
| High Risk Suicidal Behavior in Veterans-Assessment of Predictors and Efficacy of Dialectical Behavior Therapy | 1 |
| High-Throughput Screening of Therapeutic Neural Stimulation Targets: Toward Principles of Preventing and Treating Post-Traumatic Stress Disorder | 1 |
| Hormonal Regulation of Extinction: Implications for Gender Differences in the Mechanisms of PTSD | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|--|--|
| Identification and Validation of Novel Therapeutics Targets for Traumatic Brain Injury | 1 |
| Identification of Gene Expression Patterns in Brain Tissues and Peripheral White Blood Cells of Rat Model of Post-Traumatic Stress Disorder | 1 |
| Identifying Biomarkers that Distinguish Post-Traumatic Stress Disorder and Mild Traumatic Brain Injury Using Advanced Magnetic Resonance Spectroscopy | 2 |
| Implantable Microsystems for Anatomical Rewiring of Cortical Circuitry: A New Approach for Brain Repair | 1 |
| Improving Deployment Related Primary Care Provider Assessments of PTSD and Mental Health Conditions | 1 |
| Improving Work Outcomes for Veterans with Traumatic Brain Injury | 1 |
| Incidence of Traumatic Brain Injury, Mild Traumatic Brain Injury, and Postconcussion Syndrome among U.S. Service Members between 1997 and 2007 | 1 |
| Innovative Treatment of TBI via Regeneration of Neuronal Microtubules | 2 |
| Interaction of Blast and Head Impact in the Generation of Brain Injuries | 1 |
| Investigation of Prognostic Ability of Novel Imaging Markers for Traumatic Brain Injury | 1 |
| Kaptur Combat Mental Health Initiative: Risk and Resilience Factors for Combat Related Posttraumatic Psychopathology and Post Combat Adjustment | 1 |
| Kaptur Combat Mental Health Initiative: Risk and Resilience Factors for Combat Related Posttraumatic Psychopathology and Post Combat Adjustment | 1 |
| Ketamine as a Rapid Treatment for Post-Traumatic Stress Disorder | 1 |
| Kevlar Vest Protection against Blast Overpressure Brain Injury: Systemic Contributions to Injury Etiology | 1 |
| Loss of Ceruloplasmin Ferroxidase Activity Contributes to Neuronal Injury After Blast Exposure | 1 |
| Low-Level Light Therapy for Traumatic Brain Injury | 1 |
| Measuring Blast-Related Intracranial Pressure Within the Human Head | 1 |
| Measuring Intracranial Pressure and Correlation with Severity of Blast Traumatic Brain Injury | 1 |
| Mechanisms of Enhanced Fear Response after Diffuse TBI | 1 |
| Medial Prefrontal Cortex and Hypothalamic-Pituitary-Adrenal (HPA) Axis Roles in Generation of PTSD-Like Symptoms in Spark Plasma Sintering (SPS) Model | 1 |
| Mental Health and Resilience: Soldiers' Perceptions about Psychotherapy, Medication, and Barriers to Care in the United States Military | 1 |
| Microassay Diagnostic Device for Rapid Assessment of Traumatic Brain Injury | 2 |
| Mild TBI Following Exposure to Explosive Devices: Device Characteristics, Neuropsychological Functioning, and Symptoms of Post-Traumatic Stress Disorder | 1 |
| Military Blast-Related Traumatic Brain Injury: A Study of Isolated Shock Waves on Central Nervous System Injury | 1 |
| Minocycline and N-Acetylcysteine: A Synergistic Drug Combination to Treat Traumatic Brain Injury | 1 |
