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Health Care for Veterans: Traumatic Brain Injury

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Summary

In recent years, Congress, the Department of Defense (DOD), and the Department of Veterans Affairs (VA) have increased attention to traumatic brain injury (TBI), which is known as a "signature wound" of Operations Enduring Freedom and Iraqi Freedom (OEF/OIF). Although the early stages of TBI treatment may occur within the military health care system (if the injury occurs during military service), this report focuses on the VA health care system. In FY2015, VA spending for TBI is estimated to be $234 million. The VA projects the 10-year (FY2016–FY2025) costs of TBI to be $2.2 billion (including $0.5 billion for OEF/OIF veterans).

The type of treatment needed depends on the severity of the injury. Most cases of mild TBI—representing the majority of injuries—resolve without medical attention. Moderate or severe TBI requires immediate treatment. In the case of servicemembers, treatment begins at the site of the event and continues at a military treatment facility. Once stabilized, servicemembers may remain at a military treatment facility or be sent to VA medical facilities.

When servicemembers transfer from DOD to VA facilities, coordination between the two systems is necessary. Three VA and joint VA/DOD programs seek to address the transition from DOD to VA health care facilities: (1) OEF/OIF Care Management, (2) the VA Liaison Program, and (3) the Federal Recovery Coordinator Program. These programs are available to veterans with TBI as well as other qualified veterans and servicemembers.

Mild TBI may go unnoticed if an individual walks away from an injury seemingly unharmed. Despite repeated assessments of servicemembers by the DOD, veterans may enter the VA health care system with undiagnosed TBI. Thus, VA policy requires that all OEF/OIF veterans receiving medical care in the VA health care system be screened for possible TBI and that those who screen positive be offered further evaluation and specialized treatment.

Veterans with moderate or severe TBI may receive care through the VA Polytrauma/TBI System of Care (PSC), which is also available to veterans with other traumatic injuries. The PSC is geographically dispersed, thereby making specialized treatment more accessible to veterans, regardless of where they live. The PSC operates as a "hub and spoke" model with four components: (1) Polytrauma Rehabilitation Centers, (2) Polytrauma Network Sites, (3) Polytrauma Support Clinic Teams, and (4) Polytrauma Points of Contact.

The VA provides a range of long-term services and supports, most of which are available to veterans who have TBI as well as other qualified veterans. Long-term services and supports have historically been provided in institutional settings (e.g., nursing homes); however, if a veteran is able to live in the community and receive home- or community-based treatment, this arrangement is generally preferable to institutional care. The VA has an ongoing pilot program providing assisted living services to veterans with TBI and has requested authority to pay for care in Medical Foster Homes. The VA also offers services for some caregivers for veterans with TBI.

The VA conducts and collaborates on TBI research. For example, the VA is collaborating with the Department of Education's National Institute on Disability and Rehabilitation Research to develop the Traumatic Brain Injury Veterans Health Registry, and to establish a database similar to the institute's existing TBI Model System National Database.

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Traumatic Brain Injury (TBI) Overview

Traumatic brain injury (TBI) has become known as a "signature wound" of Operations Enduring Freedom and Iraqi Freedom (OEF/OIF).[1] Several years into these operations, both Congress and the executive branch showed increased attention to the health care needs of servicemembers and veterans returning from deployments with injuries—and specifically the needs of those with TBI.[2] For example, pursuant to the Traumatic Brain Injury Act of 2008 (P.L. 110-206), the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), the Department of Defense (DOD), and the Department of Veterans Affairs (VA) formed a Leadership Panel to (among other things) recommend ways for the four agencies to collaborate further to develop and improve TBI diagnosis and treatment.[3] These four agencies have implemented many of the Leadership Panel's recommendations, and in some cases implementation is ongoing. Congressional attention to TBI among veterans has continued as well.[4]

This report focuses on *current* efforts of the VA's Veterans Health Administration (VHA) to understand, identify, and treat TBI among veterans. It begins with an overview of TBI as background for the subsequent discussion of VA programs and services relevant to veterans with TBI, some of which focus on (or are limited to) OEF/OIF veterans.[5]

Causes

The Brain Injury Association of America defines TBI as "an alteration in brain function, or other evidence of brain pathology, caused by an external force."[6] In the general population, TBI results mainly from falls, motor vehicle/traffic accidents, assaults, and other instances in which the head is struck by or strikes an object.[7] In military servicemembers, TBI may result from those kinds of events or from improvised explosive devices (IEDs), mortars, grenades, bullets, or mines.[8] Some

[1] Committee on the Initial Assessment of Readjustment Needs of Military Personnel, Veterans, and Their Families, Board on the Health of Selected Populations, Institute of Medicine, "Summary," in *Returning Home from Iraq and Afghanistan: Preliminary Assessment of Readjustment Needs of Veterans, Service Members, and Their Families* (Washington, DC: The National Academies Press, 2010).

[2] See, for example, "The Current Policy Context" in Terri Tanielian and Lisa H. Jaycox, eds. *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery*, RAND Corporation, 2008, pp. 9-11; and U.S. Congress, House Committee on Veterans' Affairs, *Findings of the President's Commission on Care for America's Returning Wounded Warriors*, 110th Cong., 1st sess., September 19, 2007.

[3] The CDC, NIH, DOD, and VA Leadership Panel, *Report to Congress on Traumatic Brain Injury in the United States: Understanding the Public Health Problem Among Current and Former Military Personnel*, CDC, NIH, DOD, VA, June 2013.

[4] See, for example, U.S. Congress, House Committee on Veterans' Affairs, Subcommittee on Oversight and Investigations, *Access to Mental Health Care and Traumatic Brain Injury Services: Addressing the Challenges and Barriers for Veterans*, 113th Cong., 2nd sess., April 24, 2014.

[5] Several VA programs for post-9/11 veterans use the abbreviation OEF/OIF in their titles, and this CRS report follows that convention; however, these operations are not defined in statute.

[6] Brain Injury Association of America, *About Brain Injury: Brain Injury Definitions*, http://www.biausa.org/about-brain-injury.htm. This definition is also used by the Leadership Panel established by the CDC, NIH, DOD, and VA.

[7] U.S. Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC), *Traumatic Brain Injury in the United States: Fact Sheet*, last updated June 2, 2014, http://www.cdc.gov/traumaticbraininjury/get_the_facts.html.

