

Treatment for Posttraumatic Stress Disorder in Military and Veteran Populations: Final Assessment

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Treatment for
POSTTRAUMATIC STRESS DISORDER
in Military and Veteran Populations
Final Assessment

Committee on the Assessment of Ongoing Efforts in the
Treatment of Posttraumatic Stress Disorder

Board on the Health of Select Populations

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

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Willing is not enough; we must do.”*
—Goethe



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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations nor did they see the final draft of the report before its release. The review of this report was overseen by **Ellen Wright Clayton**, Vanderbilt University, and **Kristine M. Gebbie**, Flinders University of South Australia. Appointed by the National Research Council and the Institute of Medicine, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

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Preface

Posttraumatic stress disorder (PTSD) remains one of the signature injuries of the U.S. engagements in Afghanistan and Iraq. The burden of PTSD in service members who have been deployed in support of Operation Enduring Freedom in Afghanistan since 2001 and Operation Iraqi Freedom since 2003 is staggering. Fortunately, national awareness of the toll that PTSD has had on the health and well-being of service members, veterans, their families, and their communities has been increasing. Both the Department of Defense (DoD) and the Department of Veterans Affairs (VA) have, in a variety of reports and activities, demonstrated keen understanding of the challenges posed by PTSD. Each department has responded to the challenges with substantial funding to foster research, develop programs, and initiate services to combat PTSD. Although both departments are making strides in identifying and treating people who have PTSD symptoms, many obstacles remain before they will have a comprehensive, integrated, and high-performing approach to managing PTSD.

The 2010 National Defense Authorization Act asked the Institute of Medicine (IOM) to look at the effectiveness of the growing number of PTSD programs and services that are available for service members and veterans in DoD and VA, respectively. The present report is the second of a two-phase study. In this phase, the committee focused on the opportunities and challenges that each department faces in developing, implementing, and evaluating services and programs in the context of achieving a high-performing system to care for service members and veterans who have PTSD. The committee also conducted a focused review of DoD, VA, and other organizations' portfolios of PTSD-related research to identify where

gaps or new emphases might be addressed to improve prevention of, screening for, diagnosis of, and treatment and rehabilitation for the disorder. During its review of the literature and ongoing research and preparation of this report, it was obvious to the committee that although there is a wealth of information on PTSD, there are also substantial gaps in our knowledge of how best to manage PTSD in service members and veterans who have it. This report attempts to recognize both progress and stasis in improving care for PTSD in DoD and VA.

The committee gratefully acknowledges the many individuals and groups that generously shared their time, expertise, and insights with the committee. They provided valuable information on particular aspects of PTSD, including reports and data, and answered committee queries about their work and experience in dealing, personally and professionally, with PTSD. Among the numerous people who helped the committee are those who worked tirelessly on the committee's data requests, specifically Keith Hoffman and Wendy Funk, of Kennell and Associates; Mary Schohn, of the VA Office of Mental Health Operations; Rani Hoff, of the VA Northeast Program Evaluation Center; and many others in the Army, Navy, Marine Corps, and Air Force. The committee also visited many DoD and VA facilities and expresses its appreciation for the time, insights, and personal stories offered by a variety of leaders, mental health providers, primary care providers, specialty program directors, researchers, and purchased care providers. The committee appreciates especially the many service members and veterans who were receiving or had received treatment for PTSD and who took time to share their experiences with the committee. The committee is grateful to Roberta Wedge, who served as study director for this project, and to the IOM staff members who contributed to the project: Heather Chiarello, Emily Morden, Heidi Murray-Smith, and Anne Styka. A thank you is also extended to Daniel Bearss and Ellen Kimmel, who conducted the literature searches.

Sandro Galea, *Chair*

Committee on the Assessment of Ongoing Efforts
in the Treatment of Posttraumatic Stress Disorder

Abbreviations and Acronyms

APA	American Psychiatric Association
Army STARRS	Army Study to Assess Risk and Resilience in Service Members
BDNF	brain-derived neurotrophic factor
BHDP	Behavioral Health Data Portal
C5	Comprehensive Combat and Complex Casualty Care
CBOC	community-based outpatient clinic
CBT	cognitive behavioral therapy
CDP	Center for Deployment Psychology
COSC	combat and operational stress control
CPT	cognitive processing therapy
CSF2	Comprehensive Soldier and Family Fitness
DCoE	Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury
DCS	D-cycloserine
DoD	Department of Defense
DSM-IV-TR	<i>Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition, Text Revision</i>
DSM-5	<i>Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition</i>
EMDR	eye movement desensitization and reprocessing

fMRI	functional magnetic resonance imaging
FY	fiscal year
GAO	Government Accountability Office
ICD	International Classification of Diseases
IDES	Integrated Disability Evaluation System
IMHS	DoD/VA Integrated Mental Health Strategy
INTRuST	Injury and Traumatic Stress consortium
IOM	Institute of Medicine
MDMA	3,4-methylenedioxy-N-methylamphetamine
MFLC	military and family life counselor
MHAT	mental health advisory team
MHS	military health system
MIRECC	Mental Illness Research, Education, and Clinical Center
MST	military sexual trauma
MTF	military treatment facility
NDAA	National Defense Authorization Act
NEPEC	Northeast Program Evaluation Center
NICoE	National Intrepid Center of Excellence
NIH	National Institutes of Health
NIMH	National Institute of Mental Health
NQF	National Quality Forum
OASD(HA)	Office of the Assistant Secretary of Defense for Health Affairs
OASIS	Overcoming Adversity and Stress Injury Support
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OMHO	Office of Mental Health Operations (VA)
OSCAR	Operational Stress Control and Readiness
PACT	patient-aligned care team
PCL	PTSD Checklist
PCL-M	PTSD Checklist-Military Version
PCMH	patient-centered medical home
PDHA	Post-Deployment Health Assessment
PDHRA	Post-Deployment Health Reassessment
PE	prolonged exposure therapy
PHRAMS	Psychological Health Risk Adjusted Model for Staffing
PTSD	posttraumatic stress disorder

RePORT	Research Portfolio Online Reporting Tools database
RESPECT-Mil	Re-engineering Systems for Primary Care Treatment of Depression and PTSD in the Military
rTMS	repetitive transcranial magnetic stimulation
SIPP	specialized intensive PTSD program
SNRI	serotonin norepinephrine reuptake inhibitor
SOPP	specialized outpatient PTSD program
SSRI	selective serotonin reuptake inhibitor
STRONG STAR	South Texas Research Organizational Network Guiding Studies on Trauma and Resilience
T2	National Center for Telehealth and Technology
TBI	traumatic brain injury
TMS	transcranial magnetic stimulation
TrIOPS	Tri-service Integrator of Outpatient Programming Systems
VA	Department of Veterans Affairs
VBA	Veterans Benefits Administration
VHA	Veterans Health Administration
VISN	veterans integrated service network
VLER	virtual lifetime electronic record
WRC	Warrior Resilience Center
WSDTT	Women's Stress Disorder Treatment Team
WTRP	Women's Trauma Recovery Program

Summary

Posttraumatic stress disorder (PTSD) is one of the signature injuries of the U.S. conflicts in Afghanistan and Iraq, but it affects veterans of all eras. It is estimated that 7–20% of service members and veterans who served in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) may have the disorder. PTSD is characterized by a combination of mental health symptoms—reexperiencing of a traumatic event, avoidance of trauma-associated stimuli, adverse alterations in thoughts and mood, and hyperarousal—that last at least 1 month and impair functioning.

PTSD can be lifelong and pervade all aspects of a service member’s or veteran’s life, including mental and physical health, family and social relationships, and employment. It is often concurrent with other health problems, such as depression, traumatic brain injury (TBI), chronic pain, substance use disorder, and intimate partner violence.

COMMITTEE’S STATEMENT OF TASK AND APPROACH

The Department of Defense (DoD) and the Department of Veterans Affairs (VA) provide a spectrum of programs and services to screen for, diagnose, treat for, and rehabilitate service members and veterans who have or are at risk for PTSD. The 2010 National Defense Authorization Act asked the Institute of Medicine (IOM) to assess those PTSD programs and services in two phases. The committee’s statement of task is in Box S-1. In phase 1, the committee requested extensive data from DoD and VA on their PTSD programs and services; in addition, it looked at collaborative efforts of the two departments; provided a scientific overview of the neurobiology

BOX S-1
Statement of Task^a

The Institute of Medicine will convene a committee to conduct a study of ongoing efforts in the treatment of PTSD. The study will be conducted in two phases: the focus in phase 1 will be on data gathering and will result in the initial study as noted in the congressional legislation; the focus in phase 2 will be on the analysis of data and result in the updated study. The work of the committee is dependent upon the timely delivery of data, in a usable format, from the DoD and the VA on their current PTSD programs.

Phase 1 (initial report):

In phase 1 of the study, the committee will collect data from the Department of Defense (DoD) and the Department of Veterans Affairs (VA) on programs and methods available for the prevention, screening, diagnosis, treatment, and rehabilitation of post-traumatic stress disorder. The committee will highlight collaborative efforts between DoD and the VA in those areas. Additionally, the committee will consider the status of studies and clinical trials involving innovative treatments of post-traumatic stress disorder that are conducted by the DoD, the VA, or the private sector.

Phase 2 (updated report):

In phase 2 of the study, the committee will analyze the data received in phase 1 specifically to determine the rates of success for each program or method; and an estimate of the number of members of the Armed Forces and veterans diagnosed by the DoD or the VA as having post-traumatic stress disorder and the number of such veterans who have been successfully treated.

In addition, the committee will focus on targeted interventions at Fort Hood, TX; Fort Bliss, TX; Fort Campbell, TN; and any other locations the committee deems necessary, including VA facilities. The committee will also examine gender-specific and racial and ethnic group-specific mental health treatment services available for members of the Armed Forces, including: the availability of such treatment and services; the access to such treatment and services; the need for such treatment and services; and the efficacy and adequacy of such treatment and services.

Finally, the committee will examine the current and projected future annual expenditures by the DoD and the VA for the treatment and rehabilitation of PTSD; and provide recommendations for areas for future research with respect to post-traumatic stress disorder.

^a This is an abridged version. The full Statement of Task is found in Chapter 1.

of PTSD; assessed the evidence base on PTSD prevention and treatment approaches, including both evidence-based treatments and complementary and alternative therapies; and described barriers to accessing PTSD services in the departments. The phase 1 report was published in June 2012.

In phase 2, the committee considers what a successful PTSD management system is and whether and how such a system is being implemented in each department. This includes an assessment of what care is given and to whom, how effectiveness is measured, what types of mental health care providers are available, what influences whether a service member or veteran seeks care, and what are the costs associated with that care. The committee was also tasked with assessing PTSD-related research efforts that are being undertaken by DoD, VA, and other organizations, including the National Institutes of Health. To address these tasks, further requests for data were made of DoD and VA, database and literature searches were conducted, and nine military medical facilities and six VA medical facilities were visited.

PREVALENCE OF PTSD IN MILITARY AND VETERAN POPULATIONS

Symptoms of PTSD may occur soon after exposure to a traumatic event or be delayed, sometimes for years. Many people will never have all the symptoms or the right combination of them to meet the criteria for a full diagnosis of PTSD but may suffer with many symptoms nonetheless.

Since October 2001, more than 2.6 million U.S. military personnel have been deployed to Afghanistan in support of OEF and to Iraq in support of OIF and Operation New Dawn. Increased exposure to combat-related trauma is associated with an increased risk for PTSD. The proportion of service members who have PTSD has increased dramatically since the beginning of those conflicts, from less than 1% in 2004 to more than 5% in 2012. In 2012, 13.5% of soldiers had a diagnosis of PTSD, as did 10% of marines, 4.5% of Navy personnel, and 4% of Air Force personnel. More military women than men had a diagnosis of PTSD (13% vs 9%), as did more nonwhites than whites (11% vs 8.5%).

In 2012, about 502,000 veterans made at least two visits to VA for PTSD outpatient care; they make up 9% of all users of VA health care services, up from 4% in 2002. Of veterans entering specialized outpatient PTSD programs (SOPPs) in 2012, 47% were OEF and OIF era, 20% were 1990–1991 Gulf War era, and 34% were Vietnam era. As in the case of service members, more female veterans than male veterans had a diagnosis of PTSD in 2013 (29.4% vs 24.5%). In 2012, 23.6% (119,500) of all OEF and OIF veterans who used VA health care services had a diagnosis of PTSD.

PTSD PROGRAMS AND SERVICES

Department of Defense

In DoD, PTSD management programs and services are implemented by the individual service branches and by the Defense Health Agency through its management of the TRICARE contract programs. Each service branch has developed and implemented training, services, and programs intended to foster mental resilience, preserve mission readiness, and mitigate adverse consequences of exposure to stress, although none of these resilience or prevention programs is PTSD-specific.

DoD screens all deployed service members for symptoms of PTSD at 30 days and again at 3–6 months after return from deployment. On the basis of the screening results, service members may be referred for further evaluation and, if appropriate, treatment.

Most psychotherapy or pharmacotherapy treatments for PTSD in DoD are provided on an outpatient basis and occur in general mental health clinics, primary care settings, or specialized PTSD programs. All service branches are embedding mental health care providers in primary care clinics to reduce barriers to care. Some military installations also have intensive outpatient PTSD treatment programs that not only offer evidence-based treatments (psychotherapy and pharmacotherapy) but include complementary therapies, such as acupuncture, art therapy, and biofeedback. DoD also offers inpatient PTSD treatment programs, but these are not as widely available. Outcome data on which to determine the effectiveness of these programs in either the short term or the long term are not available. One exception to this lack of data is the National Intrepid Center of Excellence, which has some limited, short-term outcome data on service members with severe PTSD and TBI.

Department of Veterans Affairs

The VA health care system offers a full array of treatment services for PTSD, including face-to-face mental health screening and assessment, psychotherapy (individual and group), pharmacotherapy, and adjunct services, such as employment counseling. VA uses its *Uniform Mental Health Services in VA Medical Centers and Clinics* handbook to specify the minimum clinical services that must be provided at each VA medical center and community-based outpatient clinic (CBOC). VA requires annual screening for PTSD for the first 5 years of care. It also requires that two evidence-based PTSD treatments—prolonged exposure (PE) therapy and cognitive processing therapy (CPT)—be available to all veterans who need them.

Other evidence-based and complementary therapies, as adjunctive treatments, are also offered in many medical centers.

In 2012, 29% of veterans who had a diagnosis of PTSD were seen in one of 127 SOPPs, and about 1% were seen in one of 39 specialized intensive PTSD programs (SIPPs); other veterans who have PTSD were seen in general mental health or primary care clinics. Some veterans may seek readjustment counseling in VA Vet Centers. In 2012, 216,090 OEF and OIF veterans who had PTSD were seen only in a VA medical center, 24,136 were seen only in a Vet Center, and 45,908 received care in both kinds of facilities. No treatment outcome data are collected in any general mental health clinic, Vet Center, or SOPP. Outcome data are collected for the SIPPs but suggest that there are only modest improvements in PTSD symptoms after treatment in these programs. VA is modifying the electronic health record system to capture the psychotherapy that each patient receives in addition to the record already captures pharmacotherapy data.

FINDINGS AND RECOMMENDATIONS

PTSD Management Strategies

PTSD management in DoD appears to be local, ad hoc, incremental, and crisis-driven with little planning devoted to the development of a long-range, population-based approach for the disorder by either the Office of the Assistant Secretary of Defense for Health Affairs or any of the service branches. Each service branch has established its own prevention programs, trains its own mental health staff, and has its own programs and services for PTSD treatment.

VA has a more unified organizational structure than DoD and, therefore, is able to ensure a more consistent approach to the management of PTSD in its medical facilities. Its strategic plans (2011–2015 and 2016–2020) include improving the quality and accessibility of mental health care, in part, by increasing capacity and outreach to veterans and their families and expanding care for both new and aging veterans. However, there are few data to indicate that PTSD-related performance measures are being met. Although improving mental health is one of VA's 16 major initiatives in the strategic plan, highlighting improved PTSD care as a specific major initiative might help to focus attention on the needs of the growing population of veterans, including women, who have PTSD.

Although the DoD and VA are coordinating strategic efforts such as the *DoD/VA Integrated Mental Health Strategy* and the *National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families*, these activities have not proven to

be sufficient to determine whether PTSD management is improving or that a population-based approach is being used to reach and treat all service members and veterans in need of care for PTSD. Furthermore, current DoD and VA strategic efforts do not necessarily encourage the use of best practices for preventing, screening for, diagnosing, and treating for PTSD and its comorbidities, and they do not extend to ensuring continuity of care as service members transition from active duty to veteran status.

Recommendation A: DoD and VA should develop an integrated, coordinated, and comprehensive PTSD management strategy that plans for the growing burden of PTSD for service members, veterans, and their families, including female veterans and minority group members.

Leadership and Communication

Many military installations and VA medical facilities have engaged leaders who are actively working to encourage the use of best practices for PTSD. The installations and medical centers that had the most coordinated PTSD treatment and the most options for their patients appeared to be the ones that have strong, effective, and knowledgeable leaders and good communication among leaders, providers, and support staff.

In DoD and each service branch, leaders at all levels of the chain of command are not consistently held accountable for implementing policies and programs to manage PTSD effectively, including those aimed at reducing stigma and overcoming barriers to accessing care. In each service branch, there is no overarching authority to establish and enforce policies for the entire spectrum of PTSD management activities. A lack of communication among mental health leaders and clinicians in DoD can lead to the use of redundant, expensive, and perhaps ineffective programs and services while other programs, may be more effective, languish or disappear.

VA leadership engagement in PTSD management varies among sites, resulting in different types and quality of PTSD programs and services. Although the VA central office has established policies on minimum care requirements and guidance on PTSD treatment, it is unclear whether VA leaders adhere to the policies, encourage staff to follow the guidance, or use the limited outcome data available from the SIPPs to improve PTSD management.

DoD and VA leaders at the national and local levels set the priorities for PTSD care for their respective organizations. Authority, responsibility, and accountability for PTSD management need to begin at the central office level—at the level of the assistant secretary of defense for health affairs and the VA under secretary for health—and extend down to facility leaders and unit leaders. Leadership accountability can help ensure that information on

PTSD programs and services is collected and that their success is measured and reported. Effective leadership extends to supporting innovation in new processes and approaches for treatment for PTSD.

Recommendation B: DoD and VA leaders, who are accountable for the delivery of high-quality health care for their populations, should communicate a clear mandate through their chain of command that PTSD management, using best practices, has high priority.

Performance Measurement

DoD and VA do not collect data to identify best practices throughout the spectrum of their PTSD programs and services, although there are some initiatives to do so. Given that DoD and VA are responsible for serving millions of service members, families, and veterans, it is surprising that no PTSD outcome measures of any type for psychotherapy or pharmacotherapy are consistently used or tracked in the short or long term (with the exception of the VA SIPPs). Without tracking outcomes, neither department knows whether it is providing effective, appropriate, or adequate care for PTSD. Reliable and valid self-report measures are available and could be used to monitor progress, provide real-time response information to providers and patients, and guide modifications of individual treatment plans. For example, DoD is moving toward the use of a measurement-based PTSD management system through the use of the Behavioral Health Data Portal, but it has yet to be fully implemented throughout the service branches.

VA is also in the process of expanding its electronic health record to capture the types of psychotherapy that veterans are receiving, but the revised record still will not include regularly administered outcome measures. Although VA has been collecting data on its SOPPs and SIPPs for many years and publishes the compiled data in an annual internal publication, useful outcome data are scarce and available only for SIPPs. Furthermore, most veterans who have PTSD do not receive care in VA specialized PTSD programs, so their treatments and outcomes are unknown.

To better assess the success of their PTSD programs and services, DoD and VA should have a performance management system that includes

- The use of standard metrics to screen for, measure, and track PTSD symptoms and outcomes throughout DoD and VA. The departments should work with the National Quality Forum to endorse consensus performance measures for both clinical measures and quality indicators.

- Health information technology that documents a patient's PTSD treatments and progress such that the data can be aggregated at the provider, program, facility, service, regional, and national levels.
- Performance measures to inform and improve the system via integrated feedback loops, which should be used by leaders at all levels to evaluate and improve PTSD management.

Recommendation C: DoD and VA should develop, coordinate, and implement a measurement-based PTSD management system that documents patients' progress over the course of treatment and long-term follow-up with standardized and validated instruments.

Workforce and Access to Care

DoD and VA have substantially increased their mental health staffing—both direct care and purchased care. However, staffing increases do not appear to have kept pace with the demand for PTSD services, including specialized programs. DoD and VA acknowledge that it can be difficult to hire and retain staff in underserved areas in spite of targeted efforts to do so.

Staffing shortages can result in clinicians' not having sufficient time to provide evidence-based psychotherapies readily and with fidelity to the treatment protocols. The lack of time to deliver psychotherapy with fidelity is reflected in the fact that in 2013 only 53% of OEF and OIF veterans who had a primary diagnosis of PTSD and sought care in the VA received the recommended eight sessions within 14 weeks. Provision of evidence-based treatments also implies refraining from providing services or programs that lack an evidence base or whose evidence base has been deemed ineffective by recent research. The size of the VA and DoD workforces will be influenced by how efficiently and effectively staff use their time to deliver the most effective assessments and treatments. Although expanding the number of staff to meet needs may be necessary, it may also be possible to achieve equal or better results with more efficient use of existing staff and by having existing staff use the most effective programs and services.

Neither department appears to have formal procedures for evaluating the qualifications of purchased care providers, mechanisms to determine the best purchased care provider for an individual patient, or a requirement that those providers give referring providers updates on patients' progress. Having standards, procedures, and requirements for direct care and purchased care providers will help to ensure that they are trained in evidence-based treatments that are consistent with *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress*, understand military culture, continuously measure patients' progress, and, in the case of purchased care providers, coordinate with patients' DoD or VA refer-

ring providers regularly. DoD and VA have expanded training in evidence-based psychotherapies, particularly PE and CPT, for all mental health staff. However, this training is not required for purchased care providers in either department. VA is working to coordinate and standardize the use of purchased care providers through the Patient-Centered Community Care initiative, which will require that these providers be screened to ensure that they meet or exceed VA standards for credentialing, licensing, and specialty care requirements and that they share patient records with VA providers. DoD does not appear to have a similar mechanism for ensuring that its purchased care providers are trained in and using evidence-based treatments.

Recommendation D: DoD and VA should have available an adequate workforce of mental health care providers—both direct care and purchased care—and ancillary staff to meet the growing demand for PTSD services. DoD and VA should develop and implement clear training standards, referral procedures, and patient monitoring and reporting requirements for all their mental health care providers. Resources need to be available to facilitate access to mental health programs and services.

Evidence-Based Treatment

DoD and VA have expended considerable effort to develop, update, and disseminate the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress*. The guideline provides algorithms for choosing an evidence-based treatment for PTSD, addresses comorbidities, describes approaches for engaging patients in treatment, and discusses the evidence on first-line and other psychotherapies and pharmacotherapies.

However, mental health care providers in both departments do not consistently provide evidence-based treatment in spite of policies that require that all service members and veterans who have PTSD receive first-line treatments, such as CPT and PE. It is unclear what PTSD therapies most service members or veterans receive in any treatment setting and whether their symptoms improve as a result. DoD and VA are also integrating complementary and alternative therapies into some of their specialized PTSD programs, but the interventions need to be studied to establish their evidence base and to ensure that their use does not deter patients from receiving first-line, evidence-based treatments.

DoD and VA are exploring approaches to deliver treatment more expeditiously, including the use of technological applications that extend the reach of clinical care and service delivery, such as virtual reality, videoconferencing, patient avatars, and mobile applications for patients and providers. The use of telehealth may improve access to care for service members

and veterans, but pilot programs and studies need to be conducted to support their effectiveness and optimal use.

Recommendation E: Both DoD and VA should use evidence-based treatments as the treatment of choice for PTSD, and these treatments should be delivered with fidelity to their established protocols. As innovative programs and services are developed and piloted, they should include an evaluation process to establish the evidence base on their efficacy and effectiveness.

Central Database of Programs and Services

DoD does not have a central database of PTSD programs and services that are available throughout the service branches. Without such a database, it is impossible to compare programs and services, to identify the ones that are effective and use best practices, and to recognize the ones that need improvement or should be eliminated.

Although the VA prepares an annual report on its specialized PTSD programs, that report does not include all PTSD treatment settings, such as general mental health clinics and women's health clinics. Furthermore, the report does not contain any descriptive information on program elements and does not appear to be widely used. Most of the specialized PTSD programs in the service branches and VA medical facilities were developed and implemented locally. As a result, clinicians and other mental health care providers have no resource that provides information on programs (for example, type, location, admission criteria, and treatment modalities) to which they might refer service members who need specialized PTSD care, or that might serve as models for new programs at their facility.

All stakeholders, including families and direct and purchased care providers, would benefit from ready access to a routinely updated database in which programs are described and evaluated according to standardized measures. Existing resources, such as the National Center for PTSD, could be leveraged to develop more comprehensive information about VA-wide PTSD programs and services (not just specialized ones) and, in a collaborative effort, include those of DoD.

Recommendation F: DoD and VA should establish a central database or other directory for programs and services that are available to service members and veterans who have PTSD.

Family Involvement

DoD has a variety of resources to assist service members and their families and others in learning about PTSD, its diagnosis and treatment, and its impact on family and friends. Many support services are available to service members and their family members in military installations and personnel in those programs and services are trained to recognize early symptoms of PTSD, provide nonclinical supportive care, and refer service members and their families to appropriate professional care.

VA also has resources for families of veterans who have PTSD, such as the National Center for PTSD. Some veterans have expressed their interest in and preference for having their partners involved in their PTSD treatment and the need for support groups for those partners. However, there is no formal VA-wide program for engaging family members in the veterans' treatments, for providing psychoeducation in a facility, or for establishing support groups for family members. In several VA mental health programs, veterans who have PTSD and their partners and children receive couple or family therapy from professional clinicians. VA, including Vet Centers, provides peer counselors and peer support groups that help to engage veterans in treatment, reduce stigma, and promote empathy, but data on the number of veterans who seek treatment as a result of peer counseling or who participate in support groups are not available. Vet Centers also provide counseling services for family members.

Recommendation G: DoD and VA should increase engagement of family members in the PTSD management process for service members and veterans.

Research Priorities

There can be substantial barriers to conducting PTSD research within and between DoD and VA and in collaboration with academic and government organizations, and private partners. To date, there does not appear to have been a systematic effort by either department to identify those barriers and mechanisms to overcome them. Nevertheless, DoD and VA are funding broad PTSD research portfolios and are working collaboratively with the National Institutes of Health and other organizations to fill research gaps (for example, developing the joint *National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families* for improving access to mental-health services), but much work remains to be done. The committee identified the following as major foci of future PTSD-related research:

- Increasing knowledge of how to overcome barriers to implementation, dissemination, and use of evidence-based treatments to improve their accessibility, availability, and acceptability for patients and their families.
- Increasing understanding of basic biological, physiological, psychological, and psychosocial processes that lead to the development of more and better treatments for PTSD.
- Developing markers to identify better approaches for PTSD prevention, diagnosis, and treatment.
- Understanding the heterogeneity of PTSD presentations and predicting responses to treatment for them in different populations and at different times in the course of the disorder.
- Preventing the development of PTSD before and after trauma exposure.
- Developing and rigorously assessing new interventions and delivery methods (pharmacological, psychological, somatic, technological, and psychosocial) for both PTSD and comorbidities.
- Identifying effective care models, establishing evidence-based practice competences, and developing methods to enhance effective training in and implementation and dissemination of them.

Recommendation H: PTSD research priorities in DoD and VA should reflect the current and future needs of service members, veterans, and their families. Both departments should continue to develop and implement a comprehensive plan to promote a collaborative, prospective PTSD research agenda.

DoD and VA are spending substantial time, money, and effort on the management of PTSD in service members and veterans. Those efforts have resulted in a variety of programs and services for the prevention and diagnosis of, treatment for, rehabilitation of, and research on PTSD and its comorbidities. Nevertheless, neither department knows with certainty whether those many programs and services are actually successful in reducing the prevalence of PTSD in service members or veterans and in improving their lives.

1

Introduction

The current and future costs of the conflicts in and around Afghanistan (Operation Enduring Freedom [OEF]) and Iraq (Operation Iraqi Freedom [OIF] and Operation New Dawn¹), and the full magnitude of their long-term effects on those who served, will not be known for many years. Posttraumatic stress disorder (PTSD) and blast injuries, including traumatic brain injury (TBI), are the signature wounds of these conflicts and their effects can be lifelong.

As was demonstrated after World War II, Korea, Vietnam, and the 1990–1991 Gulf War conflicts, public memory is short; the needs of our returning warriors fade from the headlines. As the conflicts in Afghanistan and Iraq wind down, the public may believe that service members and veterans will no longer experience PTSD or other mental health problems, such as depression or substance use disorder. That belief is faulty: Many service members and veterans may have symptoms now or will develop them, and the risk of recurrence is ever present.

Exposure to any potentially traumatic event—such as physical or sexual abuse, natural disaster, being threatened with death, observing death,

¹ In this report, the committee uses the term *OIF* to include both OIF, which began on March 9, 2003, and ended on September 1, 2010, and Operation New Dawn, which began on September 1, 2010, and ended on December 31, 2012. These terms also include service members deployed to countries near Afghanistan and Iraq, such as Kuwait and Qatar.

or taking someone else's life—may trigger the symptoms that characterize PTSD. Those symptoms occur in four clusters²:

- intrusive re-experiencing of the traumatic event, such as recurrent nightmares or flashbacks;
- avoidance of reminders of the traumatic event;
- distortions of thinking and memory or emotional numbing; and
- persistently high physiologic arousal and reactivity.

Combat exposure is a well-known risk factor for PTSD, and the greater the number of combat-related traumas experienced during deployment, the greater the risk of developing postdeployment PTSD (Schnell and Marshall, 2008, in Tanielian and Jaycox, 2008). Many service members who deploy to a combat zone experience a combat-related trauma (Gates et al., 2012; Hoge et al., 2004; Tanielian and Jaycox, 2008), but the majority of them do not develop PTSD and are able to complete their deployments and reintegrate into military or civilian life without substantial distress or alteration in functioning. But for the estimated 7–20% of OEF and OIF service members who have clinical PTSD (Hoge et al., 2004; Seal et al., 2007; Smith et al., 2008; Tanielian and Jaycox, 2008; Vasterling et al., 2010), readjustment from combat zone deployments and reintegration into their families and communities may be severely affected by chronic distress and disability in their physical, psychological, social, and occupational functioning.

COMMITTEE'S CHARGE

The Department of Defense (DoD) and the Department of Veterans Affairs (VA) offer a variety of programs and services to prevent PTSD and to identify and treat service members and veterans who have symptoms of PTSD, depression, substance use disorder, and other common mental health disorders.³ The National Defense Authorization Act (NDAA) for FY 2010 required the secretary of defense, in consultation with the secretary of

² Although the American Psychiatric Association revised the diagnostic criteria for PTSD in the 2013 *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5)*, the committee uses the *DMS-IV-TR* criteria in this report as those are the criteria used in the studies cited in this report. More discussion of the differences between the two sets of criteria may be found in Chapter 2.

³ In the DoD, the terms *behavioral health* and *mental health* are used interchangeably, and the VA uses the term *mental health*; the committee has chosen to use the term *mental health* throughout this report, unless the term *behavioral health* is in a name.

veterans affairs, to enter into an agreement with the Institute of Medicine (IOM) of the National Academies to assess PTSD treatment programs and services in DoD and VA. The statement of task is shown in Box 1-1, and the legislative language calling for the study is in Appendix B.

In response to the NDAA, IOM convened a committee that included not only psychologists, psychiatrists, and other mental health professionals but also several members who have served in the military and others who had been employed by VA. Thus, committee members had substantial expertise in mental health needs, programs, and services in both DoD and VA; this expertise helped to inform the committee's report. Short biographies of all committee members may be found in Appendix A. This phase 2 report is the committee's final report.

Prior IOM reports that have addressed PTSD directly or indirectly were helpful in the preparation of this report: *Posttraumatic Stress Disorder: Diagnosis and Assessment* (NRC, 2006), *Improving the Quality of Health Care for Mental and Substance-Use Conditions* (IOM, 2006), *Treatment of Posttraumatic Stress Disorder: An Assessment of the Evidence* (IOM, 2008), *Provision of Mental Health Counseling Services Under TRICARE* (IOM, 2010), and *Substance Use Disorders in the U.S. Armed Forces* (IOM, 2013). The two reports that pertain to PTSD treatment were discussed in the phase 1 report and are not discussed further in this report.

The remainder of this chapter summarizes the phase 1 approach, findings, and recommendations, followed by the committee's approach to its charge for phase 2.

PHASE 1 REPORT

The phase 1 report *Treatment for Posttraumatic Stress Disorder in Military and Veteran Populations: Initial Assessment* described current approaches to PTSD prevention and treatment, neurobiologic research being conducted on PTSD in the government and private sectors, and DoD and VA programs and services for PTSD. It also considered comorbidities that are common with PTSD as well as some barriers to care.

Findings

DoD and VA each provide an array of prevention, assessment, screening, diagnosis, treatment, and rehabilitation programs and services for PTSD. Their goals are to maintain force readiness and to enable veterans to function well in daily life, respectively. DoD programs and services vary by service branch and include outpatient care, inpatient care, complementary

BOX 1-1

Statement of Task

The Institute of Medicine will convene a committee to conduct a study of ongoing efforts in the treatment of PTSD. The study will be conducted in two phases: the focus in phase 1 will be on data gathering and will result in the initial study as noted in the congressional legislation; the focus in phase 2 will be on the analysis of data and result in the updated study. The work of the committee is dependent upon the timely delivery of data, in a usable format, from the DoD and the VA on their current PTSD programs.

Phase 1 (initial report):

In phase 1 of the study, the committee will collect data from the Department of Defense (DoD) and the Department of Veterans Affairs (VA) on programs and methods available for the prevention, screening, diagnosis, treatment, and rehabilitation of post-traumatic stress disorder. The committee will highlight collaborative efforts between DoD and the VA in those areas. Additionally, the committee will consider the status of studies and clinical trials involving innovative treatments of post-traumatic stress disorder that are conducted by the DoD, the VA, or the private sector, with regard to:

- efforts to identify physiological markers of post-traumatic stress disorder;
- efforts to determine causation of post-traumatic stress disorder, using brain imaging studies and studies looking at the correlation between brain region physiology and post-traumatic stress disorder diagnoses and the results (including any interim results) of such efforts;
- the effectiveness of alternative therapies in the treatment of post-traumatic stress disorder, including the therapeutic use of animals;
- the effectiveness of administering pharmaceutical agents before, during, or after a traumatic event in the prevention and treatment of post-traumatic stress disorder; and
- identification of areas in which the DoD and the VA may be duplicating studies, programs, or research with respect to post-traumatic stress disorder.

Phase 2 (updated report):

In phase 2 of the study, the committee will analyze the data received in phase 1 specifically to determine the rates of success for each program or method; and an estimate of the number of members of the Armed Forces and veterans diagnosed by the DoD or the VA as having post-traumatic stress disorder and the number of such veterans who have been successfully treated.

In addition, the committee will focus on targeted interventions at Fort Hood, TX; Fort Bliss, TX; Fort Campbell, TN; and any other locations the committee deems necessary, including VA facilities. The committee will also examine gender-specific and racial and ethnic group-specific mental health treatment services available for members of the Armed Forces, including: the availability of such treatment and services; the access to such treatment and services; the need for such treatment and services; and the efficacy and adequacy of such treatment and services.

Finally, the committee will examine the current and projected future annual expenditures by the DoD and the VA for the treatment and rehabilitation of PTSD; and provide recommendations for areas for future research with respect to post-traumatic stress disorder.

and alternative⁴ therapies, and telehealth. The VA health care system has a number of specialized treatment programs for PTSD but offers most of its care for PTSD in general mental health and primary care settings.

DoD and VA issued an updated joint clinical practice guideline for management of PTSD in 2010 and have also issued joint guidelines for medical conditions that frequently co-occur with PTSD—such as TBI, substance use disorders, depression, and chronic pain. However, there is no guideline on how to integrate treatment for PTSD with treatment for these co-occurring conditions. Further, there are no data on whether mental health care providers in either department use the PTSD guideline or whether they offer evidence-based treatments⁵—such as prolonged exposure therapy or cognitive processing therapy, or selected serotonin reuptake inhibitors—to their patients.

Complementary and alternative treatments for PTSD—such as yoga, acupuncture, and animal-assisted therapy—received particular consideration as required by the legislation, but the lack of evidence on their effectiveness made them difficult to assess. The same was true of new techniques to deliver established, evidence-based treatments, such as telehealth and virtual reality, although studies of these are under way and some promising preliminary results have been reported.

DoD has spent millions of dollars on programs to build psychological resilience and prevent the adverse effects of military operational stress. These programs include the Army's Comprehensive Soldier and Family Fitness, the Navy and the Marine Corps Combat and Operational Stress Control programs, and the Marine Corps Operational Stress Control and Readiness program.

Many service members and veterans do not seek a diagnosis of their symptoms or seek treatment should they receive a PTSD diagnosis. The reasons for the treatment gaps are many and include patients' concerns about their careers, not getting a security clearance in the future, loss of coworker confidence, side effects from medications, and the belief that family and friends would be more helpful than a mental health professional. Additional

⁴ The committee uses the National Center for Complementary and Alternative Medicine's definitions of "complementary medicine" (a non-mainstream approach *plus* conventional medicine) and "alternative medicine" (a non-mainstream approach *instead of* conventional medicine) in this report (<http://nccam.nih.gov/health/whatiscom>, accessed April 7, 2014).

⁵ In this phase 2 report, evidence-based treatments are considered to be ones "that are most strongly supported by randomized controlled trials" (VA/DoD, 2010). That definition aligns with the Substance Abuse and Mental Health Services Administration's definition of evidence-based interventions: "strong evidence means that the evaluation of an intervention generates consistently positive results for the outcomes targeted under conditions that rule out competing explanations for effects achieved (e.g., population and contextual differences)" (Center for Substance Abuse Prevention, 2009).

barriers to care include the difficulty of getting appointments with mental health care providers and restrictions on medications that can be used to treat for PTSD when a service member is in a combat zone. For veterans, barriers to care include lack of available providers, logistic challenges, and lack of knowledge of available services.

Recommendations

Based on its findings, the committee grouped its phase 1 recommendations into five action items that are applicable to both DoD and VA: analyze, implement, innovate, overcome, and integrate, as described below. During phase 2, the committee confirmed that these findings and recommendations continue to be appropriate and necessary for improving PTSD management in DoD and VA.

A. Analyze

- A1. Study the efficacy of treatment. To move toward measurement-based PTSD care in DoD and VA, assessment data should be collected before, during, and after treatment and should be entered into patients' medical records. Such information should be made accessible to researchers with appropriate safeguards to ensure patient confidentiality.
- A2. Institute programs of research to evaluate the efficacy, effectiveness, and implementation of all PTSD screening, treatment, and rehabilitation services, including research in different populations of active-duty personnel and veterans; the effectiveness of DoD prevention services should also be assessed. DoD and VA should coordinate, evaluate, and review these efforts continually and routinely and should disseminate the findings widely.

B. Implement

- B1. Conduct PTSD screening at least once a year when primary care providers see service members at DoD military treatment facilities or at any TRICARE provider locations, as is currently done when veterans are seen in VA facilities.

C. Innovate

- C1. Rigorously evaluate specialized intensive PTSD programs for the delivery of PTSD care, including combining different treatment approaches. Such emerging treatments as complementary and alternative medicine and couple and family therapy, need to

be evaluated throughout DoD facilities (including TRICARE providers) and VA facilities for efficacy, effectiveness, and cost. More rigorous assessment of symptom improvements (e.g., such outcome metrics as follow-up rates) and of functional improvements (e.g., improvements in physical comorbidities, and memory and return to duty) is needed. The evaluations of these programs should be made publicly available.