| Mission Connect Mild TBI Translational Research Consortium | 18 |
| Mission Connect Mild TBI Translational Research Consortium: Subproject 3.5 | 1 |
| Molecular Mechanisms Underlying Individual Differences in Response to Stress in a Previously Validated Animal Model of PTSD | 1 |
| Molecular Signatures and Diagnostic Biomarkers of Cumulative, Blast Graded Mild TBI | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|--|--|
| MTBI Effects on Emotion Symptoms, Neurocognitive Performance, and Functional Impairment: A Longitudinal Study of Deployed and Non-Deployed Army Soldiers | 1 |
| Multidrug Treatment of Traumatic Brain Injury | 1 |
| Multi-Family Group Intervention for OEF/OIF Traumatic Brain Injury Survivors and their Families | 1 |
| National Capital Consortium TBI Neuroimaging Core Project | 1 |
| Neural and Behavioral Sequelae of Blast-Related Traumatic Brain Injury | 2 |
| Neural Correlates of Early Intervention for PTSD | 1 |
| Neural Mechanisms Linking Mild Traumatic Brain Injury and Anxiety States in an Animal Model | 1 |
| Neural Plasticity and Neurorehabilitation Following Traumatic Brain Injury | 1 |
| Neurobehavioral Effects of Battlemind vs. Mindfulness-Based Military Training in Army Infantry Platoons | 1 |
| Neurobiologic Evaluation of Novel Targets for Therapeutic Intervention in PTSD | 1 |
| Neurobiology of Sleep and Sleep Treatments in PTSD (NOS-STIP) | 1 |
| Neurocognitive and Biomarker Evaluation of Combination mTBI from Blast Overpressure and Traumatic Stress | 2 |
| Neuroimaging of Biomarkers for Combat Relevant Traumatic Brain Injury | 1 |
| Neuroimaging of Brain Injuries and Disorders at Cleveland Clinic | 1 |
| Neuronal Targets Mediating Active Stress Coping | 1 |
| Neuroprotective Strategies after Repetitive Mild Traumatic Brain Injury | 1 |
| Neurosteroids as Critical Modulators of the Stress Response in PTSD | 1 |
| Non-invasive Monitoring of Cerebral Venous Saturation in Patients with Traumatic Brain Injury | 1 |
| Noninvasive TBI Gravity Assessment Using a Novel Near-Infrared Diffuse Reflectance Imaging Approach | 1 |
| Novel Methods for Identification of Concussion Associated Impairment in Blast Exposure Service Members | 1 |
| Novel Smart Catheter for Multimodal Monitoring of the Head-Injured Warrior | 1 |
| NWHSS: Implement Family Member Assessment Component in the Millennium Cohort Study | 2 |
| Online PTSD Diagnosis and Treatment Training for Primary Care Physicians | 2 |
| Opiate Masking of Stress-Induced Hypervigilance: The Cause of Delayed Symptom Presentation in PTSD | 1 |
| Optimization and enhancement of clinical interface and clinical operations characteristics of the ANAM TBI assessment system | 1 |
| Optimizing Screening and Risk Assessment for Suicide Risk in the U.S. Military | 1 |
| Optimizing the Predictive Validity of the Post-Deployment Health Assessment/Post-Deployment Health Reassessment (PDHA/PDHRA) | 1 |
| Oxytocin and Social Support as Synergistic Inhibitors of Aversive Fear Conditioning and Fear-Potentiated Startle in Male Rats | 1 |
| P11, a Biomarker for Memory Retrieval: A Possible Role in Traumatic Stress | 1 |
| Parental Stress, PTSD, and Infant Health Outcomes in U.S. Military Families | 1 |