[8] Terri Tanielian and Lisa H. Jaycox, eds. *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery*, RAND Corporation, 2008, p. 310.

explosives cause a blast wave (i.e., over-pressurization force), which may result in TBI without outward physical signs of injury.[9] TBI caused by blast waves may be accompanied by other injuries (e.g., to hearing or vision).[10] The DOD reports that in 2013 (the most recent full-year data), a total of 27,324 servicemembers sustained TBI.[11] The total number of veterans who have experienced TBI is not known, in part because TBI is difficult to identify,[12] and in part because some veterans have not accessed VA health care services.[13]

Classification

Traumatic brain injury is not a specific diagnosis; the term encompasses a range of conditions. A TBI may be classified as focal or diffuse; open or closed; and mild, moderate, or severe. If the injury is localized to a small area of the brain, it is a focal injury; an injury occurring over a large area is diffuse. If the head hits, or is hit by, an object that penetrates the skull and the brain's protective coverings, the injury is open (also called penetrating); otherwise, the injury is closed and can be further classified as mild, moderate, or severe.[14]

Many methods have been used to classify TBI as mild, moderate, or severe based on one or more of the signs and symptoms that characterize TBI immediately following the injury.[15] For example, one method determines severity based on whether an individual loses consciousness and, if so, how long the loss of consciousness persists. Another method determines severity based on the duration of post-traumatic amnesia (i.e., an inability to recall events that occur after the injury, accompanied by disorientation or confusion). The Glasgow Coma Scale takes into account multiple signs of TBI, assigning points in three areas (eye opening, verbal response, and motor response), such that the sum of points ranges from 3 to 15, with lower scores indicating greater severity of TBI.[16] **Table 1** summarizes the criteria for mild, moderate, and severe TBI using these three methods, which are among the most commonly used.[17]

[9] HHS, CDC, *Explosions and Blast Injuries: A Primer for Clinicians*, accessed December 23, 2014, http://www.cdc.gov/masstrauma/preparedness/primer.pdf.

[10] HHS, CDC, *Explosions and Blast Injuries: A Primer for Clinicians*, accessed December 23, 2014, http://www.cdc.gov/masstrauma/preparedness/primer.pdf.

[11] Defense and Veterans Brain Injury Center, *DOD Worldwide Numbers for TBI*, last updated December 2, 2014, http://www.dvbic.org/dod-worldwide-numbers-tbi. See also CRS Report RS22452, *A Guide to U.S. Military Casualty Statistics: Operation Inherent Resolve, Operation New Dawn, Operation Iraqi Freedom, and Operation Enduring Freedom.* For information about TBI in the National Football League, see CRS Report R41555, *NFL Players and Efforts to Protect Them From Concussions*.

[12] Tanielian and Jaycox, eds. *Invisible Wounds of War*.

[13] See CRS Report R43579, *The Number of Veterans That Use VA Health Care Services: A Fact Sheet.*

[14] HHS, National Institutes of Health (NIH), National Institute of Neurological Disorders and Stroke (NINDS), *Traumatic Brain Injury: Hope Through Research*, last updated July 22, 2014, http://www.ninds.nih.gov/disorders/tbi/detail_tbi.htm.

[15] Medical "signs" (e.g., vomiting) are observable, whereas "symptoms" (e.g., nausea) must be reported by the patient.

[16] HHS, NIH, NINDS, *Traumatic Brain Injury: Hope Through Research*.

[17] Michael S. Jaffee et al., "Acute Clinical Care and Care Coordination within Department of Defense," *Journal of Rehabilitation Research & Development*, vol. 46, no. 6 (2009), pp. 655-666.

Table 1. Classification of TBI as Mild, Moderate, or Severe

Criteria	Mild	Moderate	Severe
Loss of consciousness	< 30 minutes	30 minutes–24 hours	> 24 hours
Post-traumatic amnesia	< 1 day	1–7 days	> 7 days
Glasgow Coma Scale score	13–15 points	9–12 points	3–8 points (coma)

Source: CRS summary of classification described by Michael S. Jaffee et al., "Acute Clinical Care and Care Coordination within Department of Defense," *Journal of Rehabilitation Research & Development*, vol. 46, no. 6 (2009), pp. 655-666.

Signs and Symptoms

Individuals with TBI may experience a range of problems, including changes in physical functioning, cognition, sensory processing, communication, and behavior.[18] In the days or weeks following a TBI, approximately 40% of patients (including those with mild TBI) develop an array of symptoms collectively called postconcussion syndrome: headaches, dizziness, vertigo, memory problems, concentration problems, sleeping problems, restlessness, irritability, anxiety, depression, and apathy. For some people, postconcussion syndrome and other problems associated with TBI may resolve over time; for others, the problems may persist for a lifetime. Signs and symptoms may depend in part on the severity of the TBI, which part of the brain was injured, the individual's age and general health, whether there has been prior injury, and other factors.

Physical Problems

Common physical signs and symptoms of mild TBI include headaches, fatigue, lethargy, dizziness, and lightheadedness. Individuals with moderate to severe TBI may experience any of these signs and symptoms, as well as repeated nausea or vomiting, a persistent or worsening headache, seizures or convulsions, numbness or weakness in their feet or hands, and loss of coordination. Their pupils might be dilated and their speech might be slurred.

Cognitive Problems

Individuals with TBI may experience cognitive problems that hinder efforts to return to work or school, or, in some cases, to manage situations in everyday life. They may become easily confused or distracted. They may experience problems with memory, attention, or concentration. They may have difficulty making plans, solving problems, or exercising judgment. Moderate to severe TBI is associated with more cognitive problems than mild TBI. Repeated mild injuries—each of which might have gone unnoticed—may result in cognitive problems equal to a moderate or severe injury.

[18] Unless otherwise noted, all information in this section is summarized from HHS, NIH, NINDS, *Traumatic Brain Injury: Hope Through Research*.

Sensory Problems

Individuals with mild TBI may also experience problems with vision, hearing, taste, smell, or touch. Vision problems, the most common sensory problems, may interfere with the ability to drive a car or operate machinery. Difficulties with hand-eye coordination may cause individuals with TBI to bump into things, drop objects, or seem unsteady. More rarely, some individuals with TBI may experience ringing in the ears; a bad taste in the mouth; a persistent noxious smell; or sensations of tingling, itching, or pain.

Communication Problems

Individuals with TBI often experience communication problems that may cause confusion and frustration for them and others around them. They may have difficulty speaking and understanding what others say. They may also struggle with non-verbal communication such as body language or facial expressions. They may have problems writing and reading.

Behavioral Problems

Most individuals with TBI experience some behavioral problems, and their family members often find these to be the most difficult problems to handle. They may feel depressed, apathetic, anxious, paranoid, agitated, irritable, frustrated, or angry. They may experience mood swings or sleep problems. They may engage in behavior that is impulsive, socially inappropriate, aggressive, or violent.