- C2. Support neurobiology research that might help translate current knowledge of the neurobiology of PTSD to screening, diagnosis, and treatment approaches and might increase understanding of the biologic basis of evidence-based therapies.

D. Overcome

- D1. Support research in both DoD and VA that investigates emerging technologic approaches (mobile, telehealth, Internet-based, and virtual reality) that may help to overcome barriers to awareness and to the accessibility, availability, and acceptability of and adherence to evidence-based treatments; disseminate the outcomes to a wide audience.

E. Integrate

- E1. Encourage research to create an evidence base to guide the integration of treatment for comorbidities with treatment for PTSD. PTSD treatment trials should incorporate assessment of comorbid conditions and the value of concurrent and sequential care. Effective treatments should be included in updates of the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress*.

APPROACH TO PHASE 2

This phase 2 report is a more in-depth evaluation of the DoD and VA PTSD services and research described in phase 1. To meet its charge, the committee undertook the following activities:

- Identify prior DoD and VA PTSD program evaluation efforts.
- Submit data requests to DoD and VA.
- Conduct database searches and literature searches.
- Visit the military installations specified in the 2010 NDAA and other sites deemed important by the committee.
- Hold open sessions to hear from representatives from DoD, VA, and other organizations.

It is important to note which populations were considered in phase 2 of this study and which were deemed outside of scope. This report focuses on service members and veterans who have PTSD as a result of their time in service. Although PTSD in military and veteran populations may also affect family members and caregivers, these populations do not fall within the purview of this report. Coast Guard members or never-activated National Guard members also were not considered in this report because the Coast Guard is under the jurisdiction of the Department of Homeland Security and never-activated National Guard members are not eligible for DoD or VA care.

On the basis of discussions with DoD and VA, it was obvious that a comprehensive survey and assessment of all PTSD treatment programs and services throughout the departments was not feasible because a survey would duplicate efforts already in progress; very few programs in DoD or VA collect data on outcomes, and many DoD and VA specialized PTSD programs were conceptualized and implemented individually or are new.

Finally, the lack of data meant that it would be impossible to determine the success rates or effectiveness of DoD and VA PTSD programs and services. Consequently, the committee believed that it could contribute to PTSD management in DoD and VA by examining where and how in the system PTSD prevention, screening, diagnosis, treatment, and rehabilitation services and programs exist, what resources, such as workforce and technology, need to be available to support these services and programs, and what challenges and successes the departments have had in implementing or sustaining them.

Information Gathering

The committee used several mechanisms to provide both quantitative and qualitative information: detailed requests for DoD and VA data and program evaluation documentation, literature and database searches, site visits, and open sessions. Each of those mechanisms is discussed below.

Data Requests

In both phase 1 and phase 2, a number of requests for data were made to DoD, the service branches, and to VA. The data requests asked for the number of service members and veterans who had received diagnoses of PTSD, types of treatments they received, where treatment was given, the duration and frequency of treatment, the comorbidities most frequently associated with PTSD, and the costs associated with PTSD treatment. Data were also requested on mental health care provider training, staffing levels, wait times for appointments, data collection efforts, and disposition

of patients. Each department was asked for information on the need for, availability of, access to, and effectiveness of PTSD treatments that are sex-specific, racial-, cultural-, or ethnic-group-specific, or specific to other factors such as service era or branch of service. The requests were made for information from 2004 to 2012. Each service branch was also asked for information on their specialized PTSD treatment programs or prevention efforts. Responses from the service branches are included in this report, where appropriate. The DoD Office of Strategic Management, which maintains oversight of the many DoD health care system databases, including those for TRICARE, provided more detailed demographic information and information on medication use, comorbidities, and treatment costs, through its database contractor, Kennell and Associates.

Data requests were also made of the VA Office of Mental Health Operations (including the Northeast Program Evaluation Center), the Office of Mental Health Services, and the Office of Research and Development, all in the Veterans Health Administration, and to the Veterans Benefits Administration (VBA). Data requested included the VA strategy for coping with the growing veteran population, staffing plans, no-show rates for appointments, and efforts to track PTSD treatments and outcomes in patients' health records. A separate data request was sent to the VA Readjustment Counseling Service (Vet Centers) for an update of information received in phase 1. VBA was also asked to provide information on veterans who have service-connected PTSD disability.

The data requests to both departments for cost information were specific to those associated with treating PTSD and its comorbidities. Information on the costs of administering PTSD programs, salaries, equipment, information technology, performance incentives and bonuses, and facilities were not requested for this report, although the committee recognizes these can add substantially to the costs of managing PTSD. All DoD, service branch, and VA responses to requests for data are included in the project's public access file.

Database and Literature Searches

To identify ongoing PTSD research projects being conducted or funded by DoD, VA, National Institutes of Health (NIH), other government agencies, and if possible, the private sector, three publicly available databases were used—the VA Health Services Research and Development database, the NIH Research Portfolio Online Reporting Tools database, and ClinicalTrials.gov. DoD also provided a list of DoD-funded PTSD studies because the department does not have a publicly available database of studies that parallels NIH and VA. The specific methods used for each database and a summary of the reviewed research are described in Chapter 9.

BOX 1-2
Databases and Websites

PILOTS	Government Accountability Office
HAPI	Medline
Congressional Budget Office	National Institute of Mental Health
Armed Forces Health Surveillance Center	PsychInfo
Congressional Research Service	PubMed
DCoE (PTSD Treatment Options)	RAND Corporation
Defense Technical Information Center	Scopus
Embase (OVID)	Web of Science

Several literature searches were conducted in October 2013 to identify new programs, services, policies, or outcomes related to PTSD in DoD and VA. The search was limited to papers in English published since 2011 (policies published since 2005), and studies had to be conducted in military or veteran populations. Search categories for PTSD included physiological biomarkers, alternative therapies, prevention and resilience, treatment and diagnosis, rehabilitation and related topics, and policy reports. Box 1-2 lists the databases and websites used for the literature searches.

Site Visits

Several site visits (see Box 1-3) informed the committee's approach, including those to the three Army bases (Fort Hood and Fort Bliss in Texas and Fort Campbell in Kentucky), as required by its charge. The visits were an opportunity to see what is available, what works, and what could be improved with regard to PTSD care. The visits were intended to be information-gathering sessions for the committee, not fault-finding exercises, and were not intended to be focus groups, surveys, or structured interviews. It was not possible, given time and resource constraints, to conduct a thorough review or even representative sampling of all military installations or of all VA facilities that provide treatment for PTSD.

During each visit, the committee asked the following open-ended questions:

- What is your facility's, service's, or department's current approach to providing PTSD care now and in the future?
- What are your successes and challenges in providing PTSD care?

- What might this committee's report say that would help you to improve PTSD care?
- What programs or services do you have or see a need for with regard to treating women and members of ethnic, racial, or cultural minorities who have PTSD?
- What treatment (or prevention) outcome data are being collected and how they are used?

Military Installations During phase 2, the committee visited two Army bases—Fort Bliss, Texas, and Fort Campbell, Kentucky—and two Marine Corps bases—Camp Lejeune, North Carolina, and Camp Pendleton, California—inasmuch as the marines had been deployed as often as, if not more often than, Army soldiers and had been engaged in substantial combat activities. Naval Medical Center San Diego and Naval Base Point Loma in California were also visited to coincide with the Camp Pendleton visit and because these naval facilities have special programs for treating PTSD and are available to members of all service branches. Joint Base Langley-Eustis (specifically Langley Air Force Base) in Virginia was visited after discussions with the Air Force Office of the Surgeon General. Of particular interest were the Warrior Combat Stress Reset Program at Fort Hood, the Warrior Resilience Center at Fort Bliss, and the intensive outpatient program at Fort Campbell.

At all the military installations, discussion participants included hospital and mental health department leaders and mental health care providers

BOX 1-3 DoD and VA Site Visits

DoD Installations

Fort Hood, TX (Army)
 Fort Bliss, TX (Army)
 Fort Campbell, KY (Army)
 Camp Lejeune, NC (Marine Corps)
 Camp Pendleton, CA (Marine Corps)
 Naval Medical Center
 San Diego, CA (Navy)
 Naval Base Point Loma, CA (Navy)
 Joint Base Langley-Eustis, VA
 (Air Force)
 National Intrepid Center of Excellence
 at the Walter Reed National Military
 Medical Center, MD

VA Medical Facilities

James J. Peters VA Medical Center,
 Bronx, NY
 Roseburg Health Care System, OR
 Palo Alto Health Care System,
 Menlo Park, CA
 San Francisco VA Medical Center, CA
 Edward Hines, Jr. VA Hospital,
 Hines, IL
 Hampton VA Medical Center, VA

from inpatient, outpatient, primary care, embedded mental health clinics, and specialized PTSD programs; primary care providers also participated in the discussions. Some of the providers had deployed to combat zones, and a number of them used complementary and alternative therapies for PTSD. Other participants included trainers in resilience and prevention programs; researchers; local community mental health care providers; leadership and case managers for the wounded warrior transition units; providers of family counseling services; administrators for the Medical Examination Board and the DoD/VA Integrated Disability Evaluation System; VA liaisons located on military bases; and service members who had received treatment for PTSD. Virtually all the service members who met with the committee were active-duty and had had at least one deployment to Afghanistan or Iraq; many of them were in Wounded Warrior programs.

Department of Veterans Affairs Medical Facilities VA medical center or health care system sites were selected to capture the heterogeneity among them and to see centers that were in different geographic locations and that served different veteran populations. Thus, the Bronx VA Medical Center serves an urban veteran population that is socioeconomically diverse and consists largely of minority-group members; the Roseburg VA Health Care System serves a rural veteran population, has an inpatient mental health facility, does not have a mental health outpatient clinic, and is in a state that does not have any military bases; the San Francisco VA Medical Center conducts extensive research on PTSD treatments and services and serves a socioeconomically diverse population; the Palo Alto Health Care System serves a geographically diverse population, has men's and women's trauma recovery programs, has a women's counseling center, has a division of the National Center for PTSD, and is considered a flagship facility for VA; and the Hines VA Medical Center serves a large suburban population and has had an influx of veterans from OEF and OIF. The Hampton VA Medical Center, in eastern Virginia, serves a large veteran population and is near several military installations.

At the visits, discussion participants included senior VA medical facility leaders and representatives of the veterans integrated service networks; inpatient, outpatient, and specialized PTSD program providers and providers at community-based outpatient clinics; complementary and alternative therapy providers; researchers; Vet Center providers; specialized providers who treat for PTSD and co-occurring conditions, such as substance use disorders and TBI; social support and rehabilitation case managers who help veterans who have PTSD with employment and family and relationship issues and who in some cases provide counseling to homeless veterans; and personnel who handle veterans' compensation and benefits examinations

for PTSD. The committee also met with groups of veterans at each VA facility. The veterans represented different eras of conflict and were asked many of the same questions that were asked of the active-duty service members.

Open Sessions

Several open sessions were held to hear from representatives of both DoD and VA with regard to the departments' strategies and activities for PTSD, and from others who were familiar with DoD and VA PTSD management efforts. The sessions supplemented the site visits and allowed more detailed discussions of DoD and VA policies and procedures with senior administrators as well as a representative from the National Guard. Finally, the director of the National Institute of Mental Health discussed PTSD research at the institute. The complete list of open session agendas, including site visits, is in Appendix C.

ORGANIZATION OF THIS REPORT

In the following chapters, DoD and VA approaches to PTSD management are considered. Chapter 2 contains a short discussion of the diagnostic criteria for PTSD, and the various outcomes that may be expected with or without treatment, as well as information on the prevalence and incidence of PTSD in service members and veterans. Chapter 3 highlights the PTSD programs and services that are available in DoD and VA and what can be ascertained about their effectiveness. A brief overview of the organization of each department's health care system is also given.

Chapters 4–8 assess important attributes of a high-performing PTSD management system. Each chapter discusses what activities in DoD and VA help them provide the best care for PTSD and where there are gaps that could be addressed. First, Chapter 4 discusses performance management requirements with a focus on performance measures that are necessary to determine whether the management of PTSD is effective. Chapter 5 identifies the current costs associated with PTSD treatment in both departments and how to determine if the care is high-value; it also discusses the information that is required to project such costs in the future. Next, Chapter 6 looks at workforce to emphasize the role of leaders in developing and sustaining a high-performing system; to determine whether sufficient DoD and VA staff are available to treat service members and veterans effectively; and to determine how training and retaining such staff are integral aspects of a high-performing workforce. Chapter 7 discusses the use of effective programs for PTSD prevention and treatment in both departments and ends with a short section on safety considerations for all treatment modalities. The focus of Chapter 8 is access to care and encompasses the acceptability,

accessibility, and availability of PTSD care in both departments as well as efforts to facilitate service members, and veterans receiving that care. This chapter also looks at aspects of patient-centered care that may encourage a patient to seek treatment for PTSD and the availability of programs for populations with specific needs.

Chapter 9 provides an in-depth examination of PTSD research being conducted by DoD, VA, and other organizations, including NIH. This chapter evaluates current research efforts and identifies gaps that might be addressed to develop new treatments and approaches to managing PTSD. Basic science, neurobiology, and new technology are all considered, as are specific treatments and the need to address comorbidities. Finally, Chapter 10 presents the committee's findings, recommendations, and conclusions.

The appendixes present short biographic sketches of the committee members (Appendix A); the 2010 NDAA language that called for this study (Appendix B); the open session agendas, including invited presenters and site visits (Appendix C); a compilation of selected PTSD centers, consortiums, and collaborations for PTSD research (Appendix D); and detailed descriptions of current PTSD research in DoD, VA, and NIH that supplement Chapter 9 (Appendix E).

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2

Diagnosis, Course, and Prevalence of PTSD

Posttraumatic stress disorder (PTSD) affects hundreds of thousands of U.S. service members and veterans. The phase 1 report presented information on the number of service members and veterans who have received diagnoses of PTSD and on how the Department of Defense (DoD) and the Department of Veterans Affairs (VA) are dealing with this growing mental health problem. To put the number of service members and veterans who have PTSD in perspective, this chapter begins with a brief discussion of recent revisions of the diagnostic criteria for PTSD as given in the American Psychiatric Association's (APA's) (2013) *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5)*. That is followed by a description of the several avenues of diagnosis, treatment, and consequences that service members or veterans who have PTSD may experience over their lifetimes. The chapter then provides an overview of the prevalence of PTSD in the general U.S. population and in U.S. military and veteran populations.

DIAGNOSTIC CRITERIA FOR PTSD

In May 2013, the American Psychiatric Association released revised PTSD criteria in *DSM-5* (see Table 2-1). PTSD is now categorized under "trauma- and stressor-related disorders," rather than as an anxiety disorder as in *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition, Text Revision (DSM-IV-TR)* (VA, 2013a). The trigger for PTSD must be exposure to actual or threatened death, serious injury, or sexual violation, as directly experienced or experienced through repeated or extreme

TABLE 2-1 Comparison of *DSM-IV-TR* and *DSM-5* Criteria for PTSD

<i>DSM-IV-TR</i> Criteria	<i>DSM-5</i> Criteria
<p>A. The person has been exposed to a traumatic event in which both of the following were present:</p> <ol style="list-style-type: none"> 1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. 2. The person's response involved intense fear, helplessness, or horror. 	<p>A. The person was exposed to one or more of the following event(s): death or threatened death, actual or threatened serious injury, or actual or threatened sexual violation, in one or more of the following ways:</p> <ol style="list-style-type: none"> 1. Experiencing the event(s) him/herself. 2. Witnessing, in person, the event(s) as they occurred to others. 3. Learning that the event(s) occurred to a close relative or close friend; in such cases, the actual or threatened death must have been violent or accidental. 4. Experiencing repeated or extreme exposure to aversive details of the event(s) (e.g., first responders collecting body parts; police officers repeatedly exposed to details of child abuse); this does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work related.
<p>B. The traumatic event is persistently reexperienced in one or more of the following ways:</p> <ol style="list-style-type: none"> 1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. 2. Recurrent distressing dreams of the event. 3. Acting or feeling as if the traumatic event were recurring (flashbacks). 4. Intense psychological distress at exposure to internal or external cues that symbolize or represent an aspect of the traumatic event. 5. Physiological reactivity on exposure to internal or external cues that symbolize or represent an aspect of the traumatic event. 	<p>B. Intrusion symptoms that are associated with the traumatic event(s) (that began after the traumatic event(s)), as evidenced by one or more of the following:</p> <ol style="list-style-type: none"> 1. Spontaneous or cued recurrent, involuntary, and intrusive distressing memories of the traumatic event(s). 2. Recurrent distressing dreams in which the content and/or affect of the dream is related to the event(s). 3. Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring. 4. Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s). 5. Marked physiological reactions to reminders of the traumatic event(s).

TABLE 2-1 Continued

DSM-IV-TR Criteria	DSM-5 Criteria
<p>C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three or more of the following:</p> <ol style="list-style-type: none"> 1. Efforts to avoid thoughts, feelings, or conversations associate with the trauma. 2. Efforts to avoid activities, places, or people that arouse recollections of the trauma. 3. Inability to recall an important aspect of the trauma. 4. Markedly diminished interest or participation in significant activities. 5. Feeling of detachment or estrangement from others. 6. Restricted range of affect. 7. Sense of foreshortened future. 	<p>C. Persistent avoidance of stimuli associated with the traumatic event(s) (that began after the traumatic event(s)), as evidenced by efforts to avoid one or both of the following:</p> <ol style="list-style-type: none"> 1. Internal reminders (thoughts, feelings, or physical sensations) that arouse recollections of the traumatic event(s). 2. External reminders (people, places, conversations, activities, objects, situations) that arouse recollections of the traumatic event(s).
<p>D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two or more of the following:</p> <ol style="list-style-type: none"> 1. Difficulty falling or staying asleep. 2. Irritability or outbursts of anger. 3. Difficulty concentrating. 4. Hypervigilance. 5. Exaggerated startle response. 	<p>D. Negative alterations in cognitions and mood that are associated with the traumatic event(s) (that began or worsened after the traumatic event(s)), as evidenced by three or more of the following:</p> <ol style="list-style-type: none"> 1. Inability to remember an important aspect of the traumatic event(s) (typically dissociative amnesia; not due to head injury, alcohol, or drugs). 2. Persistent and exaggerated negative expectations about one’s self, others, or the world. 3. Persistent distorted blame of self or others about the cause or consequences of the traumatic event(s). 4. Pervasive negative emotional state (for example, fear, horror, anger, guilt, or shame). 5. Markedly diminished interest or participation in significant activities. 6. Feeling of detachment or estrangement from others. 7. Persistent inability to experience positive emotions (e.g., unable to have loving feelings, psychic numbing).

continued

TABLE 2-1 Continued

<i>DSM-IV-TR</i> Criteria	<i>DSM-5</i> Criteria
	<p>E. Alterations in arousal and reactivity that are associated with the traumatic event(s) (that began or worsened after the traumatic event(s)), as evidenced by three or more of the following:</p> <ol style="list-style-type: none"> 1. Irritable or aggressive behavior. 2. Reckless or self-destructive behavior. 3. Hypervigilance. 4. Exaggerated startle response. 5. Problems with concentration. 6. Sleep disturbance (for example, difficulty falling or staying asleep, or restless sleep).

SOURCE: Modified from Calhoun et al., 2012, with permission.

exposure to aversive details of the traumatic event, witnessed, or (for traumatic events occurring to close family members or friends) learned about by a person. In addition, the person must experience clinically significant distress or functional impairment. The *DSM-IV-TR* A2 criterion that the person's response to a traumatic event involved intense fear, helplessness, or horror, has been removed. The 17 symptoms from *DSM-IV-TR* remain, and three have been added. *DSM-5* requires that the symptoms continue for more than a month and no longer distinguishes between acute and chronic phases of PTSD. Two subtypes of PTSD have been added: a clinical subtype with prominent dissociative symptoms for people who, in addition to meeting the criteria for PTSD, experience depersonalization and derealization symptoms and PTSD in children 6 years old and younger (APA, 2013).

The *DSM-5* diagnostic criteria for PTSD may affect the incidence and prevalence of PTSD in both military and civilian populations. Part of the difficulty in assessing and treating for PTSD is the inherent heterogeneity in presentation. For example, Galatzer-Levy and Bryant (2013) found that *DSM-IV-TR* criteria could result in 79,794 PTSD symptom combinations and that *DSM-5* criteria could result in 636,120 symptom combinations. However, as of December 2013, neither DoD or VA had accepted or implemented the revised criteria, so the impact of the diagnostic changes on military and veteran populations is yet to be determined. For the studies cited in this report, *DSM-IV-TR* criteria have been used to diagnose PTSD.

COURSE OF PTSD

Diagnosis

Diagnosis of PTSD can be challenging because of the variable onset of symptoms and the inherent heterogeneity in presentation. For example, symptoms of PTSD may occur soon after exposure to a traumatic event or may be delayed, sometimes for years (Bryant et al., 2013). In the first month after exposure to a trauma, some people may experience acute stress reactions or be relatively asymptomatic. Many people will never have all the symptoms or the right combination of symptoms required for a full diagnosis of PTSD but may have subsyndromal PTSD, which may impair functioning as well (Norman et al., 2007; Pietrzak et al., 2012). In one study, of those who developed PTSD in the first year, about one-third remitted within 3 months without treatment, 39% had a chronic course, and only 3.5% developed PTSD more than 3 months after exposure (Santiago et al., 2013). In the case of delayed PTSD, initial and later traumas, and the accrued impact of multiple traumas, might contribute to the development of PTSD, including subsyndromal PTSD, and comorbidities.

Treatment

Although some data support the idea that some early interventions can decrease the development of chronic PTSD by 50% (Rothbaum et al., 2012), other studies (discussed in the phase 1 report) suggest that other interventions, such as psychological debriefing, are not effective and might even do harm (Agorastos et al., 2011). For those who seek treatment, treatment may result in recovery or conversion to subsyndromal PTSD. Numerous factors influence treatment outcomes, and no single treatment, even ones that have substantial evidence bases, has been demonstrated to be effective for everyone who has PTSD. It has been suggested that about 33% of people in the general population who have PTSD are resistant to treatment; the non-response rates for cognitive behavioral therapy may be as high as 50% and for selective serotonin reuptake inhibitors about 20–40% (Green, 2013). Pérez Benítez et al. (2012) found that in patients who received PTSD treatment in primary care settings, the course of the disorder was chronic, with a 38% likelihood of recovery and a 30% likelihood of recurrence. Finally, the proportion of service members and veterans who have PTSD and recover without intervention is unknown.

Consequences

Exposure to traumatic events is associated with an increased risk of adverse physical health, such as cardiovascular disease and stroke (Boscarino, 2008; Cohen et al., 2009, 2010; Dirkzwager et al., 2007; Dong et al., 2004; Kubzansky et al., 2007, 2009). In the National Comorbidity Study, Kessler et al. (1995) found that having PTSD significantly increased the odds of onset of comorbid conditions. A recent meta-analysis found that 52% of people with current PTSD had co-occurring major depressive disorder (Rytwinski et al., 2013). Kornfield et al. (2012) found that in a group of Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), and other era veterans who had subsyndromal PTSD and presented to a VA primary care clinic, 43.9% had comorbid depression. In addition to comorbidities directly associated with PTSD, such as depression and substance use disorder, assessment of and treatment for PTSD may be compounded by chronic conditions of aging. For example, Vietnam veterans who have PTSD may also have cardiovascular, endocrine, and neurological symptoms and comorbidities (Boscarino, 2008; Owens et al., 2005).

If PTSD becomes chronic, various physical and mental comorbidities and psychosocial factors may require treatment. These include depression, suicidal behavior, high-risk behaviors (such as excessive use of alcohol and other drugs or intentional engagement in dangerous activities) (Marshall et al., 2001; Resnick and Rosenheck, 2008; Zatzick et al., 1997), metabolic syndrome (Cohen et al., 2009; Weiss et al., 2011), and increased inflammatory response (O'Toole and Catts, 2008).

Work performance and social relationships in the family, workplace, and community can also be adversely affected. For example, heightened partner conflict and PTSD-related hyperarousal may contribute to intimate partner violence and child maltreatment in the family.

Furthermore, a traumatic event in the life of a loved one can be traumatic for family members as well. Spouses and partners of service members and veterans who have PTSD may experience PTSD symptoms themselves (Eaton et al., 2008; Klarić et al., 2012; Renshaw et al., 2011), and can experience relationship distress in response to the service members' or veterans' PTSD symptoms (Renshaw and Caska, 2012). However, the committee's charge did not include consideration of PTSD in family members or other members of a service member's or veteran's support network.

It bears noting that PTSD is not the only health problem that service members and veterans may have; many of them have no PTSD, whether they were exposed to a traumatic event or not, but they may have other mental and physical health conditions not only as a result of their military service but from aging, lifestyle, and family history. Diagnosis and treat-

ment of any mental or physical health conditions that service members and veterans may have are important for their functioning and quality of life.

PREVALENCE OF PTSD

Although this report focuses on PTSD in service members and veterans, PTSD is not unique to these populations. Members of the general population also can develop PTSD in the aftermath of exposure to a range of traumatic experiences. To provide a context for the prevalence of PTSD in U.S. military and veteran populations, data on the overall prevalence of the disorder and other mental health disorders in the general U.S. population are discussed below.

Prevalence of PTSD in the U.S. General Population

Although most civilians have not experienced combat, PTSD may be present in these populations as a result of exposure to other traumas, such as childhood abuse, sexual abuse, and life-threatening experiences (Basile et al., 2004; Harrison and Kinner, 1998; Hoge et al., 2004; Lowe et al., 2014; Neria et al., 2007; Punamaki et al., 2010). Because people may have symptoms of PTSD for many years before seeking treatment, or have sub-syndromal PTSD, the prevalence of PTSD may be underreported.

The National Comorbidity Survey–Replication, conducted in 2001–2002, estimated that the 12-month prevalence of PTSD in the U.S. adult population was 3.6% and that the lifetime prevalence was 6.8%. Women were more likely than men to have PTSD (9.7% vs 3.6% for lifetime), and the prevalence of PTSD increased with age from 18 to 59 years, but then decreased substantially in those over 60 years old (Harvard Medical School, 2007a,b). Another national survey, the 2004–2005 National Epidemiologic Survey on Alcohol and Related Conditions, found a lifetime prevalence of PTSD of 7.3% (Roberts et al., 2011). For comparison, the 12-month and lifetime prevalence of major depressive disorder in the adult U.S. population was 6.8% and 16.9%, respectively. The 12-month and lifetime prevalences of any mental health disorder were estimated to be 32.4% and 57.4%, respectively (NIMH, 2013).

Prevalence and Incidence of PTSD in U.S. Military Populations

In 2012, more than 1,453,000 active-duty personnel and 354,000 reservists and National Guard were eligible for health care in the DoD

military health system (MHS), as were 396,000 retirees.¹ Of those, 846,822 active-duty service members and 210,193 National Guard and reservists had been deployed (Kennell and Associates, 2013). The length of deployment varies in each service branch; for example, Marine Corps deployments are typically 7 months, whereas Army deployments prior to January 2012 were 12–15 months and about 9 months after that. Of all service members who have deployed, 43% have deployed more than once, averaging 1.7 deployments (range 1–47). Of those, Army and Marines Corps personnel had the greatest average cumulative deployment lengths of 21 months and 16 months, respectively (IOM, 2013) since the beginning of OEF and OIF. Members of the Navy had an average cumulative deployment length of 13 months, followed by the Air Force with 12 months (IOM, 2013). Rona et al. (2007) report that United Kingdom forces who deployed for 13 months or more in a 3-year time frame “were more likely to fulfill the criteria for posttraumatic stress disorder.” The frequency and duration of exposure to traumatic events during deployment has been associated with an increased risk for the development of PTSD (Tanielian and Jaycox, 2008; see the phase 1 report for a more detailed discussion of deployment-related risk factors for PTSD).

Data from DoD indicate that the number of service members who are eligible to receive care in the MHS and have received a diagnosis of PTSD has grown since 2004 (see Table 2-2). Monahan et al. (2013) reported that the incidence of PTSD in recruit trainees throughout the service branches in 2000–2012 was 3.3 per 1,000 person-years or 0.1% of the total recruit trainee population, and the incidence was higher in female than in male recruit trainees (11.5 vs 1.7 per 1,000 person-years). The increase in PTSD is seen in all the service branches, particularly in the Army and Marine Corps. Men and women who have been deployed have the same prevalence (8%) of PTSD, although among all service members it is more common in women than in men (13.2% vs 8.9%) (see Table 2-3). Women comprise about 14% of active-duty service members.

Specific data on the incidence and prevalence of PTSD in eligible service members among the service branches was obtained from DoD. Table 2-2 shows that from 2004 to 2012 the fraction of all eligible service members who had a PTSD diagnosis increased from 0.4% (7,826 people) to 5.2% (123,337 people); and for service members previously deployed from 2004

¹ The number of service members who were eligible for health care in the MHS was restricted to those service members who were on active duty (including National Guard and reservists) at any point from 2004–2012. There were many more retirees eligible for care in the MHS, but they were not on active duty during 2004–2012 and so are not included in this number. If they were on active duty from 2001–2003, but not 2004–2012, they also were not counted in the 2012 cohort; it is expected, however, that the former group would be relatively small compared with the group that is included in the 2012 number of eligibles.

TABLE 2-2 Number of Eligible Service Members Who Have a Primary or Secondary Diagnosis of PTSD^a

Year	Service Members ^b	Prevalence of Service Members with PTSD (%)	Previously Deployed Service Members	Previously Deployed Service Members with PTSD (%)	Service Members with Incident PTSD
2004	2,058,773	7,826 (0.4)	558,772	3,984 (0.7)	7,803
2005	2,093,371	17,121 (0.8)	695,625	11,306 (1.6)	11,309
2006	2,088,339	25,219 (1.2)	804,928	18,084 (2.2)	12,317
2007	2,094,995	36,034 (1.7)	889,343	27,191 (3.1)	15,960
2008	2,157,012	52,343 (2.4)	997,203	41,577 (4.2)	21,589
2009	2,262,098	68,533 (3.0)	1,100,583	55,575 (5.0)	21,938
2010	2,342,910	86,575 (3.7)	1,204,886	71,388 (5.9)	23,883
2011	2,366,153	104,334 (4.4)	1,258,623	86,955 (6.9)	25,550
2012	2,370,033	123,337 (5.2)	1,307,727	104,026 (8.0)	27,952

^aA diagnosis of PTSD was considered confirmed if the service member had one inpatient stay with the diagnosis or two outpatient visits at least 1 day apart with the diagnosis. The diagnosis may be the primary or any secondary diagnosis. An eligible service member is defined as anyone who is eligible to receive care in the MHS and was ever on active duty. Some service members may have active duty but remain eligible for care in the MHS as retirees or as dependents. For example, if a male soldier is in the Army National Guard but his wife is on active duty, he is included both while he is activated as a National Guard member and after he is deactivated. Many previously deployed service members who have PTSD may have left the MHS in a year (for example, they may be receiving care in VA), and they are not counted in this table (Kennell and Associates, 2013).

^bThe number of eligible service members in a given year is an average count across that year for service members who were on active duty at some point during 2004–2012. Therefore in 2012, there was an average of 2,370,033 eligibles. At any given point during that year, the number fluctuates, but it serves as a measure of the overall cohort. If a service member ever had a diagnosis of PTSD, he or she will be counted as a “Service Member with PTSD.” That is, of the 123,337 service members who have a diagnosis of PTSD in 2012, many will have received their diagnosis before 2012, although that number represents the eligibility in 2012. In the column “Service Members with Incident PTSD,” the 27,952 service members are both eligible in 2012 and received their diagnosis of PTSD in that year.

SOURCE: Kennell and Associates, 2013.

TABLE 2-3 Number of Service Members Who Have a Primary or Secondary Diagnosis of PTSD, by Branch, Component, Sex, Race, and Rank

	Year	Previously Deployed Eligible Service Members	Eligible Service Members with PTSD (%)	Previously Deployed Service Members with PTSD (%)
Service Branch				
Army	2004	238,060	4,746 (2.0)	2,921 (1.2)
	2012	636,731	85,656 (13.5)	76,274 (12.0)
Navy	2004	128,879	1,207 (0.9)	353 (0.3)
	2012	249,093	11,189 (4.5)	7,713 (3.1)
Marines	2004	60,790	748 (1.2)	450 (0.74)
	2012	125,013	12,493 (10.0)	10,597 (8.5)
Air Force	2004	129,809	1,006 (0.8)	257 (0.2)
	2012	291,178	12,811 (4.4)	9,252 (3.2)
Component				
Active Duty	2004	455,256	5,496 (1.2)	2,847 (0.6)
	2012	846,822	59,266 (7.0)	53,086 (6.3)
Guard/Reserves	2004	92,912	1,650 (1.8)	997 (1.1)
	2012	210,193	14,098 (6.7)	12,458 (6.0)
Retirees	2004	4,575	184 (4.0)	76 (1.7)
	2012	199,779	41,282 (20.7)	33,365 (16.7)
Sex				
Male	2004	497,006	5,468 (1.1)	3,352 (0.7)
	2012	1,134,939	100,531 (8.9)	90,190 (8.0)
Female	2004	61,744	2,356 (3.8)	631 (1.0)
	2012	172,788	22,806 (13.2)	13,836 (8.0)
Race				
White	2004	363,564	5,021 (1.4)	2,591 (0.7)
	2012	835,919	71,170 (8.5)	60,282 (7.2)
Nonwhite	2004	194,569	2,738 (1.4)	1,388 (0.7)
	2012	468,823	51,660 (11.0)	43,413 (9.3)
Rank				
Junior Enlisted	2004	217,925	4,052 (1.9)	2,168 (1.0)
	2012	284,137	32,348 (11.4)	25,554 (9.0)
Senior Enlisted	2004	263,458	3,188 (1.2)	1,590 (0.60)
	2012	764,348	78,374 (10.3)	68,180 (8.9)
Junior Officer	2004	40,005	275 (0.7)	123 (0.3)
	2012	96,288	4,015 (4.2)	3,323 (3.5)
Senior Officer	2004	29,820	235 (0.8)	74 (0.3)
	2012	130,824	6,241 (4.8)	4,933 (3.8)
Warrant Officer	2004	7,435	65 (0.9)	Nor Available
	2012	31,809	2,271 (7.1)	1,988 (6.2)

NOTE: See footnote a for Table 2-2 for a description of the criteria for a diagnosis of PTSD and how eligibility was determined.

SOURCE: Kennell and Associates, 2013.

to 2012, the prevalence of PTSD increased from 0.7% to 8%. The breakdowns by subgroups of service members are also noteworthy (see Table 2-3). From 2004 to 2012, the PTSD rate increased from 1.2% to 7.0% in active-duty service members, from 1.8% to 6.7% in reservists, and from 4.0% to 20.7% in retirees (see Table 2-3). Most of the cases of PTSD were seen in service members who had deployed. The data on ranks shows that 2012 rates were lower in officers (4–5%) and warrant officers (7%) than in junior and senior enlisted personnel (11% and 10%, respectively) (Kennell and Associates, 2013). Also of note is the relationship between the severity of an injury and PTSD symptom severity. In a study of 1,402 OEF and OIF veterans, McLay et al. (2012) found that the prevalence of combat-related PTSD and symptom severity increased with the severity of the injury. The prevalence of PTSD was 8% in those without any injuries, 13% in those with a penetrating injury, 29% with blunt trauma, and 33% with combination injuries.

Data from the Armed Forces Health Surveillance Center shows that from January 1, 2000, to December 31, 2012, there were 11,033 hospitalizations of active-duty service members (all service branches) for PTSD compared with 55,586 for depression and 28,645 for alcohol abuse and dependence. Individuals hospitalized for PTSD had the highest percentage of comorbid mental health diagnoses (77.3%), and this percentage increased every year from 2006 to 2012; alcohol abuse or dependence was a frequent comorbidity (27.8%) (Armed Forces Health Surveillance Center, 2013).

PTSD was one of the top five reasons for referrals to the behavioral health restoration center in Afghanistan in 2009 and 2010. The Army Mental Health Advisory Team (MHAT-7) found that the fraction of referrals due to PTSD increased from 4% in 2009 to 7% in 2010, but most of the referrals were for occupational issues (37%), adjustment disorders (20%), and relationship problems (15%) (MHAT-7, 2011).

Among all service members who had a primary diagnosis for PTSD in 2012, alcohol dependence was the comorbidity with the most health care costs (number of service members was not given). Anxiety, sleep apnea, and depression were also among the ten most costly comorbidities in terms of both dollars and total health care services used; other comorbid physical conditions that had the most service use and costs included “care involving other physical therapy” and lumbago (Kennell and Associates, 2013).

Prevalence and Incidence of PTSD in U.S. Veteran Populations

As of September 2013, there were about 22 million veterans, of whom about 2.2 million were OEF and OIF veterans. The VA projects that the number of OEF and OIF veterans will increase to about 3–4 million in 2040 and that almost 18% of them will be female (VA, 2014).

Today, 54% of OEF and OIF veterans use VA health care services (Schiffner, 2011) compared with the overall rate of 27.9% for all veterans (VA, 2010, 2013b). A recent survey of active-duty service members found that 60% intend to use VA health care services (Westat, 2010).

Tables 2-4 and 2-5 show the overall increase in the number of veterans who are using VA health services and that have been diagnosed with PTSD. These tables highlight the markedly higher prevalence of PTSD in the growing cohort of OEF and OIF veterans. In 2012, more than 502,000 veterans made at least two visits to VA for PTSD outpatient care (VA, 2012). Those veterans make up 9.2% of all users of VA health care, up from 4.1% in 2002 (VA, 2011). The data on OEF and OIF veterans are even more dramatic; in 2011, 99,610 veterans—24.4% of all OEF and OIF veterans who used VA health care—had a diagnosis of PTSD (VA, 2012). It is likely that these numbers do not capture the full extent of PTSD among veterans. The vast majority of eligible veterans receive their health care at facilities other than VA (such as community or private providers) or receive no health care at all. VA data show that 47% of veterans who entered specialized outpatient PTSD programs in 2012 were of the OEF and OIF era, 20% were of the 1990–1991 Gulf War era, and 34% were of the Vietnam era (VA, 2012). The prevalence and incidence of PTSD in female users of VA health services are rising: In 2008, 24,157 female veterans had PTSD (7% of all veterans who had PTSD in VA), and 7,773 of the cases were new (8% of all new PTSD cases); in 2012, the corresponding figures had risen to 42,514 (8.5%), and 12,023 (10%) (NEPEC, 2013).

Like the figures for their service-member counterparts, data from VA show the frequency of comorbidities with a primary diagnosis of PTSD. In VA, the most common co-occurring mental health disorders among all veterans (male, female, OEF and OIF, and non-OEF or OIF) in 2013 were dysthymia, anxiety disorder, major depressive disorder, alcohol or drug use disorders, and bipolar disorders. The prevalence of those comorbidities has not changed substantially since 2008 (NEPEC, 2013).

The Veterans Benefits Administration (VBA) has data on service-connected disability that underscore the burden that PTSD is in VA. Veterans

TABLE 2-4 Number and Percent of VA Health Care Service Users with PTSD

Era	2003	2007	2011	2012
All Eras	190,265 (4.3%)	307,483 (6.4%)	476,515 (8.9%)	502,546 (9.2%)
OEF/OIF	230 (1.1%)	33,597 (17.0%)	99,610 (24.4%)	119,482 (23.6%)

SOURCES: VA, 2011, 2012.

TABLE 2-5 Number of VA Patients with PTSD and New PTSD Patients by Era and Sex

	Year	PTSD Patients	New Patients with PTSD* (%)
Era			
OEF/OIF	2008	77,255	34,263 (44.4)
	2013	203,786	69,130 (33.9)
Other Conflicts or Eras	2008	270,875	62,042 (22.9)
	2013	324,474	62,536 (19.3)
Sex			
Male	2008	323,973	88,532 (27.3)
	2013	479,265	117,239 (24.5)
Female	2008	24,157	7,773 (32.2)
	2013	48,995	14,427 (29.4)
Total	2008	348,130	96,305 (27.7)
	2013	528,260	131,666 (24.9)

*Defined as patients who received a diagnosis of PTSD in the year and had no record of PTSD in the previous 365 days.