| Pathogenesis of Heterotopic Ossification in Traumatic Brain Injury | 1 |
| Pathological Fingerprints, Systems Biology, and Biomarkers of Blast Brain Injury | 1 |
| Pathophysiology of Polytrauma and Novel Treatment Strategies | 1 |
| Personal Monitoring for Ambulatory PTSD Assessment | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|---|--|
| Personalized Medicine in Veterans with Traumatic Brain Injuries | 1 |
| Physical and Neuropsychiatric Trauma - Wound Healing and Tissue Preservation | 1 |
| Physical and Neuropsychiatric Trauma Wound Healing and Tissue Prevention | 1 |
| Physical and Psychometric Wound Healing and Tissue Prevention | 1 |
| Post Concussive Rehabilitation, Treatment and Fitness for Return to Duty | 2 |
| Post-Injury Treatment for Traumatic Brain Injury | 1 |
| Post-Stress Combined Administration of Beta-Receptor and Glucocorticoid Antagonists as a Novel Preventive Treatment in an Animal Model of PTSD | 1 |
| Post-Traumatic Headache and Psychological Health: Mindfulness Training for Mild Traumatic Brain Injury | 1 |
| Post-Traumatic Stress Disorder and Pain Comorbidity in Veterans | 1 |
| Posttraumatic Stress Disorder Co-Morbidity and the Deployment Cycle | 1 |
| Posttraumatic Stress Disorder, Substance Abuse and Self Harm: Mediating Relationships with Respect to Combat Stress | 1 |
| Prediction, Detection, and Prevention of Post-Traumatic Epilepsy and PTSD in Genetically Susceptible Rats | 1 |
| Progesterone in the Field-Forward Treatment of Traumatic Brain Injury | 1 |
| Prophylactic Neuroprotection for Traumatic Brain Injury | 1 |
| Protein Kinase C-Epsilon in the Amygdala-Prefrontal Cortex Circuit Regulates the Extinction of Conditioned Fear | 1 |
| Proteomic Studies of Cerebrospinal Fluid (CSF) and Plasma From Patients With PTSD | 1 |
| PTSD Trajectory, Comorbidity, and Utilization of Mental Health Services Among National Guard Soldiers | 1 |
| PTSD Trajectory, Comorbidity, and Utilization of Mental Health Services among Reserves | 1 |
| Quantitative Tractography and Volumetric MRI in Blast and Blunt Force TBI: Predictors of Neurocognitive and Behavioral Outcome | 1 |
| Regional Center of Excellence for PTSD: Phoebe Putney Memorial Hospital | 1 |
| Reintegrating Troops with Mild Traumatic Brain Injury (mTBI) into Their Communities: Understanding the Scope and Timeline of Post-Deployment Driving Problems | 1 |
| Research to Improve Emotional Health and Quality of Life Among Service Members with Disabilities (RESTORE LIVES) | 1 |
| Resonance and Spectroscopy of the Human Brain in Gulf War Illness | 1 |
| Resonance and Spectroscopy of the Human Brain in Gulf War Illness | 1 |
| Role of MicroRNAs in the Synaptic Plasticity Dysfunction During Post-Traumatic Stress Disorder | 1 |
| Root Cause of Post-Traumatic and Development Stress Disorders | 1 |
| Scaffold/Neural Stem Cells-Based Tissue Engineering in a Traumatic Brain Injury Model | 1 |
| Sensors to Assess Pressure-Mediated Effects on Blast-Induced TBI | 1 |
| Small Molecule Activators of the TRK Receptors for Neuroprotection | 1 |
| Small Molecule Activators of the Tropomyosin-Receptor-Kinase (Trk) Receptors for Neuroprotection in TBI | 3 |