Comorbid Conditions

Individuals with TBI may also suffer from comorbid conditions, which include both mental and physical illnesses. Mental disorders associated with TBI include posttraumatic stress disorder (PTSD) and depression; estimates of how often such conditions co-occur with TBI vary.[19] Although some studies have found a link between TBI and increased alcohol or drug use, a report by the Institute of Medicine (IOM) found just the opposite: limited/suggestive evidence of an association between TBI and *decreased* alcohol and drug use within one to three years of the injury.[20]

Individuals with TBI are at increased risk of developing epilepsy and neurodegenerative diseases such as Alzheimer's disease, Lewy body dementia, or Parkinson's disease. Repetitive blows to the head can result in chronic traumatic encephalopathy, a condition that may begin with loss of concentration, attention, or memory and may eventually progress to problems with coordination, gait, slurred speech, and tremors. Post-traumatic hypopituitarism, a neuroendocrine disorder associated with TBI, may lead to other neuroendocrine conditions, including hypothyroidism and deficiencies in growth hormone and gonadotropin. Individuals with TBI may also develop sleep

[19] Brent E. Masel and Douglas S. DeWitt, "Traumatic Brain Injury: A Disease Process, Not an Event," *Journal of Neurotrauma*, no. 27 (August 2010), p. 1529–1540; and Tanielian and Jaycox, eds. *Invisible Wounds of War*.

[20] Masel and DeWitt, "Traumatic Brain Injury: A Disease Process, Not an Event;" and Institute of Medicine (IOM), *Gulf War and Health, Volume 7: Long-term Consequences of Traumatic Brain Injury* (Washington, DC: The National Academies Press, 2009).

disturbances, obstructive sleep apnea, incontinence, sexual dysfunction, metabolic dysfunction, or musculoskeletal dysfunction.[21]

Treatment

How TBI is treated varies with the severity of the injury, along with other factors.[22] Most cases of mild TBI resolve without medical attention; education about mild TBI can effectively "normalize symptoms and provide expectation of rapid recovery."[23] Moderate or severe TBI requires medical attention; treatment may include surgery, medication, rehabilitation, psychotherapy, case management, and other services.[24] In the case of severe TBI, which often co-occurs with other serious injuries, individuals often experience long-term physical or mental disabilities that require ongoing rehabilitation and nursing care.[25] The various types of treatment may be provided in a variety of settings, from inpatient surgery in an acute care hospital to home-based rehabilitation services. Both the required types of treatment and the appropriate setting of care may change over time, as an individual with moderate to severe TBI moves from acute care to post-acute care to long-term services and supports (if needed).

Acute Care

In general, acute care refers to short-term care for a serious illness or injury. For individuals with moderate to severe TBI, acute care may include surgical interventions (e.g., to relieve pressure inside the skull), medication (e.g., to prevent further injury), and other interventions (e.g., life support) for both the TBI and any other injuries. Acute care for individuals with moderate to severe TBI may begin at the location the injury occurred or in a medical facility; it may be delivered in a hospital's emergency department or intensive care unit, for example. Acute care generally involves a multidisciplinary team of health care providers representing neurosurgery, neurology, physical medicine, psychiatry, and neuropsychology. Some experts have suggested that the best outcomes are achieved when ancillary services (e.g., physical and occupational therapy, audiology, and optometry) begin during the acute phase of treatment rather than later during the post-acute phase, which is more typical.[26]

The duration of acute care for individuals with moderate to severe TBI may vary, depending on the severity of TBI, the level of functional impairment, comorbid conditions (e.g., other injuries or diseases), and other characteristics (e.g., age).[27] Acute care continues until an individual is

[21] Masel and DeWitt, "Traumatic Brain Injury: A Disease Process, Not an Event"; and IOM, *Gulf War and Health, Volume 7: Long-term Consequences of Traumatic Brain Injury*.

[22] Unless otherwise noted, all information in this section is summarized from HHS, NIH, NINDS, *Traumatic Brain Injury: Hope Through Research*.

[23] Charles W. Hoge et al., "Mild Traumatic Brain Injury in U.S. Soldiers Returning from Iraq," *New England Journal of Medicine*, vol. 358, no. 5 (2008), pp. 453-463.

[24] Michael S. Jaffee et al., "Acute Clinical Care and Care Coordination within Department of Defense," *Journal of Rehabilitation Research & Development*, vol. 46, no. 6 (2009), pp. 655-666.

[25] Jaffee et al., "Acute Clinical Care and Care Coordination within Department of Defense."

[26] Jaffee et al., "Acute Clinical Care and Care Coordination within Department of Defense."

[27] Department of Health and Human Services (HHS), Agency for Healthcare Research and Quality (AHRQ), "Multidisciplinary Postacute Rehabilitation for Moderate to Severe Traumatic Brain Injury in Adults," *Comparative Effectiveness Review*, No. 72, June 29, 2012.

medically stable, at which point the individual may be released or transferred to post-acute care, depending on the severity of the TBI and any other medical conditions.

Post-Acute Care

Post-acute care generally begins when an individual is medically stable, no longer in need of acute care services, and still in need of some services. For an individual with moderate to severe TBI, post-acute care primarily takes the form of intensive rehabilitation to maximize functioning.[28] Post-acute rehabilitation services may be provided in inpatient, outpatient, or home-based programs, among other settings. A treatment plan is tailored to meet the individual's needs in areas such as physical, occupational, and speech therapy; physical medicine (physiatry); mental health care; and social support. Over time, the treatment plan changes to address the individual's changing needs.

Long-Term Services and Supports

Long-term services and supports are intended to help maintain or improve an individual's level of physical functioning and quality of life. The need for long-term services and supports is generally defined by limitations on an individual's ability to independently perform basic personal care activities—known as activities of daily living (ADLs)—over an extended period of time. (See the textbox for more information about ADLs.) In individuals with moderate to severe TBI, such limitations may be due to either physical problems (which may require hands-on assistance) or cognitive problems (which may require supervision or guidance). Services may include preparing meals, doing laundry and other housework, and helping with medication, among others. Supports may include the use of special equipment, assistive devices, or technology by a physically impaired person (e.g., a wheelchair ramp). An individual's need for long-term services and supports may change over time as his or her condition changes.[29]

Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs)

Activities of daily living (ADLs) include eating, using the toilet, bathing, dressing, getting in and out of a bed or chair, and walking across a small room, among other activities. Individuals with difficulties performing ADLs may require environmental modifications (e.g., handrails), assistive devices (e.g., wheelchairs), or assistance from another person. A caregiver may help with ADLs directly (e.g., by dressing the individual) or indirectly (e.g., by reminding the individual of the next step in dressing himself or herself).

Instrumental activities of daily living (IADLs) are more cognitively complex activities that generally involve developing and executing a plan. IADLs include preparing meals, taking medications as prescribed, using a telephone, performing housework, doing laundry, getting around outside the home, shopping, and managing money, among other activities. A caregiver may help with IADLs directly (e.g., by preparing a meal) or indirectly (e.g., by reminding the individual of the next step in preparing a meal).