SOURCE: NEPEC, 2013.

may apply for service-connected status for a disorder, including PTSD, at any time. They then receive a comprehensive clinical assessment by VA to determine whether they meet the criteria for PTSD and the degree of disability associated with the diagnosis. The VBA database includes many veterans who do not seek health care at VA but have been found in a VA assessment to have PTSD. In 2003, 196,641 OEF and OIF veterans had service-connected PTSD; however, as of 2013, 653,249 veterans had service-connected PTSD, or 17.5% of all veterans who were receiving compensation for service-connected health conditions in 2013. Of those, about 451,500 were adjudicated to be at least 50% disabled and so qualified for priority group 1² for VA care, and another 165,500 were at least 30% disabled but less than 50% and so qualified for priority group 2. PTSD is the third most common major service-connected disability, after hearing loss and tinnitus (VBA, 2014).

Data from DoD and VA show marked increases in PTSD among military service and veteran populations. Although these numbers are likely to underestimate the incidence and prevalence of PTSD, they demonstrate that action is needed to respond to this growing problem.

² See the phase 1 report or http://www.va.gov/healthbenefits/resources/priority_groups.asp for more information on priority groups (accessed January 10, 2014).

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3

PTSD Programs and Services in the Department of Defense and the Department of Veterans Affairs

Both the Department of Defense (DoD) and the Department of Veterans Affairs (VA) have comprehensive health care systems that include numerous programs and services designed to prevent, screen for, diagnose, and treat for PTSD, and to rehabilitate service members and veterans who have or are at risk for PTSD. Many of the programs and services are under different commands and authorities in the departments, which make it difficult to identify and evaluate them. This is particularly true for DoD, where various mental health programs are under the authority of the DoD central office and dispersed across the service branches, installation commanders, and medical commanders. In VA, policy and oversight for PTSD programs are managed from the central office, but regional and local health care directors have responsibility for day-to-day operations and program or service innovations.

DoD and VA have acknowledged the need for a more integrated approach to mental health care and, in 2011, began development of the collaborative *DoD/VA Integrated Mental Health Strategy* (IMHS) (DoD/VA, 2011). The strategy uses a public health model to improve DoD and VA mental health care for all active-duty service members, National Guard and reserve component members, veterans, and their families. The IMHS has four strategic goals: expand access to mental health care in DoD and VA; ensure quality and continuity of care across the departments; advance care through community partnership, education, and successful public communication; and promote resilience and build better mental health care systems. According to the strategy, these goals are to be achieved within 3 years by developing and implementing 28 strategic actions. The strate-

gic goals will include both operating plans and performance metrics. The IMHS is a good beginning to a comprehensive approach to better mental health management in the departments, but it is not PTSD-specific. There is also a lack of information on whether the strategy has been implemented across DoD and VA and what progress has been made on achieving the goals and the strategic actions, to date.

In this chapter, the organizational structure of the mental health care systems in DoD and VA are briefly described. The chapter then presents various programs and services for PTSD that are available in DoD and VA, with particular emphasis on PTSD programs that are available to service members at Fort Hood and Fort Bliss, Texas, and at Fort Campbell, Tennessee (as required by the committee's statement of task). Where data are available on the effectiveness of a program, this information is noted. The chapter concludes with a summary of DoD and VA PTSD or mental health program evaluations that are being, or have recently been, conducted by the departments or by other organizations.

DEPARTMENT OF DEFENSE

DoD has worked to prevent, diagnose, and treat for PTSD for many years. PTSD-related or -focused services are offered at military treatment facilities (MTFs), embedded mental health clinics, and primary care clinics. Responsibility for developing, implementing, and evaluating PTSD programs and services resides in several offices in DoD and the service branches. The next section provides an overview of the organization of the DoD health care system followed by a description of the prevention programs, screening and diagnostic assessments, and treatment and rehabilitation programs that are available to service members. This section also includes descriptions of PTSD programs that are available in the community if they treat a large number of service members or provide a service that is not available on the military installation.

Organization

Overseen by the Office of the Assistant Secretary of Defense for Health Affairs [OASD(HA)], the military health system (MHS) is responsible for maintaining the readiness of military personnel by promoting physical and mental fitness, providing emergency and long-term casualty care, and ensuring the delivery of health care to all service members, retirees, and their families. MHS coordinates efforts of the medical departments of the Army, Navy (includes the Marine Corps), and Air Force; the joint chiefs of staff; the combatant command surgeons; and private-sector health care providers,

hospitals, and pharmacies. Figure 3-1 shows the organizational structure of the major health care components in DoD.

How mental health care is provided within DoD varies greatly among its service branches. Mental health care is provided to service members in garrison primarily in MTFs and affiliated mental health clinics that are on or near military bases. The affiliated mental health clinics operate under the direction of regional Army or Navy medical commands of the military departments or Air Force air-base wing commanders. The Navy provides the majority of mental health service to the Marine Corps. Because each installation has its own unique arrangement of medical facilities—including hospitals, clinics, dispensaries, and aid stations—it is not possible to make generalizations regarding the availability of facilities on each installation. Many military facilities are now under joint commands, for example, Joint Base Langley-Eustis (Air Force and Army).

A large component of the MHS is the TRICARE network. Although TRICARE is sometimes used to describe only purchased care, the committee uses the term in a broader sense: as a wide-reaching health care provider for DoD beneficiaries that includes service members, retirees, and their families and delivers *direct care* through MTFs and *purchased care* through network and non-network civilian health professionals, hospitals, and pharmacies (TRICARE Management Activity, 2013). The DoD TRICARE Management Activity contracts with community purchased care providers when direct care providers are not available or supplemental service is required. In 2013, it is estimated that about 9.66 million beneficiaries¹ were eligible for DoD medical care—15.2% were active-duty service members and 3.7% were members of the National Guard or reserves—and 5.5 million beneficiaries were enrolled in TRICARE. According to TRICARE Management Activity, a network of 56 hospitals and medical centers and 361 ambulatory health clinics provide direct care in the MHS, and more than 3,300 network acute-care hospitals and 914 behavioral health facilities provide purchased care (TRICARE Management Activity, 2013).

The organization of health care services, as depicted in Figure 3-1, provides a sense of where PTSD management services reside in the department and the service branches. PTSD management programs and services are implemented by each service branch, and by the OASD(HA) through its management of the TRICARE contract programs. Both the OASD(HA) and the service branches have issued policy directives and instructions that pertain to the prevention of, assessment of, treatment for, or management of PTSD, such as ASD(HA) memorandum “Clinical Policy Guidance for

¹ Beneficiaries include sponsors (active-duty, retired, and National Guard and reserve members) and family members (spouses and children who are registered in the Defense Enrollment Eligibility Reporting System); in some situations, other people may be considered beneficiaries.

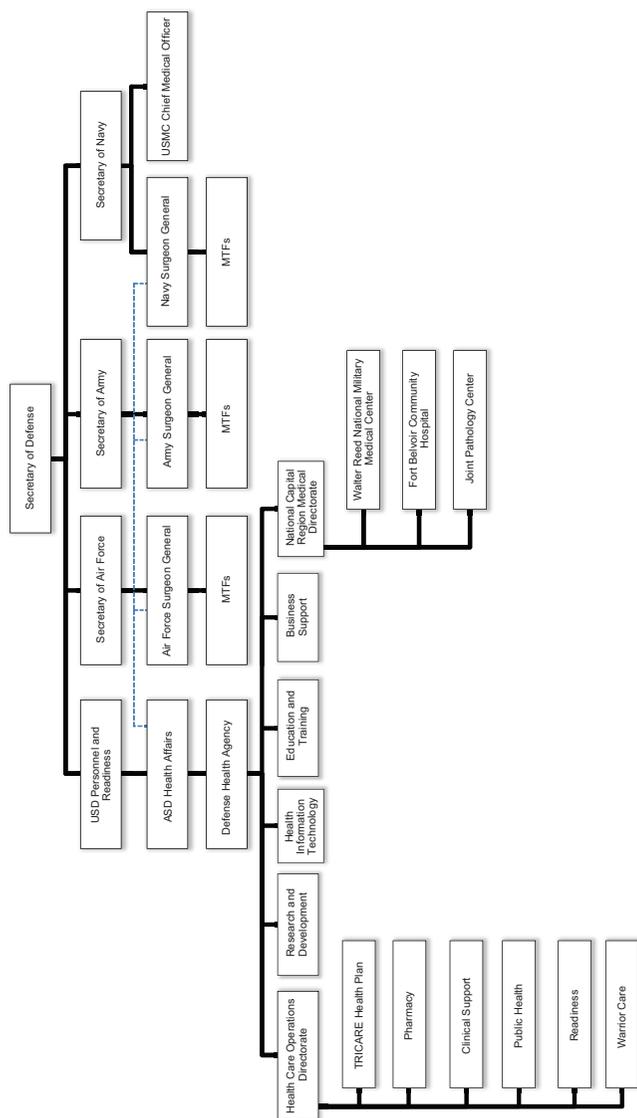


FIGURE 3-1 Organization of health care services provided by DoD in the continental United States. Health care in theater is under a different command structure from that in garrison and is not included in this figure. The OASD(HA) oversees force health protection and readiness programs and the Defense Health Agency. It has an administrative and policy relationship to the MTFs, which report to the surgeon general for each service branch. All medical facilities in the national capital region of Washington, DC, regardless of the service branch to which they belong, are under the jurisdiction of the Defense Health Agency.
 NOTE: ASD = Assistant Secretary of Defense; MTF = military treatment facility; USD = Under Secretary of Defense; USMC = U.S. Marine Corps.

Assessment and Treatment of Post-traumatic Stress Disorder” (August 24, 2012) and DoD Instruction 6490.09, “Directors of Psychological Health” (February 2, 2012). Many of these policies have been implemented recently or are in the process of being implemented, so compliance with them and their effects on improving PTSD management have not yet been assessed.

Prevention Programs

Each service branch has developed and implemented training, services, and programs intended to foster mental resilience and to preserve mission readiness and effectiveness, and mitigate adverse consequences of exposure to stress (DoD, 2011b), but none is PTSD-specific. While there is overlap in the goals of these programs, the content of each one is tailored to a particular service branch.

Army

Comprehensive Soldier and Family Fitness (CSF2) is a resilience-building program designed to enhance the performance of soldiers, their families, and Army civilians. CSF2 has five dimensions—physical, emotional, social, family, and spiritual—and consists of four components: master resilience training, comprehensive resilience modules, the global assessment tool, and the Army Center for Enhanced Performance (U.S. Army, 2012b; Weinick et al., 2011). The master resilience training for noncommissioned officers and midlevel supervisors is a “train the trainer” model, in which master resilience trainers pass on lessons from their training to the soldiers in their units. The effectiveness of this program is discussed in Chapter 7.

Navy and Marine Corps

The foundation for psychological health promotion and mental disorder prevention in both the Navy and Marine Corps is their Combat and Operational Stress Control (COSC) Program, in which unit leaders are directly responsible for protecting the mental health of their service members and families (Marine Corps Combat Development Command and Navy Warfare Development Command, 2010; Nash, 2011). Navy–Marine Corps COSC trains leaders to use three tools for assessing and promoting mental health: the “stress-continuum model” (a color-coded tool for identifying levels of stress and discriminating normative from at-risk stress states), five “core leader functions” (strengthen, mitigate, identify, treat, and reintegrate), and Combat and Operational Stress First Aid, a military-specific version of psychological first aid for early, preclinical management of acute stress (Nash and Watson, 2012).

The Marine Corps developed the Operational Stress Control and Readiness (OSCAR) program as a means to disseminate Navy–Marine Corps COSC principles and practices throughout its operating forces. OSCAR is intended to prevent, identify, and manage stress reactions at the level of operational units through two simultaneous efforts: training OSCAR mentors (small-unit leaders) and extenders (chaplains, corpsmen, and non-mental-health medical providers). OSCAR mentors and extenders monitor and manage the stress of unit members by using the COSC tools and embedding OSCAR providers (mental health professionals) directly in combat units throughout their deployment cycles to provide clinical support (Nash, 2006).

Air Force

In 2008, the Air Force began Airmen Resilience Training to enhance resilience, increase recognition of stress symptoms, and connect airmen with information on when, how, and where to access mental health and other support services. It has predeployment and postdeployment reintegration education components that all airmen are required to take, and a master resiliency training component, similar to that of the Army’s CSF2 program (U.S. Air Force, 2012a; Weinick et al., 2011). The Air Force requires that all its installations have traumatic stress response teams to offer resilience education for those likely to experience traumatic events, followed by education, intervention, screening, psychological first aid, and referral as necessary (U.S. Air Force, 2006). Exposed airmen can seek up to four one-on-one education and consultation meetings with a team member. The meetings, however, are not considered to be treatment for exposure to a traumatic event and, therefore, often are not documented.

Screening and Diagnosis Services

DoD has a series of screenings and assessments for mental health during the deployment cycle for all service members—the pre-deployment health assessment, the post-deployment health assessment (PDHA), and the post-deployment health reassessment (PDHRA) (DoD, 2011a). The pre-deployment health assessment is administered within 60 days before deployment and documents general health information on each service member. There is only one mental health question: “During the past year, have you sought counseling or care for your mental health?” As noted in the phase 1 report, this question is of questionable usefulness for the assessment of predeployment mental health concerns. An affirmative response to the question may result in referral to a medical provider for further assessment for deployment.

The PDHA is given to service members within 30 days after they leave their assigned posts or after their return from deployment and the PDHRA is administered 3–6 months after return from deployment. Both the PDHA and the PDHRA ask the same four standardized questions related to PTSD symptoms. On the basis of responses to the questions, a service member may be referred for further evaluation (GAO, 2008). Each service has its own process for administering the assessments. For example, the Marine Corps administers the PDHA and the PDHRA in deployment health clinics along with other screening tools, such as automated neuropsychological assessment metrics for traumatic brain injury. As noted in the phase 1 report, symptoms of PTSD may be underreported on the PDHA and PDHRA, and as a result, the true prevalence of PTSD in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans may be higher than estimated.

Not everyone who is given a referral seeks treatment; 32% of those who receive referrals for outpatient mental health care do not activate them (Dinneen, 2011). As of the first quarter of 2010, data indicate that about 65% of those referred for mental health consultations actually received treatment (Dinneen, 2011). Updated information on the number of mental health referrals that get activated was requested from DoD but was not received for this report. At a visit to a Marine Corps base, the committee heard that 59% of all mental health referrals were activated, compared with 78% of referrals for traumatic brain injury (TBI), 83% for substance abuse, and 77% for neurological problems.

Treatment Programs and Services

Although early interventions for stress management may occur while a service member is serving in theater, most PTSD treatment is delivered in garrison, on and off base. In addition, most treatment for PTSD is outpatient and occurs in general mental health clinics or primary care settings. Figure 3-2 illustrates the treatment pathways available to service members who have PTSD. For example, service members who have mild symptoms or subsyndromal PTSD may be treated in primary care clinics. DoD has adopted the patient-centered medical home model (PCMH) to provide mental health services in primary care settings to improve patient access to mental health care, provide coordinated care for comorbidities, and decrease overall health costs (DoD, 2013a; TRICARE Management Activity, 2013). The PCMH also provides a mechanism for primary care sites to receive patients back from specialty mental health care and to coordinate maintenance treatment with mental health and rehabilitative services. Case facilitators assist primary care clinicians with follow-up, symptom monitoring, and treatment adjustment (medication, counseling, or both) (Engel et al., 2008).

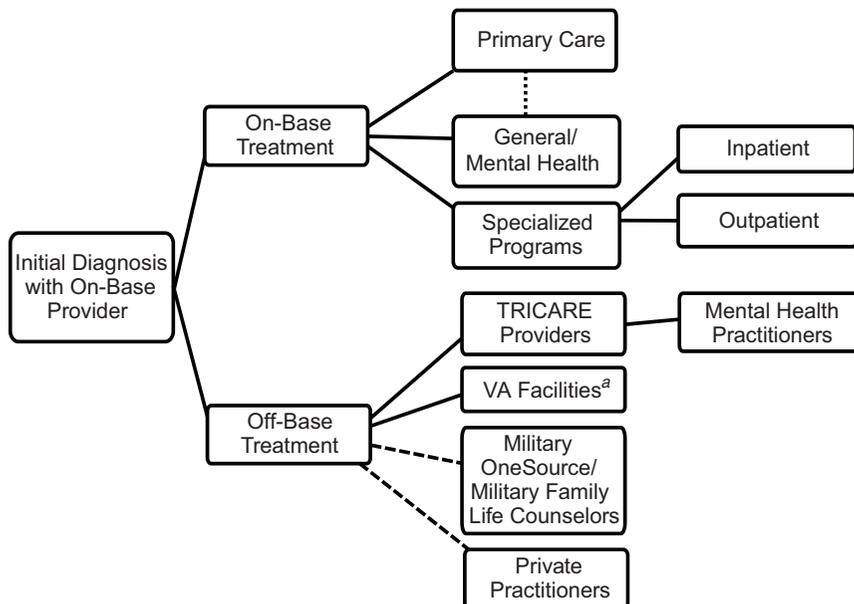


FIGURE 3-2 PTSD treatment pathways available in DoD. Dotted line between primary care and general mental health denotes that many service branches are moving to the PCMH model in which mental health practitioners are embedded in primary care teams. On-base providers may recommend that some service members seek counseling from Military OneSource and MFLC counseling for co-occurring conditions such as relationship problems, although a referral is not required to seek that counseling. Service members who seek care from private practitioners who are not part of the TRICARE network do not need a referral from an on-base provider.

^a Treatment for active-duty service members in VA facilities is rare, but it is an option in some locations.

The Army, Air Force, and Marines are all implementing some form of integrated mental health care. The Army's Re-engineering Systems for Primary Care Treatment of Depression and PTSD in the Military (RESPECT-Mil) model of integrating mental health care in primary care settings has been replaced by a PCMH network of over 40 embedded behavioral health clinics that support combat brigades, expand intensive outpatient programs, and standardize case management (U.S. Army, 2013b). The Air Force Behavioral Health Optimization Program also integrates mental health and primary care services to reduce stigma and enhance access to mental health care (DoD, 2013b; U.S. Air Force, 2011). The Navy is integrating mental health personnel within its Medical Home Port programs, and the Marine-

Centered Medical Home is currently under development with collaboration from the Navy and the Marine Corps deployment health clinics (DoD, 2013b).

In the Army, mental health care providers are in both MTFs and mental health clinics embedded in brigades (3,000–4,000 soldiers). MTFs provide both outpatient and inpatient treatment, whereas embedded clinics are limited to outpatient care. Embedded mental health care providers also serve as advisers to the commanders of their operational units. The Army has established 44 embedded clinics in brigades and plans to establish them service-wide (U.S. Army, 2013a). Embedded health teams consist of 13 providers and staff, including at least one uniformed officer who is a mental health care provider (Blakeley and Jansen, 2013).

Outpatient care for marines and Navy personnel is provided mainly through mental health clinics close to the units, but MTFs also provide some PTSD treatment. OSCAR providers can also treat marines who have PTSD. As full members of the operational units to which they are assigned, OSCAR providers increase access to mental health services in garrison, during training, and during deployment. Marine Corps deployment health clinics also have embedded providers to treat for mild to moderate mental health conditions in a timely manner and thus reduce the need for referrals. During 2005–2012, 5,390 marines had PTSD encounters in primary care clinics, 16,483 had encounters in mental health settings, and 1,496 had encounters in other clinics. Of Navy personnel, 2,714 had PTSD encounters in primary care clinics during 2005–2012, 13,320 had encounters in mental health clinics, and 1,371 had encounters in other clinics (U.S. Navy, 2013). For many years, the Navy has stationed a full-time clinical psychologist on each of its aircraft carriers for the duration of their overseas deployments.

All Air Force MTFs have mental health outpatient clinics. During 2005–2011, 7,028 Air Force personnel who had PTSD were treated in outpatient clinics, 6,413 in specialty mental health clinics, and 3,347 in primary care clinics. Those in the outpatient clinics received an average of 9.4 psychotherapy sessions (range of averages 8.1 sessions in 2005 to 10.9 sessions in 2011); however, 64% of airmen attended seven or fewer psychotherapy sessions (U.S. Air Force, 2012b). The Air Force has mental health care providers in its intelligence and remotely piloted aircraft units as well (U.S. Air Force, 2013).

Each service branch also embeds mental health care providers in especially high-risk units, such as special operations units and units in which personnel are involved in intelligence, surveillance, and reconnaissance. Although the goals of embedding are to shorten the physical distance between patients and providers, to enhance mutual trust and understanding, and potentially to decrease barriers to care for PTSD, no studies have confirmed

the efficacy or effectiveness of the embedded mental health programs in the service branches.

Service members in need of more intensive PTSD treatment may be referred to a specialized program. There are 21 such programs in DoD: six intensive outpatient programs, eleven partial hospitalization or day treatment programs, and four residential treatment facilities. Intensive outpatient programs operate 3–4 hours per day and 3–5 days per week, and generally run 4–6 weeks. Patients in those programs remain with their units during treatment (O’Toole, 2012). Criteria for admission to these programs are variable; for example, some programs accept patients who have substance use disorder in addition to PTSD and others do not.

Some military installations offer intensive outpatient treatment programs that include evidence-based psychotherapy and pharmacotherapy as recommended in the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress* (VA/DoD, 2010), as well as such complementary and alternative therapies as meditation, recreational therapy, and biofeedback. One example of an intensive outpatient PTSD program is the Army Warrior Resilience Center (WRC; originally the Restoration and Resilience Center) at Fort Bliss, Texas. This 4-week, 35-hour/week program treats 3 concurrent cohorts of 10 soldiers who have combat-related PTSD; cohorts are distinguished by medical board evaluation status. Referrals to the WRC generally come from the embedded mental health clinics or the Family Advocacy Program. Participation in the program is voluntary but the soldiers must be willing to try all therapies offered in the program. Every soldier has at least one complementary and alternative therapy session daily to calm down and relax after psychotherapy. WRC also offers family and partner support groups. Patient outcomes are tracked with the PTSD Checklist-Military (PCL-M), Patient Health Questionnaire-9, and a generalized-anxiety disorder assessment tool at entry, midpoint, and completion of the program. WRC offers aftercare services for soldiers who need additional individual or group therapy and has drop-in yoga, art, and meditation classes and spousal support activities. WRC providers reported that when outcomes were tracked in the original Restoration and Resilience Center program, 80% of soldiers planning to return to duty were able to do so, but current numbers were not available. Although the WRC staff reported that they collect data on patient outcomes, they had not published any results.

Another example is the Army Warrior Combat Stress Reset Program at Fort Hood, Texas, which was modeled after the Fort Bliss Restoration and Resilience Center and the Walter Reed Army Medical Center complementary and alternative medicine programs and includes a program evaluation plan. The program consists of 3 weeks of intensive daily treatment for groups of 12 soldiers that uses evidence-based individual therapy; group therapy; acupuncture; relaxation techniques; a variety of complementary

and alternative interventions, such as yoga, meditation, neurofeedback, and cranial electrical stimulation; and occupational therapy. That treatment regimen can be followed by 8 additional weeks of therapy if necessary. The current wait list for the program is about a year, and priority is given to soldiers who want to remain on active duty. Soldiers who have substance use disorders are not eligible for the program and are referred to a dual-diagnosis intensive outpatient program. The PCL-M and depression and anxiety measures are given before and after the program along with patient satisfaction surveys, to measure outcomes and changes in PTSD symptoms (Wesch, 2011), but results have not been published. Although the Reset leaders would like to expand the program to accommodate more soldiers, there is no space available at Fort Hood for them to do so.

Partial hospitalization (programs associated with a hospital) and day treatment programs (programs that are usually outpatient) for PTSD are similar to intensive outpatient programs. They have highly structured environments and activities—similar to residential settings, but without crisis stabilization or acute detoxification services—and generally operate a minimum of 6 hours per day, 5 days per week. Treatments promote functioning in home and work and typically include peer socialization, group support, psychoeducation, life skills training, medication management, individual and family therapy, and complementary and alternative therapies. Although the Army, the Navy, and the Marine Corps have partial hospitalization programs for PTSD, the Air Force does not have any specialized residential, partial hospitalization, or day treatment programs for PTSD and it refers its personnel to other programs if necessary (U.S. Air Force, 2012b).

One example of a civilian partial hospitalization program is Freedom Care, at the University Behavioral Health hospital in El Paso, Texas. Freedom Care treats active-duty service members from Fort Bliss and elsewhere who have combat PTSD, addiction, or a dual diagnosis of PTSD with addiction, military sexual trauma, or other psychiatric diagnoses. The program runs 6 hours per day, 5 days per week; the average stay is 2 weeks. The program offers evidence-based treatments, process and educational group therapy, and other interventions such as art therapy, pet therapy, aquatics, and rock climbing, as well as family therapy and individual therapy for spouses and children, which are offered after hours. On the average, 20 service members participate in the program at any time. Patient outcomes are assessed by using the clinician-administered PTSD scale and the PCL-M, but no program results have been published.

Residential PTSD treatment programs offer 24-hour intensive care with medication management, group psychotherapy, individual and family therapy, and complementary and alternative therapies (O'Toole, 2012). One example is the Overcoming Adversity and Stress Injury Support (OASIS) program at Naval Base Point Loma in San Diego. At any time, there are

two groups of 10 participants in the 10-week program. The program aims to return more than 25% of participants to duty or to an equivalent of satisfactory civilian functioning. The 23 program staff members, including a chaplain, offer a broad array of evidence-based and complementary and alternative therapies in both individual and group formats. Chaplains are an integral part of the OASIS program, where they help with counseling for the moral injury, guilt, and shame that often accompany PTSD (Naval Medical Center San Diego, 2013). OASIS also offers posttraumatic growth classes, couples counseling, and canine therapy, in which service members help to train service dogs for others. Participants who have PTSD and an alcohol problem have daily Alcoholics Anonymous sessions and receive treatment for compulsive behavior. Program leaders report that there are statistically significant differences between pretreatment and posttreatment PCL scores (mean scores, 69 and 58, respectively), and on the before and after assessments, 99% and 82% of patients, respectively, met the diagnostic threshold for PTSD (Naval Medical Center San Diego, 2013).

Most inpatient mental health treatment in DoD focuses on stabilizing a service member in the acute or crisis phase (for example, when people are expressing suicidal or homicidal ideation or attempts). The MTF psychiatric wards visited by the committee generally had fewer than 15 beds. The average number of inpatient bed days per soldier admitted for PTSD was 11.3 (U.S. Army, 2012a) and 10.5 days for Air Force personnel (U.S. Air Force, 2012b).

Finally, each service branch also has a Wounded Warrior program to help service members who need long-term medical support to transition back to active duty (about 2%) or separate from the military. Many service members in these programs have received a diagnosis of PTSD and many have comorbidities, such as TBI, although precise numbers are not available. Case managers coordinate service members' medical appointments and treatments. Some of those programs, such as the Marine Corps' Wounded Warrior Battalion, have long-term follow-up designed to monitor the needs and outcomes of program alumni in the years after discharge, but how often such follow-up occurs and whether it is successful in connecting those in need with effective services are unknown.

Rehabilitation Programs and Services

As noted in Chapter 2, PTSD is often accompanied by other psychiatric, medical, or psychosocial conditions, such as alcohol dependence, anxiety, obstructive sleep apnea, lumbago, depression, and rehabilitation procedures that require treatment (Kennell and Associates, 2013). Although treatment of comorbidities is vital for the effective management of PTSD, there is a lack of evidence on how best to treat for PTSD and comorbid conditions.

The National Intrepid Center of Excellence (NICoE) on the campus of the Walter Reed National Military Medical Center was established in 2010 to provide state-of-the-art care for service members who have severe mental health problems and TBI. NICoE offers both evidence-based psychotherapy and pharmacotherapy and such complementary and alternative therapies as animal-assisted therapy, biofeedback, journaling, recreation therapy, and mind–body skill building. The program is 4 weeks long and service members are given six clinical evaluations before and after treatment. Of the 293 patients who completed the PCL-M during 2011–2013, 46% had clinically significant improvement (a change of 10 points or more), 32% had improvement below clinically significant levels, 4% had no change, 14% reported worsening of symptoms, and 3% reported clinically significant worsening of symptoms (NICoE, 2013). Those values must be viewed with caution, however, as there is no comparison group. Satellite NICoEs are being built at military installations around the country such as Camp Lejeune, North Carolina, and Fort Campbell, Kentucky.

The Navy has some outpatient and inpatient treatment programs that treat for co-occurring PTSD and substance use disorders, such as the substance abuse rehabilitation program at the San Diego Naval Base and the OASIS program. Some MTFs, such as that at Fort Campbell, have nearby or colocated clinical services to address PTSD and TBI. However, many military substance use disorder programs do not treat for PTSD. Other medical departments, clinics, and programs that focus on treating such medical conditions as chronic pain, amputations, spinal cord injuries, and severe burns have embedded psychologists, social workers, or other mental health personnel to provide collaborative care for PTSD and comorbid mental health conditions.

One example of a collaborative care program is the Comprehensive Combat and Complex Casualty Care (C5) program at Naval Medical Center San Diego for severely injured service members. An interdisciplinary team provides inpatient clinical management; orthopedics; amputee care and prosthetics; physical, occupational, and recreational therapy; and mental health assessment and treatment, including specialized treatment programs for both PTSD and mild TBI. Each 8-week intensive PTSD treatment cycle has a maximum of eight patients who receive cognitive processing therapy (CPT), group sessions, trauma bereavement, and complementary and alternative therapies (such as art therapy). C5 also involves families in patients' recovery and offers pastoral care and counseling as well as career transition services. A VA federal recovery coordinator can help patients with the transition to VA care if they are leaving the military. About 2,000 patients have been through C5 since it began in 2006 (Weinick et al., 2011). Patient outcomes are measured with the PCL-M, the Brief Symptom Inven-

tory, and a patient satisfaction survey, but resources for tracking outcomes are not available.

Psychosocial problems (considered to be part of rehabilitation)—such as uncontrolled anger, intimate partner violence, and child maltreatment—may also occur with PTSD. Each service branch has programs and providers to address those issues, but concurrent treatment of PTSD is not required. The programs are staffed by civilians and are generally under the authority of the installation commander, not the MTF. For example, the Marine Corps Community Services program offers nonmedical counseling to marines and their families for marital conflicts, child welfare concerns, and anger management. Family advocacy programs focus on relationship issues and offer marriage and family therapy but not PTSD treatment, although they may make referrals. This lack of integration between PTSD treatment programs and those for co-occurring psychosocial issues may make it difficult to comprehensively treat them both.

Evaluations of DoD Programs and Services

The increase in PTSD-related programs available to service members and their families has prompted DoD to initiate several evaluations of them, both internal and external. The DoD Task Force on Mental Health (2007) found that although a great variety of mental health services and programs were offered at military installations—including family, medical, and religious programs—there were “various degrees of segregation of these programs and no consistent plan for collaboration in promoting the psychological health of service members and their families.” The report also noted that “the services are stovepiped at the installation and service levels.” This section discusses some of the most recent and comprehensive evaluations of DoD programs and services for PTSD.

Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoEs)

DCoE was established to lead and streamline DoD efforts to coordinate the prevention of and care for mental health conditions and TBI for service members and their families (GAO, 2012). Previously, no organization or entity had coordinated or monitored all such existing DoD activities (Weinick et al., 2011). DCoE can only make recommendations to the ASD(HA); it does not have authority to establish or enforce policies (GAO, 2011a).

In a review of 211 DoD mental health and TBI programs, Weinick et al. (2011) found that only about 23% of them had conducted an outcome evaluation in the previous year, and only 45% had collected any outcome data. In response to that review, in 2012, DCoE launched its own review

of 166 DoD mental health, suicide, and substance abuse programs to identify those programs believed to have the highest-quality care and the best outcomes as well as programs in need of assistance and those that could be eliminated. The evaluation report was completed in 2013 but is not available for review.

To assist DoD mental health leaders in determining the effectiveness of their programs, the RAND Corporation developed a *Program Evaluation Guide* for DCoE, a step-by-step how-to manual for conducting standardized program evaluations (DCoE, 2012). Although the guide is comprehensive, its use by DoD program managers is neither required nor monitored by DCoE (Carleton Drew, DCoE, personal communication, January 9, 2014), and there is no information as to whether it is being used by any DoD PTSD or other mental health program managers to assess their programs.

The Deployment Health Clinical Center (DHCC), a component of DCoE, is involved in clinical care, health services delivery research, and clinical education and outreach. It has a specialty care program specific to PTSD, deployment-related stress, and difficulties in adjusting to postdeployment life. The Tri-service Integrator of Outpatient Programming Systems (TrIOPS) activity within the Deployment Health Clinical Center is evaluating and attempting to synchronize the treatments offered in the 21 PTSD intensive outpatient programs among the service branches (O'Toole, 2012). The TrIOPS survey indicated that outcomes are typically assessed by using the PCL (80%), but no outcome data were reported and a formal evaluation of the programs is not available.

Institute of Medicine

In March 2014 the IOM released its report *Preventing Psychological Disorders in Service Members and Their Families* that evaluated risk and protective factors for mental health in these populations and suggested that prevention strategies are needed at multiple levels—individual, interpersonal, institutional, community, and societal. The report reviewed and critiqued DoD reintegration programs and prevention strategies for PTSD, depression, recovery support, and prevention of substance abuse, suicide, and interpersonal violence. Although an array of programs exists, the report found that DOD's current infrastructure does not support optimal programming. It recommended that DoD implement evidence-based resilience, prevention, and reintegration programs and eliminate non-evidence-based programs; use a systematic approach to existing evidence-based measures; use validated psychological screening instruments and conduct systematic targeted prevention annually and across the military life cycle (from accession to separation) for service members and their families; implement comprehensive universal, selective, and indicated evidence-based preven-

tion programs targeting mental health in military families; and use existing evidence-based community-level prevention interventions.

RAND Corporation

The RAND Corporation has conducted several in-depth program and service evaluations for DoD, including assessment of selected prevention and resilience programs to determine those that incorporate evidence-informed practices (Meredith et al., 2011). It has also estimated the prevalence of mental health conditions in service members and identified gaps in DoD's mental health care services, especially for PTSD, depression, and TBI (Tanielian and Jaycox, 2008).

During 2009–2011, RAND developed a comprehensive catalog of psychological health programs sponsored or funded by DoD. It identified 211 programs of which 103 were PTSD-related (Weinick et al., 2011); those programs are listed in Appendix C of the committee's phase 1 report. However, the survey only cataloged the programs, using a very specific definition of a program, and did not assess their effectiveness or efficacy. The report also did not assess traditionally delivered clinical services for PTSD, including treatment modalities, offered in MTFs. The authors of the report stated that, in general, the programs did not collect data on their effectiveness and that, even when they did, such data were not publicly available for assessment. Most of the programs were relatively new, few service members had completed them, and long-term follow-up data were not collected. The report also concluded that knowledge and materials are seldom shared between programs, no single authority within DoD or any of its service branches maintains a complete listing of current or developing programs, and their uncoordinated proliferation may lead to substantial inefficiencies (Weinick et al., 2011).

RAND conducted an in-depth program evaluation of the Real Warriors Campaign (Acosta et al., 2012), a DoD-wide multimedia program to build and promote resilience, facilitate recovery, and support the reintegration of returning service members, veterans, and their families. The evaluation found several problems with the website and campaign materials; for example, communication metrics are not being used to guide strategic decisions about the campaign, there are no progress or outcome evaluations, and there is no feedback on the website or review of the site's usability. A similar evaluation of the DoD inTransition program is expected to be completed in 2014.

Samueli Institute

The Samueli Institute, a nonprofit research organization supported by DoD, has evaluated several base-specific program initiatives at the Marine Corps Camp Lejeune. Similar to the aforementioned RAND Corporation report findings, the institute found that there is no central resource for tracking or accessing the vast number and different types of mental health programs available on base or in the community; this makes it difficult for anyone to find the best services to meet the need of a marine and his or her family.

RAND and the Samueli Institute conducted a joint program evaluation of the Warrior Optimization Systems at Fort Carson, Colorado. This 4-hour training program helps soldiers to learn stress management and self-regulating skills for coping with combat and operational stresses, enhancing resilience, improving performance, and facilitating reintegration. Soldiers who attended the program reported greater resilience and had fewer PTSD symptoms and better postdeployment reintegration than those who did not (Samueli Institute, 2013a).

The institute has evaluated several studies of specific complementary and alternative therapies to assess their potential for treating PTSD, such as healing touch with guided imagery (Jain et al., 2012) and acupuncture (Lee et al., 2012). The institute is currently evaluating relaxation response training at Fort Bliss to determine whether this program can reduce trauma symptoms in soldiers who have screened positive for symptoms of PTSD (Samueli Institute, 2013b).

DEPARTMENT OF VETERANS AFFAIRS

VA offers a broad array of health care services, including primary and specialized medical and mental health services as well as adjunct services that help veterans with employment, housing, and social issues. This section provides a brief overview of the organization of VA mental health offices, followed by descriptions of VA prevention programs and services, screening and diagnostic services, treatment programs, and examples of rehabilitation programs available to veterans who have PTSD. The section concludes with an overview of PTSD program evaluations that have been conducted by VA or other organizations.

Organization

In July 2011, VA announced a reorganization of mental health programs and services in the Veterans Health Administration (VHA) central office to enhance oversight and reduce variation in the delivery of mental

health services throughout the VA health care system (Schoenhard, 2011). The Office of Mental Health Operations (OMHO), which ensures the implementation of mental health policies, and the Veterans Integrated Service Network (VISN) directors report directly to the deputy under secretary for health for operations and management (see Figure 3-3). The Office of Mental Health Services, which works closely with OMHO, will continue to develop mental health policy and will also take the lead in working with DoD to develop and disseminate evidence-based practice guidelines for PTSD management. The VA Office of Information and Technology,

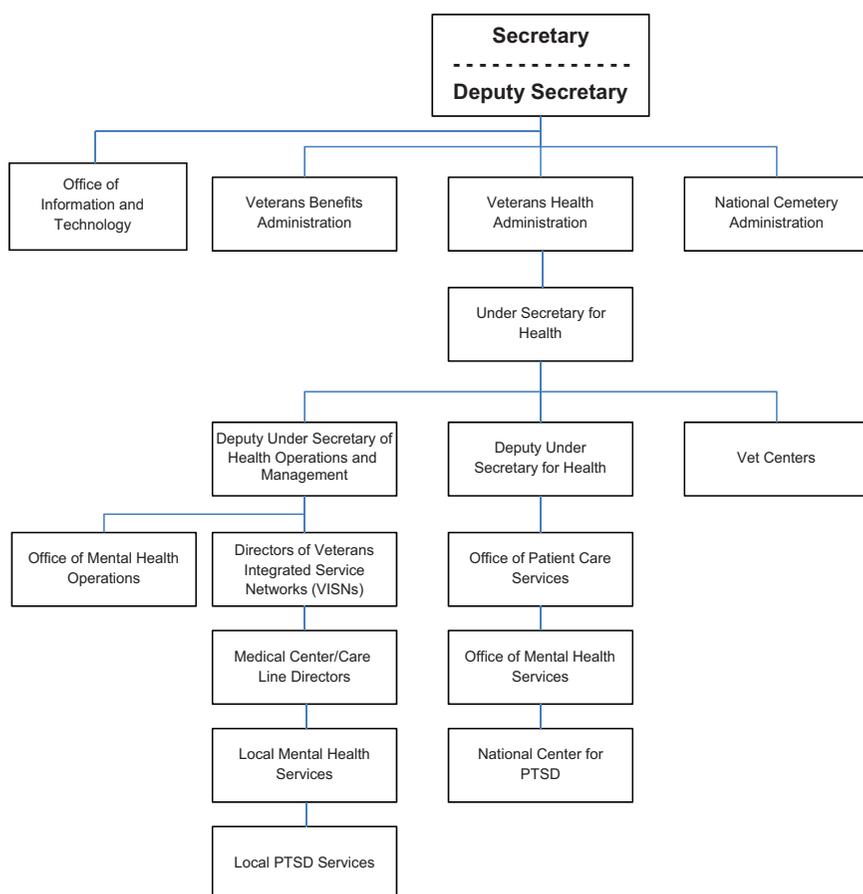


FIGURE 3-3 VA organization chart showing PTSD management responsibilities in various mental health departments and services.

which reports to the Office of the Secretary of the VA, provides strategy and technical direction, guidance, and policy for all information technology resources, including the maintenance of the electronic health record system.