| Spreading Depressions as Secondary Insults after Traumatic Injury to the Human Brain | 1 |
| Stable Intravenous Fluorohydrocarbon Emulsion with High Oxygen Capacitance Combined with Hyperbaric Oxygen for the Acute Salvage of Tissue Injury After TBI | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|---|--|
| Stem Cell Therapeutics for Military Relevant Brain Injury Using Amnion-Derived Multipotent Progenitor (AMP) Cells | 1 |
| Stimulant Therapy and Memory Strength: Implications for the Emergence and Treatment of PTSD | 1 |
| Suicide Prevention Research | 1 |
| TBI Effects of Marine Corp Breacher Training Program | 1 |
| The Association between Suicide and OEF/OIF Deployment History | 1 |
| The Effects of Hypoxia on Cognitive Function in Aviators and Complex System Operators that Have Had a Mild Traumatic Brain Injury | 1 |
| The Effects of Explosive Blast as Compared to Post-Traumatic Stress Disorder on Brain Function and Structure | 1 |
| The Effects of Systemic Hyperoxia and/or Hyperventilation on the Oxidative Injury and Cerebral Perfusion After TBI and Hemorrhage | 1 |
| The International Brain Research Foundation (IBRF) Disorders of Consciousness (DOC) Advanced Care Protocol (ACP) | 1 |
| The Investigation of Emerging Technologies and Field Expedient Methods for Screening Traumatic Brain Injury and Tracking Initial Recovery | 1 |
| The Role of Early Stress on the Development of PTSD After Blast Injury | 1 |
| The Role of Microglial Subsets in Regulating Traumatic Brain Injury | 1 |
| The Root Cause of Post-traumatic and Developmental Stress Disorders | 1 |
| The Separate and Cumulative Effects of TBI and PTSD on Cognitive Function and Emotional Control | 1 |
| The Soldier Medic Mettle Study | 2 |
| The STRONG STAR Multidisciplinary PTSD Research Consortium | 1 |
| To Support Institute of Creative Technologies (ICT) contract W911NF-04-D-0005 | 2 |
| To Support Institute of Creative Technologies (ICT) contract W911NF-04-D-0005 (follow-on fiscal year 2009 and fiscal year 2010) | 1 |
| Translation of Cognitive Neuroscience to Rehabilitation for Patients with TBI | 1 |
| Traumatic Brain Injury Diffusion Magnetic Resonance Imaging Research Roadmap Development Project | 1 |
| Treatment of TBI and Concomitant Hemorrhage With Ghrelin | 1 |
| Treatment of TBI with Hormonal and Pharmacological Support, Preclinical Validation Using Diffuse and Mechanical TBI Animal Models | 1 |
| Treatment of Traumatic Brain Injury by Localized Application of Subatmospheric Pressure to the Site of Cortical Impact | 1 |
| Ultrahigh Resolution Retinal Imaging with Adaptive Optics for Early Diagnosis of Traumatic Brain Injury | 1 |
| Understanding Injury Mechanisms of Blast-Induced Neurotrauma: Validation of Human Injury Surrogates | 1 |
| Understanding Psychological Recovery through Resilient Army National Guard Veterans | 1 |
| Understanding Resilience in Wounded Warriors and Their Families | 1 |
| Understanding the Brain Mechanism Underlying Depression in Combat-Related Traumatic Brain Injury | 1 |
| Use of Neural Progenitor Cells and Attractive Proteins to Heal TBI | 1 |
| Vagus Nerve Stimulation (VNS) and Rehabilitation in the Treatment of TBI | 1 |