Source: CRS Report R43495, *Long-Term Services and Supports: In Brief.*

Long-term services and supports may be provided in institutional settings such as nursing facilities, in community-based settings such as adult day health care centers, or in private homes.

[28] Department of Health and Human Services (HHS), Agency for Healthcare Research and Quality (AHRQ), "Multidisciplinary Postacute Rehabilitation for Moderate to Severe Traumatic Brain Injury in Adults," *Comparative Effectiveness Review* No. 72, June 29, 2012.

[29] CRS Report R43495, *Long-Term Services and Supports: In Brief.*

Both formal (paid) and informal (unpaid) caregivers may provide long-term services and supports. Formal caregivers may be licensed or skilled health care workers such as nurses, physical or occupational therapists, and social workers. More often, however, they are non-licensed health care workers such as certified nursing assistants, home health aides, and personal care aides. Informal (unpaid) caregivers such as family members, friends, and neighbors provide the vast majority of long-term services and supports.[30]

Relevant VA Programs and Services

Although the early stages of TBI treatment may occur within the military health care system if the initial injury occurs during military service, a description of the military health care system is beyond the scope of this report, which focuses on the VA health care system.[31] In FY2014, VA spending for TBI was $229 million (including $55 million for OEF/OIF veterans). In FY2015, VA spending for TBI is estimated to be $234 million (including $61 million for OEF/OIF veterans). The VA projects the 10-year (FY2016–FY2025) costs of TBI to be $2.2 billion (including $0.5 billion for OEF/OIF veterans).[32] It should be noted that OEF/OIF veterans represent approximately 11% of patients treated by the VA.[33]

As discussed above, the type of treatment needed depends on the severity of the injury. The VA and the DOD have jointly developed evidence-based clinical practice guidelines treating mild TBI,[34] which represents the majority of injuries.[35] Most cases of mild TBI, however, resolve without medical attention. Moderate or severe TBI requires immediate treatment. In the case of servicemembers, treatment begins at the site of the event and continues at a military treatment facility. Once stabilized, servicemembers may remain at a military treatment facility or be sent to VA medical facilities for continuing treatment, rehabilitation, and transitional care.

VA programs and services relevant to TBI include (1) coordinating the transition from DOD to VA care, (2) screening and evaluation, (3) acute and post-acute care provided through the VA Polytrauma/TBI System of Care (PSC), and (4) long-term services and supports. In addition, the VA conducts TBI research, both independently and collaboratively.

Coordinating the Transition from DOD to VA Care

When servicemembers transfer from DOD to VA facilities (regardless of whether they are discharged from active duty to veteran status), coordination between the two systems is necessary. Three VA and joint VA/DOD programs seek to address the transition from DOD to VA health care

[30] CRS Report R43495, *Long-Term Services and Supports: In Brief*.

[31] See CRS Report RL33537, *Military Medical Care: Questions and Answers*; and CRS Report RS22452, *A Guide to U.S. Military Casualty Statistics: Operation Inherent Resolve, Operation New Dawn, Operation Iraqi Freedom, and Operation Enduring Freedom*.

[32] VA, *Congressional Submission: FY2016 Funding and FY2017 Advance Appropriations*, Volume II: Medical Programs and Information Technology Programs, p. VHA-258.

[33] Ibid., p. VHA-11. In 2014, the VA treated 697,479 OEF/OIF veterans out of 6,632,735 total patients.

[34] VA and Department of Defense (DOD), *VA/DOD Clinical Practice Guideline for Management of Concussion/mild Traumatic Brain Injury (mTBI)*, April 2009, http://www.healthquality.va.gov/management_of_concussion_mtbi.asp.

[35] Mild TBI accounted for 84% of servicemembers sustaining TBI in 2000–2013. Defense and Veterans Brain Injury Center, *DOD Worldwide Numbers for Traumatic Brain Injury*, http://www.dvbic.org/dod-worldwide-numbers-tbi.

facilities: (1) the VA Liaison Program, (2) OEF/OIF Care Management, and (3) the Federal Recovery Coordinator Program. These programs are available to veterans with TBI as well as other qualified veterans and servicemembers.

VA Liaison Program

Since 2003, the VA Liaison Program has placed VA employees at military treatment facilities, where they provide onsite consultation about VA resources. Liaisons coordinate referrals with the OEF/OIF Care Management teams at local VA facilities; they maintain involvement until health care is arranged and transfer is complete.[36]

OEF/OIF Care Management

Since 2007 every VA Medical Center has had an OEF/OIF Care Management Team to coordinate, monitor, and track the care of severely ill or injured OEF/OIF servicemembers and veterans. The team consists of (at a minimum) a program manager, a clinical case manager, and a transition patient advocate. Program managers and clinical case managers are either nurses or social workers. Transition patient advocates serve as personal advocates for patients moving through the VA health care system. This service is available to all OEF/OIF veterans without referral.[37]

Federal Recovery Coordination Program

In 2007, the VA and the DOD jointly established the Federal Recovery Coordination Program (FRCP), which coordinates services provided by the DOD, the VA, and other public and private entities.[38] Veterans and servicemembers with TBI (one of several qualifying conditions) can self-refer to the FRCP or be referred by clinicians, family members, veterans service organizations, and others. Each veteran (or servicemember) enrolled in the FRCP is assigned a Federal Recovery Coordinator, who coordinates care but does not provide direct services. As of December 2012, the FRCP had 24 Federal Recovery Coordinators[39] and 902 active clients, including 412 veterans.[40]

In 2011, the Government Accountability Office (GAO) found that the FRCP faced challenges when coordinating with other programs.[41] Because the majority of enrollees are enrolled in at

[36] VA, *Department of Veterans Affairs Liaison for Healthcare Stationed at Military Treatment Facilities*, VA Handbook 1010.02, November 13, 2009. This VHA Handbook was scheduled for recertification by November 30, 2014.

[37] VA, VHA, *Care Management of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) Veterans*, VHA Handbook 1010.01, October 9, 2009. This VHA Handbook was scheduled for recertification by October 31, 2014.

[38] VA, *Federal Recovery Coordinator Program*, VA Handbook 0802, March 23, 2011; and U.S. Government Accountability Office, *DOD and VA Health Care: Federal Recovery Coordination Program Continues to Expand but Faces Significant Challenges*, GAO-11-250, March 23, 2011.

[39] DOD Task Force on the Care, Management, and Transition of Recovering Wounded, Ill, and Injured Members of the Armed Services (RWTF), *2013-2014 Annual Report*, September 2014. The number is as of FY2013.