VA has issued a number of policies, directives, guidelines, and handbooks on mental health services and programs. Primary among them is the VHA Handbook 1160.01, *Uniform Mental Health Service in VA Medical Centers and Clinics* (VA, 2008) which establishes the minimum clinical requirements for VA mental health services in medical centers and community-based outpatient clinics (CBOCs) and specifies those program components that must be available to ensure that all veterans receive equitable care throughout the VA health care system. PTSD services are also detailed in the VHA Handbook 1160.03, *Programs for Veterans with Post-Traumatic Stress Disorder (PTSD)* (VA, 2010), which establishes procedures for a continuum of PTSD programs for veterans from screening to rehabilitation.

National Center for PTSD

Many of VA's PTSD programs and research initiatives originate in its National Center for PTSD, which has several sites around the country. The center focuses on PTSD research; the education of veterans, their families, and professionals; and the promotion of best practices. Best-practices efforts for PTSD include assisting in the 2010 revision of the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress*, product development (such as mobile applications for PTSD; websites; the VA CPT manual; and assessment tools, including the Primary Care-PTSD screen and the PCL), professional training, and program support and evaluation. The center is also trains VA mental health professionals in CPT and prolonged exposure (PE) therapy via an onsite clinical training program; mentoring PTSD program managers to promote best practices, continuing education and problem solving; and providing expert PTSD consultation to any VA clinician who treats for PTSD. The public Web page of the National Center for PTSD helps veterans find a treatment facility near them, has testimonials from veterans about the benefits of treatment for PTSD, and links to other resources such as PTSD Coach Online. The provider Web page allows access to the PILOTS database that contains references to the world literature on PTSD and has information on PTSD assessment tools and screens, clinical training tools, and a military culture course.

Prevention Programs and Services

In the forefront of VA prevention activities are the 300 readjustment centers (Vet Centers) that assist veterans in returning to civilian life. Services

include individual, group, and family counseling; employment counseling; counseling related to military sexual trauma (MST)²; outreach; substance use disorder assessment and referral; bereavement counseling; referral for other mental health and medical problems; and guidance on VA benefits. Combat veterans of any era—including current OEF and OIF active-duty, National Guard, and reserve service members—may use Vet Center services. In 2013, almost 200,000 veterans and their families visited a Vet Center and the Vet Center Combat Call Center received almost 44,000 calls. The 70 mobile Vet Centers are used for outreach and to increase access to the estimated 41% of veterans in the VA system who live in rural areas (GAO, 2011c).

Screening and Diagnosis Services

It is VA policy to screen every patient who is seen in a primary care clinic for PTSD, MST, depression, and problem drinking during the patient's first appointment. Screenings for depression and problem drinking are repeated annually for as long as a veteran uses services, but PTSD screening is repeated annually for the first 5 years and once every 5 years thereafter (Schoenhard, 2011; VA, 2008). Affirmative answers to 3 of the 4 questions on the Primary Care PTSD screen result in an additional screening for suicide. MST is screened for only once, generally at the first appointment, unless new information indicates the need for additional screenings. Vet Centers also screen all veterans for PTSD and MST and veterans may also self-screen through VA's My HealthVet website (VA, 2012c).

VA policy stipulates that all veterans who receive a mental health referral on the basis of a positive screen must be contacted within 24 hours for an immediate medical needs evaluation, and receive follow-up care within 14 days of referral in nonemergency situations (GAO, 2011c; VA, 2008). The numbers of veterans screened, referred to diagnosis, and referred for treatment could not be determined because such referrals are not coded in a consistent way in the administrative medical record.

Treatment Programs and Services

VA medical centers offer a full array of treatment services for PTSD, including pharmacotherapy, face-to-face mental health assessment and diagnosis, group and individual therapy, and psychotherapy (particularly

² *Military sexual trauma* is a term used in VA for "sexual harassment that is threatening in character or physical assault of a sexual nature that occurred while the victim was in the military, regardless of geographic location of the trauma, gender of the victim, or the relationship to the perpetrator" (VA, 2012b).

the evidence-based CPT and prolonged exposure [PE] therapy). Figure 3-4 shows the various treatment pathways available to a veteran who is diagnosed with PTSD. The most common treatment setting is in general mental health outpatient clinics, although some veterans may receive care in more than one venue; for example, a veteran who receives psychotherapy from an outpatient PTSD clinical team may continue to receive follow-up care in a general mental health clinic or primary care setting. VA tracks the location (but not the type) of treatment given by assigning a code to every outpatient clinic and every inpatient or residential bed setting.

Each VA medical center has at least one “PTSD specialist” (VA, 2008) who is expected to have expertise in treatment for PTSD. These specialists

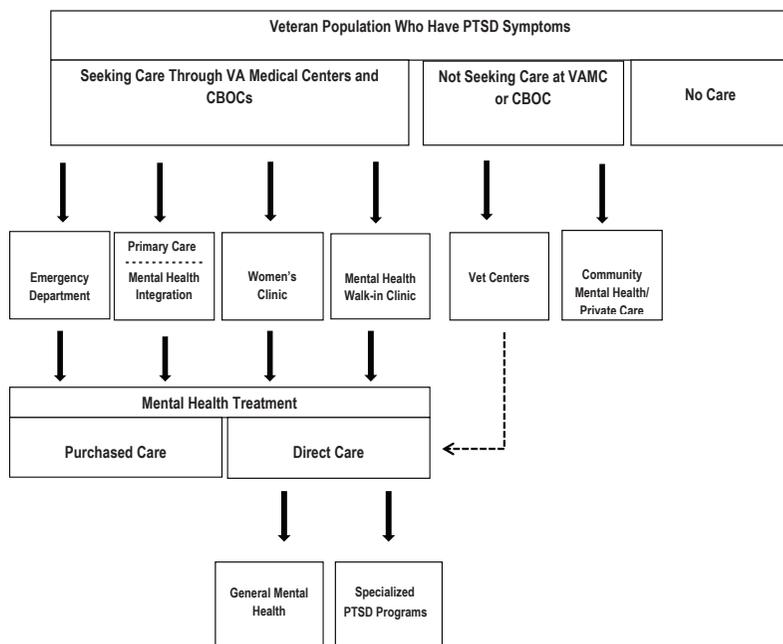


FIGURE 3-4 PTSD treatment pathways available in VA. Most PTSD treatment occurs in general mental health clinics or primary care clinics. Veterans may also receive counseling for PTSD symptoms in Vet Centers or from private community mental health care providers or choose to receive no care at all. The dotted line between Vet Centers and Direct Care is to show that some Vet Centers provide psychotherapy for PTSD or may refer veterans to another VA setting for direct care. Primary care and mental health practitioners are moving to a model in which mental health practitioners are embedded in primary care teams. Specialized PTSD programs are available for veterans who require more intensive services.

enter treatment information into the electronic health record by using a special PTSD encounter code; treatment outcomes are not reported. Each VA medical center has also appointed a coordinator to serve as a clinical champion for evidence-based psychotherapies and to promote clinical infrastructures that support their delivery.

Primary Care Centers

Many veterans receive PTSD treatment in VA primary care clinics. In 2011, 10.4% of veterans seen in primary care had a diagnosis of PTSD, compared with 3.5% of all U.S. patients (Klein, 2011). VA has been integrating collaborative mental health and other medical resources into primary care settings to establish patient-aligned care teams (PACTs; originally called Primary Care-Mental Health Integration) (Klein, 2011), a form of the PCMH. As of 2011, integrated care had been implemented in 124 of 140 VA medical facilities (Kearney et al., 2011). Mental health care providers in primary care teams may prescribe medications to manage low to moderate symptoms of PTSD, provide psychological treatments, work as case managers, and provide referrals to specialty PTSD care when warranted. During site visits to VA facilities, both primary care and mental health care providers indicated that the PACT approach was effective in treating veterans who have PTSD and reducing the number of referrals for specialty care.

Specialized Outpatient PTSD Programs (SOPPs)

VA has 166 specialized outpatient and inpatient PTSD treatment programs (VA, 2012a). There are 127 specialized outpatient PTSD programs (SOPPs): 120 PTSD clinical teams, four substance use PTSD teams, and three women's stress disorder treatment teams. SOPPs may have specific inclusion or exclusion criteria, such as substance use disorder status or legal status (for example, not awaiting trial or sentencing), but there is no uniform, national policy on admission criteria. Services provided by the interdisciplinary PTSD clinical teams include assessment and diagnosis; individual, group, and family therapy; psychoeducation; pharmacotherapy and medication management; supportive therapy; cognitive behavioral therapy, PE, and CPT; and referrals to other services or clinics. There is no standardized approach to treatment although all veterans are to be offered PE or CPT. Substance-use PTSD teams provide assessment, symptom management, and group and individual psychotherapy. Women's stress disorder treatment teams are similar in structure to the PTSD clinical teams and provide face-to-face and group treatment to female veterans. Treatment approaches are similar to those of other SOPPs.

In 2012, of the 502,546 veterans who had PTSD and used VA services,

146,615 (29.2%) were seen in SOPPs, compared with 81,423 veterans in 2004 (37.5%); 27,904 (26%) of the patients seen in the SOPPs in 2012 were new (VA, 2011, 2012a). Thus, despite a large increase in the number of veterans seen in SOPPs from 2004 to 2012, a smaller percentage of veterans were receiving treatment in them. The frequency of visits (VA uses the term *intensity of treatment*) also appears to have decreased in the specialized PTSD programs, including the SOPPs, over the last decade. The average number of PTSD-related stops (visits) per veteran who received care in any VA setting declined from 12.53 in 2002 to 10.91 in 2011 (VA, 2011). In 2004, the average number of SOPP visits per veteran was 8.5; it decreased to 7.4 in 2012 (VA, 2011, 2012a). The committee suggests that reasons for the decline may include staffing shortages, high treatment dropout rates, and treatment completion in fewer sessions, but no data are available to confirm this.

Of the 16,736 veterans who entered a SOPP (and for whom data are available) during 2012, 43% had served in OEF or OIF (VA, 2012a) and 34% in Vietnam; 89% were male, 64% were Caucasian, 81% had been exposed to enemy or friendly fire, and 37% were applying for PTSD-related service connection. Comorbidities were high in veterans in the SOPPs: 29% had a concurrent diagnosis of substance use disorder, 54% had a non-psychotic axis I diagnosis,³ 4% had a psychotic axis I diagnosis, and 60% had a chronic medical problem (VA, 2012a). Only 1% were currently on active duty, but 5% were still active in the reserves or National Guard (VA, 2012a). MST during time in service was reported by 20%, and 14% reported sexual trauma either before or after their time in service (sex not specified).

Specialized Intensive PTSD Programs (SIPPs)

In 2012, VA had 39 SIPPs that provided care to a relatively small number of patients (3,792, 0.7% of all VA PTSD patients). There are six types of SIPPs: evaluation and brief-treatment PTSD units, PTSD residential rehabilitation programs, PTSD domiciliary programs, PTSD day hospitals, specialized PTSD inpatient programs, and female trauma recovery programs (VA, 2012a). The programs were locally developed and so are different from each other in structure (for example, residential vs day hospital), length of stay (average, 42.1 days; range, 21.7–76.8 days; VA, 2012a), and

³ The American Psychiatric Association *Diagnostic and Statistical Manual of Mental Disorders* uses a five-axis system to diagnose mental health disorders (APA, 2000): axis I includes clinical disorders, axis II includes personality disorders and mental retardation, axis III includes general medical conditions, axis IV includes psychosocial and environmental problems, and axis V includes global assessment of functioning.

treatment approach. Most programs are comprehensive, offering a variety of interventions and treatment options, including evidence-based therapies and complementary and alternative therapies.

SIPPs provide trauma-focused treatment for veterans who require more intense and monitored care. Evaluation and brief treatment PTSD units provide 14–28 days of care for acute cases in inpatient psychiatric units with mandatory follow-up care after a stay. PTSD day hospitals provide intensive outpatient care for 3–6 weeks in individual or group settings (VA, 2010). PTSD residential rehabilitation programs and PTSD domiciliary programs also provide longer-term care, generally for 28–90 days, to prepare veterans to re-enter the community (VA, 2010).

The women's trauma recovery programs are 60-day live-in rehabilitation programs that include PTSD treatment and coping skills for reentering the community. There are only two such programs in VA, and they served a total of 73 women in 2012. About 6.4% of all VA users, 7% of participants in all SIPPs, and 10% of all patients in SOPPs are female (VA, 2012a).

Most patients in SIPPs have served in OEF and OIF (36%) or Vietnam (32%). The majority of program participants (65%) had a current chronic medical problem, and 18% were participating in a pain-management component of PTSD treatment. In addition, 81% reported that they had been exposed to enemy or friendly fire; of the 1,381 (36%) who had non-combat-related PTSD, 20% reported MST and 16% non-military sexual trauma. SIPP participants have comorbidities that include substance use disorders (47%), axis I nonpsychotic disorders (45%), and axis I psychotic disorders (9%). At admission, 84% were not working (VA, 2012a).

The Readjustment Counseling Service estimates that 36% of all veterans who receive Vet Center services for any reason are not seen in any other VA facility (Fisher, 2014). In 2012 and the first quarter of 2013, a total of 261,998 OEF and OIF veterans who had PTSD were seen in a VA medical center, and 70,044 veterans received service for PTSD in Vet Centers. Of these, 216,090 were seen only in a VA medical center, 24,136 only in a Vet Center, and 45,908 in both kinds of facilities (VA, 2013). Fourteen Vet Centers are colocated with CBOCs.

Rehabilitation Programs and Services

The scope of rehabilitation needs for veterans is broad, particularly for those with some of the most impairing outcomes. For example, veterans who have PTSD are over-represented in incarcerated, homeless, substance-dependent, and chronically unemployed groups. Some VA programs have active outreach to these populations such as the homeless programs and the OEF/OIF/Operation New Dawn teams and OEF/OIF Coordinators who identify and work with these veterans in their catchment areas. VA

offers a full array of rehabilitation services to veterans who have PTSD, including vocational rehabilitation, such as compensated work therapy, the Department of Housing and Urban Development–VA Supportive Housing program for homeless veterans, and a full spectrum of state-of-the-art physical rehabilitation services.

The Veterans Benefit Administration (VBA) evaluates and adjudicates all claims for service-connected PTSD. It also provides rehabilitation services for those who are substantially impaired by service-connected PTSD, including evaluation services, and educational and vocational-training services. VBA staff provides some of the initial evaluation services and act as case managers in the rehabilitation process. Most services are provided through payments by VBA to educational, vocational, and rehabilitation organizations or individual service providers. VBA also provides additional services for patients who have PTSD, such as loans, non-service-connected pensions, and education benefits. Those services are available for all veterans who have PTSD, regardless of whether their PTSD has been adjudicated as being service-connected.

Evaluations of VA Programs and Services

VA conducted a review of the mental health programs and services in its 140 medical facilities during 2012 and provided the evaluation report to the committee in November 2013. VA also sponsored the RAND and Altarum Institute report *Veterans Health Administration Mental Health Program Evaluation: Capstone Report* (Watkins et al., 2011), which evaluated the quality of care delivered to veterans with PTSD and four other mental health or substance use diagnoses. These reports are discussed in greater detail below.

Veterans Health Administration

A primary VA mental health program evaluation effort is the national baseline assessment of the implementation of the VHA handbook *Uniform Mental Health Services in VA Medical Centers and Clinics* conducted by OMHO (2013). For this effort, the 140 VA health care facilities completed an electronic questionnaire for 19 health care and service domains, including PTSD. Specific qualitative evaluation metrics included whether specialty PTSD treatment was implemented as required by the handbook, the use of prescription medications, and whether the services were being provided in a timely manner. OMHO used the survey responses and site visit interviews to assess the strengths and needs for improvement of all facilities.

The results of the site visits were evaluated with qualitative research methods; specifically, the final summaries of the reports of the site visits

were analyzed by using software that identified key words and phrases. Specific findings from the OMHO report are discussed in other chapters of this report. The percentages reported in the qualitative analysis, although useful for identifying system-wide strengths and weaknesses, are not comparable with quantitative data, and thus the results of the OMHO survey must be interpreted with caution. Furthermore, it cannot be assumed that a failure to mention a specific mental health concern, such as wait times, in the survey indicates that it is not an issue in a particular site (OMHO, 2013).

RAND Corporation and Altarum Institute

RAND Corporation and the Altarum Institute conducted an in-depth 4-year evaluation (2006–2010) of VA mental health care and services for 836,699 veterans who had a diagnosis of PTSD, schizophrenia, bipolar disorder, major depression, or substance use disorder. This effort included the development of 88 performance indicators, 31 of which could be evaluated with administrative data alone, and the other 57 required both administrative and medical record data. There were four categories of indicators: quality and extent of diagnosis and assessment practices, quality and extent of treatment processes, chronic disease management, and rehabilitation. For example, one of the indicators for PTSD was the proportion of veterans with the diagnosis who had a new treatment episode documented for PTSD symptoms with a standard instrument within 30 days of the episode. A medical record review showed that only 5.6% of the PTSD cohort (357,289 veterans) met this indicator (Watkins et al., 2011). Most of the performance indicators did not show significant improvement over the study duration, but a large number of veterans initiated VA services over this period.

Other key finding in the report included lack of standardization and classification of clinical assessment and treatment practices for use in administrative data sets, inadequate development and dissemination of mental health performance measures, infrequent use of outcome measures in clinical practice, and lack of process coordination. Inherent weaknesses in the data systems—such as administrative data that are separate and not linked to pharmacy, laboratory, or cost data sets—seriously impeded the use of the information in these databases to improve quality of care. Although veterans in this cohort comprised only 16.5% of the VA patient population, they accounted for about 41% of acute inpatient discharges, 40% of outpatient encounters, and 34% of total costs. Psychotherapy, pharmacotherapy, and specialized services for PTSD were reported to be available at 96–99% of VA medical centers and 64–88% of CBOCs, but only 20% of veterans who had PTSD had documented use of at least one psychotherapy with cognitive behavioral therapy elements. Veterans who had PTSD and received cognitive behavioral therapy had a mean of 13.5 visits (time frame not given).

Government Accountability Office

GAO has conducted several studies of VA PTSD management activities since the beginning of OEF and OIF. In 2005, GAO reported that VA needed to improve PTSD services (GAO, 2005), and in 2011 it found that there were substantial barriers for veterans in accessing VA mental health care (GAO, 2011c). Recently it has assessed VA PTSD research funding and found that “from fiscal year 2005 through fiscal year 2009, intramural PTSD-research funding ranged from 2.5 percent to 4.8 percent of VA’s medical and prosthetic research appropriation.” It noted that VA incorporates research findings into its clinical practice guidelines (GAO, 2011b).

SUMMARY

DoD and VA offer a broad array of programs and services to prevent, screen, diagnose, and treat for PTSD in service members and veterans in military installations and VA medical facilities. DoD puts more emphasis on preventing the development of PTSD than does VA, and each service branch has developed some form of a combat and operational stress control and resilience program with mandatory participation. VA prevention efforts focus primarily on the use of Vet Centers to provide veterans with counseling and referrals.

Most service members and veterans who have mild symptoms of PTSD receive care in primary care or general mental health clinics. Both DoD and VA are integrating mental health providers in primary care clinics to reduce barriers to care. These collaborative care teams can result in fewer referrals to specialty care, better long-term outcomes (after specialty care is complete), and more coordinated care for comorbidities. All the service branches and many VA medical centers have a version of a patient-centered medical home. Those who have more severe PTSD symptoms may be treated in a general mental health clinic. Service members and veterans with the most severe symptoms and those who have not responded to prior treatments may be admitted to specialized outpatient or inpatient programs. In DoD, there are 21 such programs, such as the Warrior Resilience Center at Fort Bliss, and they offer a variety of evidence-based and complementary and alternative therapies. However, these individually conceived and developed programs treat only small numbers of service members each year and their effectiveness is not known.

In VA, the 127 SOPPs and 39 SIPPs treat a relatively small number of veterans who have PTSD, 29% and less than 1%, respectively. They, too, offer a variety of evidence-based therapies, primarily CPT and PE, but many of them also offer complementary and alternative therapies. There are three SOPPs and two SIPPs specifically for female veterans. Despite the

increase in the number of veterans seen in SOPPs from 2004 to 2012, a smaller percentage of veterans who have PTSD are receiving treatment in them, and the number of outpatient visits per veteran also declined during this time. The reasons for this reduction in service are unclear and may be due to a number of factors, but they warrant further consideration. VA also provides rehabilitation and support services to veterans who have PTSD and comorbidities, such as homelessness and unemployment, and other benefits such as disability evaluations and compensation.

Internal and external evaluations of DoD and VA PTSD programs and services have been undertaken by numerous organizations. Virtually all of the evaluations of both departments have found the lack of data on which to make quantitative assessments of the programs' effectiveness to be a major shortcoming. The most recent evaluation of DoD mental health programs prepared by DCoE is unavailable. The VA collects more programmatic information than does DoD, but outcome data are still scarce. The use of performance metrics to address this issue is discussed in the next chapter.

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4

Performance Management

Performance management is an evolving iterative process that continuously assesses performance needs and expectations. Components of such a quality measurement and reporting system might include translating quality-of-care measurement concepts into performance-measure specifications; pilot testing the performance-measure specifications to determine their validity, reliability, feasibility, and cost; ensuring use of the performance measures and their submission to a performance-measure repository; and analyzing and displaying the performance measures in a format or formats suitable for the intended users and audiences (IOM, 2006). As outlined in Box 4-1, the National Quality Forum (NQF) recommends that government and private sector health care providers use common performance measures for both clinical measures and quality indicators (Kizer, 2000, 2001). A high-performing posttraumatic stress disorder (PTSD) management system will adopt commonly accepted and used performance measures whenever they are available, and will coordinate the use of these measures with other systems with which they interact (for example, DoD might coordinate with VA).

The collection and appropriate use of patient-specific data are essential to managing performance in any health care system. As detailed in the committee's phase 1 report, easily administered self-report measures of PTSD symptoms are available and widely used, such as the Primary Care PTSD screen and the PTSD Checklist (PCL). Other psychosocial, symptom severity, and functional assessment tools include the Clinician-Administered PTSD Scale, the Mississippi Scale, the Connor-Davidson Resilience Scale, and the Global Assessment of Function.

BOX 4-1 National Quality Forum (NQF)

NQF is a nonprofit, public-private organization, established in 1999, that has nearly 400 member organizations. It is a voluntary consensus standards body with a mission to improve the quality of American health care by setting national priorities and goals for performance improvement, endorsing national consensus standards for measuring and publicly reporting on performance, and promoting the attainment of national goals through education and outreach programs. NQF does not *develop* health care performance standards but instead *endorses* standards that have been developed by other entities after they have been carefully reviewed against established criteria and successfully complete a rigorous consensus process (Kizer, 2000, 2001).

NQF meets the requirements of a voluntary consensus standards body, defined by the attributes of openness (i.e., broadly inclusive of interested stakeholders), balance of interest, due process, consensus, and an appeals process. The Office of Management and Budget Circular A-119 defines consensus as “general agreement, but not necessarily unanimity, and includes a process for attempting to resolve objections by interested parties.” Voluntary consensus standards are defined as technical standards such as specifications of materials, performance, design or operation; test methods; sampling procedures; and related management systems practices that are developed or adopted by voluntary consensus standards bodies. They have legal standing.

The National Technology and Transfer Advancement Act of 1995 and Circular A-119 explicitly direct federal agencies to use voluntary consensus standards, in lieu of developing their own standards, unless the consensus standards would be inconsistent with applicable law or otherwise impractical. All 18 federal agencies (including DoD Health Affairs and Veterans Health Administration) involved in providing, paying for, or regulating health care have been represented in NQF and several have been represented on its Board of Directors. DoD policy also explicitly encourages its agencies to adopt and use nongovernmental voluntary consensus standards (DoD, 2011b).

This chapter describes current and planned performance management efforts at DoD and VA. It focuses primarily on the tools that both departments use to measure and manage performance.

DEPARTMENT OF DEFENSE

This section describes the current and planned efforts by DoD to manage performance for PTSD care and identifies the challenges that the department faces in doing so. In particular, the committee focuses on the efforts of DoD and the service branches to measure PTSD treatment outcomes.

In 2009, DoD adopted a strategic performance measurement framework called the Quadruple Aim, which incorporates the three dimensions of improved quality of care—population health, a positive patient experience, and cost—and adds a fourth dimension, increased readiness (Dinneen, 2011). The framework does not define specific performance goals for the department or what metrics will be used to measure performance.

Several reports have documented that DoD does not have adequate systems in place to manage performance and to improve the quality of mental health care for service members (DoD Task Force on Mental Health, 2007; IOM, 2010, 2013). In two recent reports to Congress, DoD stated that it could improve the efficiency and effectiveness of its health care system through

- establishing system accountability, continuous innovation, access to appropriate care, information continuity, and provision of well-managed and coordinated care (DoD, 2013a);
- setting detailed and specific goals and tasks related to the performance of the system; and
- creating the Defense Health Agency (DHA) (DoD, 2013b).

To that end, DoD has mandated that by September 2014 all patient-centered medical home clinics in military treatment facilities (MTFs) will use a standard performance dashboard for the top five chronic illnesses, including anxiety and trauma-related disorders, to monitor and improve performance.

Tools

A major barrier that DoD must overcome to improve PTSD management is the lack of systematic collection, analysis, and dissemination of metrics to assess the quality of PTSD care. Metrics measure program effectiveness, quality of care, program awareness, and availability and acceptance of mental health services.

Executive Order 13625 (August 31, 2012) called for DoD to review all of its existing mental health and substance abuse prevention, education, and outreach programs across the military services and the Defense Health Program to identify the key program areas that produce the greatest impact on quality and outcomes, and rank programs within each of these program areas using metrics that assess their effectiveness. By the end of Fiscal Year 2014, existing program resources shall be realigned to ensure that highly ranked programs are implemented across all of the military services and less effective programs are replaced.

No specific DoD policies or procedures stipulate the use of measurement-based care for PTSD. In an effort to assess mental health outcomes across DoD, the assistant secretary of defense for health affairs released guidance on clinical outcomes for mental health in MTFs (Woodson, 2013). The guidance calls for the service branches to document clinical outcomes at all points of mental health care by using standardized measures, specifically those of the Army's Behavioral Health Data Portal (BHDP) (see Box 4-2).

Behavioral Health Data Portal

The goal of the BHDP “is to effectively engage providers to use metrics in their daily care to systemically improve the quality of care across DoD” (U.S. Army, 2013). At each visit, soldiers complete a self-report assessment by using a netbook while waiting to see a mental health care provider at an appointment. For PTSD, the patient completes measures of both military and nonmilitary trauma at initial evaluation and at every follow-up visit. The results are available to the clinician, in real time, to inform clinical decision-making. The BHDP can also track which therapies are provided

BOX 4-2

Key Functional Elements of the Behavioral Health Data Portal

1. rapid check-in capability for beneficiaries using barcode scans of identification cards,
2. sorting and filtering of provider and clinic patient lists,
3. tracking ability for the patient care team,
4. real-time graphing of clinical outcomes and symptom presentations for provider dashboards,
5. reporting of readiness data from ePROFILE and eMEB,
6. deployment history reports,
7. warrior transition unit status and case management,
8. standardized intake documentation template based on intake note structure,
9. patient satisfaction data collection,
10. identification and tracking of risk levels assigned by the provider,
11. integration of deployment health assessment data,
12. initial aggregate reporting capability, and
13. the ability to create and publish different surveys for specific clinic processes.

SOURCE: U.S. Army, 2013.

and when they are delivered. Data can be aggregated at many levels to compare patients, providers, clinics, and MTFs.

As of December 2013, the BHDP was operational in specialized mental health programs at all 57 Army MTFs with an estimated 30,000–40,000 entries per month (LTC Millard Brown, U.S. Army, personal communication, December 19, 2013) and the Air Force was beginning to pilot the portal at three sites. The Navy currently uses its Psychological Health Pathways, which is similar to the BHDP, at some bases, but eventually this system will be replaced by the BHDP. The BHDP has the potential to serve DoD as a universal method of collecting routine metrics for mental health care, including for PTSD, in an electronic format to improve its quality and effectiveness. At present, no evaluation of the data is available, so its usefulness cannot yet be determined.

The Navy Bureau of Medicine and Surgery has begun quarterly assessments of compliance with the VA/DoD clinical practice guideline for PTSD in all specialty mental health clinics. No additional information, however, on how the assessments are conducted or on rates of compliance was provided (U.S. Navy, 2013).

Electronic Health Records

DoD has a universal electronic health record, but no attempt has been made to use it as a mechanism for assessing treatment outcomes in the aggregate, and purchased care providers outside DoD cannot access it. The 2012 report to Congress from the DoD/VA Interagency Program Office stated that both departments continue to work on developing a single integrated electronic health record and the Virtual Lifetime Electronic Record (VLER). The VLER Health Exchange program manages the electronic exchange of clinically relevant health information between the departments and other government and private-sector health-exchange partners. The departments have implemented the VLER Health Exchange pilot at four joint locations, partnering with private-sector health information exchange organizations and the VA at another seven locations (DoD/VA Interagency Program Office, 2011).

Challenges and Limitations

Tracking outcome measures is fundamental in ensuring quality throughout the care continuum, from prevention through treatment. DoD Instruction 6490.05 (DoD, 2011a) “Maintenance of Psychological Health in Military Operations,” directs medical and line leaders to evaluate the effectiveness of their prevention programs empirically and to collect and analyze data on the stressors and stress reactions experienced by service

members. A recent IOM report (2014) noted that DoD had numerous resilience and prevention programs that lacked an evidence base for their effectiveness or metrics to assess their impact. That report called on DoD to “dedicate funding, staffing, and logistical support for data analysis and evaluation to support performance monitoring of programs for accountability and continuous improvement.”

At its site visits, the committee found minimal or no use of outcome data to improve performance of DoD PTSD programs or services regardless of the care setting. Most PTSD programs, including specialized PTSD programs, that the committee visited did not collect and analyze outcome data. In the few cases where data were collected, personnel were almost universally not available to enter and analyze them or to evaluate and disseminate results. Resources also were not available for conducting follow-up assessments of former program participants to determine long-term outcomes. Although providers and patients often spoke in glowing terms about these programs, their effectiveness in the long and short terms remains virtually unknown. DoD leaders informed the committee that standard outcome metrics are not communicated between DoD and VA to facilitate continuity of PTSD care.

DEPARTMENT OF VETERANS AFFAIRS

Unlike DoD, in which each service branch is essentially an autonomous organization, VA is a more unified health care system (described in greater detail in Chapter 3). VA has been found to perform as well as, and in many cases exceeds, the performance of other systems on measures of prevention, management of chronic diseases, and treating acute conditions (IOM and NAE, 2013).

The VA 2011–2015 strategic plan (VA, 2011) highlights the need for performance measures for assessing progress in meeting its major initiative of improving mental health care for veterans. Four of the five performance measures in the plan address PTSD, but there does not appear to be any documentation as to whether those targets had been met:

- Provide 96% of patients with a mental health evaluation within 14 days of their first (index) mental health encounter by the end of 2012. Strategic target: 96%.
- Screen 97% of eligible patients at required intervals for PTSD by the end of 2012.
- Increase the percentage of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans who have a primary diagnosis of PTSD and who receive a minimum of eight psychotherapy

sessions within a 14-week period. FY 2011 target: 15%; strategic target: 60%.

- Increase the percentage of eligible OEF and OIF PTSD patients who are evaluated at required intervals for symptoms. FY 2011 target: to be determined; strategic target: to be determined.

A 2009 study by the RAND Corporation and the Altarum Institute found that the mental health care offered in VA was as good as or better than that available from private insurers or Medicare and Medicaid on the basis of nine measures of quality, such as the use of medications and treatment engagement. But the report also found that the quality of care varied among the veterans integrated service networks (VISNs) and that treatment for substance use disorders and care for veterans with diagnoses of PTSD or the other four diagnoses of interest was inadequate on the basis of VA's own performance guidelines (Watkins et al., 2011). For example, only 20% of veterans who had PTSD and should have received an evidence-based treatment did so. .

The ability of VA to implement a population-based approach to PTSD care for veterans is somewhat restricted by the current eligibility regulations for enrollment into VA health care. One exception to this lack of a population-based approach is the ability of veterans who served in a theater of combat after 1998 and left active duty after January 2003 to receive health care services from the VA for 5 years after their service.

Tools

The current VA performance management system does not allow clinicians to adequately track a patient's PTSD treatments, other than medications, or any patient outcomes in the electronic health record, so it is difficult to determine whether the psychotherapy or pharmacotherapy being used is effective and safe. To address this tracking issue, VA has developed and is implementing electronic health record documentation templates for cognitive processing therapy and prolonged exposure therapy to identify when those therapies are used. System-wide implementation of the templates was to begin in November 2013 (Office of Mental Health Operations, 2013), but as of January 2014 it was still not operational because of information technology issues (Kathleen Lysell, VA Office of Mental Health Services, personal communication, January 29, 2014). The process measures do not appear to be tied to tracking short-term and long-term patient outcomes, only whether a specific therapy was given. Although the committee believes that this data collection effort is a good step, it notes that unless this measure and the one for pharmacotherapy are tied to con-

tinuous tracking of individual patient outcomes, they will not necessarily result in improved delivery of effective care.

Challenges and Limitations

The VA Northeast Program Evaluation Center (NEPEC) is responsible for conducting evaluations of VA PTSD clinical programs and specialized services. It compiles the annual *The Long Journey Home*, an internal report that provides detailed data on each VA specialized outpatient PTSD program (SOPP) and specialized intensive PTSD program (SIPP), presented in the aggregate, by VISN, and by individual facility. Information includes demographics (sex, race, era of service, work status, and so on), service (type of specialized treatment, prior psychiatric treatment, and prior specialized treatment), number of veterans served, number of visits, staffing, workload, direct costs and cost efficiency by program type, treatments offered in house or referred out, comorbid diagnoses, and outcome measures, such as changes in PTSD Checklist (PCL) scores if they are available (VA, 2012).

The most compelling evidence of the lost opportunity to use data from *The Long Journey Home* to improve program performance can be found in the lack of demonstrated improvement in specialized programs over the years. Patients in the SIPPs are assessed at program entry and 4 months after treatment completion by using the PCL, the Mississippi short-form, and the NEPEC scale for PTSD (VA, 2012); similar data are not provided for veterans in SOPPs, although PCL scores at intake are provided. Rates of patient follow-up in the SIPPs range from 0% to 100% (average, 54%) (VA, 2012). There are other data gaps in the information collected in *The Long Journey Home*: veterans who receive PTSD care in other venues, such as mental health clinics, are not included; data on pharmaceutical use are given only for prazosin and benzodiazapines; and the number of veterans who receive care in the medical facility versus those who are referred out for care is not reported.

Many of the SIPPs demonstrated little or no improvement over the course of years. At several of the committee's VA site visits, clinical staff stated that although they were aware of the *Long Journey Home* reports, they had not seen them and thus did not use them. The *Long Journey Home* is an example of where routine data for at least one type of PTSD program are being collected but are not used to improve the quality of care or national standardization of these intensive, expensive programs.

SUMMARY

A high-performing PTSD management system requires well-defined performance measures and feedback mechanisms to ensure that both fa-

avorable and unfavorable activities, processes, and outcomes are recognized (such as identifying best practices), addressed, and used to improve care. The results of periodically administered measures need to be made available to clinicians to inform patient care decisions and to leaders to keep them apprised of how patients and clinicians are doing and where improvements might be made.

DoD lacks a mechanism for the systematic collection, analysis, and dissemination of data for assessing the quality of PTSD care. Metrics of program effectiveness, quality of care, program awareness, and availability and acceptance of PTSD services are needed. There are no specific DoD policies or procedures that stipulate the use of measurement-based care for PTSD and no consistent use of standardized outcome measures, before, during, or after treatment. Although the BHDP might improve the collection of patient data, it is currently being used only by the Army and no data on its effectiveness are currently available.

VA does not track the PTSD treatments a patient receives, other than medications, or any treatment outcomes in the electronic health record. This lack of performance measures makes it difficult to determine whether the psychotherapies or pharmacotherapies being used are effective and safe for treating PTSD and any comorbidities. The exceptions to the lack of data collection in the VA are the SOPPs and SIPPs, where PTSD symptoms are measured at intake but treatment outcome measures are collected only for the SIPPs at 4 months after veterans leave the programs. For several of the SIPPs, the difference in veterans' PTSD symptoms prior to and after treatment is not substantial, and it was not clear whether or how those outcome data are used to improve the programs. Furthermore, fewer than one-third of veterans who have PTSD are treated in those specialized programs; outcome data for those treated in other VA settings are not available.

This chapter underscores the need to improve performance management in both DoD and VA. Performance metrics that can be used to track patient symptoms and outcomes are available and could be readily implemented in both departments.

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5

High-Value Care

Demands for posttraumatic stress disorder (PTSD) services among service members and veterans are at unprecedented levels and are climbing. This chapter offers the Department of Defense (DoD) and the Department of Veterans Affairs (VA) an approach for assessing the value of the PTSD services that they provide. If each department better understands the outcomes and costs associated with PTSD care in their systems, they can work toward maximizing the value of that care.

The recent Institute of Medicine (IOM) report *Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis* (IOM, 2013a), states that value in health care may be defined in many ways, none of them universally accepted. The DoD military health system (MHS) defines value as the readiness, experience of care, and population health, divided by per capita cost (Middleton and Dinneen, 2011). VA has defined value as the sum of technical quality, access to care, patient functional status, and service satisfaction divided by the cost or price of care (Kizer and Dudley, 2009). These values may be impossible to quantify but they serve to help identify components of a conceptual model of health care value. This report adopts the definition of value from the 2008 IOM report *Evidence-Based Medicine and the Changing Nature of Health Care* as the quality of care achieved, in terms of outcomes, relative to the cost of delivering health care and related services (IOM, 2008). To determine whether high-value care is being delivered, a health care system must measure and track outcomes in the population receiving the care and compare them with the amount or cost of care that is delivered. One practical method for monitoring outcomes is the electronic health record. Costs of PTSD care must also be

monitored and accurately connected to specific services (such as sessions of psychotherapy or drug prescriptions) and to the patients' outcomes associated with the services.

Prevention, screening, diagnosis, treatment, and rehabilitation services for PTSD can result in better quality of life, healthier relationships, improved vocational and financial performance, and better overall function, all of which are of intrinsic value to affected people, their families, and their communities. Evaluations of cost-effective interventions and programs must factor in the intrinsic and practical value PTSD management activities in addition to assessing the direct and indirect financial costs of care. Direct costs associated with preventing and treating PTSD include psychotherapy and pharmacotherapy, but there are other costs that may affect annual operating costs of the departments such as compensation (salary, bonuses, and incentives) for new and current staff members, training and hiring costs, information technology requirements, and administrative charges. Ineffective treatments or no treatment for PTSD may also lead to increased societal and monetary costs if they result in adverse patient outcomes and increased disease burden requiring further medical care, or in other conditions such as homelessness or unemployment.