Appendix III: RDT&E-Funded Projects

| Clinical Research and Development (award titles) | Number of projects funded under title |
|--|--|
| Validation of the Single-Photon Emission Computerized Tomography (SPECT) Ligand CLINDE as a Marker of Microglial Activation in Baboons | 1 |
| Vascularizing Bone Scaffolds for Craniofacial Reconstruction | 1 |
| Veridical and Adaptive Decision Making | 1 |
| Visual Information Restoration and Rehabilitation via Sensory Substitution Technology | 1 |
| Wearable Flexible Blast Monitor | 1 |
| When Good Memory Mechanisms Go Bad: Toward an Understanding of the Role of Protein Kinase C (PKM)-Zeta in Post-Traumatic Stress Disorder | 1 |
| Xenon as a Neuroprotectant in Traumatic Brain Injury | 1 |
| Total | 397 |

Source: Army Medical Research and Materiel Command.

Appendix IV: Examples Provided by the Army Medical Research and Materiel Command of Ongoing Research That Was Representative of Positive Results Achieved to Date

In providing us with lists of PH and TBI research projects, officials at the Army Medical Research and Materiel Command cited three projects, in particular, that they indicated were representative of positive results achieved to date: the Biomarker Assessment for Neurotrauma Diagnosis and Improved Triage System; clinical testing of NNZ-2566, a drug to treat patients who experience TBI; and protocols and guidelines for developing refined medical imaging that can detect TBI.

The first, the Biomarker Assessment for Neurotrauma Diagnosis and Improved Triage System (BANDITS), is an example of a Research and Technology Development project. According to information provided by the Army, no approved test to objectively diagnose mild TBI exists, and the aim of the BANDITS program is to develop a blood test to detect brain cell damage. Three systems to measure blood samples are anticipated. The first would be a bench-top system about the size of a large printer and would be deployable only with larger battlefield medical units. The second system would be smaller, approximately the size of a loaf of bread, and thus more easily deployable. The third system would be a hand-held, battery-powered device deployable with individual medics. Figure 2 depicts one of the systems. According to information provided by the Army, in a limited trial of fewer than 100 patients, the BANDITS program has achieved levels of accuracy equivalent to those of medical tests currently relied on to detect heart damage and prostate cancer. The Army is continuing clinical trials for Food and Drug Administration licensure and expects to complete them in 2013.

**Appendix IV: Examples Provided by the Army
Medical Research and Materiel Command of
Ongoing Research That Was Representative of
Positive Results Achieved to Date**

Figure 2: System Anticipated from the Army's Biomarker Assessment



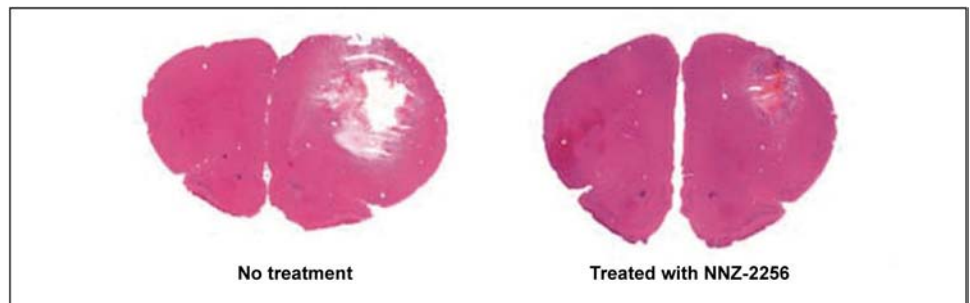
Source: DOD.

The second project entails clinical testing of a potential drug treatment for TBI and is an example of a Clinical Research and Development project. According to information provided by the Army, no approved drug yet exists to treat TBI, and the aim of the project is to develop NNZ-2566, a drug candidate that could reduce death and disability from moderate to severe TBI and speed recovery from mild TBI. An intravenous form of the drug has been developed for moderate to severe TBI patients, and an oral formulation will be developed for mild TBI patients. NNZ-2566 was found to be safe in humans in its initial clinical trial and is currently undergoing a larger intermediate trial to see if it will reduce the effects of TBI damage. If that trial is successful, a final large trial will be completed

Appendix IV: Examples Provided by the Army Medical Research and Materiel Command of Ongoing Research That Was Representative of Positive Results Achieved to Date

with the hope of approval by the Food and Drug Administration by 2016. Figure 3 depicts the difference between a brain with penetrating brain injury that receives no treatment and a brain that does receive treatment with NNZ-2256.