[40] Carol A. Weese, *Federal Recovery Coordination Program*, Briefing to RWTF, January 15, 2013.

[41] U.S. Government Accountability Office, *DOD and VA Health Care: Federal Recovery Coordination Program Continues to Expand but Faces Significant Challenges*, GAO-11-250, March 23, 2011. See also U.S. Congress, House Committee on Veterans' Affairs, Subcommittee on Health, *The Federal Recovery Coordination Program: From Concept to Reality*, 112th Cong., 1st sess., May 12, 2011; U.S. Congress, House Committee on Veterans' Affairs, Subcommittee on Health, *The Federal Recovery Coordination Program: Assessing Progress Toward Improvement*, (continued...)

least one other program for wounded servicemembers or veterans, the FRCP must coordinate the efforts of care providers and other care coordinators. Having multiple care coordinators increases the potential for duplication of effort, conflicting treatment goals, or failure to address problems (if each coordinator thinks someone else is handling the problem).

In November 2012, the Interagency Care Coordination Committee (IC3) was chartered to monitor DOD and VA care coordination and case management activities for wounded, injured, or ill servicemembers and veterans (not limited to those with TBI), as well as their families and other caregivers.[42] The IC3 found that, across the DOD and the VA, more than 50 programs were operating in accordance with more than 240 agency policies. In January 2013, the IC3 launched a feasibility assessment of a "Lead Coordinator" concept at two VA medical centers and one military treatment facility; the assessment has been expanded to include more—but still a small minority of—facilities.

Screening and Evaluation

Moderate or severe TBI is likely to be recognized immediately at the time of the initial injury; however, mild TBI may go unnoticed if an individual walks away from an injury seemingly unharmed. Despite repeated assessments of servicemembers by the DOD, veterans may enter the VA health care system with undiagnosed TBI. Since 2007, VA policy has required that all OEF/OIF veterans receiving medical care in the VA health care system be screened for possible TBI (to identify cases of TBI that might otherwise go untreated).[43] Those who screen positive must be offered further evaluation and specialized treatment.[44]

The VA adapted a screening instrument from one used by the DOD. This screening instrument was incorporated into the computerized patient record system, which automatically alerts providers when a screening is required and prompts them to ask a series of questions. If a veteran screens negative for possible TBI, no further action is required. If a veteran screens positive for possible TBI, a follow-up evaluation is required (unless refused by the veteran), because not all veterans who screen positive actually have TBI.

Accurately diagnosing TBI is complicated by symptoms that overlap with posttraumatic stress disorder (PTSD), such as difficulty concentrating, irritability or angry outbursts, and memory loss.[45] Because of the complexity of diagnosing TBI and differentiating symptoms of other disorders, specialized training is required to conduct the Comprehensive TBI Evaluation, which

(...continued)

112th Cong., 1st sess., October 6, 2011; and U.S. Government Accountability Office, *Federal Recovery Coordination Program: Enrollment, Staffing, and Care Coordination Pose Significant Challenges*, GAO-11-572T, May 13, 2011.

[42] Interagency Care Coordination Committee, *Interagency Care Coordination Committee (IC3) Update*, Briefing to RWTF, April 16, 2014.

[43] Lucille Beck, *VA Polytrauma System of Care*, Briefing to RWTF, October 29, 2013.

[44] VA, Veterans Health Administration, *Screening and Evaluation of Possible Traumatic Brain Injury in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) Veterans*, VHA Directive 2010-012, March 8, 2010. This VHA Directive expires March 31, 2015.

[45] American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (Arlington, VA: American Psychiatric Association, 2013), pp. 271-280.

includes determining the origin of the injury, administering a 22-item neurobehavioral symptom inventory, conducting a targeted physical examination, and preparing a treatment plan.[46]

The VA Office of Inspector General found that a majority of VA staff informed veterans of TBI screening results; appropriately referred veterans who screened positive for comprehensive evaluations (or documented veterans' refusals); made sufficient attempts to reschedule when veterans failed to appear for evaluation appointments; and offered families relevant training.[47] Of the cases the Office of Inspector General examined, 21% did not complete the comprehensive evaluation within 30 days of a positive screen (or document veterans' refusal); 21% did not have a case manager assigned at the time of the evaluation; 15% did not have care plans; and 22% had no documentation that care plans were shared with the veterans and/or their families.

Acute and Post-Acute Care: VA Polytrauma/TBI System of Care

Veterans with moderate or severe TBI may receive care through the VA Polytrauma/TBI System of Care (PSC), which is also available to veterans with other traumatic injuries.[48] Established in 2005 pursuant to the Veterans Health Programs Improvement Act of 2004 (P.L. 108-422), the PSC is designed to function within the existing VA health care system, which is organized into 21 geographic regions, called Veterans Integrated Service Networks (VISNs). Like the larger VISN structure, the PSC is geographically dispersed, thereby making the specialized treatment more accessible to veterans, regardless of where they live. The PSC operates as a "hub and spoke" model with four components: (1) Polytrauma Rehabilitation Centers, (2) Polytrauma Network Sites, (3) Polytrauma Support Clinic Teams, and (4) Polytrauma Points of Contact. In FY2013, across all four components, the PSC served 50,516 unique patients (including both veterans and servicemembers) in outpatient clinics and 1,381 unique patients in inpatient units; however, these patients did not necessarily all have TBI.[49]

Polytrauma Rehabilitation Centers

Five regional Polytrauma Rehabilitation Centers serve as regional referral centers, the "hubs" of the PSC. They provide acute inpatient medical and rehabilitation services and consultation, as well as research and education related to polytrauma and TBI. Each Polytrauma Rehabilitation Center has an interdisciplinary treatment team, which includes a rehabilitation physician (physiatrist), registered nurses, social workers, speech-language pathologists, physical therapists, occupational therapists, recreation therapists, and a neuropsychologist, among others.[50]

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[46] VA, Veterans Health Administration, *Screening and Evaluation of Possible Traumatic Brain Injury in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) Veterans*, VHA Directive 2010-012, March 8, 2010. This VHA Directive expires March 31, 2015.

[47] VA, Office of Inspector General, *Combined Assessment Program Summary Report: Evaluation of Polytrauma Care in Veterans Health Administration Facilities*, Report No. 12-01702-303, September 11, 2013.

[48] VA, VHA, *Polytrauma System of Care*, VHA Handbook 1172.01, March 20, 2013http://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=2875.

[49] Lucille Beck, *VA Polytrauma System of Care*, Briefing to RWTF, October 29, 2013.