DEPARTMENT OF DEFENSE

Maintaining a fit and ready force is of primary importance to DoD. Treatment and rehabilitation of service members who are injured or ill can lead to great cost savings for DoD, given that the costs of recruiting and basic training for each service member average around \$75,000 (AMSARA, 2012). If high-value PTSD care is provided to those who need it, DoD can see savings in health care costs for the service member and in the larger costs of maintaining a fit and ready force. This section presents data on the current costs of PTSD care in DoD and projections for future annual expenditures for the treatment of and rehabilitation for PTSD in service members. Family members and other beneficiaries of the MHS may have PTSD as a result of the service member's PTSD or their own trauma. However, the costs associated with treating PTSD in those beneficiaries is beyond the scope of the committee's task and is not considered in this report, although it is expected that such treatment would add to DoD's overall costs for PTSD care. The section concludes with findings on DoD's challenges in achieving high-value PTSD care.

Cost of Care

The total cost of PTSD care in DoD includes the cost of services provided in general medical and mental health clinics, specialized outpa-

tient treatment programs, inpatient hospital settings, and by TRICARE purchased-care providers, as well as the cost of prevention and screening efforts. A recent Government Accountability Office (GAO) report on the funding of DoD mental health programs provides some background for an analysis of the cost of PTSD care (GAO, 2012). Beginning in 2007, \$900 million in DoD appropriations supported mental health and traumatic brain injury (TBI) activities. GAO reported that from 2007 through 2010, DoD spent more than \$2.7 billion on activities related to treatment for and research on these conditions; however, the report did not present information specifically on the cost of PTSD care.

Although the costs of PTSD prevention efforts were not available for this report, it is expected that those efforts are of high cost to DoD. For example, it is estimated that the Army's Comprehensive Soldier and Family Fitness program had initial implementation costs of \$125 million and incurs annual costs of \$50 million (U.S. Army, 2009; Zoroya, 2013).

To examine the current and projected DoD annual expenditures for PTSD treatment, the DoD Office of Strategic Management was asked to provide information on the use of PTSD care and its associated costs. Table 5-1 shows the number of service members who had diagnoses of PTSD and the costs of DoD PTSD treatment and rehabilitation in 2004–2012.

Total expenditures for PTSD care increased substantially over the 8-year period, from \$29.6 million in 2004 to \$294.1 million in 2012. The increase was driven primarily by the increase in the number of service members who had PTSD, but there was also an increase in the average cost per treated service member; total cost per treated service member increased by 32.0% and inpatient cost increased by 36.5%. Outpatient and prescription drug costs per service member remained relatively flat over the period after adjustment for inflation (Kennel and Associates, 2013).

It is important to note that those costs include only services for which PTSD was the primary or secondary diagnosis. If costs of other services, such as comorbidities, are included, total health care costs increased from \$9,693 per PTSD patient in 2004 to \$18,259 in 2012, an increase of 88.4%. That is a much larger increase than the one seen in non-PTSD patients. For a non-PTSD patient who had a mental health disorder, inflation-adjusted total health care costs increased from \$3,020 in 2004 to \$4,278 in 2012 (41.7%), but the costs per non-PTSD patient who did not have a mental health disorder actually decreased from \$2,250 to \$1,951 (–13.3%) (Kennel and Associates, 2013).

An increasing proportion of PTSD care for service members is being provided through TRICARE as purchased care. The percentage of total cost that is spent on TRICARE services increased from 19% in 2004 to 40% in 2012 (Kennel and Associates, 2013). Total costs for PTSD care delivered by purchased care providers increased dramatically from 2007

TABLE 5-1 DoD Costs for PTSD Care of Eligible Service Members Who Have Primary or Secondary Diagnoses of PTSD^a

Year	No. of Service Members Who Have PTSD	Total PTSD Costs (millions)	Total Cost per Service Member Who Has PTSD	Inpatient Cost per Service Member ^b	Outpatient Cost per Service Member ^b	Prescription Drug Cost per Service Member ^b
2004	8,633	\$29.6	\$3,425	\$14,172	\$2,048	\$491
2005	15,285	\$46.0	\$3,011	\$12,807	\$1,808	\$515
2006	19,266	\$67.4	\$3,499	\$14,358	\$1,970	\$520
2007	25,502	\$89.4	\$3,507	\$14,274	\$1,990	\$465
2008	35,929	\$160.2	\$4,459	\$17,221	\$2,559	\$463
2009	42,686	\$214.8	\$5,032	\$17,648	\$2,990	\$502
2010	50,001	\$226.6	\$4,533	\$18,496	\$2,268	\$502
2011	57,246	\$268.4	\$4,688	\$18,993	\$2,344	\$524
2012	65,076	\$294.1	\$4,520	\$19,341	\$2,095	\$500

^aCosts are limited to direct costs of services associated with a diagnostic code of PTSD. Costs are adjusted for inflation and are reported in 2012 dollars. A diagnosis of PTSD was considered confirmed if a service member had one inpatient stay with the diagnosis or two outpatient visits at least one day apart with the diagnosis. The diagnosis may be the primary or a secondary diagnosis. An eligible service member is defined as anyone who is eligible to receive care in the MHS, and was ever on active duty. Some service members may leave active duty, but remain eligible for care in the MHS as retirees, or dependents. These costs do not include those associated with training, recruiting, or retaining mental health providers.

^bCosts among users of the service only.

SOURCE: Kennell and Associates, 2013.

to 2012, from \$22.4 million to \$131 million, and purchased care costs as a percentage of total costs increased from 29.6% to 44.6% (Kennell and Associates, 2013).

Data collected by the Armed Forces Health Surveillance Center show that from 2006 to 2012 the number of hospitalizations of service members for PTSD increased by 192% (numbers not given). The mean length of stay for PTSD hospitalization increased from 10 days in 2000 to 17 days in 2012. There were significant differences in hospitalization rates for PTSD between the service branches: Army, 114.1/10,000 person-years; Marine Corps, 65.2; Navy, 20.8; and Air Force, 19.5. Those hospitalized for PTSD had many comorbidities (Armed Forces Health Surveillance Center, 2013). Such increases in hospital care for PTSD can have substantial associated costs.

As shown in Figure 5-1, PTSD care costs have increased substantially over the last several years. If the trend continues, total costs for PTSD could exceed \$500 million by 2017. However, in light of the recent troop draw-down, that is unlikely. Instead, with fewer active-duty service members and fewer deployments, the number of new PTSD cases among service members might decline, resulting in a leveling out or potentially a decrease in total

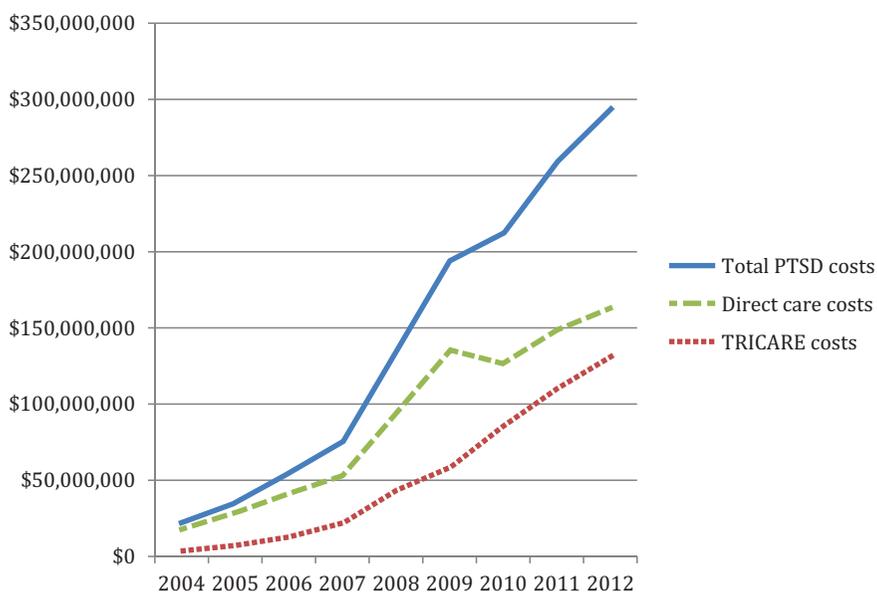


FIGURE 5-1 Costs of direct care for PTSD, cost of TRICARE for PTSD, and total cost of care for PTSD over time, 2004–2012. Costs are not adjusted for inflation. SOURCE: Kennell and Associates, 2013.

DoD costs in the future, assuming no new conflicts. The drawdown may also change DoD's medical mission. If the need for PTSD care decreases, DoD medical assets will probably decrease as well, and more care may be shifted to the TRICARE network or, in the case of retiring and separated service members, partially shifted to VA.

Projecting costs is difficult given the uncertainty around service member levels, military treatment facility (MTF) capacity, and the potential for future military engagements. The primary driver of costs is the number of service members, and therefore any projection of future PTSD costs must be based on estimates of the number of future service members. The committee was unable to identify any such projections and so was not able to estimate future PTSD costs. If data on the projected number of service members were available, DoD could use that number and the incidence of PTSD to generate the projected number of service members who may have PTSD and then multiply that product by the average cost per service member who has PTSD to get an estimate of total PTSD costs. Such an approach involves a number of assumptions, however, such as the prevalence of PTSD and the treatment cost per service member remaining constant. Considering that the total number of service members who may experience trauma that leads to PTSD will be smaller as the current military operation in Afghanistan continues to wind down, the number of service members who have incident PTSD is likely to decline in the near future. However, the assumption in this case is that, unlike troops who served in Vietnam, service members who were in Afghanistan and Iraq and who have symptoms of PTSD will seek mental health care sooner rather than waiting years, so the costs may be more immediate.

Determining and Achieving High-Value Care

In addition to reporting the cost of current PTSD care and projections of future expenditures, it is important to try to determine the value of PTSD care that is currently provided in DoD. As discussed above, value was defined as the quality of care achieved, in terms of outcomes, relative to the cost of delivering that care. This section is a consideration of how high-value PTSD care can be determined in DoD for prevention, screening, and treatment activities.

Prevention and Screening

Recent reports and studies, presentations by DoD representatives, and the committee's site visits substantiate that DoD does not systematically collect data on the effectiveness of its stress prevention efforts (IOM, 2013b,c, 2014; Weinick et al., 2011). In phase 1, each service branch was asked for

outcome data from PTSD prevention programs, but no useful data were provided. The costs of the programs are not well tracked although it is clear that considerable resources are being invested in many of those prevention efforts. The committee was also unable to determine the costs of administering the postdeployment health assessment and the post-deployment health reassessment that are used to screen for mental health problems in service members who have deployed. Therefore, given the lack of outcome data and cost information, it is impossible to determine whether DoD is providing high-value prevention and screening services for PTSD.

Treatment

As mentioned in Chapter 3, service members who have PTSD can receive direct care in MTFs and associated clinics or from TRICARE purchased-care providers. If the PTSD programs or services offered in garrison are at capacity or unavailable, service members may be referred to purchased-care providers or specialized programs in the community that are part of the TRICARE network. TRICARE covers outpatient psychotherapy sessions for up to two sessions per week in any combination of individual, family, group, and collateral sessions, as long as two therapy sessions of the same type do not occur on the same day. Individual psychotherapy sessions are covered for up to 60 minutes or, for crisis sessions, 120 minutes. However, this allotted time is not sufficient for delivering certain first-line psychotherapies with fidelity to their manualized protocols. For example, a prolonged exposure (PE) therapy session should last 90 minutes (Foa et al., 2007), but this “extra” time is not covered for reimbursement by TRICARE. Purchased care providers may also provide 90-minute sessions of family, conjoint, or group psychotherapy (TRICARE Management Activity, 2013). Intensive outpatient care is one of the core services offered in private, VA, and other public mental health plans, but TRICARE requires that patients be referred to inpatient programs, which may be farther from where they live and may cost considerably more. For example, in VA, the average cost of intensive (inpatient) programs for PTSD in 2012 was \$20,497, compared with \$1,638 in specialized outpatient programs (VA, 2012). TRICARE has been criticized for not covering intensive outpatient services for mental health conditions, including PTSD, despite acknowledgement by TRICARE that such services are an important component of mental health care (e.g., DoD Task Force on Mental Health, 2007). TRICARE does cover partial hospitalization programs. Intensive outpatient services could be appropriately offered and reimbursed if this obvious deficiency in TRICARE’s mental health coverage were corrected.

Patient treatment outcomes are not systematically tracked in either DoD programs or TRICARE network programs although the costs of the

services are available. In 2012, the most recent year on which complete data are available, DoD spent \$294.1 million on services for PTSD in MTFs and TRICARE, of which \$131.2 million (44.6%) was for TRICARE services alone (Kennell and Associates, 2013). Without tracking patient outcomes over the long-term and connecting them with costs of care, it is impossible to know the value of the PTSD treatment services. One effort to compare the cost of PTSD care provided by a specialized DoD program with the cost of PTSD care in a network residential program was identified. The Naval Medical Center San Diego compared Overcoming Adversity and Stress Injury Support (OASIS), a 10-week residential PTSD program (see Chapter 3 for a description), with residential treatment programs at two civilian care facilities in San Diego. The OASIS program treats about 160 patients per year with annual operational costs of \$2.24 million, or about \$14,000 per patient. OASIS program leaders reported that the program delivers higher-quality care at lower cost than the civilian programs (Ken Richter, Director, OASIS, personal communication, April 9, 2013). However, the specifics of how the OASIS program staff came to that conclusion, whether they factored in the indirect costs of program operation, and what data demonstrated that they provided “higher-quality” care were not provided. Care provided by on-base DoD programs may indeed be more cost effective than purchased care programs, but without an analysis of comparable long-term patient outcomes among programs, this cannot be determined.

DoD pays for direct care and purchased care services by volume—for example, number of patients seen—and not value. Although DoD has begun to track the types of mental health interventions offered in mental health programs and patient outcomes (see Chapter 4), these efforts are not consistent among programs and do not extend to all PTSD care settings. Should outcome data eventually be available, the results will need to be connected to costs to estimate the relative value of PTSD care in DoD, but at present such estimates cannot be made. In a 2013 report to Congress, DoD describes plans to increase value in its beneficiary health care system by aligning incentives with health and readiness outcomes to reward value creation (DoD, 2013). That effort applies broadly to all DoD health care, but anxiety disorders constitute one of five targeted conditions to be addressed by the changes. The pay-for-value model will be piloted before its planned implementation in October 2015 (DoD, 2013).

DEPARTMENT OF VETERANS AFFAIRS

Reducing the PTSD burden is of particular interest to VA, which is responsible for all medical and disability costs associated with PTSD in benefit-eligible veterans. Prevention efforts, early intervention in, and treatment for PTSD and co-occurring medical conditions may have cost-saving

effects far into the future for veterans of the current conflicts (Geiling et al., 2012; Tuerk et al., 2012). Some veterans may improve after brief, acute treatment and need little aftercare, but others may have more persistent or chronic PTSD and need longer-term rehabilitation. Regardless of a veteran's PTSD course, in the context of limited resources, a high-performing system of PTSD care will provide high-value treatment for each patient population.

This section presents data on the current costs of PTSD care in VA and projections for annual expenditures for treatment and rehabilitation for PTSD. It concludes with findings on challenges to achieving high-value PTSD care in VA. The costs associated with treating veterans' family members who have PTSD—who are not currently eligible for care in the VA health care system—are not considered in this report.

Cost of Care

The cost of PTSD care in VA includes services provided in general medical and mental health clinics, other general treatment and rehabilitation venues, and specialized PTSD programs. Several recent studies have examined the medical and societal costs of the current conflicts in Iraq and Afghanistan (Bilmes, 2007; Goldberg, 2007; Tanielian and Jaycox, 2008) or calculated the cost of PTSD care in VA for recent combat veterans (Congressional Budget Office, 2012). The VA Health Economics Resource Center estimated that the minimum cost of mental health service utilization was \$93.22 per appointment in 2009 (VA, 2011). The RAND Corporation and Altarum Institute conducted a mental health program evaluation for VA that focused on quality of service, service use, and costs of service for 837,000 veterans who have PTSD, major depression, substance use disorders, schizophrenia, or bipolar I disorder. On the basis of 2007 data, 16.5% of the total VA veteran population had one of these diagnoses, of whom 42.7% had a diagnosis of PTSD. The total annual cost for health care for a veteran who had PTSD was estimated to be \$11,342, which was more than double the annual VA health care cost of a veteran without PTSD; 73.1% of health care costs for veterans who had PTSD was for non-mental health services (Watkins et al., 2011). The Congressional Budget Office (2012) has examined VA's treatment services for PTSD and TBI and found that PTSD and TBI were highly comorbid in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans. The cost of treating veterans who have PTSD was at least three times greater than the cost of treating veterans who do not have PTSD or TBI; the first year of treatment was the most expensive, possibly because of the need to treat additional health problems such as combat injuries, although specific data were not given.

VA responded to extensive data requests to capture the cost of PTSD treatment in direct care and purchased care for all veterans in 2002–2012.

The number of veterans who have PTSD and sought care in VA increased by 249%, from 143,791 in 2002 to 502,546 in 2012 (VA, 2012), driven by an influx of OEF and OIF veterans. The VA Northeast Program Evaluation Center reported that in 2012, 108,745 veterans received care in specialized outpatient PTSD programs (SOPPs), at a total cost of \$178,077,961, or \$1,638 per patient. In addition, 4,275 veterans were admitted to specialized intensive PTSD programs (SIPPs) at an average cost of \$20,497 per patient. However, veterans treated in those specialized programs made up only 30% of the 502,546 veterans who had diagnoses of PTSD and received VA services. Costs of PTSD services throughout VA, but excluding treatment provided in the specialized programs, are not available. Tables 5-2 and 5-3 show the numbers of veterans who had PTSD and total PTSD costs through VA from 2010 to 2012 (NEPEC, 2014).

Data from the Veterans Benefits Administration on service-connected compensation for PTSD, including compensation for many veterans who did not seek health care in VA, show that from 2003 to 2013 the number of veterans from all eras evaluated and adjudicated to have service-connected PTSD increased from 196,641 to 653,249; the latter figure includes 205,309 OEF and OIF veterans (VBA, 2014). Cost information on compensation for veterans with service-connected PTSD was not requested.

Many veterans of all eras seek counseling or treatment for PTSD symptoms in Vet Centers rather than or in addition to care in VA medical facilities. Although this is not specific to PTSD care, VA has requested an increase in Vet Center funding from \$197 million in 2013 to \$208 million in 2014 (VA, 2013). Costs of PTSD care in Vet Centers are not available and were not included in the cost data received from the VA on its specialized PTSD programs.

As in DoD, any projections of PTSD costs in VA have to be based on the number of veterans who seek PTSD care in VA and would involve a number of assumptions. Although the VA Office of the Actuary provides data on the projected number of veterans through 2040, the actual number will depend on whether the United States engages in any future military conflicts and other factors. Given such estimates, however, VA could multiply the number of veterans by the proportion that use VA services and by the proportion of veterans who use VA services that have a diagnosis of PTSD. Finally, VA could multiply the latter by the average cost per treated veteran who has PTSD to derive a projected cost of PTSD care. However, as in the case of DoD, that assumes that the proportions and average costs will remain constant or change in predictable ways. As the number of OEF and OIF veterans who seek VA care increases with the DoD drawdown over the next several years, there may be an increase in the number of OEF and OIF veterans who seek care for PTSD as service members who were reluctant to seek care while in the military may be more likely to seek care

TABLE 5-2 Number of Veterans Who Have PTSD and PTSD Costs

Year	Veterans Using VA			Veterans Who Have PTSD		PTSD Costs (millions) ^a
	Veterans	N	%	N	% of Those Using VA	
2010	23,031,892	5,232,182	22.7	438,091	8.4	\$2,559
2011	22,676,149	5,372,354	23.7	476,515	8.9	\$2,933
2012	22,328,279	5,462,222	24.5	502,546	9.2	\$3,035

^aBased on the average cost of mental health care per patients who had a diagnosis of PTSD.

SOURCE: NEPEC, 2014.

TABLE 5-3 Number of OEF and OIF Veterans Who Have PTSD and PTSD Costs

Year	OEF/OIF Veterans Using VA			OEF/OIF Veterans Who Have PTSD		PTSD Costs (millions) ^a
	OEF/OIF Veterans	N	%	N	% of Those Using VA	
2010	2,588,924	334,812	12.9	82,239	24.6	\$451
2011	2,915,418	408,142	14.0	99,610	24.4	\$560
2012	3,210,220	506,871	15.8	119,482	23.6	\$673

^aBased on the average cost of mental health care per patient who had a new diagnosis of PTSD.

SOURCE: NEPEC, 2014.

as veterans. Hence, any projected costs would be rough estimates at best and should be interpreted with caution.

Determining and Achieving High-Value Care

Direct Care

VA has no consistent system for tracking patient outcomes and connecting them to costs of care, so whether VA provides high-value care for PTSD cannot be determined. In addition, without standardized system-wide metrics of patient outcomes and costs in VA, DoD, and other health care systems, it is impossible to compare the value of PTSD services provided by these organizations. The VA SIPPs track patient outcomes and costs of care, but whether the data are used to improve quality or value cannot be determined. For example, in 2012, the 39 SIPPs had 3,792 entrants for a total cost of \$88,572,953, or \$23,578 per patient. The average PTSD Checklist (PCL) scores for veterans at admission to the programs and 4 months after discharge were 65.9 and 60.2, respectively. That indicates that most program graduates met the criteria for clinically significant PTSD after discharge on the basis of a PCL cutoff score of 50 (VA, 2012). Furthermore, VA does not track similar data on outcomes for any of the SOPPs or in the general mental health clinics, so it is impossible to assess the value of these programs and services. The 2012 *Long Journey Home* report showed that 93% of veterans in the SOPPs completed a PCL at admission with an average score of 62.0, but PCL scores are not collected at treatment completion (VA, 2012).

Several approaches may help reduce future costs of providing PTSD care, including the use of evidence-based treatments. A small study of 70 veterans who received PE or cognitive processing therapy (CPT) demonstrated substantial reductions in mental health service use and costs (Meyers et al., 2013). The authors found that direct costs for mental health care decreased by 39.4% during the 1-year period when veterans received PE or CPT. Assuming that the decrease in mental health service use was due to a decreased need for such services, evidence-based treatments such as CPT and PE may constitute high-value care for PTSD. In a study of 60 veterans who had PTSD and were followed for 12 months before receiving PE and 12 months after treatment, Tuerk et al. (2012) found that the 44 treatment completers (defined as attending at least 7 PE sessions) had clinically and statistically significant decreases in PTSD symptoms, as measured using the PCL. Mental health service use in the 12 months post-PE treatment decreased by a mean of 3 appointments compared with pre-treatment, whereas non-completers had slightly more service use post-treatment. The average annual cost of health care services for both completers and non-

completers was about \$693 prior to treatment but after treatment decreased to \$386 for completers and increased to \$810 for non-completers. Providing effective care for PTSD might therefore improve patient outcomes and lead to cost savings.

Purchased Care

VA refers veterans to community providers when a medical facility does not have the capacity to provide the care that they need. Over the last 10 years, purchased care in VA has expanded from an infrequently used adjunct to care in VA medical facilities to a critical element of clinical care delivery. Data on purchased care costs of PTSD were not included in VA's response to the committee's data requests. However, a previous study of use and costs of VA health care service for veterans in the year after service in Afghanistan and Iraq found that purchased care was responsible for 5.5% of mental health costs for male veterans and 3.8% for female veterans (Leslie et al., 2011).

A 2011 assessment by the National Academy of Public Administration found that the management of administrative and other support systems for purchased care had not kept pace with its increased use. The report concluded that the quality of care provided through purchased care and the return on investment in this program were indeterminate, in part because information on which to ascertain its value was not readily accessible. The report also noted that VA used antiquated administrative systems and technology, but several actions were under way to improve it (Pane et al., 2011). As part of its Patient-Centered Community Care initiative (see Chapter 6), VA has recently awarded two 5-year contracts for a combined \$9.3 million to two health care management companies to consolidate and standardize the quality of purchased care providers via nationwide networks of providers. Those networks are not yet established, and their value and costs cannot be determined (Philpott, 2013). The lack of a system for comparing patient outcomes with the cost of their care makes it especially challenging to determine whether purchased care for PTSD is of high value.

SUMMARY

To deliver high-value health care, an organization must be able to determine patient outcomes and costs. However, neither DoD nor VA is in a position to do that, primarily because of the lack of outcome data and a lack of cost information for specific treatment modalities (with the exception of pharmacotherapy, where the costs of drugs can be determined). Costs of PTSD care are high in both DoD and VA. In 2012, the most recent year on which data are available, DoD spent \$294.1 million and VA just

over \$3 billion on PTSD care for service members and veterans, respectively. DoD costs may be even higher, given its responsibility to treat eligible family members or other dependents who have PTSD as well. Although those costs might be expected to decrease in DoD in light of the recent drawdown, there will be a corresponding increase in VA costs as service members transition to VA care. In addition, there is an increasing reliance on purchased care in both systems, and even less is known about the value of care delivered in such settings.

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6

Workforce

Maintaining an appropriate and adequate workforce can be challenging for any health care system. Staffing the many programs and services that the Department of Defense (DoD) and the Department of Veterans Affairs (VA) have for the prevention, diagnosis, and treatment for posttraumatic stress disorder (PTSD) requires a large and diverse workforce that is trained and capable of providing the best care available and that is led by effective, engaged, and knowledgeable leaders. But having sufficient numbers of mental health providers is not enough to ensure that patients receive comprehensive care using best practices. An effective workforce requires that all mental health care providers be qualified and able to provide the best care and that they have the time and incentives to deliver it. Mental health care providers (such as, psychiatrists, psychologists, nurse practitioners, and social workers) need to be well qualified, appropriately licensed and credentialed, and trained to recognize and treat for PTSD using best practices.

Mental health care providers need adequate resources (such as time and money) to attend training in evidence-based treatments and deliver the treatments with fidelity and to improve their competence by continuing supervision and consultation with master trainers or mentors (Foa et al., 2013; Karlin et al., 2010; Ruzek et al., 2012). Training in evidence-based treatments without sufficient time for coursework and direct supervised clinical experience may instill an unwarranted sense of competence in providers and may ultimately do more harm than good (Foa et al., 2013). Seasoned providers need to be given opportunities to be mentors and

newly trained providers need time to work with mentors when this is recommended.

An often overlooked aspect of providing optimal mental health care is the need to maintain the mental well-being of providers themselves, who may experience “compassion fatigue” or “secondary traumatic stress.” The risk of secondary (or vicarious) trauma can be reduced by providing appropriate training, ensuring manageable caseloads, and encouraging provider consultations when treating difficult patients (Munroe et al., 1995).

In this chapter, the committee discusses the role of leaders in ensuring the best care available for PTSD and highlights the training needs of providers to manage PTSD. Other issues that might affect the DoD and VA workforce but are not considered in this report are organizational approaches to recruitment and retention of staff and the use of performance incentives to encourage specific activities. Recruitment and retention may be particularly important for installations and medical facilities located in underserved areas because an estimated 77% of U.S. counties have a severe shortage of mental health professionals (Thomas et al., 2009) and these shortages are most acute in rural areas (Hunt et al., 2012). However, the committee does not have data to assess these needs. The committee highlights ways in which each department is attempting to ensure an adequate and competent workforce and the challenges that they face in trying to do so.

DEPARTMENT OF DEFENSE

In the sections below, the role of leadership in managing and coordinating PTSD programs and services in and between the service branches is discussed, followed by the types and numbers of direct care providers and purchased care providers and their qualifications and training. The importance of understanding military culture and other factors that may affect a service member’s engagement in and response to PTSD treatment is then considered. The section ends with a synopsis of caring for mental health care providers in DoD.

Leadership

Responsibilities for prevention of and treatment for PTSD are shared by military and civilian leaders at many levels in the DoD hierarchy (see Figure 3-1). The top levels of leadership in DoD and its service branches establish priorities and strategies for PTSD recognition and treatment, and they shape the cultures within which PTSD care is delivered. The responsibilities begin at the highest organizational levels (joint chiefs, under secretary of defense for personnel and readiness, assistant secretary of defense for health affairs) and are transmitted via chains of authority through the

military surgeons general, the medical officer of the Marine Corps, and commanders of medical regions and military treatment facilities (MTFs), to the leaders and administrators of clinics and treatment programs of all types.

In the last decade, DoD has greatly expanded its mental health services, including those targeting PTSD, but this expansion presents military leaders with many challenges. These include an infusion of new mental health staff on installations, many of whom are civilian contractors or temporary employees who may be unfamiliar with PTSD or military culture; embedding of mental health care providers in line-unit organizational structures; frequent turnovers in leadership at all levels because of deployments and attrition; increased use of TRICARE purchased-care providers to treat active-duty service members; lack of standards for specialized PTSD programs; and the growth of military and civilian programs that address PTSD.

Because many DoD installations, National Guard members, and reservists are in rural areas, DoD leaders face difficulties in maintaining an adequate number of trained clinicians in the MTFs and in surrounding communities to meet the mental health needs of these populations. Military installations in rural and geographically less desirable areas can be chronically understaffed. To recruit qualified providers, DoD leaders must be able to offer compensation and incentives to compete with other potential employers in desirable areas and to encourage providers to move to and remain in less desirable ones.

MTFs are commanded by senior medical leaders who answer to their service branches' surgeons general, whereas prevention and resilience programs for the same military population are managed through an entirely separate chain of command. Other mental health resources may be under the installation command. Most PTSD programs were developed at local levels and operate under the authority of local commanders. Such fragmentation and stovepiping of components of PTSD-related care hampers communication, coordination, and efforts to address population needs. No central point of contact in DoD appears to be cognizant of all efforts to prevent, screen for, or treat PTSD in the military, let alone have sufficient knowledge, responsibility, and authority to ensure the quality and consistency of efforts to manage PTSD in all service branches or at the national level, including resilience and stress prevention programs.

The success of senior leadership of PTSD programs depends heavily on the knowledge, skills, and attitudes of more junior leaders in the military organizations in which they operate. The response of unit leaders, from junior noncommissioned officers to commanding officers, can have a substantial effect on whether service members who have PTSD are properly evaluated, offered treatment, or allowed to comply with treatment. For example, pressures to complete operational or training missions may conflict

with a service member's need to have time off from his or her duties to complete the prescribed PTSD treatments. Even if a unit commander encourages compliance with the treatment protocols for subordinates' PTSD, small-unit leaders may not believe that PTSD is a bona fide medical problem and may view a service member's report of PTSD symptoms as a problem of character or motivation.

Such negative perceptions of mental health by service members and their leaders continue to be a major obstacle to the effective management of PTSD in DoD. The 2011 Army mental health advisory team (MHAT) in-theater survey of deployed soldiers showed that of those who screened positively for a mental health problem, 46% thought their leaders would view them differently if they sought care, 34% thought their unit leaders would blame the service member for the problem, and 14% of soldiers and 10% of marines reported that their leaders discouraged the use of mental health services (MHAT-7, 2011). The military recognizes the critical role of junior leaders in the propagation of stigma, and each service branch has enacted education programs for noncommissioned officers to reduce stigma. For example, the Marine Corps Combat and Operational Stress Control and Operational Stress Control and Readiness (OSCAR) programs provide education on stress reactions to leaders at all levels to reduce barriers to PTSD care. On site visits, some service members stated that their commanders were supportive of their seeking care for their PTSD, but others acknowledged that though there had been improvements in commanders' attitudes toward PTSD, many commanders were not sympathetic to the issue.

Mental Health Care Providers

Direct Care Providers

DoD health facilities are staffed by nearly 146,400 personnel—about 60,400 civilians and 86,000 uniformed providers, including about 31,800 officers (TRICARE Management Activity, 2013). A variety of uniformed and civilian mental health care providers deliver inpatient and outpatient PTSD care in the military health system (MHS). Some providers in specialized PTSD programs and services are also trained in complementary and alternative treatments, such as biofeedback, meditation, and acupuncture. Service members who have PTSD and family members may also receive counseling at family support and counseling centers and the chaplain service that are not part of the medical system.

In 2007, the DoD Task Force on Mental Health examined mental health care resources and concluded that DoD funding and personnel were both insufficient (DoD Task Force on Mental Health, 2007). In response, DoD developed a population-based model, the Psychological Health Risk-

Adjusted Model for Staffing (PHRAMS), to estimate mental health staffing needs in both the MHS and the TRICARE purchased-care network (Harris and Marr, 2011). Although the model has not been validated, it has been used by the Army, Navy, and Air Force to estimate their mental health staffing needs (GAO, 2010; U.S. Air Force, 2012; U.S. Army, 2012). PHRAMS takes into account demographic and deployment risk factors to forecast mental health staffing needs throughout the MHS (DoD et al., 2013), and users can modify it to apportion direct versus purchased care, adjust productivity metrics, account for underuse, and alter the distribution of projected service members in different risk groups (IOM, 2013). The Institute of Medicine (IOM) report *Substance Use Disorders in the U.S. Armed Forces* found PHRAMS to be a useful tool for assessing mental health staffing needs in DoD (IOM, 2012).

In theater, only uniformed providers offer mental health services. In the early years of the conflicts in Afghanistan and Iraq, the Air Force provided the majority of the deployed mental health care providers, but by 2013 the Army provided 84% of them, the Navy 10%, and the Air Force 7% (U.S. Army, 2013). The MHATs, which conduct periodic assessments of mental health issues in theater found that the overall ratio of mental health care providers to service members among all service branches in theater has increased from 1:1,756 in 2005 to 1:567 in 2013 (MHAT-7, 2011; MHAT-9, 2013). The increase in staff was, in part, to accommodate the surge in U.S. forces in Afghanistan. The 2013 MHAT-9 report recommended that a staffing ratio of one mental health care provider for 700–800 soldiers (the Army model) is appropriate, but different services may need different staffing ratios depending on their mental health care delivery models (MHAT-9, 2013). The report acknowledged that the larger issue is to find the best way to use the mental health personnel so that service members know who they are and how to contact them if care is needed.

Mental health staff in DoD increased from about 4,000 in 2007 to almost 6,500 in 2010 (Dinneen, 2011), and the number has continued to increase. As of June 2012, the Army had 5,438 mental health care providers (psychologists, psychiatrists, social workers, mental health nurses and nurse practitioners, technicians, counselors, and other licensed mental health providers), including those who serve primarily in wellness or prevention roles; 1,594 of the providers were in mental health clinics. There were twice as many civilian as uniformed direct care providers (3,308 vs 1,713) (U.S. Army, 2012). The Air Force reported having 855 mental health care providers (psychologists, psychiatrists, social workers, and others) in May 2012—including uniformed, civilian, and contract personnel—assigned to 75 Air Force bases (numbers were not broken out by type of provider) (U.S. Air Force, 2012). The Navy, which also provides the vast majority of mental health services for the Marine Corps, in November 2013 had

1,524 military and civilian mental health care providers (psychologists, psychiatrists, social workers, mental health nurses and nurse practitioners, technicians, counselors, and other licensed mental health providers). The Marine Corps is also served by 60 marine mental health care providers and 22 OSCAR providers (U.S. Navy, 2013).

During site visits to multiple military installations, mental health care providers reported an ever-increasing demand for PTSD services, which often resulted in an inability to schedule patients for evidence-based treatment according to protocols. As a consequence, more active-duty service members are being referred to the TRICARE network of purchased care providers.

Purchased Care and Contract Providers

There are about 478,000 purchased care providers in the TRICARE network, of whom 62,000 are mental health care providers—psychiatrists, clinical psychologists, certified psychiatric nurse specialists, clinical social workers, certified marriage and family therapists, pastoral counselors, and mental health counselors (IOM, 2010; TRICARE Management Activity, 2013). TRICARE Management Authority (as of October 2013, incorporated into the newly established Defense Health Agency) was originally designed as a way to treat DoD retirees and dependents who could not be seen at MTFs because of lack of provider availability. In recent years, however, TRICARE has expanded to include purchased care for active-duty service members in areas where installations do not have the capacity or expertise to deliver appropriate and timely care.

During site visits, DoD providers reported that referral of active-duty service members to purchased care providers was rare before Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), but this practice is now common as a result of direct care staffing shortages. It was unclear how decisions were made about whether a service member would be treated on the installation or referred to purchased care. Purchased care referrals are also used when there is a need for specialized programs that are not available on the installation, such as dual-diagnosis programs for PTSD and substance abuse. The referral process appeared to be ad hoc, informal, and nonspecific, that is, installation providers cannot recommend a specific purchased care provider who might meet a service member's needs best. Although purchased care providers must meet state licensing and other certification requirements to treat TRICARE beneficiaries (Humana Military, 2013), the quality of PTSD care given by these providers, including the use of evidence-based approaches, is largely unknown and unmonitored by installation mental health leaders or TRICARE management.

DoD offers two contracted programs—Military OneSource and Military and Family Life Counselors (MFLCs)—that offer counseling for adjustment problems to service members and their families. The programs provide confidential support services and referrals but are not supposed to provide clinical PTSD care. Military OneSource staff are available 24 hours per day, 7 days per week, and offer supportive, nonmedical counseling via telephone, in person, or online to active-duty, National Guard, and reserve service members and their families (Military OneSource, 2013). MFLCs are credentialed civilians who work close to units (often brigades) and offer short-term counseling on military life issues, such as coping with deployment and reintegration stress, and referrals as necessary.

Provider Training and Qualifications

The IOM report *Provision of Mental Health Counseling Services Under TRICARE* (2010) concluded that a comprehensive quality management system was needed in DoD because of “widespread deficiencies in the training of providers and in the infrastructure that supports their practice.” Such a quality management system would include focused training in mental and related medical conditions, competency in military culture, and a systematic process for continued education and training on changes in evidence-based practices. To address these training needs, DoD provides a variety of workshops on prolonged exposure (PE) therapy, cognitive processing therapy (CPT), and eye movement desensitization and reprocessing (EMDR) therapy for PTSD, but it does not require that trainees participate in subsequent consultation (supervision or mentoring) to ensure that they use the therapies effectively or with fidelity. The gold standard of training typically involves 2- to 3-day experientially based workshops followed by weekly consultation sessions with a mentor, but this expensive training approach restricts the number of participants.

TRICARE providers are not required to be trained in evidence-based practices, nor is there any systematic method to ascertain a provider’s training before military patients may be referred to them. The 2007 DoD Task Force on Mental Health recommended that DoD require that TRICARE contractors have training that is equivalent to that of its direct care providers (DoD Task Force on Mental Health, 2007). Some purchased care providers are trained in at least one evidence-based psychotherapy and report that they use it with their military patients. Although DoD pays for direct care staff to be trained in evidence-based therapies, it will not pay for purchased care providers to receive similar training.

The DoD Center for Deployment Psychology (CDP) is a primary training resource, offering in-person and Web-based training on PTSD for military and civilian mental health professionals in “high-quality, cultur-

ally-sensitive, evidence-based behavioral health services.” The online PE and CPT courses are 75-minute introductory sessions that comprise primarily text-based content (<http://www.deploymentpsych.org/training>). As of 2013, more than 8,000 providers had taken either the CPT or PE online course. These courses cannot be considered a substitute for the multiday experiential trainings.

The Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE) also offers educational resources on evidence-based treatments via annual conferences and publicly accessible monthly webinars on specific mental health topics; providers may obtain continuing education credits for both the conferences and the webinars. DCoE has developed toolkits to promote the use of VA/DoD clinical practice guidelines and to enhance training (DCoE, 2013). None of these training approaches has been subject to rigorous evaluations or assessments of their participation rates or impact.

DoD is supporting projects to develop computer-based virtual-patient simulation training (see Chapter 9 and Appendix E) (Talbot et al., 2012). Such approaches include static-image supported and text- or menu-interactive case presentations, low-fidelity interactive patient scenarios, high-fidelity software simulations, virtual-human conversational agents, and live-human standardized patients. The effectiveness of these new approaches is still being studied, but should they prove useful, virtual-patient technology could help supplement current in-person training.

Service-Specific Providers

The Army Medical Department Center and School trains its mental health care providers in PTSD treatments. During 2008–2011, the Office of the Surgeon General of the Army reported that more than 2,800 mental health care providers had been trained in evidence-based psychotherapies. Table 6-1 shows the annual number of Army providers trained in psychotherapy for PTSD.