Figure 3: Brain Imagery Demonstrating the Impact of Treatment with NNZ-2256

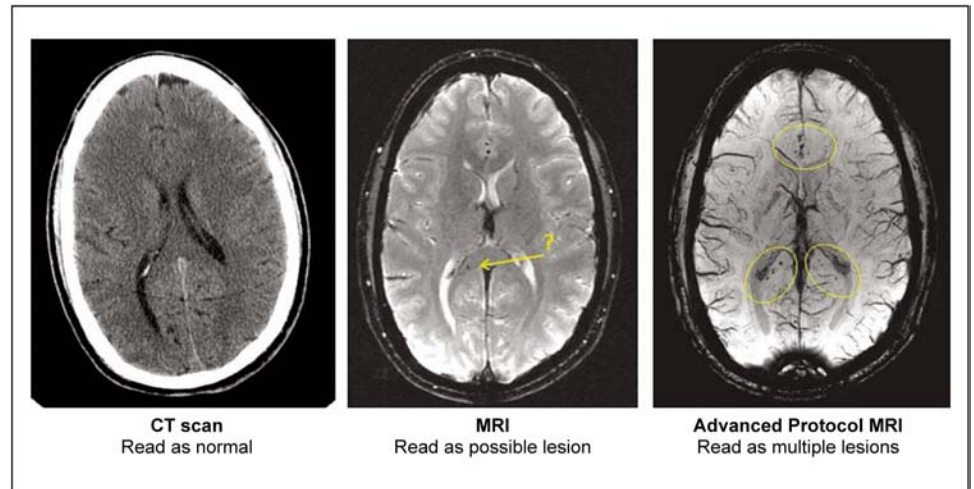


Source: DOD.

The third RDT&E project that Army Medical Research and Materiel Command officials cited entails protocols and guidelines for developing refined medical imaging that can detect TBI. According to the Army, no approved test exists that can objectively diagnose TBI. Currently, the diagnosis of TBI is made by assessing symptoms, such as fatigue, headaches, visual disturbances, memory loss, poor attention/concentration, sleep disturbances, and the loss of balance. Using a high-powered magnetic resonance imaging (MRI) machine, Army researchers have developed an advanced imaging protocol that produces 41,000 images of the brain; standard MRIs of the brain produce 350 images. The added images are computer enhanced to show brain lesions undetectable with standard medical imaging approaches. Going forward, the effort is intended to develop a new standardized imaging protocol that can be achieved on existing medical imaging machines routinely found in medical centers. Using the new protocol, 64 percent of patients with normal computer tomography (CT) and MRI scans were shown to have MRI findings of trauma. Figure 4 displays the differences among CT, routine MRI, and advanced protocol MRI scans.

**Appendix IV: Examples Provided by the Army
Medical Research and Materiel Command of
Ongoing Research That Was Representative of
Positive Results Achieved to Date**

Figure 4: Differences among CT, Routine MRI, and Advanced Protocol MRI Scans



Source: DOD.

Appendix V: Comments from the Department of Defense



THE ASSISTANT SECRETARY OF DEFENSE

1200 DEFENSE PENTAGON
WASHINGTON, DC 20301-1200

HEALTH AFFAIRS

13 Jan 2012

Ms. Brenda Farrell
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Ms. Farrell:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-12-154, "DEFENSE HEALTH: Coordinating Authority Needed for Psychological Health and Traumatic Brain Injury Activities," received on December 1, 2011, (GAO Code #351513). Overall the Department concurs with the recommendations made in this report. Regarding the second recommendation, Health Affairs will work with other organizations in the department to address concerns regarding reliability of obligations and expenditure data. The Department of the Army provided comments and technical corrections, which have been incorporated into our response.

Thank you for the opportunity to review and provide comments. The points of contact on this issue are Mr. Ronald Henke (Functional) and Mr. Gunther Zimmerman (Audit Liaison). Mr. Henke may be reached at (703) 681-3726, or Ronald.Henke@tma.osd.mil. Mr. Zimmerman may be reached at (703) 681-4360, or Gunther.Zimmerman@tma.osd.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Woodson".

Jonathan Woodson, M.D.