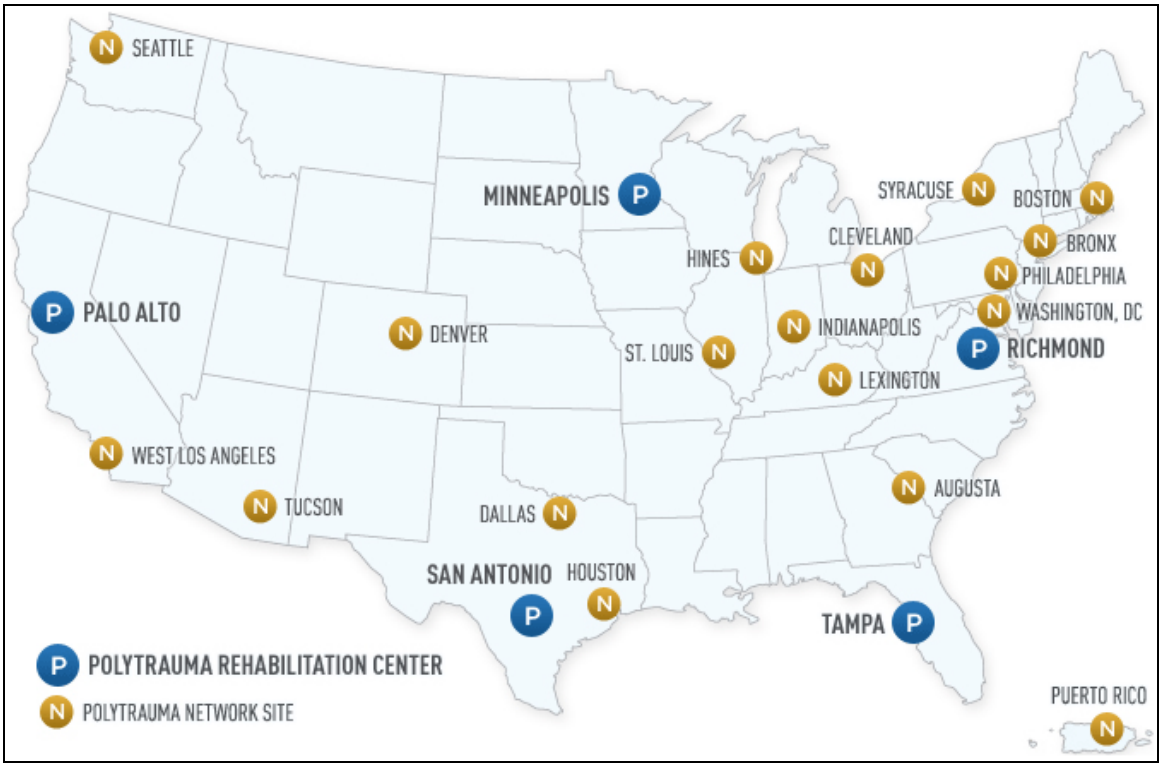
[50] VA, VHA, *Polytrauma/TBI System of Care: Polytrauma Rehabilitation Centers*, last updated March 24, 2014, http://www.polytrauma.va.gov/system-of-care/care-facilities/polytrauma-rehabilitation-centers.asp.

Polytrauma Network Sites

Twenty-three Polytrauma Network Sites extend the "spokes" of the PSC to each VISN (including one co-located with each of the Polytrauma Rehabilitation Centers) plus Puerto Rico. Polytrauma Network Sites provide continued medical care and rehabilitation services in a setting appropriate to the needs of veterans, servicemembers, and families following discharge from a Polytrauma Rehabilitation Center. Polytrauma Network Sites may also serve as entry points for rehabilitation services for those with mild to moderate TBI or polytraumatic injury.[51] **Figure 1** shows the location of each Polytrauma Network Site, including the Polytrauma Rehabilitation Centers.

Figure 1.VA Polytrauma/TBI System of Care (PSC)

Locations of Polytrauma Rehabilitation Centers (PRCs) and Polytrauma Network Sites (PNSs)



Source: U.S. Department of Veterans Affairs (VA), Veterans Health Administration (VHA), *Polytrauma/TBI System of Care: Polytrauma System of Care Facilities*, http://www.polytrauma.va.gov/system-of-care/care-facilities. (This map is from an earlier version of the website; it is accurate but is no longer available online).

Note: PNSs are also co-located with the PRCs in Richmond, Tampa, Minneapolis, Palo Alto, and San Antonio.

Polytrauma Support Clinic Teams

Eighty-six Polytrauma Support Clinic Teams extend care to VA medical facilities that do not have Polytrauma Rehabilitation Centers or Polytrauma Network Sites. In coordination with Polytrauma Network Sites, Polytrauma Support Clinic Teams allow veterans, servicemembers, and families to

[51] VA, VHA, *Polytrauma/TBI System of Care: Network Sites*, last updated May 23, 2014, http://www.polytrauma.va.gov/system-of-care/care-facilities/network-sites.asp.

continue their medical care and rehabilitation services closer to home and may also serve as entry points for rehabilitation services for those with mild to moderate TBI or polytraumatic injury.[52]

Polytrauma Points of Contact

Thirty-nine VA medical centers have designated Polytrauma Points of Contact, who are responsible for coordinating the treatment of veterans at facilities that lack the necessary services to provide specialized care. In addition to coordinating case management and referrals throughout the PSC, Polytrauma Points of Contact may provide a limited range of rehabilitation services.[53]

Long-Term Services and Supports

The VA provides a range of long-term services and supports through multiple programs with varying eligibility criteria. TBI may be one of many qualifying conditions for participation, rather than the focus of the programs. Long-term services and supports have historically been provided in institutional settings (e.g., nursing homes); however, if a veteran is able to live in the community and receive home or community-based treatment, this arrangement is generally preferable to institutional care. The VA has an ongoing pilot program providing assisted living services to veterans with TBI. In addition to institutional and noninstitutional services for veterans, the VA offers services for some caregivers.

Institutional Services

The VA provides institutional long-term services and supports for eligible veterans—including but not limited to those with TBI—who require a nursing home level of care (i.e., 24-hours supervision, medical care, skilled nursing care, and help with activities of daily living). This level of care may be delivered in VA Community Living Centers, private nursing homes under contract with the VA, or state veterans' homes.[54] Veterans may stay in these institutional settings temporarily (e.g., as a transitional placement between a hospitalization and returning home) or permanently.

Noninstitutional Services

The VA provides a range of noninstitutional long-term care services for veterans who are able to live independently if they have some assistance to accommodate their health conditions. These programs, which are available to (but not specifically for) veterans with TBI, include community residential care, adult day health care, home-based primary care, skilled home care, homemaker and home health aide services, home hospice care, respite care, and home telehealth.[55] **Table 2** summarizes these programs.

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[52] VA, VHA, *Polytrauma/TBI System of Care: Support Clinic Teams*, last updated May 23, 2014, http://www.polytrauma.va.gov/system-of-care/care-facilities/support-clinic-teams.asp.