The Office of the Surgeon General of the Air Force reported that as of May 2012, all Air Force MTFs had mental health care providers who had been trained in evidence-based treatments for PTSD. Providers, including all psychology and social-work residents, are sent to master clinician development courses for PE and CPT. A mobile training team also travels to Air Force bases around the world to train providers on these psychotherapies. Between 2007 and 2011, the CDP trained 706 Air Force providers, and between 2008 and 2010, an additional 704 received training in PE from the University of Texas Health Science Center. The Air Force intends to continue to provide CPT and PE training to all of its clinicians (U.S. Air Force, 2012).

TABLE 6-1 Number of Army Mental Health Care Providers Trained in Evidence-Based Treatments for PTSD

Training Type	2008	2009	2010	2011
Eye movement desensitization and reprocessing	68	313	267	273
Cognitive processing therapy	30	282	388	228
Prolonged exposure therapy	129	220	194	233
Cognitive behavioral conjoint therapy	30	30	132	42
Total	257	845	981	776

SOURCE: U.S. Army, 2012.

The Navy reported that all of its direct care providers (military and civilian), including its psychiatry and psychology residents and interns, have been trained in cognitive-based treatments, exposure-based treatments, or both, and it trains about 30–40 providers a year in them. However, it does not keep statistics on the number of contract providers trained in evidence-based psychotherapies for PTSD, specifically. The Navy Bureau of Medicine and Surgery supports providers in their continuing education by funding online cognitive behavioral therapy and CPT training (U.S. Navy, 2013).

Each service branch trains most of its prescribers (psychiatrists, nurse practitioners, and physicians' assistants) in pharmacotherapies for PTSD through military psychiatry and psychology training programs. All military psychiatry residency training programs have additional training in treating PTSD in military contexts, but there is no specific certification for prescribing PTSD medications.

Training staff in evidence-based psychotherapies is a necessary but not sufficient condition for ensuring that evidence-based treatments are delivered to patients. DoD does not document trainee mentoring or whether those trained in evidence-based care use it in clinical practice. Therefore, it is not clear that their level of training is sufficient to provide evidence-based treatments effectively or with fidelity.

Military Culture

All DoD direct care and purchased care mental health providers need to be knowledgeable about military culture and the particular contextual issues, such as era of service, that may influence a service member's response to stress or treatment. The assistant secretary of defense for health affairs issued guidance that specifies that within the first year of hire, all direct care civilian and new military providers "have sufficient training or experience

in military culture and terminology to deliver context-sensitive care for the treatment of psychological conditions related to war trauma” (Office of the Assistant Secretary of Defense, 2010). Although the guidance may ensure that direct care providers are knowledgeable about military culture, it does not address the need for such training for purchased care providers.

Providers who are on active duty, are veterans themselves, or have family members who are service members will have an appreciation of military culture and may be comfortable treating active-duty and retired service members, but nonveteran civilian providers may lack that understanding and could benefit from education about military culture. Service members reported frustration and lack of trust with providers who did not have an understanding of their military experiences.

DoD and VA are collaborating with CDP to develop educational modules and a website about military culture. The first module, *Military Culture Core Competencies for Healthcare Professionals: Self-Awareness and Introduction to Military Ethos*, is available online from the center (CDP, 2014). The website offers educational supplements, references from the modules, and additional professional tools, such as videos (CDP, 2013a). CDP has partnered with such organizations as the Indiana National Guard, the National Guard Psychological Health Program, and the Military Family Research Institute to develop and conduct provider training specific to the needs of military members and their families. More than 200 mental health clinicians have completed the training program and are listed in the Star Behavioral Health Providers registry, which service members can search to locate those clinicians in four states: California, Georgia, Indiana, and Michigan (CDP, 2013b). However, the impact of the registry on changing provider methods and improving quality of care is unknown.

Care of Providers

Military mental health care providers are considered to be higher risk for secondary trauma or stress reactions than are civilian mental health professionals because of their exposure to a highly stressed patient population and military operational stressors, such as multiple deployments, ethical dilemmas, and inadequate reprieve time (Ballenger-Browning et al., 2011; Pechacek et al., 2011; Rubin and Weiss, 2012). Cieslak and colleagues (2013) found that about 20% of mental health care providers who treat military patients have secondary traumatic stress. A higher frequency of secondary traumatic stress was seen in providers who had a personal history of trauma, reported having too many patients, and had more negative appraisals of the impact of indirect exposure to trauma. One approach to dealing with secondary trauma is the Overcoming Adversity and Stress Injury Support (OASIS) peer support program for both civilian and uniformed mental

health care providers, which is led by an external counselor. OASIS leaders noted that time for peer support is not built into the providers' work environment, but it is necessary for keeping the workforce healthy and able to focus on patients (Naval Medical Center San Diego, 2013).

DEPARTMENT OF VETERANS AFFAIRS

As with DoD, VA has a large and diverse workforce of mental health care providers and support staff. Although the majority of mental health care in VA is delivered by employees, the VA also uses purchased care providers to supplement direct care in underserved areas, and to provide specialty care. Managing this workforce requires VA leaders at all management levels to foster the use of best practices, maintain a competent workforce, and encourage innovation. In the sections below, the role of VA leaders is discussed. The remaining sections describe the VA workforce, including direct care providers, purchased care providers, and training efforts in VA (particularly for evidence-based treatments).

Leadership

The organizational structure of VA encourages accountability at all levels of management. Accountable leadership extends through all levels, from PTSD program managers, to directors of mental health departments, and to facility, VISN, and central office leadership. VA leaders are responsible for all potential veterans who could use VA health services, not only those who are currently using services. VA leaders need to plan for managing veterans who have PTSD and respond to acute treatment, but they also need to plan for those who have chronic PTSD and comorbidities and will require mental health and other services into the future.

The VA Office of Mental Health Operations (OMHO) and the Office of Mental Health Services are the lead offices for developing and implementing strategies for addressing current and future PTSD management demands. OMHO is collaborating with other VA program offices, including offices for primary care, patient-aligned care teams, and rehabilitation and polytrauma services. In response to a query about the mechanisms that are used to ensure that local mental health leaders are able to plan, implement, and evaluate PTSD programming, OMHO replied that "performance review is the major mechanism for incentivizing leadership at all levels to implement clinical policy" (OMHO, 2013b). OMHO reviews PTSD care via site visits and provides feedback on good practices and needs for improvement to VISN and facility mental health leadership both directly and through a SharePoint site. VA's Northeast Program Evaluation Center provides data on specialized PTSD programs in its annual report *The Long Journey Home*

and works with PTSD mentors in each veteran integrated service network (VISN) to assist in coordinating PTSD services and implementing strong clinical practices. Other VA offices such as the National Center for Analysis and Statistics and the Veterans Benefits Administration collect and analyze extensive amounts of data that can potentially be useful to managers in strategic planning and program implementation.

Executive Order 13625 (August 31, 2012) called for enhanced partnerships between VA and community providers, and increased VA mental health staffing. It also calls for VA and the Department of Health and Human Services to develop a plan for a rural mental health recruitment initiative. VA leaders face many of the same challenges in recruiting and retaining mental health professionals in a highly competitive environment as does DoD. The OMHO site visit report indicated that 60% of VA medical centers had problems with recruitment or retention of qualified staff, particularly psychiatrists, but also clerical and administrative staff who handle patient scheduling and staff for primary care–mental health integration programs (OMHO, 2013a). National vacancy rates were greatest in psychiatry (14.2%), followed by psychology (13.2%), social work (9.9%), and nursing (9.1%). In 2009, annual turnover of VA mental health staff was 26% (Watkins et al., 2011).

Some medical center leaders are aware of and concerned about the growing numbers of veterans of current and previous conflicts that need PTSD services and are strategizing about resource allocation to meet this growing need. However, other local medical center and mental health service leaders have not actively embraced a population-based approach to PTSD care for all the veterans who were living in their catchment areas, and they appeared naive with respect to the possibility of a large influx of veterans who need treatment for PTSD and other mental health services as the current conflict in Afghanistan comes to a close. That range of response by medical center leaders to PTSD demand and consequent treatment availability and adequacy underscores the need for more consistent strategic planning and implementation for PTSD management among and within VA administrative levels.

A National Academy of Public Administration report on the VA purchased care program recommended that senior VA management “provide clear policy direction about performance goals and expectations for VA purchased care, including the allocation of resources between VA-provided and purchased care to best meet strategic goals” (Pane et al., 2011). To accomplish that, the VA Chief Business Office should establish a more effective performance management system—including a portfolio of performance metrics to assess productivity, accuracy, timeliness, and customer satisfaction—and improved accountability for data accuracy and management. Furthermore, the report emphasized that accountability and respon-

sibility for purchased care management and outcomes need to be better defined, communicated, understood, and executed by all involved in the program. The need for accountability and responsibility extends to enacting and enforcing staffing standards, business rules, and standard operating procedures. Clear lines of authority should span the office of the deputy under secretary for health for operations and management, the Chief Business Office, the VISNs, and the consolidated claims-processing sites (Pane et al., 2011).

Communication issues can arise with regard to care for veterans who have PTSD. Veterans generally have some choice of where to access PTSD care in VA, whether through a medical center, a community-based outpatient clinic (CBOC), or a Vet Center. Vet Center staff do not report to medical center directors (they report up a different line directly to the under secretary for health). Because of that organizational structure, it may be difficult to coordinate treatment for patients seen in Vet Centers if they receive other care at the medical center. There appears to be considerable variation in coordination and communication between Vet Centers and local VA medical facilities, ranging from a close working relationship to virtually no interaction between the two. Vet Center representatives at a few sites noted that access to the veterans' electronic health records in VA was "spotty" but that when they were able to access patient information, it was helpful; VA providers in CBOCs or medical centers cannot access Vet Center data systems.

In an effort to promote community collaboration, each VA medical center hosts a mental health summit to promote awareness and use of VA mental health resources and to help veterans to gain access to community services (VA, 2013b). These summits began in 2013.

Mental Health Care Providers

Direct Care Providers

Most health care for veterans is provided by VA employees. VA employs 3,088 psychiatrists, 3,675 psychologists, 3,966 psychiatric nurses, 5,278 social workers, and 3,142 other mental health care providers (such as licensed marriage and family therapists and licensed professional counselors) (OMHO, 2013b). VA increased its outpatient mental health staffing from about 6,500 full-time equivalents in 2005 to more than 11,500 in 2012, including an influx of 1,600 mental health care providers and 300 support staff in 2012–2013. Increases in staffing in general mental health programs and specialized outpatient PTSD programs (SOPPs) have not kept pace with the substantial increase in numbers of veterans who have a diagnosis of PTSD and are seeking care in VA facilities. In 2012, clinicians

in the SOPPs were seeing an average of 136 patients in a year, 24% of them new patients (VA, 2012a).

VA does not have an explicit staffing model for mental health (Schohn, 2013), but in 2011, it began piloting guidance on general outpatient staffing levels. OMHO expects to retain specialized PTSD clinical programs in all VA medical centers and clinics while adapting to the new guidance (OMHO, 2013b). The guidance recommended a ratio of 6.6–7.5 clinical and clerical full-time equivalent staff for every 1,000 veterans who use mental health services (not PTSD specific). Facilities have flexibility to establish their own staffing programs but are instructed to use interdisciplinary teams to provide comprehensive general outpatient mental health care. VA is expanding the guidance to address staffing for specialty mental health services and is piloting this guidance in four VISNs (OMHO, 2013b).

In 2012, the OMHO visited all 140 VA health care systems (medical centers and some of their large CBOCs) to evaluate the implementation of the VHA handbook *Uniform Mental Health Services in VA Medical Centers and Clinics* (see Chapter 3 for a description of the survey process). In the site visit report, the need for PTSD care providers was noted by 31% of all sites and 34% of CBOCs. Some CBOCs also reported problems in obtaining adequate telehealth services for mental health (30%) and difficulties in providing evidence-based psychotherapy (36%). These numbers do not mean that the remaining sites do not have staffing issues, merely that staffing was not specifically mentioned at the sites as a strength or weakness. CBOC clinical staff reported that they often performed multiple roles with little backup support. Staffing shortages also result in less than optimal fidelity in the delivery of evidence-based treatments (OMHO, 2013a).

In addition to licensed and trained direct care providers, VA uses other types of providers to augment its clinicians. In November 2013, VA announced that it had hired 815 peer specialists and peer apprentices. The newly hired employees are veterans who have successfully dealt with their own mental health recovery for at least a year and now are helping to guide fellow veterans through their difficult issues. Peer specialists are trained and certified (VA, 2013d).

In response to the DoD/VA Integrated Mental Health Strategy, VA has begun incorporating chaplains into mental health care as part of a collaborative model. Nieuwsma et al. (2013) found that both DoD and VA chaplains care for people with mental health problems, although DoD chaplains tended to see people with less severe life stressors and mental health issues, whereas VA chaplains were seeing people with more psychiatric issues. Some VA and DoD facilities reported that chaplain services were well integrated into mental health services and that personal relationships facilitated referrals to each service, but at other facilities, barriers to integration

included a lack of trust, chaplains feeling that mental health professionals did not understand or value their work, and chaplain staffing shortages.

Some veterans choose to receive PTSD management services at Vet Centers. In 47 of the 300 Vet Centers, VA medical staff provide regularly scheduled services, and 69 provide readjustment services at their supporting medical centers or CBOCs (Fisher, 2014). Vet Centers employ over 1,900 people, about 72% of whom are veterans, and most of the veterans are combat veterans. About one-third of all Vet Center staff served in OEF, OIF, or both. Furthermore, about 60% of direct counseling staff in Vet Centers are licensed and qualified mental health professionals, such as psychologists and social workers (Fisher, 2014). The Readjustment Counseling Service reported that not all of its providers are trained in PE or CPT, but it continues to offer training and supervision for providers working toward certification in these treatments. The Readjustment Counseling Service is in the process of hiring a qualified and licensed clinician to provide family counseling in every Vet Center (Fisher, 2014).

Purchased Care Providers

Like DoD, VA contracts with purchased care providers, primarily to serve veterans who live long distances from VA facilities or for highly specialized services not available in a local or preferred VA medical center. Use of those providers has expanded recently to compensate for VA staffing shortages that have led to long waits for appointments. A 2013 Government Accountability Office (GAO) report found that the number of veterans receiving purchased services increased from 821,000 in 2008 to 976,000 in 2012, a 19% increase (GAO, 2013). Although the VA was asked to provide specific data on the use of purchased care for PTSD for this report, it did not do so.

An evaluation of the purchased care program by the National Academy of Public Administration (Pane et al., 2011) found that VA used an antiquated administrative system, was not well managed at any level, and was highly decentralized and prone to substantial errors in payments. The academy stated that “high level VA management should provide clear policy direction about performance goals and expectations for VA purchased care, including the allocation of resources between VA-provided and purchased care to best meet strategic goals” and that VA “should build greater program management competence and capacity for overseeing the Fee Care Program and supporting the consolidated claims processing sites” (Pane et al., 2011). GAO (2013) has also criticized VA for lack of oversight of its purchased care program.

Local VA medical center leaders are responsible for developing and managing networks of purchased care providers. As is the case with

TRICARE providers, the quality of PTSD treatment delivered by purchased care providers for veterans is largely unknown because no standards or performance measures are in place for them (see Chapter 4). Although purchased care providers must be licensed, VA, like DoD, does not screen or assess the providers to ensure that they are trained in or offer evidence-based treatments for PTSD, that they are familiar with or adhere to the VA/DoD clinical practice guideline for PTSD, or that they are familiar with military culture. Although directors of mental health departments in some facilities acknowledged that the lack of standards for purchased care is an issue, facility leaders did not, in general, find this to be a major responsibility for them or have a strategy for increasing the accountability of their purchased care providers.

VA medical facilities do not appear to have formal referral processes to ensure that veterans receive care from purchased care providers who have expertise in deployment-related PTSD. The Reaching Rural Veterans Initiative in Pennsylvania found that primary care providers in the purchased care system frequently lacked knowledge and awareness of PTSD and were unaware of treatment resources available at VA that might help their veteran patients who had PTSD. Those gaps are important because 23% of the primary care providers reported that over one-third of their veteran patients had mental health problems, but only 8% of the providers felt that they had adequate knowledge of current mental health treatments for these problems (Boscarino et al., 2010).

To address issues of quality of care offered by purchased care providers, VA recently contracted with two health management companies as part of its Patient-Centered Community Care initiative. The contractors will provide inpatient and outpatient specialty care and mental health care services when local VA medical centers have long wait times to see specialists or when veterans live far from the nearest VA facilities. They will be responsible for consolidating and standardizing the quality of purchased care providers, and for screening them to ensure that they meet or exceed VA standards for credentialing, licensing, and specialty-care requirements. Providers must see patients within a specified period and be geographically convenient, and medical files generated by purchased care specialists must be shared with VA promptly to ensure that all care is closely monitored and coordinated by VA (VA, 2013c).

Provider Training and Qualifications

VA has implemented a national program to train its therapists in evidence-based psychotherapies for PTSD and has established formal criteria for credentialing them in PE and CPT. The criteria include participation in structured workshops and consultations (supervision) designed

by the developers of the treatment programs. VA has trained more than 6,600 VA and DoD mental health care providers in evidence-based treatments (Schohn, 2013). As of October 2013, 4,890 VA mental health care providers had received training in CPT, 1,864 in PE, and 1,204 in both (OMHO, 2013b). One survey found that more than 90% of VA providers who completed CPT or PE training were delivering these therapies more than 6 months later (Schohn, 2012). However, in a survey of 2,184 clinical staff in VA specialized PTSD programs (outpatient and inpatient), only 955 (44%) of the providers reported using PE or CPT (VA, 2012a). The OMHO survey of 140 VA medical facilities found that in 48% of the facilities, staff reported trouble in getting training in evidence-based psychotherapies or access to post-training consultations (OMHO, 2013a). VA lacks a mechanism to verify the extent to which trained staff are delivering CPT or PE, although it is attempting to improve the electronic health record to track the use of these therapies (see Chapter 4).

The VA does not track the number of VA mental health care providers who had received training in EMDR because there is no formal competence-based training program for it (OMHO, 2013b); however, in 2012, 340 providers in VA specialized PTSD programs (both outpatient and inpatient) indicated they had been trained in an evidence-based psychotherapy other than PE or CPT (VA, 2012a). VA does not have formal training for EMDR, stress inoculation training, or prescribing selective serotonin reuptake inhibitors and serotonin norepinephrine reuptake inhibitors, all rated as first-line treatments in the VA/DoD clinical practice guideline for PTSD. No national prescriber training for the medications is offered by VA.

The National Center for PTSD offers a number of training opportunities. It has sponsored monthly telephone and online lecture series on implementation of the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress* and several lecture series on pharmacologic treatment for PTSD (including coordinating psychotherapy and medications), which were accessed by more than 15,000 contacts (OMHO, 2013b). The effectiveness of these training efforts is not known. The center is also piloting online training for evidence-based psychotherapies; however, this training program lacks the recommended consultation component. Nevertheless, more than 200 VA providers and 200 community providers have been trained by using these online programs (Kuhn and Ruzek, 2013). It also offers an online course “Understanding Military Culture When Treating PTSD” (OMHO, 2013b). Several VA providers reported that in addition to clinical staff, administrative staff who process veterans for intake would benefit from military culture training.

Eligibility requirements for VA training programs in PE and CPT necessitate that clinicians be permanent, licensed mental health staff (that is, psychiatrist, psychologist, social worker, advanced practice mental health

nurse, licensed professional mental health counselor, or marriage and family therapist) and that they spend at least 50% of their time treating patients with PTSD (OMHO, 2013b). Such stringent training prerequisites may create a barrier to the wider dissemination of those psychotherapies. To address the barrier, VA is developing a decentralized PE and CPT training and consultation capacity to reach providers who may spend less than 50% of their time in treating patients who have PTSD. The new training program will be phased in in 2014 (OMHO, 2013b).

To address recruiting and training needs VA has collaborated effectively with several colleges and universities to recruit master's-level and PhD-level social work students to work in its mental health clinics. The VA health care system is affiliated with about 110 medical schools and more than 1,200 other schools throughout the United States (VA, 2012b). The VA Office of Academic Affairs funds thousands of mental health and medical education training programs and fellowships. In 2011, nearly 117,000 mental health care providers received some of or all their clinical training in VA, and an estimated 50% of U.S. psychologists and 70% of VA psychologists received VA training before employment (VA, 2013a). Several master's-level programs in social work have established paid clinical field internships in VA mental health clinics and Vet Centers and, to a smaller extent, in DoD medical facilities. For example, the Smith College School for Social Work maintains a network of paid and unpaid master's in social work and PhD clinical internships at 16 DoD and VA sites. Before completing their degrees, students are immersed in educational programs that include structured training and regular supervision in cognitive behavioral therapy, PE, and CPT for PTSD.

Care of Providers

As in DoD, VA administrators and clinicians have recognized the psychological toll experienced by mental health and ancillary providers who work regularly with veterans who have trauma-related conditions and serious mental health concerns. VA leaders have recognized that staff need to maintain their own health and well-being in their work settings and avoid the potentially adverse effects of secondary trauma. A recent survey that assessed burnout among 138 mental health providers in VA PTSD clinical teams found 12% of the sample reported low professional efficacy, 50% reported high levels of exhaustion, and 47% reported high levels of cynicism (Garcia et al., 2014). Mental health providers who treat for PTSD may benefit from programs or supports aimed at preventing and addressing burnout.

SUMMARY

Over the last decade, DoD and VA have expanded their workforces of both direct care and purchased care providers for service members and veterans who have PTSD. In the DoD, there is no central leader who has sufficient responsibility and authority to ensure the quality and consistency of efforts to manage PTSD in all service branches or at the national level; different PTSD services and programs are the responsibility of different commands and service branches. VA leaders have more authority and processes to implement organizational changes to improve PTSD services at the VISN and local medical facility levels.

DoD health facilities are staffed by nearly 146,400 personnel—about 60,400 civilians and 86,000 uniformed providers, who provide mental health care in a variety of military settings, from in theater, to embedded mental health clinics and primary care clinics, to MTFs. DoD has also expanded its use of purchased care providers, particularly for service members in underserved areas. The approximately 62,000 TRICARE mental health care providers deliver acute, outpatient, and inpatient PTSD care.

VA has many of the same workforce issues as DoD. As of 2013, it employed more than 19,000 mental health care providers, most of them in outpatient care, but this workforce has proven to be inadequate to provide the increasing number of veterans who have PTSD with adequate evidence-based treatments. In 2012, about one-third of VA medical centers and CBOCs reported inadequate staff, and 60% of VA medical centers had problems with recruitment or retention of qualified staff, including clerical and administrative staff. To supplement its clinicians, VA uses peer counselors to provide non-clinical support services. Many veterans also receive mental health services in Vet Centers, about 60% of which have licensed and qualified mental health care staff. In spite of increased numbers of direct care providers, the number of veterans receiving purchased care services increased 19% from 2008 to 2012.

In both DoD and VA, referral to purchased care providers appears to be ad hoc and not a thoughtful clinical process. The use of purchased care providers is also problematic because neither DoD or VA assesses purchased care providers to ensure that the providers are trained in or offer evidence-based treatments for PTSD, that they are familiar with or adhere to the VA/DoD clinical practice guideline for PTSD, that they are familiar with military culture, or that they assess patient outcomes and report them to the referring clinician. The VA Patient-Centered Community Care initiative may help to ensure that its purchased care providers meet the same credentialing and reporting requirements as VA direct care providers.

Each service branch provides training in evidence-based treatments for PTSD for all its direct care mental health clinicians, although the extent of

that training, particularly the use of supervised consultations for PE and CPT, is often not clear. CDP offers training, both in person and online, to DoD providers in evidence-based treatments, but the effectiveness of this training has not been evaluated. VA has implemented a national program to train its therapists in evidence-based psychotherapies, particularly PE and CPT, including participation in structured workshops and ongoing supervision. VA has trained more than 6,600 VA and DoD mental health care providers in those therapies. Working with academic institutions to provide hands-on training for their students is one mechanism that may expand the pool of potential, trained employees in both departments.

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7

Effective and Safe Care

All health care systems strive to provide effective and safe interventions to improve or maintain the health of their patients, including prevention efforts. In this report the term *effective* is used to mean that a specific posttraumatic stress disorder (PTSD) service or program results in a better outcome for the service member or veteran compared with other services or programs, including no service or program. The term *safe* means that the risk of harm is acceptable and well characterized. Although the effectiveness of many PTSD treatments is well established, a specific treatment might not be equally effective in all people, nor is any treatment necessarily appropriate for all patients for all presentations of PTSD or at every point along its course.

The phase 1 report reviewed the evidence base for many prevention approaches and treatments for PTSD, including psychotherapy, pharmacotherapy, and complementary and alternative therapies. That report also considered the treatment of several common comorbidities such as traumatic brain injury (TBI) and chronic pain. This chapter considers whether and how Department of Defense (DoD) and Department of Veterans Affairs (VA) are achieving success in providing effective and safe treatments for PTSD and the difficulties that they have experienced in delivering these treatments.

DETERMINING EFFECTIVE CARE

Clinical practice guidelines provide recommendations on the best practices for the treatment of a condition on the basis of reviews of scientific

evidence and expert consensus. State-of-the-science guidelines assess the strength of the evidence, the manner in which evidence was collected and evaluated, and the populations to which it pertains. Implementation strategies, such as reminders in the medical record and decision support tools, can help ensure that clinicians adhere to guidelines (IOM, 2013a,b). The Institute of Medicine (IOM) has established standards for the development of trustworthy clinical practice guidelines (IOM, 2011).

DoD and VA developed the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress* in 2004 and updated it 2010. This joint guideline, which meets the IOM guideline standards, reflects the evidence base (and safety concerns, if applicable) for first-line and other psychotherapies and pharmacotherapies for PTSD, including complementary and alternative therapies, and delivery formats (group versus individual sessions). The guideline also provides brief advice on assessing comorbidities in patients who have PTSD, where best to treat them (for example, in a primary care versus specialty clinic), and the effects of the comorbidities on PTSD treatment (VA/DoD, 2010). Although there are VA/DoD guidelines for treating some conditions that may co-occur with PTSD—such as major depressive disorder, TBI, or substance use disorder—there is no guideline that addresses specifically the concurrent treatment of PTSD and its common comorbidities (<http://www.healthquality.va.gov>).

In its phase 1 report, the committee recommended that DoD and VA mental health care providers follow their own guideline.¹ The committee also concurred strongly with the guideline recommendation that “patients who are diagnosed with PTSD should be offered one of the evidence-based trauma-focused psychotherapeutic interventions that include components of exposure and/or cognitive restructuring; or stress inoculation training,” as well as “selective serotonin reuptake inhibitors (SSRIs), for which fluoxetine, paroxetine, or sertraline have the strongest support, or serotonin norepinephrine reuptake inhibitors (SNRIs), for which venlafaxine has the strongest support, for the treatment of PTSD” (VA/DoD, 2010). A 2013 meta-analysis of treatment efficacy for PTSD was consistent with the VA/DoD guideline in finding that cognitive therapy including cognitive processing therapy (CPT); exposure therapy, such as prolonged exposure (PE) therapy; and eye movement desensitization and reprocessing (EMDR)

¹ The committee uses the VA/DoD clinical practice guideline to define evidence-based treatments as ones “that are most strongly supported by randomized control trials” (VA/DoD, 2010). That aligns with the Substance Abuse and Mental Health Services Administration definition of evidence-based interventions: “strong evidence means that the evaluation of an intervention generates consistently positive results for the outcomes targeted under conditions that rule out competing explanations for effects achieved (e.g., population and contextual differences)” (Center for Substance Abuse Prevention, 2009).

were effective psychotherapies, and SSRIs were the most effective pharmacotherapies (Watts et al., 2013).

Some of the first-line evidence-based treatments, such as PE, have manuals that provide detailed protocols for their use. Adherence to the manuals in a manner that is sensitive to individual patients' needs can help to ensure that the treatments are effective, although modifications may be necessary to address patient needs and preferences. Frequent and consistent monitoring of patient symptoms and outcomes are also important to determine the effectiveness of a PTSD treatment and to indicate if and when modifications may be necessary. Adequate monitoring, education, and support from the health care provider can help ensure patient compliance, identify adverse reactions, and track treatment responses.

DELIVERY OF EFFECTIVE CARE

Optimal delivery of evidence-based treatment for PTSD requires organizational resources and leadership support, an organizational culture that expects and rewards the delivery of those treatments (Foa et al., 2013), and adherence to the VA/DoD guideline for PTSD and treatment manuals. Delivery of evidence-based psychotherapy and pharmacotherapy will also be influenced by a patient's needs, the provider's clinical judgment, and the treatment setting. For example, some patients may prefer to be treated in a primary care clinic, whereas others may require care in a specialty intensive program. Clinicians also need to be aware of any comorbid conditions a patient might have—not only physical or other mental health conditions but psychosocial problems such as relationship issues—because these conditions may need to be addressed before or concurrently with PTSD treatment.

Stepped care is one approach that may improve the delivery of effective treatment (Zatzick et al., 2004, 2013). In this model, first-line, evidence-based treatments are offered initially, but if a patient does not respond adequately or is reluctant to engage in such treatments, a provider may try second-line or third-line, lower-intensity approaches—such as psychoeducation, a complementary or alternative therapy, or sleep aids—to treat the patient's PTSD symptoms. Repeated measurements of PTSD symptoms then allow the “stepping up” of care to higher-intensity, evidence-based interventions for patients who remain symptomatic. Measurement-based stepped care may be an optimal approach to integrating treatment-engagement strategies such as psychoeducation with established evidence-based PTSD interventions.

DEPARTMENT OF DEFENSE

This section examines DoD performance regarding the use of evidence-based and other interventions for PTSD and how those interventions are delivered to service members. Ways in which DoD has achieved success or faced challenges in providing effective interventions for the prevention and diagnosis of and treatment for PTSD in service members are discussed. The use of evidence-based treatments, complementary and alternative treatments, and prevention and resilience programs in DoD is also considered.

Determining Effective Care

Evidence-Based Treatment

The Army Medical Command has mandated that all military treatment facility commanders, mental health care providers, and other medical care providers deliver evidence-based care for PTSD according to the VA/DoD clinical practice guideline (U.S. Army, 2012b). However, DoD and the service branches lack data on whether the guideline is being used by providers to inform treatment decisions (IOM, 2013c). They do not track and evaluate the types of treatments that patients receive or their outcomes although efforts to do so have begun, for example, the Army's Behavioral Health Data Portal (see Chapter 4).

A RAND Corporation study of PTSD, depression, and TBI in service members returning from Afghanistan and Iraq estimated that 53% of those who met criteria for PTSD had sought help from a mental health care provider, but fewer than half of those who sought help received minimally adequate treatment. Minimally adequate treatment with a psychotropic drug was considered to be use of the prescribed medication for as long as the provider wanted to use it and at least four visits with a provider in the preceding 12 months. Minimally adequate psychotherapy was defined as at least eight visits, each lasting at least 30 minutes, with a mental health professional in the preceding 12 months (Tanielian and Jaycox, 2008).

No DoD data on the use of evidence-based psychotherapy and patient outcomes were available because such data are not collected at the national or service branch level. Data on prescriptions for pharmaceuticals that are used to treat for PTSD (and other mental health conditions) were available, but those data must be interpreted cautiously because, although the Food and Drug Administration has approved two drugs for PTSD—sertraline (Zoloft, Lustral) and paroxetine (Paxil, Pevexa)—it is not possible to determine whether they or any of the other drugs were prescribed specifically for PTSD rather than for a comorbid condition.

A small amount of data has been collected on intensive PTSD outpa-

tient programs in DoD. The Tri-service Integrator of Outpatient Programming Systems (TrIOPS) in the DoD Deployment Health Clinical Center surveyed 15 such programs and found that 13 of them used cognitive behavioral therapy, 10 used CPT, 5 used PE, and 8 used EMDR; how often the psychotherapies were used in the programs was not reported (O'Toole, 2012). No details on the survey methods or response rates were provided.

Complementary and Alternative Therapies

Military personnel use complementary and alternative therapies for a variety of health conditions, including PTSD, but DoD does not have data on what therapies are available on or near installations or on the number of service members who may use them and why. Goertz et al. (2013) found that 45% of 16,146 military survey participants reported use of at least one complementary or alternative treatment in the preceding year. The 2004–2006 Millennium Cohort Study found that of 86,131 participants in all service branches and components, 41% reported use of any of the 12 complementary and alternative therapies listed in the survey in the preceding year. Of those who had a self-reported diagnosis of PTSD (2.3% of participants), fewer than 5% used any provider-assisted or self-administered complementary and alternative treatment (Jacobson et al., 2009).

Several PTSD programs in DoD use complementary and alternative therapies such as acupuncture, meditation, neurofeedback, and relaxation techniques, and some DoD mental health care providers and service members find benefits in those therapies for PTSD. The National Intrepid Center of Excellence and the Overcoming Adversity and Stress Injury Support programs use the therapies to calm some of the hypervigilance symptoms of PTSD and to keep patients engaged in treatment until they are ready for or are able to access more trauma-focused therapy such as PE or CPT (Koffman and Helms, 2013; Sargent et al., 2013). Thirteen of the 15 PTSD intensive outpatient programs surveyed by TrIOPS offered some form of complementary and alternative treatment (O'Toole, 2012). The Warrior Resilience Center at Fort Bliss, Texas, is using a combination of evidence-based treatments and several complementary therapies (such as acupuncture, Reiki, and meditation) to treat soldiers who have PTSD (see Chapter 3 for more information on this program). Although the evidence base to support the effectiveness of most of these treatments is lacking, a few studies show positive results (see phase 1 report).

Prevention and Resilience

Preventing the development of mental health problems, including PTSD, has been a goal of DoD for many years. Each service branch has

developed its own resilience or stress control training programs to help service members cope with the stresses of military life, particularly deployments and combat, and to prevent the development or exacerbation of mental health problems. In 2011, DoD Instruction 6490.05 *Maintenance of Psychological Health in Military Operations* required the service branches to evaluate on an annual basis the quality and effectiveness of their combat and operational stress control programs. The long-term effect of such resilience training on preventing PTSD after exposure to a traumatic event is unknown, but some programs, such as the Army's Comprehensive Soldier and Family Fitness (CSF2), are collecting data to assess its effectiveness (Harms et al., 2013). The Army is required to conduct a study of all its resilience programs and specifically to assess the effectiveness of CSF2 and report its findings to Congress by October 2014.

The CSF2 program (described in Chapter 3) is based in part on the Penn Resilience Program and the Army's earlier Battlemind program. In an extensive review of the CSF2 program, Steenkamp et al. (2013) found that although some aspects of the program may be beneficial to soldiers and their families, the global assessment tool used by the Army to measure outcomes in the CSF2 program does not assess PTSD symptoms and so could not be used to determine any association between resilience training and prevention of PTSD, and no other evidence is available on its short-term or long-term effectiveness. The Army found in its own assessments of CSF2 that "there is currently no evidence that [the Penn Resilience Program] is effective among adults or in settings outside of schools" (Harms et al., 2013). Furthermore, CSF2 had no direct effect on the incidence of PTSD, depression, or anxiety. The Army noted that "resilience training will likely result in only a slight reduction in the odds of a soldier experiencing one of these negative outcomes [PTSD, depression, or anxiety] as a result of the training." Furthermore, in an internal non-peer-reviewed report of the effect of Master Resiliency Training on five mental health diagnoses (including PTSD), no differences were found in the rates of diagnoses of mental health, after controlling for deployment, between those who received Master Resilience Training and those who did not (Harms et al., 2013).

A recent IOM study of DoD programs to prevent mental health disorders was also critical of the CSF2 program. The study found that although some statistically significant improvement was seen in a few global assessment tool subscales that are part of CSF2, the effect sizes were very small, and there were no clinically meaningful differences between pretest and posttest scores (IOM, 2014). Moreover, the study concluded that the shortcomings in DoD's use of evidence-based practices for its prevention and resilience programs could have adverse effects on the mental health and well-being of service members and their families. It was recommended that DoD use only evidence-based programs and policies and eliminate

non-evidence-based programming. The committee believes that this recommendation could be expanded to include all PTSD screening, diagnosis, treatment, and rehabilitation programs in DoD.

The Navy, Marine Corps, and Air Force have also established service-specific stress control programs for all their members (see Chapter 3). But as with the Army CSF2 program, there is a lack of data with which to assess their effectiveness in fostering resilience and preventing mental health problems.

Delivery of Effective Care

DoD helps to ensure that its PTSD interventions are effective and safe by training providers in evidence-based psychotherapies (see Chapter 6). The Army recommends that its mental health providers use the VA/DoD clinical practice guideline and other evidence-based assessment tools (OTSG/MEDCOM Policy Memo 12-035, April 10, 2012). The Navy has begun to assess compliance with the guideline on a quarterly basis, but results are not available (U.S. Navy, 2013).

One study of the use of evidence-based psychotherapy for PTSD by trained DoD staff was identified. Borah et al. (2013) found that 25% of Air Force providers trained in PE or CPT had not seen a single PTSD patient since training; 80% of those who saw at least one PTSD patient had used CPT at least once, and 70% of those trained in PE had used it at least once. Barriers to applying the training included lack of time to deliver it as required and lack of posttraining supervision.

At site visits, the primary reason given for lack of treatment fidelity among DoD mental health care providers in outpatient clinics was staff shortages. Although DoD providers are able to schedule a service member for an initial consultation within the required number of days (Pritt, 2013), follow-up appointments might be available only every 4–6 weeks thereafter rather than the recommended 1–2 weeks. To reduce the scheduling delays, service members may be given an appointment with any provider who has an opening, rather than a preferred provider, potentially resulting in treatment continuity issues.

DoD intensive outpatient programs for PTSD deliver treatments in a variety of modalities and settings. For example, the Warrior Resilience Center at Fort Bliss, the Warrior Combat Stress Reset Program at Fort Hood, and the National Intrepid Center of Excellence at the Walter Reed National Military Medical Center differ in length, patient needs and characteristics, and use of adjunctive therapies. To make the PTSD intensive outpatient programs more consistent throughout the service branches and to encourage the use of standardized assessment tools and treatment outcome measures, TriOPS has formed a network of 21 specialized PTSD

programs (intensive outpatient, partial hospitalization or day treatment, and residential). TrIOPS intends to serve as a central source to facilitate communication, collaboration, process improvement, and dissemination of best practices, standards of care, and program effectiveness among DoD specialized PTSD programs (O'Toole, 2012). This effort to coordinate delivery of specialized PTSD programs is commendable, but there is no information on whether the TrIOPS effort has resulted in more consistent and effective care throughout these programs.

DEPARTMENT OF VETERANS AFFAIRS

This section examines VA's use of evidence-based and other interventions for PTSD and how the interventions are delivered to veterans. VA achievements and challenges in providing effective and safe interventions for the prevention and diagnosis of and treatment for PTSD in veterans of all eras are also considered. Effective care for veterans is discussed with a focus on evidence-based treatments and complementary and alternative therapies.

Determining Effective Care

VA seeks to provide all veterans who have mental health conditions access to effective, evidence-based practices as clinically appropriate, and to ensure the availability of sufficient staff to provide the treatments with fidelity to their manuals. Its guiding documents encourage the use of evidence-based care for PTSD: the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress* (VA/DoD, 2010), and Handbook 1160.05, *Local Implementation of Evidence-Based Psychotherapies for Mental and Behavioral Health Conditions*. Handbook 1160.05 governs VA mental health care and specifies the goals of and procedures for evidence-based psychotherapies (but not pharmacotherapy) at the local level (VA, 2012a). It covers access and capacity requirements, clinic and scheduling needs, treatment planning and clinical implementation, and training needs (OMHO, 2013b). VA Handbook 1160.01, *Uniform Mental Health Services in VA Medical Centers and Clinics*, requires that all PTSD specialty programs and services be able to meet the treatment needs of veterans who have co-occurring PTSD and substance use disorder (VA, 2008).