Enclosures:
As stated

GOVERNMENT ACCOUNTABILITY OFFICE (GAO) DRAFT REPORT—DATED
DECEMBER 1, 2011
(GAO CODE #351513/GAO-12-154)

“DEFENSE HEALTH: COORDINATING AUTHORITY NEEDED FOR
PSYCHOLOGICAL HEALTH AND TRAUMATIC BRAIN INJURY INQUIRIES”

DEPARTMENT OF DEFENSE COMMENTS TO THE RECOMMENDATIONS

To increase visibility over how Department of Defense (DoD) is spending appropriated funds to address Psychological Health (PH) and Traumatic Brain Injury (TBI) conditions, we recommend that the Secretary of Defense direct the Assistant Secretary of Defense for Health Affairs to take the following four actions:

RECOMMENDATION #1: Include expenditures for PH and TBI activities in annual reports to Congress as directed by Section 1634 of the National Defense Authorization Act for Fiscal Year 2008.

DoD RESPONSE: Concur. Although expenditure data often lags the end of the year by many months, we will include expenditure information that is available at the time we must submit the annual PH and TBI reports.

RECOMMENDATION #2: Develop, maintain, and coordinate quality control mechanisms that help ensure that the obligation and expenditure data they report on PH and TBI projects and research are complete and accurate.

DoD RESPONSE: Concur with comments. DoD agrees it would be preferable to obtain all fiscal data from a single source to allow for confirmation of data reliability. Unfortunately, the DoD accounting structure does not allow for a single system of accumulating and reporting fiscal data. Health Affairs/TRICARE Management Activity recognizes its responsibility for maintaining and reporting accurate fiscal data relating the TBI/PH program, and will take steps to improve the accuracy and reliability of the data where possible.

RECOMMENDATION #3: If patient costs are provided in future annual reports, clearly show what is included and not included for all patient costs; and.

DoD RESPONSE: Concur. The patient data provided in previous years was intended to be informative. However, acknowledging that it may have been confusing and recognizing our limited ability to provide the detail desired by the GAO, we will omit this information in future reports.

RECOMMENDATION #4: Revisit Defense Centers of Excellence (DCoE's) role as DoD's coordinating authority for issues concerning its PH and TBI, as stated in its own plan, and determine whether it or another organization should perform this function.

DoD RESPONSE: Concur. DCoE's role has evolved over time. The *DoD Strategic Approach for Staffing, Resourcing, and Sustainment of Medical Centers of Excellence (CoE)* report to Congress submitted in April 2011 described the future strategy for Centers of Excellence, including DCoE, to provide the highest quality of care for our Service members and our other beneficiaries. It outlined the role of the DCoE to focus on associated and well-defined groups of clinical conditions and achieve improvement in clinical outcomes through clinical, educational, and research activities.

The "revisit" of DCoE's role is underway. A CoE Advisory Board, which is part of the Military Health System's governance structure, is overseeing the development of a revised and detailed Concept of Operations for DCoE. The Board directed the DCoE to develop "Pathways of Care for Post-Traumatic Stress Disorder and Depression" covering the spectrum from prevention through reintegration or transition and lead the development of clinical guidance, measures of effectiveness, educational materials, identification of research priorities, and strategies for improving access to care. Among other initiatives, DoD's Cost Assessment and Program Evaluation office requested that DCoE assume a larger role in psychological health and traumatic brain injury program evaluation.

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

Brenda S. Farrell, Director, (202) 512-3604 or farrellb@gao.gov

Staff Acknowledgments

In addition to the contact named above, Revae Moran, Acting Director; David E. Moser and Marilyn Wasleski, Assistant Directors; Geraldine Beard; Karen Nicole Harms; Travis Hill; LaToya Jeanita King; Felicia Lopez; Grant Mallie; Charles Perdue; Beverly C. Schladt; Michael Silver; Amie Steele; Cheryl A. Weissman; and Ricardo A. Marquez made key contributions to this report.

Related GAO Products

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