[53] VA, VHA, *Polytrauma/TBI System of Care: Points of Contact*, last updated May 23, 2014, http://www.polytrauma.va.gov/system-of-care/care-facilities/points-of-contact.asp.

[54] The state veterans' home program is a federal-state partnership; eligibility criteria are established by the state.

[55] The VA also offers spinal cord injury home care as part of the Spinal Cord Injury & Disorders (SCI&D) system of care. See VA, VHA, *Spinal Cord Injury & Disorders*, last updated October 29, 2014, http://www.sci.va.gov/.

Table 2. VA Noninstitutional Long-Term Services Relevant to Veterans with TBI

Program	Description
Community Residential Care (CRC)	Community Residential Care (CRC) is a form of enriched housing that provides health care supervision to eligible veterans who (1) do not need acute hospital care, (2) are not able to live independently, and (3) have no suitable caregiver.[a] The VA inspects and approves CRC settings (e.g., assisted living homes and medical foster homes); however, the cost of residential care (e.g., room and board) is financed by veterans' own resources.
Adult Day Health Care (ADHC)	ADHC can help veterans who might otherwise require nursing home placement to continue living in their homes. ADHC centers provide constant supervision in a safe environment to allow veterans to participate in activities outside the home. In addition to therapeutic and socialization activities, ADHC programs offer nutrition, rehabilitation, nursing care, social services, and coordination of care.[b]
Home-Based Primary Care (HBPC)	HBPC delivers routine health care services to the homes of veterans whose medical issues make travel to clinic-based services challenging. HBPC may provide primary care, nursing, medication management, rehabilitation, assistance with ADLs (e.g., dressing) or IADLs (e.g., planning and preparing meals), and other services.[c]
Skilled Home Care	The Skilled Home Care program pays licensed non-VA medical professionals to provide services similar to HBPC.
Homemaker and Home Health Aide	The Homemaker and Home Health Aide Program arranges for a home health aide to go to a veteran's home on a regular schedule to help with personal care needs such as feeding and bathing.
Home Hospice Care	The Home Hospice Care program provides supportive services to both the veteran and the caregiver during the final stages of life. An interdisciplinary team from a non-VA hospice agency is available 24 hours a day, seven days a week. The program also provides grief counseling for immediate family members (not limited to the caregiver) after the veteran's death.
Respite Care	The Respite Care program may provide care to a veteran through in-home services, ADHC services, or temporary admission to a VA Community Living Center or a VA-contracted Community Residential Care Facility. The VA may provide respite care when a caregiver is unexpectedly hospitalized, has a family emergency, needs to go out of town, or needs a break from caregiving responsibilities.
Home Telehealth	The Home Telehealth program makes care coordinators available by telephone or online to caregivers who live at a distance from a VA Medical Center. In addition to care coordination, the program may also provide education, training, and telephone or online support groups.

Source: VA, VHA, *VA Caregiver Support*, http://www.caregiver.va.gov/support (unless otherwise noted).

Notes: The VA also offers spinal cord injury home care as part of the Spinal Cord Injury & Disorders (SCI&D) system of care. See VA, VHA, *Spinal Cord Injury & Disorders*, http://www.sci.va.gov/.

a. VA, VHA, *Community Residential Care Program*, VHA Handbook 1140.01, February 10, 2014.

b. VA, VHA, *Adult Day Health Care*, VHA Handbook 1141.03, September 29, 2009. This handbook was scheduled for recertification by September 30, 2014.

c. VA, VHA, *Geriatrics and Extended Care: Home Based Primary Care*, last updated September 1, 2014, http://www.va.gov/geriatrics/guide/longtermcare/home_based_primary_care.asp.

Pilot Program: Assisted Living Services for Veterans with TBI

The VA has an ongoing pilot program to assess the effectiveness of providing assisted living (AL) services to eligible veterans with TBI. The AL-TBI pilot program is administered through contracts with non-VA (private sector) residential care facilities that specialize in rehabilitation for individuals with TBI. In administering the AL-TBI pilot program, the VA collaborates with the Defense and Veterans Brain Injury Center, a component of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (which itself is a collaborative effort of the VA and the DOD). The AL-TBI pilot program was established as a five-year pilot program pursuant to Section 1705 of the National Defense Authorization Act for Fiscal Year 2008 (P.L. 110-181). Section 501 of the Veterans Access, Choice, and Accountability Act of 2014 (P.L. 113-146, as amended) extends the pilot program through October 6, 2017.[56] The program was further amended by the Veterans Traumatic Brain Injury Care Improvement Act of 2014 (P.L. 113-257), which changed reporting requirements and modified the terminology (e.g., changing ‘‘assisted living’’ to ‘‘community-based brain injury residential rehabilitative care’’).

In addition to the pilot program, the VA has authority to contract with non-VA (private sector) facilities to provide assisted living services specifically to OEF/OIF veterans with TBI whose deficits in ADLs and IADLs would otherwise require nursing home care that generally exceeds their nursing needs. This authority was established under Section 507 of the Caregivers and Veterans Omnibus Health Services Act of 2010 (P.L. 111-163).

VA Proposal: Medical Foster Homes

Within the category of Community Residential Care (as described in **Table 2**), Medical Foster Homes (MFHs) serve more medically complex and disabled veterans by combining placement in a small adult foster home with enrollment in Home-Based Primary Care (as described in **Table 2**).[57] Currently more than 600 VA-approved caregivers provide MFH care to more than 700 veterans in 43 states—paid by the veterans. The VA has proposed legislation authorizing payments for care in VA-approved MFHs for veterans who would otherwise need nursing home care.[58] The VA argues that many veterans who presently reside in nursing homes at VA expense would opt for MFH instead if the VA paid for it. The VA estimates that the 10-year (FY2016–FY2025) costs would be $176 million.

Services for Caregivers

The Caregivers and Veterans Omnibus Health Services Act of 2010 (P.L. 111-163) required the VA Secretary to establish a “program of comprehensive assistance for family caregivers” of any eligible veteran who has a serious injury incurred or aggravated in the line of duty on or after September 11, 2001, and who is in need of personal care services.[59] For approximately 25% of

[56] See CRS Report R43704, *Veterans Access, Choice, and Accountability Act of 2014 (H.R. 3230; P.L. 113-146)*.

[57] VA, VHA, *Medical Foster Home Procedures*, VHA Handbook 1141.02, November 10, 2009. This handbook was scheduled for recertification by November 2014. See also VA, VHA, *Geriatrics and Extended Care: Medical Foster Home Care and Elder Veterans*, December 27, 2014, http://www.va.gov/geriatrics/Guide/LongTermCare/Medical_Foster_Homes.asp.