Evidence-Based Treatment

To address the challenges of delivering evidence-based psychotherapy, VA facilities are required to provide all veterans who have PTSD access to PE or CPT (VA, 2008). Individual VA medical centers and very large

community-based outpatient clinics (CBOCs)—those servicing more than 10,000 unique veterans each year—must provide adequate staff to deliver evidence-based psychotherapy when it is clinically indicated. Large and middle-size CBOCs may provide PE and CPT through telehealth when necessary (VA, 2008). Eftekhari et al. (2013) evaluated 1,931 veterans who had PTSD and were treated by 804 VA clinicians who had completed a 4-day experimental training workshop for PE. After PE treatment, the fraction of veterans who met the criteria for PTSD on the basis of PTSD Checklist (PCL) scores decreased from 87.6% to 46.2%.

The 39 specialized intensive PTSD programs (SIPPs) in the VA vary with regard to size, the population served, and program goals and methods. In 2012, an average of 45% of veterans admitted to the SIPPs received CPT (range, 15–76%), 8% received PE (range, 0–67%), 72% received another type of psychotherapy (range, 47–83%), and 72% received other unspecified therapies (range, 46–83%) (VA, 2012b). Veterans in the SIPPs do not have substantially improved outcomes on the basis of mean preadmission and 4-month follow-up scores on the Mississippi short form (38 vs 38.6), the Northeast Program Evaluation Center PTSD scale (17.1 vs 15.6), or the PCL (65.9 vs 60.2) (VA, 2012b). Why the programs had such poor outcomes is unknown; however, this lack of effectiveness for SIPPs is not new. Fontana and Rosenheck (1997) compared outcomes for long-stay SIPPs with short-stay specialized evaluation and brief treatment PTSD units and with nonspecialized general psychiatric units for 1 year after discharge. They found that veterans in all three programs showed improvement at the time of discharge, but these improvements disappeared over the follow-up period, especially among veterans who had participated in the long-stay programs. Long-stay programs cost \$18,000 more per patient per year but were no more effective than short-stay intensive PTSD programs. It is unclear why, after more than 15 years of poorly sustained outcomes and high costs, the VA has not used these findings on the SIPPs to improve care for veterans who are being treated for PTSD.

In 2012, VA also had 436 PTSD specialist sites in medical centers, CBOCs, and outpatient clinics and 127 specialized PTSD outpatient programs (SOPPs) around the country. In contrast with the SIPPs, VA collects PCL scores only at intake for veterans in the SOPPs; no after-treatment PCLs are collected (VA, 2012b). Lack of treatment outcome data (as discussed in Chapter 4) contributes to the committee's (and VA's) inability to assess the effectiveness of treatment that veterans receive in the SOPPs or from PTSD specialists.

Bernardy et al. (2012) found that 81–84% of all veterans who had a diagnosis of PTSD in VA in 1999–2009 received at least one psychotropic medication. In particular, the use of first-line SSRIs or SNRIs rose from 50% in 1999 to about 59% in 2009. The use of low-dose quetiapine and

nonbenzodiazepines increased by 9.7% and 9.1%, respectively, over the years, whereas use of tricyclic antidepressants (about 10%), nefazodone (about 11.7%), and benzodiazepines (about 6.7%) decreased. Moreover, the decline in benzodiazepine use was offset by increase in use (from 4% in 2007 to 13% in 2009) of closely related nonbenzodiazepine hypnotics, primarily the gamma-aminobutyric acid agonist drug zolpidem once it became a VA formulary-approved drug in 2008. In a 2012, 52% of veterans in SIPP received some form of pharmacotherapy (range, 21–76%) (VA, 2012b). Garfield et al. (2011) found that of VA patients who had comorbid depression and PTSD, 25% received no antidepressant pharmacotherapy, 25% received some pharmacotherapy, and 50% received adequate antidepressant treatment.

Vet Centers are not subject to the same care requirements as are VA medical centers or CBOCs. They do not have to make PE or CPT treatments available to all veterans who use their services, although many of them are able to do so (Fisher, 2014). In a survey of 27 Vet Centers, 21 provided one or more forms of evidence-based therapy (VA Office of Inspector General, 2011).

Complementary and Alternative Therapies

Similar to military personnel, many veterans use complementary and alternative treatments for PTSD. Cohen et al. (2013) surveyed 683 veterans about their use of different therapies for PTSD; of the 292 veterans who reported using any therapy for PTSD, 24% used a complementary or alternative modality—generally meditation, yoga, or acupuncture—and 61% used a complementary or alternative therapy in conjunction with conventional treatments, such as psychotherapy or pharmacotherapy. One study found that the use of complementary and alternative therapies among veterans is comparable to their use by the general public (Micek et al., 2007). Other surveys not specific to PTSD have found that nearly three-quarters of veterans who do not use complementary and alternative therapies would do so if they were offered at VA, and 40% of complementary and alternative medicine users would use additional ones if they were provided (Campbell et al., 2006; McEachrane-Gross et al., 2006).

Many VA specialized PTSD treatment programs incorporate such complementary and alternative therapies as guided imagery, progressive muscle relaxation, and stress management–relaxation therapy, but there is considerable variability in what is offered in any particular program. In a survey of 125 of the specialized programs (outpatient, residential, and inpatient), 120 of them reported offering at least one complementary or alternative therapy (Libby et al., 2012). An average of 75% of patients who were admitted to SIPP received an unspecified therapy that was not PE, CPT, another form

of psychotherapy, or pharmacology (VA, 2012b). Among the 166 SIPPs and SOPPs, 77 (46%) offered complementary and alternative treatments in the program, and some programs made referrals for these therapies to external providers (VA, 2012b). For example, at Roseburg Health Care System a recreational therapist coordinates many of the complementary and alternative therapies offered through the residential PTSD program, including origami, tai chi, and community outings. Other VA sites, such as the Palo Alto Health Care System have or partner with programs in which veterans who have PTSD train service dogs for other veterans.

Delivery of Effective PTSD Care

Delivery of effective interventions for PTSD requires that providers be able to schedule appointments for evidence-based treatments for the recommended length of time and frequency (for example, PE requires 90-minute sessions, preferably at least once a week for 8–15 weeks). The 2012 VA Office of Mental Health Operations (OMHO) survey of 140 medical facilities found that 31% of VA medical centers reported that they had difficulty in scheduling evidence-based psychotherapy with fidelity, and 40% of the facilities reported that they needed to improve access to evidence-based treatments and reduce excessive wait times for those treatments. The ability of CBOCs to provide evidence-based psychotherapy was noted specifically as needing improvement at 36% of the sites. Large patient caseloads contributed to scheduling problems, as did pressure to keep appointments to 30 minutes, which is not in compliance with recommended session length for PE and CPT (OMHO, 2013a). Using automated coding of provider notes, Shiner et al. (2013) found that evidence-based psychotherapies were used less often than reported by administrative coding (6.6 sessions vs 9.1 sessions, respectively, over 6 months), and that only 6.3% of the veterans in the sample of outpatient PTSD clinics received at least one session of PE or CPT. Among 20,284 veterans who had PTSD, VA administrative data showed that only 64% received either medication or counseling for PTSD, and only 33% of the total sample received “minimally adequate treatment,” defined as receiving at least four 30-day supplies of psychiatric or antidepressant medications or at least eight counseling visits (Spoon et al., 2010).

A 2012 evaluation of nearly 300 VA staff who had received CPT training found a statistically significant number of them agreed that adherence to the CPT protocol increased patient satisfaction with therapy, improved patient outcomes, was effective for most patients visiting outpatient PTSD clinics, and did not increase therapist burnout. The two most frequently reported reasons for not starting CPT with more patients were “having

no or little room in their schedule” and “workload is too heavy” (Chard et al., 2012).

It may be easier to provide evidence-based psychotherapy in residential settings because there is usually sufficient time to deliver them during the veterans’ stay. In 2012, the average length of stay in a SIPP was 46 days (range, 4–221 days) (VA, 2012b). However, it might not always be possible to continue weekly outpatient therapy sessions once patients leave the residential program. About 79% of veterans who leave a SIPP receive some form of aftercare or are referred to another treatment program (VA, 2012b). Such transitions from inpatient care to outpatient care were cited as concerns in the OMHO report. Only 24% of facilities met the performance measure for timely follow-up of patients after discharge from inpatient or residential programs. The most common reasons for the delays were lack of established policies to assist with the transition, difficulties in scheduling follow-up appointments, and locating appropriate follow-up services in other VA facilities or in the community (OMHO, 2013a).

VA is increasing its use of telehealth to improve delivery of evidence-based treatment to veterans who have PTSD and live in underserved areas. Some 30% of CBOCs reported having telehealth services for mental health available (OMHO, 2013a). Telehealth can help providers to deliver evidence-based psychotherapy and pharmacotherapy to veterans in facilities that lack appropriate staff or whose staff do not have enough time to deliver weekly psychotherapy sessions.

PATIENT SAFETY IN DOD AND VA

Patient safety is often neglected by health care practitioners and organizations. Although patient safety usually refers to the recognition and reporting of adverse effects that occur most commonly in connection with drug therapy and physically invasive procedures, they are also important in connection with other interventions, including psychotherapy. Harm can occur from prescribed pharmacotherapies and from the use of nonprescription products (dietary supplements, alcohol, and over-the-counter medications) and from exacerbation of existing symptoms during psychotherapy. The VA/DoD guideline for PTSD recommends that patients be assessed for safety, including assessment of the risk of harm to self and others (VA/DoD, 2010).

Patient Monitoring

Frequent and routine monitoring of patients for possible adverse effects of pharmacotherapy or psychotherapy is imperative to ensure safety. Mechanisms to monitor both patients and providers can be built into health care systems (IOM, 2000). Interdisciplinary team-based care and

cross-checks—such as checklists, chart reminders, and record reviews—can substantially enhance patient safety (IOM/NAE, 2013). Monitoring needs to occur at key stages of treatment—for example, at treatment initiation, shortly after initiation, periodically thereafter, and when treatments are changed—or when a patient is in crisis. Patients who are not monitored adequately may discontinue care and those that abruptly or prematurely cease the use of PTSD medications because of side effects or lack of response may have withdrawal symptoms or other complications that pose safety risks.

One safety issue that may be overlooked is the use of purchased care providers to treat service members or veterans who have PTSD. Because those providers do not have access to a service members' or veterans' electronic health records, they may not be aware of all medications (prescribed, over-the-counter, and supplements) that patients are taking. This lack of information increases the potential for drug interactions or adverse effects if additional medications are prescribed. Obtaining a complete treatment history, including the use of all interventions, whether evidence-based, over-the-counter, complementary and alternative, or psychoeducation, can improve patient safety.

Contraindicated Medications

Of particular concern for patients who have PTSD is the use of antipsychotics and benzodiazepines for its treatment as these medications can have serious adverse effects. The VA/DoD guideline advises against their use for PTSD because of a lack of efficacy data, and DoD and VA are working to decrease the prescribing of these medications for service members and veterans who have PTSD. In February 2012, DoD issued *Guidance for Providers Prescribing Atypical Antipsychotic Medication*, which cautions that these drugs are not approved as treatments for PTSD or sleep disturbances and recommends monitoring of and provider training in their use. In April 2012, the Army issued *Policy Guidance on the Assessment and Treatment of Post-Traumatic Stress Disorder* (U.S. Army, 2012b), which specifies that the use of benzodiazepines and atypical antipsychotics to treat for combat-related PTSD is contraindicated and strongly discourages their use. Data are not yet available to determine the effects of these guidance documents on the use of these medications in DoD.

A review of almost 357,000 veterans who had PTSD found that 25.6% of veterans were prescribed second-generation antipsychotics and 80.2% of those prescriptions were from mental health care providers, and 37.0% of the veterans were prescribed benzodiazepines and 68.8% of the prescriptions were from mental health care providers (Abrams et al., 2013). This study indicates that veterans who have PTSD are frequently prescribed medications that are not recommended by the VA/DoD guideline, and the

majority of these prescriptions come from mental health care providers who should be knowledgeable about the recommended medications for PTSD. VA has introduced a tracking system to monitor the use of benzodiazepines and antipsychotics in patients who have PTSD, as part of a system-wide effort to increase treatment safety. It is unclear what actions will result from this monitoring, but this is an important step in promoting a critical and careful approach to pharmacotherapy in veterans who have PTSD. A study of 32 VA medical centers found that the recommended metabolic monitoring of patients beginning antipsychotic use was inconsistent, depended somewhat on a patient's diagnosis, and was below national standards (Mittal et al., 2013). With use of antipsychotics to treat for resistant depression and anxiety, the detection and management of metabolic side effects remains important.

Polypharmacy

Polypharmacy (the use of multiple drugs for a health condition) and overmedication should not be confused in prescribing medications for service members and veterans who have PTSD. Prescribing multiple medications or polypharmacy in itself does not necessarily prompt a safety concern; instead it is the manner in which medications are prescribed (for example, one provider or multiple providers) and the level of oversight (such as regular follow-up appointments and appointments with the same provider) that need attention. Polypharmacy is a valid concern in that the risk of untoward effects is expected to increase with the number of concomitant drugs. The use of multiple drugs may be warranted and is more likely to be encountered in veterans than in the active-duty military population for a number of reasons, including a higher degree of chronicity and accumulation of comorbid disorders over a veteran's lifespan, and there are fewer restrictions on the types of medications that may be used with veterans than with active-duty service members.

DoD has recognized that the concomitant use of multiple medications can be a safety issue for service members who take multiple drugs for their PTSD and for any comorbidities, such as substance use disorder and chronic pain (Defense Health Board, 2011; U.S. Army, 2012a). DoD data show that from 2004 to 2013 there was a steady increase in the number of concurrent drugs prescribed to patients who had a primary diagnosis of PTSD, including the use of multiple psychotropic drugs (see Table 7-1). For active-duty service members, medications that impair alertness or reaction time may compromise fitness for duty.

VA data show that from 2008 to 2012 for newly diagnosed veterans who have PTSD, the use of multiple medications has decreased. The number of veterans who are receiving no medications has increased substantially

TABLE 7-1 Percentage of Service Members with a Primary Diagnosis of PTSD Receiving Psychotropic Medications

Year	1 Medication	3–4 Medications	5 or More Medications
2004	31%	30%	9%
2009	22%	36%	15%
2012	22%	37%	18%

SOURCE: Kennell and Associates, 2013.

TABLE 7-2 Percentage of Newly Diagnosed Veterans Receiving Medications for PTSD

Year	No Medication	1 Medication	3–4 Medications	5 or More Medications
2008	15%	20%	30%	9%
2012	22%	23%	25%	8%

SOURCE: NEPEC, 2013.

and the number receiving only one medication has increased slightly (see Table 7-2) (NEPEC, 2013).

SUMMARY

The *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress* reflects the evidence base (and safety concerns) for first-line psychotherapies and pharmacotherapies used to treat for PTSD—PE, CPT, EMDR, stress inoculation training, SSRIs, and SNRIs—and adherence to it can help ensure effective treatment of service members and veterans. The guideline also assesses other therapies with less robust evidence bases such as complementary and alternative therapies, couple therapy, and group versus individual therapies. Frequent and consistent monitoring of patients' PTSD symptoms, comorbidities, and outcomes is important to determining the effectiveness and safety of a treatment.

DoD attempts to ensure the delivery of effective care for PTSD by recommending that all mental health care providers use the VA/DoD guideline. Some evidence-based psychotherapies also have manuals that indicate the length and frequency of treatment sessions. Adherence to the guideline and treatment manuals by DoD providers is not tracked, but studies indicate that many service members do not receive adequate evidence-based treatment for their PTSD. The primary reason given for not adhering to the

PTSD guideline or treatment manuals is a lack of time to schedule appointments at the recommended frequency and duration. Complementary and alternative therapies are used as adjunct treatments for PTSD symptoms in some specialized PTSD programs and by individual service members. However, as with first-line treatments, the use of these therapies and their effectiveness are not tracked or evaluated. Each service branch has developed a resilience and combat and operational stress control program for preventing mental health problems in service members, but the effectiveness of these programs has not been determined.

VA strives to provide effective and safe care for PTSD through the use of the *Uniform Mental Health Services in VA Medical Centers and Clinics* handbook and the VA/DoD clinical practice guideline. As with DoD, VA does not track adherence to either the guideline or the handbook, and the psychotherapy a veteran receives is not recorded in the electronic health record; pharmacotherapy is captured in the record. Studies indicate that many veterans do not receive evidence-based treatments in the recommended manner. Long wait times for and between appointments can reduce the effectiveness of any of the treatments. More specialized treatment for PTSD is given in the VA SOPPs and SIPPs. Data from 2012 indicate that most veterans in SIPPs had little or no improvement in their PCL scores at 4 months after treatment, although the reasons for this lack of improvement are not known. Comparable outcome data are not available for other treatment settings such as SOPPs or general mental health clinics. Some Vet Centers offer evidence-based treatment for PTSD, but again, there is a lack of data on how many veterans receive such care and whether it is effective.

Most service members and veterans who have PTSD receive some form of pharmacotherapy, in some cases multiple prescriptions. As the number of patients receiving multiple medications continues to grow, so do safety concerns about drug interactions and the use of contraindicated medications. DoD does not have a system in place to monitor these safety issues, but VA has recently implemented a system to monitor the use of antipsychotics and benzodiazepines.

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8

Access to Care

Access to care is essential for any organization that hopes to provide successful prevention, screening, diagnosis, treatment, and rehabilitation for posttraumatic stress disorder (PTSD). Access has been defined as the timely use of health services to achieve the best possible health outcomes (IOM, 1993). In this chapter, three dimensions of access to PTSD care in Department of Defense (DoD) and Department of Veterans Affairs (VA) are considered—availability, accessibility, and acceptability.

- Availability measures the extent to which a health care system has the resources, such as personnel and technology, required to meet the needs of patients. To ensure availability of effective care, a PTSD management system ensures that care is equitable for users and potential users.
- Accessibility refers to activities to overcome such institutional hurdles as a poor referral process and such logistic problems as distance to treatment site and reaching those in underserved areas. It can also refer to accommodating patients' needs such as extended hours of operation, which may encourage them to seek and remain in treatment.
- Acceptability incorporates patient-centered care and takes a holistic view of the patient, integrating all health issues and social factors that may influence the patient's priorities and preferences for care, including such individual characteristics as age, sex, and ethnicity and culture of the patient and the provider (Delbanco, 1992; Gerteis et al., 1993; IOM, 2013; Laine and Davidoff, 1996;

Zatzick et al., 2001). Involving patients and their families in care decisions that address patient preferences and establish treatment goals (including the right to refuse or not seek care) can lead to increased patient engagement and better adherence to the plan of care (Batten et al., 2009; Khaylis et al., 2011; MacDermid Wadsworth et al., 2013), which can lead to better health outcomes and lower health care costs (Cosgrove et al., 2013).

A patient's beliefs about mental health (his or her own and that of others), including what can cause and who is at risk for mental health problems and the value of engaging professional help and expectations about treatment can all influence seeking care. Negative and erroneous assumptions about mental illness (that is, stigma¹) are widespread in both civilian and military society and can be held by people who have symptoms of a mental health disorder. Stigma can adversely affect access to, engagement in, and adherence to mental health care (Corrigan, 2004).

Executive Order 13625 (August 31, 2012), "Improving Access to Mental Health Services for Veterans, Service Members, and Military Families," requires DoD, VA, and other federal departments to take steps to meet current and future demands for mental health and substance use disorder treatment for service members, veterans, and their families. The following sections assess DoD and VA efforts to ensure the availability, accessibility, and acceptability of PTSD care for service members and veterans.

DEPARTMENT OF DEFENSE

There is considerable variability in service members' access to PTSD treatments in military treatment facilities (MTFs), in mental health clinics, and from TRICARE purchased care providers. Service members reported a number of difficulties in receiving care for their PTSD, such as long waits to see a preferred provider and a lack of confidence in a provider's capabilities. Access can depend on the acceptability of the care that is offered to a service member. Acceptability is influenced by a service member's preferences, characteristics, situation, and social supports. Barriers to accessing care and approaches to overcoming those barriers are discussed in this section.

¹ Stigma is often cited as a barrier to seeking mental health care. The committee uses this term to mean negative attitudes about mental health conditions at the societal, institutional, or individual level, including those of the person who has the condition (Burnam et al., 2008, in Tanielian and Jaycox, 2008).

Availability

Given the growing number of service members who have PTSD and are in need of mental health services, ensuring that they are treated promptly and consistently is a concern. The issue of service members' timely access to mental health care has been the subject of some scrutiny (IOM, 2013; Tanielian and Jaycox, 2008; VA Office of the Inspector General, 2012). DoD policy requires that mental health care providers in primary care complete an initial clinical consultation with a service member within 10 days of receiving a primary care referral (DoD, 2013a), but DoD does not track wait times and time between appointments (Wendy Funk, Kennell and Associates, Inc., personal communication, January 23, 2013).

There has been a substantial increase in the number of DoD health care beneficiaries, including active-duty service members, who are referred to TRICARE contractors for PTSD care. The Government Accountability Office (GAO) recently reported on a congressionally mandated, 4-year access-to-care survey of DoD health care beneficiaries, including reservists (GAO, 2013). The survey showed that only 39% of civilian mental health care providers were willing to accept new TRICARE patients compared with 67% of primary care and 77% of specialty care providers. About 28% of the 24,000 TRICARE beneficiaries in the survey reported problems in accessing mental health care: 45% of the respondents reported that mental health care providers would not take TRICARE payments, 25% reported that providers would not take new TRICARE patients, 24% reported that travel distances to providers willing to see them were too great, and 24% reported that the wait for appointments was too long. The most common reason that providers cited for not accepting new TRICARE patients was a lack of awareness or knowledge about the TRICARE program (GAO, 2013).

Although all the military installations have mental health clinics that can treat for PTSD, few installations have specialized outpatient or residential programs for PTSD. There are only 21 specialized PTSD outpatient programs throughout the service branches (O'Toole, 2012), and no data were available on access to these programs, the number of patients that they serve, or how service members are prioritized for admission.

Accessibility

Accessibility to PTSD care in DoD varies according to location and setting, particularly whether in theater or in garrison. Repeated surveys of service members deployed to Afghanistan and Iraq, such as those conducted by mental health advisory teams (MHATs), indicate that accessing mental health care during deployment to a war zone can be difficult. Enlisted

soldiers who screened positive for any mental health problem were more than twice as likely as those who did not screen positive to perceive that mental health services were not available (27.0% vs 11.2%), that it was difficult to get an appointment (29.4% vs 12.2%), that it was difficult to get time off work to go for treatment (47.8% vs 18.5%), and that it was too difficult to get to a location where mental health services were available (31.7% vs 15.5%) (MHAT-7, 2011). When the same questions were asked of marines in theater, similar differences were reported between those who screened positive for any mental health problem and those who did not. For example, 7.9% versus 7.0%, respectively, reported that mental health services were not available, 11.9% versus 6.6% that it was difficult to get an appointment, 24.5% versus 18.3% that it would be difficult to get time off work to go for treatment, and 14.2% versus 12.5% that it was too difficult to get to a location where mental health services were available (MHAT-7, 2011).

A survey of 1,659 Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) service members found that 17% of respondents reported receiving mental health care in the past year, either from a specialty mental health or primary care provider. Of those seen by a specialty mental health provider, 79% found that treatment helped “a lot or some” and none thought it was not at all helpful, whereas for those who saw a primary care provider, 51% though treatment had helped “a lot or some” but 15% reported that treatment was not at all helpful (Wong et al., 2013). The authors note that previously deployed active-duty personnel were much more likely to seek care from specialty mental health care providers, where they received more numerous, intensive, and longer treatment sessions than from primary care providers.

Specialized intensive PTSD care, particularly for residential or dual diagnosis care (usually substance use disorders), is not always available in an installation or in local communities, and a service member and family may need to travel a considerable distance from a base to access such care. This in effect precludes their families from participating in their treatment. Some installations do have programs to treat PTSD and comorbidities concurrently, such as the Overcoming Adversity and Stress Injury Support program and the PTSD and traumatic brain injury clinic at Fort Campbell, but they may not be near a service member’s duty station and they often have long wait lists.

The phase 1 report addressed barriers to accessing mental health services and recommended that DoD explore telehealth approaches. One such approach that is being pilot-tested is having mental health care providers conduct psychotherapy and pharmacotherapy sessions via videoconferencing with a provider in an MTF or large clinic and a service member in a remote clinic. This telehealth approach may result in fewer missed ap-

pointments and more effective use of a clinician's time if the patient has a shorter travel distance and is more likely to keep regular appointments. Telehealth services are located at three medical centers—Walter Reed National Military Medical Center, Maryland; Warrior Resiliency Program, Texas; and Tripler Army Medical Center, Hawaii—and include access for deployed service members (DoD, 2013b). DoD has also established online and telephone resources for mental health issues for service members and their families; for example, Military OneSource is available online and by telephone 24 hours a day, 7 days a week.

Vet Centers have extended services to all military personnel who are or have been on active duty in OEF and OIF, not only those who served in combat. No data are available on the number of active-duty service members who are using Vet Centers, but almost a half-million OEF and OIF veterans had contact with a Vet Center as of 2010 (Fisher, 2014). Although most Vet Centers operate during normal business hours, they may also offer extended hours (evenings and weekends) for counseling on request.

Acceptability

Acceptability of care depends on a service member's needs and preferences. This section focuses on factors that influence service members' interest in treating their PTSD, including stigma; how patient characteristics effect treatment; and the role of social support. All those factors are part of a patient-centered approach to PTSD care.

Some service members dislike using evidence-based medications for PTSD because of adverse effects. Diagnosis of and medications used to treat for PTSD can, in some situations, automatically result in a service member's being non-deployable, relieved of duty or command, or being unable to carry weapons. Such restrictions on duties may make service members reluctant to seek treatment or use medications for PTSD. Having an array of treatment options can help engage patients in care.

Perceptions of Mental Health Care

Personal beliefs may hinder service members from seeking care for their PTSD. Hoge et al. (2004) found that many soldiers and marines have beliefs that can interfere with accessing care, including the belief that getting mental health care would cause them to be seen as weak (65%), to be treated differently by unit leaders (63%), to lose the confidence of their peers (59%), or to be blamed for their problems (50%). A recent survey of marines found that the most common factors that affected decisions to seek mental health care were a desire to solve their own problems (65%), fear of their commanders losing trust in them (50%), being treated differently

(45%), lack of confidentiality (37%), and adverse effects on their career (37%) (Momen et al., 2012). Some surveys have found that beliefs about stigma are strongest among those who screen positive for mental health problems (Hoge et al., 2006; MHAT-7, 2011). The MHAT-7 and MHAT-9 reports concluded that, on the basis of surveys of soldiers and marines deployed to Afghanistan in 2006, 2007, 2010, and 2013, stigma as a barrier to care has declined among marines who are experiencing psychological symptoms but has been unchanged among soldiers. The perception of barriers to care had also decreased in both groups (MHAT-7, 2011; MHAT-9, 2013).

The DoD TRICARE Management Activity found that of 80,000 service members returning from OEF and OIF who used military health services, 20% had received mental health counseling for personal or family problems and of those 87% found the counseling helpful. About 4% of those who did not receive counseling indicated that it was because of such barriers as an inability to get an appointment and concerns about effects on one's career (TRICARE Management Activity, 2013). Among 577 OIF combat veterans who screened positive for PTSD, depression, or general anxiety disorder, three-quarters recognized they had a problem, but only 40% were interested in receiving help. Negative attitudes about mental health care were associated with lower interest in receiving it (Brown et al., 2011).

DoD has undertaken a number of efforts to address these negative attitudes about mental health care. DoD Instruction 6490.08 (DoD, 2011) states that health care providers do not need to notify a service member's commander if he or she self-refers or has a medical referral for mental health services, but the impact of this instruction on reducing stigma is unknown. Embedding mental health care providers in units to give service members and mental health staff the opportunity to get to know each other outside the clinic may also reduce stigma. Embedded mental health staff work closely with and can educate unit commanders on the benefits of mental health care for their unit members and are able to provide ad hoc advice and referrals. Integrating mental health care into primary care clinics is yet another effort to decrease stigma by reducing the negative perception of visiting a separate mental health clinic. Public-service announcements and websites, such as After Deployment (<http://www.afterdeployment.org>), are also being used to reduce negative views of mental health care among service members and the general public.

Service Member Characteristics

The Interagency Task Force on Military and Veterans Mental Health—a collaboration between DoD, VA, and the Department of Health and

Human Services—stated that mental health strategies need to respond to the diversity of veterans, service members, and their families, including diversity in sex, race, ethnicity, sexual orientation, and age, and that mental health educational and outreach efforts be tailored to those factors (DoD et al., 2013).

Most DoD efforts to accommodate minority groups have focused on military women, who make up about 14% of active-duty personnel. Although women have historically been excluded from direct combat roles, they have been exposed to combat and other violence in Afghanistan and Iraq. Sexual assault is the primary causal factor of PTSD in military women, whereas combat experience is the strongest predictor of PTSD in men (Kang et al., 2005; Street et al., 2008). Women and men who have experienced a prior assault (including sexual or violent physical assault) are more likely to develop postdeployment PTSD symptoms after combat exposure than are women and men who had no prior assault (22% vs 10% in women and 12% vs 6% in men) (Smith et al., 2008).

Each service branch has established its own sexual assault prevention and response program and guidance (NAVADMIN 181/13, Marine Corps Order 1752.5A, Army MEDCOM Regulation 40-36, and Air Force Policy Directive 36-60) in compliance with DoD Directive 6495 (April 30, 2013), but these documents do not specify any protocols for treating service members who have sexual-assault-related PTSD. These programs are required to provide care that is gender responsive, culturally competent, and recovery oriented.

Data on PTSD in racial minorities underscore the importance of considering race and ethnicity in patient-centered care in DoD. The prevalence of PTSD in 2012 in white beneficiaries was 8.5% compared with 11.0% in nonwhites (see Table 2-3). No information was found in the published literature or DoD reports on the need for and availability of racial and ethnic-group-specific mental health treatment services in the military. Other than separate therapy groups for men and women who have experienced sexual trauma (but not combat-related PTSD), no programs tailored to specific sexes, races, or cultures were identified. At site visits, most of the mental health providers indicated that there was little or no need for such programs.

Social Support

Many service members seek treatment for their PTSD only when family members insist that they do so. Many service members and providers reported that they would like to have more family involvement in service members' PTSD treatment, including PTSD education programs, support groups for families, and couple and family therapy. Some specialized PTSD

treatment programs—such as the Warrior Resilience Center at Fort Bliss, Texas—do offer support groups for partners of service members who are in the program, and they are well received. In particular, the National Intrepid Center of Excellence (NICoE) encourages family members to participate in the service member's treatment plan through its family services program. However, there are barriers to a family's participation in the service member's care. One is that many DoD mental health clinics and providers are at capacity for treating service members who have PTSD, and they do not have additional resources to offer education or other support programs to family members or to involve families more closely in service members' treatment.

Higher levels of posttraumatic stress symptoms have been associated with lower couple functioning in Army couples (Melvin et al. 2012). Khaylis et al. (2011) found a strong positive association between PTSD symptoms and degree of relationship distress. They also reported that service members who had symptoms of PTSD had a distinct preference for family-based interventions over individual treatment. NICoE offers short-term solution-focused therapy sessions for spouses and family members in individual, marital, and group sessions after care hours if appropriate.

Many support services are available to service members and their family members in military installations, such as Military and Family Life Counselors, Family Advocacy Programs, Marine Corps Community Services, and Families OverComing Under Stress. Other support services for service members and their families include installation chaplains, numerous community groups (such as the Yellow Ribbon Program), and peer-support groups. NICoE has informal support groups for spouses through its family services. Many family counseling services are housed in buildings that are often at a distance from the mental health or primary care clinics and do not interact with them regularly. Chaplains may be a service member's (or veteran's) first contact regarding a mental health problem because they are associated with reduced stigma, greater confidentiality, and more flexible availability (Besterman-Dahan et al., 2012; Nieuwsma et al., 2013).

TRANSITIONING FROM DOD TO VA

DoD and VA have jointly developed the Integrated Disability Evaluation System (IDES) to shorten the time required for a service member who is being medically separated to receive a disability rating from both departments (see the phase 1 report for more information on IDES). GAO (2012) found that average IDES case-processing times for active-duty personnel and reservists were 394 and 420 days, respectively, far exceeding the stated goals of 295 and 305 days but less than the 540 days typically required for the previous evaluation process. Only 19% of active-duty and 18% of

National Guard or reserve component members completed the process and received benefits within the time goals. The number of IDES cases who have PTSD has not been reported. Shortening the disability process expedites the transition of a service member to veteran status and eligibility for VA care.

There are challenges for service members who have PTSD as they transition between the DoD and the VA health care systems. Transitioning between systems may affect access and quality of care, for example, because of treatment interruption, the need to form new relationships with providers who are not familiar with one's history or progress, and handoff errors (IOM, 2013). VA established the Office of Seamless Transition to ensure that OEF and OIF veterans have access to any needed services in VA. The responsibilities of that office have moved to the Office of Care Management and Social Work Services and the Office of Interagency Health Affairs. VA liaisons are available to facilitate the transition for ill, wounded, and injured service members (for example, those in Wounded Warrior battalions or being medically separated from the military) as they move from DoD to VA. Such assistance consists of setting up all necessary medical appointments in VA before a service member leaves active duty. If the service member already has a diagnosis of PTSD, the VA liaison helps to coordinate continued PTSD care in VA. However, not all installations have VA liaisons. Military liaisons (service branch representatives stationed in VA medical centers), VA health care liaisons, and VA social workers and nurses who are responsible for patient issues are all coordinated by the Office of Care Management and Social Work Services. DoD and VA staff facilitate continuity of care and services in the VA medical facility closest to a veteran's residence after his or her military discharge (Office of Interagency Health Affairs, 2013). No information is available on whether this approach to transitioning care from DoD to VA is increasing access to care.

OEF/OIF/OND (Operation New Dawn) care management teams are in every VA facility to assist these veterans in accessing and coordinating care. The teams have lists of service members who are separating from the military in their catchment areas and can actively reach out to them. Case managers in each VA medical center and benefits office coordinate with DoD discharge staff and serve as the VA points of contact for reservists (Office of Interagency Health Affairs, 2013). These case management teams manage more than 50,000 OEF and OIF veterans (VA, 2012b).

The joint DoD and VA inTransition program is specific to service members who are receiving mental health care and who are transitioning within or across the military, from deployment to redeployment, from the military to veteran status, or, for National Guard and reservists, from civilian status to activated status (www.health.mil/inTransition). DoD Health Affairs Policy 10-001 (DoD Office of the Assistant Secretary of Defense, 2010) calls for transition support coaches to work with these service members to

provide patient education, answer technical mental health questions, and connect service members with appropriate providers. There are no published data on the effectiveness of this program or on how many service members have used it.

DEPARTMENT OF VETERANS AFFAIRS

VA serves a highly diverse, although still largely male, population, many of whom receive care from VA for their entire lives after leaving military service. OEF and OIF veterans who have PTSD are accessing mental health care in VA in greater numbers than veterans of previous eras (Elbogen et al., 2013; Shiner et al., 2012). OEF and OIF veterans had significantly more PTSD treatment visits than Vietnam veterans, but Vietnam veterans have more overall medical visits as a result of age-related and comorbid conditions (Harpaz-Rotem and Rosenheck, 2011).

Not all veterans are eligible for care in the VA health care system. VA has established eight priority groups; veterans in priority group 1 are those who have VA-rated service-connected disabilities that are 50% or more disabling and those determined by VA to be unemployable because of service-connected conditions.² Veterans who served in a theater of combat after November 11, 1998, and who were discharged from active duty on or after January 28, 2003, are eligible for comprehensive VA health benefits for 5 years following their discharge. At the end of the 5 years, those veterans are assigned to the highest priority group for which they qualify at that time. Some veterans who have PTSD may receive care from non-VA providers such as a community clinic or a private provider, and other veterans may have symptoms of PTSD but not seek care from any source (see Figure 3-4). This section examines the availability, accessibility, and acceptability of care for PTSD in VA and efforts to increase access to it, as well as the challenges VA faces in doing so.

Availability

VA provides an array of PTSD interventions, including specialized treatment, in its medical centers, community-based outpatient clinics (CBOCs), and Vet Centers, but not all levels of care or types of care are available in all VA medical facilities. For example, in the specialized intensive PTSD programs (SIPPs), pharmacotherapy and a variety of psychotherapies are offered. Some psychotherapies are available specifically for veterans who have PTSD and substance use disorders. VA is also integrating mental health

² The VA priority groups are described at http://www.va.gov/healthbenefits/resources/priority_groups.asp (accessed April 2, 2014).

care providers into primary care clinics for veterans who need less intensive PTSD treatment. As of 2013, mental health care providers were in 89% of the 349 VA primary care clinics in medical centers and large CBOCs (Davison, 2013). CBOCs that have more than 1,500 unique veteran visits per year are required to provide mental health services; smaller CBOCs can refer veterans to contract care providers in the community (VA, 2008). The VA 2012 report of the Office of Mental Health Operations (OMHO) found that 105 (75%) of 140 health care facilities surveyed were providing evidence-based psychotherapies for PTSD (OMHO, 2013a), although it is unclear where the care was offered (for example, in medical centers or CBOCs) or whether there was adequate capacity to provide services for all those who require it.

Timeliness of appointments has been an issue for veterans treated at VA. Wait times for admission to a specialized PTSD outpatient program (SOPP) was highly variable by veterans integrated service networks (VISNs) and medical facility, averaging 47.2 days (range, 7–163 days) (VA, 2012a). The Veterans Health Administration *Uniform Mental Health Services in VA Medical Centers and Clinics* handbook requires that all VISNs provide timely access to residential services for PTSD (VA, 2008), but wait times for admission to a SIPP averaged 68 days (range, 22–117 days) (VA, 2012a).

The VA handbook also requires that all first-time patients referred to or requesting mental health services receive an initial evaluation within 24 hours and a more comprehensive diagnostic and treatment-planning evaluation within 14 days of the desired date of care (VA, 2008). VA reported a 95% success rate for meeting that 14-day goal; however, the VA inspector general found that the measure that VA was using to track those times was flawed. For example, VA reported how long it took to conduct an evaluation, not how long a veteran waited to receive an evaluation. Better estimation methods indicated that only about 49% of appointments met this 14-day goal (VA Office of Inspector General, 2012).

The VA handbook further requires that PTSD treatment be initiated within 14 days of the time when a provider and a patient wish to begin. VA again reported success rates of 95% for new patients and 98% for established patients receiving treatment within that period, but the inspector general stated that more accurate estimates were 64% and 88%, respectively (VA Office of Inspector General, 2012). As the inspector general noted, “for established patients, medical providers told us they frequently scheduled the return to clinic appointments based on their known availability rather than the patient’s clinical need. For example, providers may not have availability for 2–3 months, so they specify that as the return to clinic time frame.”

In a 2009 survey of 6,190 veterans who had PTSD or one of four other mental health diagnoses, 40–50% they were usually or always able

to receive an appointment for counseling or treatment “right away” or as soon as they wanted it; 15% or less reported never being able to do so (Watkins et al., 2011). A retrospective analysis by Maguen et al. (2012) found that among OEF and OIF veterans the median time from the end of last deployment until initiation of care was about 1.5 years for primary care, about 2 years for mental health outpatient care, and about 4 years for minimally adequate mental health care (defined as eight or more outpatient visits within a 12-month period). About 30% of veterans attending mental health outpatient care at least once received minimally adequate care within 1 year of their first visit. Moreover, the authors found that there was a median lag time of 7.5 years between an initial mental health treatment session and initiation of minimally adequate care.

The OMHO report (2013a) cited the following areas for improvement in the 140 medical facilities: making mental health services available in a timely manner, scheduling of mental health services, and providing required mental health services at CBOCs to ensure services in rural locations. Specifically, OMHO found that 45% of the facilities reported wait times of weeks or months for veterans seeking PTSD care; 22% stated that evidence-based treatments were offered for PTSD but that access to them was limited for a variety of reasons (unspecified); 30% noted that evidence-based treatments could not be offered at the frequency required; 40% noted long wait times for evidence-based treatments; 40% reported inadequate after hours and weekend appointments; and 35% noted gaps in telehealth capacity, primarily lack of staff.