[58] VA, *Congressional Submission: FY2016 Funding and FY2017 Advance Appropriations*, Volume II: Medical Programs and Information Technology Programs, pp. VHA-212–VHA-213.

[59] 38 U.S.C. § 1720G(a). Note that eligibility is based on “injury” and not “illness.”

program participants, TBI is the qualifying injury.[60] For caregivers who are designated as the primary provider of personal care services for an eligible veteran, the program offers a monthly stipend, medical care,[61] mental health care, and respite care (i.e., temporary care provided to relieve the usual caregiver). Additional services available to these and other caregivers include training in providing personal care services, payment for travel to the veterans' medical appointments, and counseling. The Government Accountability Office (GAO) found that the VA had initially underestimated demand for services in the caregiver program.[62] More than three times the estimated number of caregivers were approved to participate in the program during its first few years, and the workload was consequently larger than anticipated, leading to delays in delivering program benefits.[63]

The VA's "program of general caregiver support services" (also established under P.L. 111-163) provides more limited benefits (e.g., no monthly stipend) to caregivers for a larger group of veterans (e.g., not limited to post-9/11 veterans).[64] This program is open to caregivers for any veteran who needs personal care services because of an inability to perform one or more activities of daily living, a need for supervision or protection based on symptoms or residuals of neurological or other impairment or injury, or such other matters as specified by the VA Secretary. Under this program, caregiver support services include information about the supportive services available to caregivers from the VA and other agencies, training in providing personal care services, appropriate respite care, and counseling. Some VA services for caregivers (e.g., respite care) predate the specific programs established under P.L. 111-163.

In a 2014 report about caregivers for wounded servicemembers and veterans (termed "military caregivers"), RAND finds that post-9/11 military caregivers differ from caregivers for veterans of previous eras. In addition to being younger on average and caring for younger veterans, post-9/11 military caregivers are more likely to be veterans themselves, nonwhite, employed, and unconnected to a support network. Post-9/11 military caregivers are also more likely to care for someone with mental health or substance use disorders. RAND finds that military caregivers "consistently experience worse health outcomes, greater strains in family relationships, and more workplace problems than non-caregivers, and post-9/11 military caregivers fare worst in these areas."[65] The RAND report includes four recommendations, summarized in the textbox below.

RAND Recommendations for Caregiving Programs

- *Empowering caregivers* involves helping them develop caregiving skills, reducing the stress of caregiving, and raising public awareness of their value.

[60] U.S. Government Accountability Office, *VA Health Care: Improvements Needed to Manage Higher-Than-Expected Demand for the Family Caregiver Program*, GAO-15-245T, December 3, 2014. Testimony for U.S. Congress, House Committee on Veterans' Affairs, Subcommittee on Health, *VA's Caregiver Program: Assessing Current Prospects and Future Possibilities*, 113th Cong., 2nd sess., December 3, 2014.

[61] This refers to the Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA). See CRS Report RS22483, *Health Care for Dependents and Survivors of Veterans*.

[62] U.S. Government Accountability Office, *VA Health Care: Improvements Needed to Manage Higher-Than-Expected Demand for the Family Caregiver Program*, GAO-15-245T, December 3, 2014. Testimony for U.S. Congress, House Committee on Veterans' Affairs, Subcommittee on Health, *VA's Caregiver Program: Assessing Current Prospects and Future Possibilities*, 113th Cong., 2nd sess., December 3, 2014.

[63] By May 2014 about 15,600 caregivers had been approved.

[64] 38 U.S.C. § 1720G(b).

[65] Rajeev Ramchand et al., *Hidden Heroes: America's Military Caregivers*, RAND, Santa Monica, CA, 2014, p. xviii.

- *Creating caregiver-friendly environments* involves promoting supportive workplace policies and including caregivers as part of the veterans' health care teams.
- *Filling gaps in programs* involves basing caregiver support on their caregiving responsibilities (rather than their relationships to the veterans) and expanding respite care services.
- *Planning for the future* involves creating plans for continuity of caregiving (e.g., if the current caregiver is unable to continue providing care), developing more sustainable programs (e.g., through cross-sector coordination and integration), providing caregivers access to high-quality services, and investing in further research.

Source: Rajeev Ramchand et al., *Hidden Heroes: America's Military Caregivers*, RAND, Santa Monica, CA, 2014.

Research

Within the VA, TBI research is supported by two organizational units: the Office of Research and Development and the Mental Health Strategic Healthcare Group. In general, the Office of Research and Development funds intramural research by individual VA investigators and researchers.[66] Research related to TBI includes developing and testing new treatments, as well as studying changes in the brain, thinking, and psychological well-being.[67] Research on TBI and related conditions may also be conducted under the auspices of the VA's Mental Health Strategic Healthcare Group, which supports research efforts conducted at the National Center for PTSD, four Centers of Excellence, and 10 Mental Illness Research Education and Clinical Centers.[68]

The VA is collaborating with the Department of Education's National Institute on Disability and Rehabilitation Research (NIDRR) to develop the Traumatic Brain Injury Veterans Health Registry, which is intended to facilitate future research by providing longitudinal data on the demographics, military service, injury, and treatment of all OEF/OIF veterans with TBI.[69] The VA is also working with the NIDRR to establish a database similar to the institute's existing TBI Model System National Database (established in 1989), which is intended to facilitate research collaboration and program evaluation.[70] Congress has encouraged and in some cases required the VA to collaborate with other entities involved in TBI research. For example, the National Defense Authorization Act for Fiscal Year 2008 (P.L. 110-181) required the VA to collaborate with the TBI rehabilitation research community, the Defense and Veterans Brain Injury Center,[71] NIDRR grantees, and other governmental entities engaged in TBI rehabilitation.

[66] The ORD supports research through four research divisions: Biomedical Laboratory Research and Development (BLR&D), Clinical Science Research and Development (CSR&D), Rehabilitation Research and Development (RR&D), and Health Services Research and Development (HSR&D).

[67] VA, VHA, Office of Research and Development, *Traumatic Brain Injury*, last updated September 10, 2014, http://www.research.va.gov/topics/tbi.cfm.

[68] VA,VHA, *MIRECCs and CoE*, last updated October 3, 2014, http://www.mirecc.va.gov/.

[69] VA, VHA, VA Quality Enhancement Research Initiative (QUERI), *Polytrauma/Blast-Related Injuries QUERI Center Strategic Plan: FY2013 through FY2015*, November 2012, p. 20.

[70] Ibid., pp. 20-21.

[71] See ongoing studies at Defense and Veterans Brain Injury Center, *Current DVBIC Studies*, last updated December 2, 2014, http://www.dvbic.org/research/browse/current-dvbic-studies.

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