Accessibility

Some VA facilities do not have specialized intensive PTSD services, and patients who require these services must be referred to other VA facilities. That can result in long travel distances, even across the country, and result in separation from family and other social support. VA has found that veterans in the SOPPs travel an average of 30 miles (range of averages among VISNs, 16–54 miles) between their homes and the SOPPs (VA, 2012a). VA has 70 mobile Vet Centers to expand access to counseling for veterans, service members, National Guard members, and reservists in rural areas (Fisher, 2014); they are important because Vet Center use by veterans in rural areas is lower than it is in urban areas (Brooks et al., 2012).

The national VA no-show rate for mental health appointments is 18% (Mike Davies, Executive Director Access and Clinic Administration Program, VA, personal communication, November 23, 2013), although those specifically for PTSD may differ. No-shows can indirectly reduce accessibility of care because when appointments go unfilled, providers or adminis-

trative staff may spend clinical time trying to contact no-shows to ensure their safety.

VA is exploring options to increase accessibility and reduce barriers to PTSD care via new technologies such as telehealth and mobile telephone applications. The VA National Telemental Health Center is promoting the delivery of prolonged exposure (PE) therapy and cognitive processing therapy (CPT) and has hired or reassigned more than 100 staff to focus on the telehealth delivery of these therapies. VA is also piloting three CPT and PE telehealth clinics to augment the local delivery of these therapies and expand their reach to more rural areas (OMHO, 2013b), but results as to its ease of use and effectiveness are not yet available. One study of 85 American Indian veterans who had PTSD and received services through rural telehealth clinics found that their use of general medical and mental health services, and use of psychotropic medications, was increased after receiving telehealth (Shore et al., 2012). A meta-analysis of 13 studies of telehealth treatments found they were associated with significant reductions of PTSD symptoms and resulted in better treatment effects compared with wait lists; however, this analysis also found telehealth outcomes were inferior compared with face-to-face interventions; the studies were not specific to veterans (Sloan et al., 2011). Although telehealth for PTSD may improve some veterans' access to evidence-based therapies, it may not necessarily alleviate staff shortages, even if in some situations (for example, a veteran in a CBOC and a provider in a VA medical center) it cuts providers' or veterans' travel time to appointments. Some facilities appear to be successfully providing telehealth (both psychotherapy and pharmacotherapy) to veterans in CBOCs and have dedicated telehealth clinicians. With this technology, veterans who otherwise might not have access to a mental health care provider in their closest facility can schedule regular, weekly appointments with medical center providers.

In spite of VA's increased use of technology to improve access to PTSD services, there continue to be institutional barriers (such as Internet restrictions, lack of computer literacy, and lack of dedicated and secure equipment) to its use. For example, requirements of the Health Insurance Portability and Accountability Act restrict technological options for mental health care providers to e-mail their patients or provide appointment reminders via text message without a secure platform (45 C.F.R. Parts 160, 162, and 164). There are also privacy and cybersecurity issues related to the use of telehealth, such as the requirement that veterans who would like to have telehealth psychotherapy in their own homes use computer equipment provided by VA.

Mobile telephone applications (apps) and mental health resource websites can keep veterans engaged in care between appointments and provide educational materials to them and their families. For example, the jointly

developed VA and DoD PTSD Coach app can be downloaded by anyone. It provides general information about PTSD, allows users to track and manage their PTSD symptoms, and links them with support resources (VA, 2013). The Make the Connection website (<http://maketheconnection.net>) has a variety of tools and information to connect veterans with appropriate services and professionals. The website contains a resource locator, including PTSD programs; screening tools, such as the PTSD Checklist; and general information on PTSD. The National Center for PTSD website contains extensive information for veterans, families, providers, and the general public on PTSD diagnosis, treatment, and research. See Chapter 9 for more information on technological innovations for PTSD management.

Acceptability

As with service members, such societal and personal factors as veterans' attitudes and beliefs about mental health, sex, and ethnicity influence their use of PTSD care. In a recent survey of 143 OEF and OIF veterans who screened positive for PTSD but did not seek treatment, Stecker et al. (2013) found that the four factors most closely associated with decisions not to seek treatment were concerns about treatment itself, such as not wanting medications (40%); lack of emotional readiness for treatment (35%); stigma (16%); and logistical issues, such as lack of time (8%).

A survey of 6,190 veterans with PTSD or one of four other mental health disorders that assessed patient-centeredness and reasons for seeking care from the VA found 42% of them rated their VA mental health care as "the best counseling or treatment possible," and 74% reported being helped "a lot" or "somewhat" by the treatment that they received in the past 12 months. Only one-third, however, reported that their symptoms had improved with the counseling or treatment (Watkins et al., 2011).

The VA handbook *Uniform Mental Health Services in VA Medical Centers and Clinics* and the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress* both call for veterans and their providers to collaborate on decisions about particular treatments for a veteran's mental health conditions (VA, 2008; VA/DoD, 2010). For veterans to make such informed treatment decisions, they need to be educated about what treatment options are available and the risks, benefits, and possible outcomes associated with each option, including no treatment. The VA/DoD clinical practice guideline states that "providers should explain to all patients with PTSD the range of available and effective therapeutic options for PTSD" (VA/DoD, 2010). Psychoeducation that explains the development and symptoms of PTSD and introduces treatment concepts and options can help to engage patients in evidence-based interventions (Chen et al., 2013). Some VA sites have a formal patient education process. For example, the

Edward J. Hines VA Medical Center uses CORE, a two-session education program for all veterans who express an interest in receiving evidence-based treatment for PTSD. The first session provides an overview of what PTSD is and the many possible symptoms, and the second session is a description of treatment options and how they work. Some VA medical centers provide psychoeducational groups for couples, which introduce veterans and chosen family members to basic information about PTSD, co-occurring conditions, and the potential impact of PTSD on a veteran's family. Patient testimonials can also encourage other patients to seek PTSD treatment (Pruitt et al., 2012).

Veteran Characteristics

VA serves a diverse population of veterans—including veterans of all ages, eras, ethnic groups, and race—and a growing number of women. Care should be individualized on the basis of such factors as a veteran's background, symptom presentation, characteristics, preferences, living situation, sex, race, socioeconomic status, employment status, legal status, and goals of treatment. In a study of veterans who had PTSD, sex and era of service influenced the veterans' goals of treatment—veterans from OEF and OIF reported anger and hypervigilance symptoms and nightmares less often than veterans who served in other conflicts. Female veterans were more likely to want help with coping and functioning, self-concept, and sexual trauma, whereas male veterans wanted help with anger and sleep (Rosen et al., 2013).

Treatment plans for PTSD need to factor in treatment for comorbidities as well. For example, a small study of 35 veterans who had both PTSD and substance use disorder found that nearly two-thirds of them preferred to integrate their PTSD and substance use disorder treatments, as opposed to receiving treatment for each condition sequentially; however, only eight veterans reported receiving integrated treatment (Back et al., 2014). Many veterans who have PTSD may also be experiencing psychosocial problems—such as homelessness, unemployment, divorce, or be in an abusive relationship—all of which may influence their interest in seeking treatment and their treatment preferences.

Sex-Specific Care for PTSD

All VA facilities are required to accommodate and support women and men with safety, privacy, dignity, and respect, and all inpatient and residential-care facilities must provide separate and secured sleeping accommodations for women (VA, 2008). Women who have PTSD have been found to have higher rates of VA health service use, including hospitalizations, than

men who have PTSD (Maguen et al., 2012). Goldzweig et al. (2006) found that although predictors for PTSD were similar in male and female veterans (for example, combat and sexual trauma), women experienced higher rates of mental health disorders and medical comorbidities. In a review, Bean-Mayberry et al. (2011) found that OEF and OIF female veterans had higher rates of positive screens for PTSD symptoms than recently deployed men and were disproportionately affected by the symptoms.

VA reports that it is increasing the treatment capabilities in all VA medical centers and clinics to serve its growing population of female veterans better (see Chapter 3). Every VA medical center has a Women Veterans Program Manager who serves as an advocate and coordinator for women veterans to assist them in obtaining needed services. The 2008–2009 VA Survey of Women Veterans Health Programs found that 34% of the 195 reporting VA health care facilities had designated women’s mental health providers in general outpatient mental health clinics and 48% had group therapy for women in these clinics; 24% of women’s primary care clinics provided mental health services (Oishi et al., 2011).

In 2012, 11% of patients in SOPPs were women; 18 of the 127 SOPPs treated no women (7 of these sites treated fewer than 10 men), and fewer than 5% of patients in 26 SOPPs were women. The three women’s stress disorder treatment teams (WSDTTs), a type of SOPP, are located in Dallas, Texas; Loma Linda, California; and Albuquerque, New Mexico. These three SOPPs admitted a total 112 women in 2012—70 in the Dallas program, 5 in Loma Linda, and 37 in Albuquerque (VA, 2012a).

The VA handbook requires that residential rehabilitation and treatment programs, one form of SIPP, be provided to female veterans at a level equivalent to that for male veterans. In 2012, 11 of 40 SIPP treated no women; in the ones that did treat women, the percentage of female patients varied from 1% to 24%, and most treated 10% or fewer female patients. In three VISNs, the intensive programs treated no women at all, and in another nine VISNs, the intensive programs treated 5% or fewer women (VA, 2012a). There are two small residential SIPP—women’s trauma recovery programs (WTRPs)—located in Batavia, New York (6 beds), and Palo Alto, California (10 beds), that in 2012 treated a total of 73 women. This unexplained variation in the number of women treated in the SOPPs and SIPP is of concern, but possible reasons for it include a lack of outreach to women and program exclusion criteria.

VA estimates that about one-fifth of female veterans enrolled in VA screen positively for military sexual trauma (MST). One survey of 166 female veterans discharged from VA inpatient or residential programs for MST found that 96% of them had received a diagnosis of PTSD and nearly all of them had more than one mental health disorder, particularly depression and substance use disorder (VA Office of Inspector General, 2012).

MST services are available in all VA medical centers for both women and men (OMHO, 2013b), and the use of MST services by both female and male veterans is increasing (McCutcheon, 2013). For example, the Bay Pines Health Care System has a Center for Sexual Trauma Services that treats only women and has a residential program, but this program is not identified as a WTRP or WSDTT (VA Office of Inspector General, 2012).

Each VA medical center has a dedicated MST coordinator and is “strongly encouraged” to give veterans who are being treated for MST the option of being assigned a same-sex mental health care provider or an opposite-sex provider if the trauma involved a same-sex perpetrator (VA, 2008). The OMHO site visit report found that 31% of sites specifically mentioned problems in providing adequate staffing for MST, 26% noted the inappropriate use of MST staff, and 31% of sites reported that CBOCs had difficulty in providing MST services because of staffing shortages (OMHO, 2013a).

Racial, Cultural, or Ethnic Group-Specific Care for PTSD

The availability of culturally tailored treatments may enhance engagement by members of racial and ethnic minority groups (Carter et al., 2012; Manson, 1996), but empirical evidence on their reach and effectiveness is lacking (Pole et al., 2009). There is a dearth of literature on approaches for matching patients who have PTSD to specific treatments and what, if any, patient characteristics might improve treatment acceptability and response. Tailoring treatment is important in VA because the population of veterans who receive mental health care from VA is diverse; about 23% of veterans who received PTSD care in SOPPs are black, 10% are Hispanic, and 15% identify themselves as of another nonwhite race or ethnicity (VA, 2012a).

VA acknowledges the importance of integrating racial, cultural, or ethnic group-specific needs of individual veterans into the clinical context by, for example, developing specific programming for American Indian veterans to address both the high proportion of rural residence of this group, which limits their potential access to mental health services, and their high rates of military service (OMHO, 2013b). Clinicians also need to be sensitive to the beliefs and cultural traditions of a veteran’s tribe, and how these may affect treatment, such as including a shaman, using sweat lodges, or using other traditional medicines (OMHO, 2013b). Cultural sensitivity of providers is an important aspect of treatment of any veteran. VA’s National Center for PTSD has developed educational videos (for example, related to PTSD cross-cultural considerations, black veterans, Hispanic veterans, and Asian-Pacific Islander veterans) on the cultural issues of racial and ethnic groups. They are available for both VA and non-VA audiences (OMHO, 2013b).

VA has also tailored programs to address veterans who served in different eras as they may have different treatment needs. For example, Chard et al. (2010) found that Vietnam veterans who had chronic PTSD did not respond as well to CPT as did OEF and OIF veterans. For OEF and OIF veterans, special programs include Serving Returning Veterans—Mental Health teams. The teams collaborate with the postdeployment integrated-care initiative teams, which are in primary care clinics throughout the VA system, to offer rapid, comprehensive assessment of and treatment for mental health, medical, and psychosocial needs of combat veterans. Regularly scheduled calls between the two teams provide opportunities for sharing information on effective practices for treating the OEF and OIF population.

Social Support

Social support can help veterans who have PTSD engage in care. Support systems can include family, friends, colleagues, and others who are interested in the health and well-being of a veteran. Some veterans face substantial challenges, such as unemployment, homelessness, and loss of social contacts, and need wraparound support services.

VA offers a number of social support and rehabilitation programs and services to meet those needs, including the Housing and Urban Development–Veterans Affairs Supportive Housing program, and Compensated Work Therapy, a vocational rehabilitation program. These programs work in collaboration with mental health care providers to ensure that veterans’ medical and social support needs are met. A small randomized controlled trial of veterans who had PTSD and received either individual placement and supported employment or vocational rehabilitation treatment found that individual placement and support with competitive employment was more effective than vocational rehabilitation only (76% vs 28%) in helping veterans obtain and maintain employment (Davis et al., 2012).

The family is a potential source of support for a veteran who has PTSD, although PTSD itself also can be the source of distress and disturbance for family members. Thus, support of the family provides a mechanism for preserving and enhancing long-term social support of a veteran who has PTSD. Some veterans have expressed great interest in partner involvement in their PTSD treatment and stated that they wished that their spouses or partners were able to receive more education and support, including a VA spouse-support group to help them to cope.

VA health care leadership endorses family involvement in veterans’ mental health care and is examining the multifamily group treatment model as a potential mechanism for providing family psychoeducation, communication training, and problem-solving skill building; the group format encourages social support (Sherman et al., 2012). Although VA medical

centers do not provide mental health counseling for family members unless they are seen conjointly with the veteran in family or couples therapy, most SOPPs “plan to work with family”; information on what these interactions consist of was not provided (VA, 2012a). The National Center for PTSD offers a course for providers “Couples and PTSD” that explains methods for including partners and loved ones in the assessment and treatment of veterans who might have PTSD.

VA has recently hired over 800 peer support personnel (VA and Sherrard, 2013). The use of peer counselors and peer support can increase the acceptability of PTSD care for veterans (Barber et al., 2008; Davidson et al., 2006; New Freedom Commission on Mental Health, 2003; SAMHSA, 2011a). Peer counselors are veterans themselves (some of whom may have or have had PTSD) who can provide experiential advice on the need for PTSD treatment and treatment options. Although they are not clinicians and do not provide therapy, they have an understanding and an ability to relate to other veterans because they may have had similar experiences. Peer counselors have been found to improve veterans’ recovery (SAMSHA, 2011b). Peer-to-peer programs facilitate opportunities for veterans to talk with trained peer supporters who can offer educational and social support and provide avenues for additional help if needed (DCoE, 2011). Peer support groups can help to reduce the stigma related to accessing evidence-based treatment for PTSD and lead some veterans to take the initiative to seek trauma-focused treatment (Pruitt et al., 2012; VA and Sherrard, 2013). Peer support groups also provide a long-term resource for veterans after they complete the acute phase of treatment. In 46% of VA OMHO site visits to facilities, it was noted specifically that peer support had or could have a benefit for their staffing and veteran care (OMHO, 2013a).

Vet Centers provide social support to combat veterans and their families. Vet Center counselors, 72% of whom are veterans, offer confidential, culturally competent services and referrals for MST, substance abuse, employment, bereavement, family counseling for military-related issues, and outreach and community education. It is estimated that over a half million OEF and OIF veterans have been in contact with a Vet Center staff member (Fisher, 2014).

SUMMARY

DoD and VA are working to improve the availability, accessibility and acceptability of PTSD care for service members and veterans but much remains to be done. DoD does not track information on wait times or time between mental health appointments. In spite of education efforts to overcome the perception by service members and commanders that seeking treatment is unacceptable, stigma and other perceived barriers to care such

as lack of belief that treatment will be effective or an inability to take time to attend appointments, persist. The availability of some PTSD services such as specialized programs is limited as there are few of them and they treat only a small number of service members annually.

More service members are being referred to TRICARE purchased care providers; the availability of these providers can also be uncertain. No PTSD programs tailored to specific sexes, races, or cultures in DoD were identified, other than separate therapy groups for men and women who have experienced sexual trauma. There is no information on the need for and availability of racial and ethnic group-specific mental health treatment services in the military.

VA serves a highly diverse, although still largely male, veteran population. Most PTSD care in VA is provided in general mental health clinics and other nonspecialized settings. The SOPPs and SIPPs treat only about one-third of veterans who have PTSD and used VA health care in 2012. MST services are available in all VA medical centers for both women and men, and each medical center has a dedicated MST coordinator, although adequate MST services are not always available. VA has only a few mental health programs that integrate the racial, cultural, or ethnic group-specific needs with clinical treatment; for example, specific programming has been developed for American Indian veterans and some programs are tailored to veterans who served in different eras.

Overall, in both the DoD and VA there are few opportunities for families to be involved in service members' or veterans' PTSD treatment. Some counseling and support services are available to family members on military installations, but these services are typically not integrated with mental health services. PTSD education programs, support groups for families, and couple and family therapy, such as those offered at NICoE, might be beneficial for both service members and their family members. VA is limited in the support services it can offer to families of veterans who have PTSD. Veterans expressed an interest in having more programs available for their family members to learn about PTSD, and some also stated that they would like family members, usually a spouse or partner, to be more engaged in their treatment. VA is leveraging the use of peer counselors to improve access to and promote the acceptance of PTSD care. Vet Centers have extended their services also, including the availability of peer counselors, to all military personnel who are or have been on active duty in OEF and OIF, not only those who have served in combat and are veterans.

DoD and VA are increasing the accessibility of PTSD care through telehealth, particularly having providers deliver evidence-based treatments via videoconference to patients at distant locations. They have also developed mobile apps and educational websites to reach and engage a greater number of service members and veterans.

DoD and VA are also working to improve the transition process from active-duty status to veteran status through the use of the Integrated Disability Evaluation System. VA liaisons are available to facilitate the transition for ill, wounded, and injured service members as they move from DoD to VA by setting up all necessary medical appointments in VA before a service member leaves active duty.

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9

Research on PTSD

A high-performing system for posttraumatic stress disorder (PTSD) management identifies and effectively applies research findings on prevention, assessment, diagnosis, and treatment to provide optimal care. Other attributes of a high-performing system are fostering new research on innovative approaches for PTSD management; expediting translation of new research findings to people who have PTSD and to their health care settings; striving to anticipate future research directions to address knowledge gaps; and exploring new ways to reduce stigma and promote access to and dissemination of evidence-based treatment. In its phase 1 report, the committee presented an overview of the current knowledge base on PTSD prevention, assessment, diagnosis, and treatment, including comorbidities and rehabilitation. This chapter reviews the research portfolios of the Department of Defense (DoD), the Department of Veterans Affairs (VA), and the National Institutes of Health (NIH) to assess specifically how science is fostered and what research is being conducted. The chapter ends with a discussion of the challenges to translating research into practice and a discussion of leveraging technology to improve access to and delivery of PTSD care.

FOSTERING RESEARCH

Conducting basic science, clinical, and health-management research requires an environment that can provide knowledgeable investigators with sufficient resources, a collaborative organizational structure, and innovative and forward-thinking leadership. Some of the ways in which DoD

and VA (and to some extent NIH) have fostered PTSD-related research are establishing clear mission statements for research, investing in the research, establishing an action plan, learning how to translate research into practice, and supporting innovation in technology.

Research Missions in DoD, VA, and NIH

DoD, VA, and NIH all conduct or support PTSD research and they have distinct but complementary research missions (Castro et al., 2013). DoD relies to some extent on the expertise and infrastructure of VA and NIH for research in PTSD prevention and treatment interventions. Research in VA tends to be focused on the long-term health of veterans. Its infrastructure can support and leverage clinical trials and epidemiological studies, and it has the capability to translate research findings into clinical care. DoD and VA collaboration in research has increased in recent years; examples include the *National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families* and a research collaboration guidebook, which was created to foster cooperation between DoD and VA investigators in human subjects health care research (VA and DoD, 2013). PTSD research in NIH includes basic and clinical research, funded primarily through the National Institute of Mental Health (NIMH). Results of such basic and clinical research can be used to inform PTSD prevention, diagnosis, and treatment.

Although this chapter focuses on PTSD research funded by DoD, VA, and NIH, the pharmaceutical industry invests in new medications to treat for PTSD, although that investment has declined in recent years (DoD et al., 2013). There are also private efforts by foundations and other organizations to improve care of people who have PTSD. Numerous large centers, consortia, and collaborations funded by DoD, VA, and others, such as the South Texas Research Organizational Network Guiding Studies on Trauma and Resilience, are working toward a better understanding of PTSD prevention, pathogenesis, and treatment. More detailed information on some of those centers, consortiums, and collaborations can be found in Appendix D.

National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families

On August 31, 2012, President Obama issued Executive Order 13625, which directs DoD, VA, the Department of Health and Human Services, the Department of Education, and the Department of Homeland Security to “take steps to meet the current and future demand for mental health and substance abuse treatment services for veterans, service members, and their families.” In response, those departments developed a national research

action plan in August 2013, which was organized around an interagency research continuum framework. For each component of the continuum—foundational science, epidemiology, etiology, prevention and screening, treatment, follow-up care, and services research—the interagency group was to undertake a gap analysis and identify short-term, mid-term, and long-term research needs to improve the prevention and diagnosis of and treatment for PTSD in service members and veterans (Castro et al., 2013; DoD et al., 2013). The research plan also considers comorbid conditions as appropriate.

As part of the National Research Action Plan, DoD, VA, and NIH have identified several PTSD research goals (Castro et al., 2013). They also identified several cross-cutting actions to increase transparency and communication among the departments (DoD et al., 2013). For example, “a new commitment will be to move the DoD’s medical research into the NIH Research Portfolio Online Reporting Tools via Electronic Research Administration Commons” (DoD et al., 2013). The committee believes that such a move will increase the transparency of mental health and other research being funded by DoD. The committee commends DoD, VA, and NIH for the thorough review they are undertaking, and it agrees with the gaps and future research goals the departments have identified.

Recent Funding for Mental Health and PTSD Research

Since 2007, DoD has invested \$771 million in more than 453 mental health research studies. Of that investment, 60% supports PTSD research, 12% resilience research, 9% family-related research, and the remainder other types of mental health research (Miller, 2014). Since 2009, VA has invested \$556.6 million in mental health research¹ (see Table 9-1), and its funding of PTSD research has remained steady at around \$30 million per year over the past 5 years. However, as a percentage of VA’s mental health research budget, PTSD research funding has decreased from a peak of 32.4% in 2010 to 24.6% in 2013 (Gleason, 2012), despite marked increases in the prevalence and incidence of PTSD in veterans who seek care in VA, as described in Chapter 2.

In 2011, DoD had 162 active PTSD studies for a total investment of \$297.4 million (Defense Health Program and VA, 2011). The greatest funding that year went to treatment (40.0%), basic science (27.6%), and

¹ This funding supports research, equipment (typically Year 1 investment), salaries for non-clinical primary investigators, and VA administrative overhead (Gleason, 2012). It does not support research administration at VA medical centers, clinician primary investigator salaries (which are supported by medical care appropriation), animal facility support, research supported by non-Office of Research funding, or research system infrastructure (Gleason, 2012).

TABLE 9-1 VA Funding Amounts for Mental Health Research and PTSD

Year	Mental Health Research (million)	PTSD Research (million)
2009	\$92.0	\$27.6 (30.0%)
2010	\$105.6	\$34.2 (32.4%)
2011	\$121.7	\$36.4 (29.9%)
2012	\$115.3	\$30.8 (26.7%)
2013	\$122.0	\$30.0 (24.6%)

SOURCE: Data are from Gleason, 2013.

resilience (17.9%). In 2011, VA had 130 active studies on PTSD for a total investment of \$155.4 million (Defense Health Program and VA, 2011). The greatest funding went to treatment (42.3%), epidemiology (25.1%), and basic science (17.1%). Those research priorities reflect DoD and VA efforts to understand, prevent, and treat for PTSD in service members and veterans who are exposed to traumatic events.

COMMITTEE'S SUMMARY OF CURRENT RESEARCH ON PTSD

In the committee's statement of task, it was asked to "consider the status of studies and clinical trials involving innovative treatments for PTSD that are conducted by DoD, VA, or the private sector," particularly physiological markers, causation, alternative therapies, and the use of pharmaceutical agents to prevent and treat PTSD (see Chapter 1, Box 1-1). The committee was also asked to provide recommendations for future PTSD research. This section presents an overview of PTSD research that is funded by DoD, VA, NIH, and other organizations. The categories of research in this chapter are based on the structure of the committee's phase 1 report (IOM, 2012).

To identify PTSD research projects, the committee looked at several publicly available research databases. The committee limited its review to studies in adult populations and those on mechanisms, screening, diagnosis, treatment, or barriers related to PTSD in service members and veterans. Studies were excluded if they were specific to traumatic brain injury (TBI), caregiver support, or insomnia, chronic pain, and unexplained illnesses in veterans. The remaining studies were categorized into broad topic areas (see Table 9-2). Studies in each category were enumerated by funding agency and summarized to identify gaps and overlaps in the research. The following databases provided most of the research information:

- The NIH Research Portfolio Online Reporting Tools (RePORT) database (<http://report.nih.gov>) contains intramural and extramural research funded by NIH, the Centers for Disease Control and Prevention, the Agency for Healthcare Research and Quality, the Health Resources and Services Administration, the Substance Abuse and Mental Health Services Administration, and VA. The RePORT database was searched on June 6, 2012, using the term *PTSD* for all active projects. The committee recognizes that this database is not static and that new projects may have been funded since June 2012.
- The VA Health Services Research and Development database “pursues research that underscores all aspects of VA healthcare: patient care, care delivery, health outcomes, cost, and quality” (VA, 2011). The database was searched for all studies that were active during 2007–2012, on November 15, 2012, using the term *PTSD*.
- The ClinicalTrials.gov database includes information about interventional and observational medical studies in human volunteers. Although it does not include all clinical trials conducted in the United States, it does contain the majority of federally and privately funded studies conducted under investigational new drug applications. The database search was conducted on August 27, 2013, using the term *PTSD*. Studies were eliminated if they were completed or expected to be completed before 2011, or were withdrawn.

The committee also obtained from DoD a list of PTSD studies it funded² because, unlike VA and NIH, it does not have a publicly available database of studies.

Table 9-2 gives an overview of the research categories used by the committee and the number of funded studies in each category. The committee then provides a broad description of why each research category in this chapter is important for understanding and treating for PTSD in DoD and VA. It also provides a general summary of the *ongoing* research from the NIH RePORT database, the VA Health Services Research and Development database, the ClinicalTrials.gov database, and the information provided by DoD. Because the research is ongoing and not yet published (in most cases), citations could not be provided for some of the summaries below. More detailed descriptions of the ongoing studies reviewed by the committee are given in Appendix E. The level of detail provided in each of the research categories below and in Appendix E are variable and reflect the number

² A list of these studies can be obtained by contacting the National Academies Public Access Records Office.

TABLE 9-2 Research Categories and Targets^a

Research Category	Number of Studies Identified in Searches				
	DoD	VA	NIMH	Other NIH Institutes	Other Organizations ^b
Physiology, Neurobiology, and Behavior	40	18	134	32	23
Understand the process from trauma to exposure to PTSD; identify early markers of the development of PTSD after trauma; understand genomic changes associated with PTSD; identify differential responses to treatment; and establish preclinical studies of new pharmacotherapies.					
Prevention	21	9	18	4	8
Identify factors that promote or prevent the development of PTSD and interventions that may minimize PTSD after trauma.					
Screening	4	5	3	0	0
Understand the effectiveness and accuracy of screening and whether screening is associated with better PTSD outcomes.					
Diagnosis and Determining Symptom Severity	5	5	1	0	0
Identify accurate and effective methods to diagnose PTSD and to determine symptom severity.					
Treatment	78	101	31	26	104
Identify and understand effective pharmacotherapies, somatic treatments, psychotherapies, and treatments that combine psychotherapies and pharmacotherapies; complementary and					

alternative medicine; models for the delivery of PTSD care; different modalities for treatment interventions; treatments tailored to specific gender or racial groups; and treatments for PTSD in parallel with comorbidities.

Barriers	10	37	5	2	0
Individual, family, provider, and institutional barriers to the delivery of high-quality, evidence-based care; barriers to integrating findings from basic research into new treatments and clinical practice; and barriers to research or administrative reviews on the particularities of military culture, operational tempo, and institutional processes.					
Long-Term Outcomes Associated with PTSD	9	10	4	5	0
Understand long-term health outcomes and the development of comorbidities such as cardiovascular disease in people diagnosed with PTSD.					
Intimate Partner Violence	0	4	2	2	1
Understand risks for intimate partner violence or interpersonal violence in people diagnosed with PTSD.					
Training	6	3	17	8	3
Training providers to improve the diagnosis and treatment of PTSD and research or training grants for career development.					

^aThis table represents the committee's search of NIH RePORT, HSR&D, ClinicalTrials.gov, and research studies provided by DoD. Some studies could have been considered under multiple categories but were counted only in the most relevant category to avoid an overestimation of studies. There were also numerous studies that were funded by more than one organization. The committee tried to identify the main funding source so that the study would only be counted once in the table, but this was not always possible and some studies, particularly studies funded jointly by DoD and VA, were counted twice. Because of these caveats, Table 9-2 may underestimate the number of studies under each category or funding source, especially for DoD-, VA-, and NIH-funded research.

^bIncludes international organizations, U.S. universities, hospitals, nonprofits, and pharmaceutical companies.

of studies and the level of information the committee was able to obtain about those studies.

The database information was variable and there were limitations to the committee's review of the research. For example, some of the research descriptions had details on the study population, methodology, and even preliminary results, whereas others had only a title and a brief description of the goals and objectives of the study. The databases also varied in how costs and funding information were presented, so the number of studies in each funding column in Table 9-2 may be underestimated. In some cases, it was difficult to determine who was funding a particular study. The table does not reflect ongoing collaborations. Thus, the table should be considered as a general representation of currently or recently funded PTSD research.

Physiology, Neurobiology, and Behavior

As detailed extensively in the committee's phase 1 report (IOM, 2012), the neurobiology of emotion and defensive responses to fear, anxiety, avoidance, and reward has been extensively investigated for several decades (Charney, 2003; Garakani et al., 2006; Hammack et al., 2012; Hartley and Phelps, 2010; Lanius et al., 2011; Martin et al., 2009; McTeague and Lang, 2012; Quirk et al., 2006). One reason is a desire to understand the brain-behavior interactions from a basic neuroscience perspective. Another is a desire to advance knowledge of the psychopathology of anxiety and mood disorders in general and of PTSD in particular. DoD, VA, and NIMH have set priorities for funding in these topics to elucidate the mechanistic underpinnings of the pathophysiology of fear and anxiety that are commonly observed in people who have PTSD. Some of the research reviewed by the committee is summarized below with a discussion of its relevance to PTSD psychopathology and treatment. The committee notes that other emotions, such as shame and guilt, frequently accompany a diagnosis of PTSD (Lee et al., 2001; Urlic and Simunkovic, 2009; Wilson et al., 2006); these social emotions may play a role in PTSD etiology and persistence and are not necessarily modeled or captured in existing experimental models and paradigms that focus on fear and anxiety.

Mechanistic Research

Understanding the psychological and neurobiological mechanisms by which traumatic experiences result in maladaptive emotional and threat responses is fundamental to basic research and of the translation of research on PTSD (see the section "Translating Research into Practice"). That understanding has been approached from a number of perspectives, from

cellular to cognitive to cultural (Feodorova and Saragian, 2012; Martin et al., 2009; Quirk et al., 2006; Schafe et al., 2001; Zovkic and Sweatt, 2013). Given that PTSD is triggered by experience and is commonly viewed as a disorder that emerges with an inability to cope with or recover from the aftermath of the trauma (Shvil et al., 2013), the primary focus of basic research has been the neurobiology and psychology of emotional learning and memory (Cahill, 1997; Hartley and Phelps, 2010; Kim and Jung, 2006; Maren, 2001; Milad and Quirk, 2012; Pitman et al., 2012; Rudy et al., 2004; Zovkic and Sweatt, 2013). Some people diagnosed with PTSD overgeneralize their fears and exhibit substantial avoidance symptoms, so animal research on passive and active avoidance is helpful. Overgeneralization is another research area that is very active (Dunsmoor et al., 2011; Lissek, 2012). The mechanisms of action by which some experiences can change neural networks are of the utmost importance for understanding the development and persistence of PTSD.

On the cellular level, one approach to understanding mechanisms of action is to study how different types of receptors interact with their ligands to mediate memory formation under normal physiological conditions. That knowledge can inform how malfunction or modification of cellular mechanisms could lead to changes in memory formation that may be relevant to the pathophysiology of PTSD. Over the last several decades, research has generated a wealth of knowledge about the processes by which learning and memory lead to the activation of several types of receptors; this activation triggers intracellular cascades that result in the activation of gene transcription and translation and causes synthesis of new proteins and modification of synaptic connections between neurons (Andero and Ressler, 2012; Gunduz-Cinar et al., 2013; Hauger et al., 2012; Johansen et al., 2011; Lutz, 2007; Shekhar et al., 2005). That line of research has helped to identify some cellular targets that may play a role in the pathophysiology of PTSD, such as corticotrophin-releasing factor, brain-derived neurotrophic factor (BDNF), and N-methyl-D-aspartate receptors. A recent study by Pace et al. (2012) found increased activity of nuclear factor kappa-light-chain-enhancer of activated B cells in women who have PTSD arising from childhood abuse, suggests an enhanced inflammatory system and decreased immune cell glucocorticoid sensitivity. New and promising work in preclinical neuroscience reviewed by the committee includes research to understand BDNF and its receptors (tyrosine receptor kinase B and some potential new targets such as neuropeptide Y and neurosteroids).

Building on the foundation of the cellular and molecular mechanisms of memory requires an understanding of the diverse and interacting brain systems and psychological processes that support adaptive and maladaptive memory formation and expression. One fundamental principle is that several kinds of memory make up distinct brain circuits, each having unique

characteristics. For instance, different memory systems support the conscious retrieval of episodes, habitual actions, and physiological defensive reactions (Luethi et al., 2009). Preliminary research suggests that the impact of trauma and stress on learning and memory depends on the type of memory assessed. One important topic that has not been investigated extensively is how different types of memory systems interact. Given that PTSD is characterized by intrusive and habitual episodic memory retrieval accompanied by heightened learned threat responses and physiological arousal, this might be an important avenue for future research.

Cellular and brain systems that support learning and memory have the potential to elucidate mechanisms of memory storage (consolidation) and restorage (reconsolidation). Traumatic events that result in PTSD could be conceptualized as resulting in memories that are over-consolidated. Knowing how that works, whether and how memories are retained in the absence of retrieval, and how memories are reconsolidated after retrieval are critical for understanding PTSD and could lead to new interventions. Traditional research on learning and memory has focused on memory encoding and retrieval, not the storage process itself, which is a promising topic.

Current nonpharmacological approaches to treating PTSD are based largely on controlling fear through either cognitive regulation or through exposure and extinction (Bisson et al., 2013; Rachamin et al., 2009). Initial studies of fear conditioning and extinction focused on fear learning because patients who have PTSD may overconsolidate traumatic memories (Pitman et al., 1989). However, recent studies suggest that over consolidation of fear memories may not be evident in PTSD—at least using *de novo* fear conditioning and extinction paradigms—and the extinction of conditioned fear memories may be deficient in PTSD patients (Milad et al., 2008, 2009). Although exploring means to enhance those techniques is useful, the committee identified relatively few ongoing studies of the mechanisms of fear resilience or fear-control techniques beyond extinction or cognitive regulation. In addition, the committee found little research on the relationship between the stress–hypothalamic pituitary axis response and the mechanisms of emotion and fear control. Those mechanisms are inherently intertwined in PTSD, so understanding their interactions is important and research on this topic should be expanded. Although an understanding of basic general psychological and neurobiological principles underlying the development and persistence of PTSD is clinically important, this research cannot be adequately translated into treatment and prevention unless it is known how the mechanisms interact with individual characteristics. For example, an important variability factor for PTSD is sex differences. The incidence of some anxiety and mood disorders is twice as high in women (Kinrys and Wygant, 2005), who seem to have symptoms for longer periods and poorer prognoses compared with men (Breslau et al., 1998; Seedat et

al., 2005). Despite these epidemiological data, relatively little is known about how sex differences may impact the underlying neurobiology and psychology of PTSD. In healthy humans and in clinical populations, studies do not generally exclude women, even if the differences between males and females are not fully explored or characterized (Lebron-Milad and Milad, 2012). However, the vast majority of PTSD-related research is conducted only in male animals, which may potentially limit its relevance to half the human population. Basic research for such physical conditions as heart disease must include an appreciation of sex differences, and this same standard should be extended to basic and translational research for PTSD.

Genomics

The factors that lead to individual differences in the development of PTSD are both experiential and genetic (Admon et al., 2013; Kremen et al., 2012; Mehta and Binder, 2012). The genomic basis of PTSD is critically important for determining who might be at risk. That includes identifying genotypes implicated in vulnerability or resilience to PTSD, gene pathways that undergo epigenetic modification after trauma exposure, and differential expression of genes in people who have and do not have PTSD (Almli et al., 2014). Because PTSD is fundamentally a brain disorder, identifying epigenetic modifications that result in differential gene expression in brain regions known to be dysfunctional in PTSD patients has a high priority. However, because brain tissue from living people cannot be assayed, brain-focused studies to identify differentially expressed genes are generally conducted in animal models. The committee identified human studies that are investigating whether epigenetic and expression differences observed in peripheral tissues are associated with PTSD.

The genomics of PTSD is in its infancy compared with the genomics of other common psychiatric disorders such as schizophrenia (Koenen et al., 2013). There is a great deal of knowledge to be gained in this field, but whether it will translate into innovative interventions to prevent or ameliorate PTSD is unknown. The most promising research for translation appears to be prospective human studies that integrate multiple levels of biological data. The best method for such studies begins with identifying people before exposure, but studies of people in the acute aftermath of a traumatic event are also likely to produce important translational results. The translational impact of PTSD genomics could be improved by integrating genome-wide data (for example, genotype, epigenetic, and gene expression) into treatment studies of PTSD, as has been done with functional magnetic resonance imaging research. Such studies may provide information on genomic profiles of people who do and do not respond to treat-

ment and information on genomic correlates (for example, gene expression changes) of symptom remission.

A major concern about genomic research on PTSD is the narrow focus on candidate genes—whether for genotype, epigenetic, or gene expression studies—in light of the discrediting of this approach for other psychiatric disorders, such as schizophrenia and bipolar disorder (Pitman et al., 2012). A further concern is the relatively small number of human studies due to current funding constraints. PTSD genomics would benefit from the formation of a PTSD working group in the Psychiatric Genomics Consortium aimed at sharing genotype, epigenetic, and gene expression data among human studies (Koenen et al., 2013). Large consortia have produced robust genomic discoveries related to other psychiatric disorders, such as schizophrenia (Sullivan et al., 2012), and there is no reason to assume that it would be different for PTSD. The major barriers to such a consortium are VA and DoD restrictions on the sharing of genomic data. For example, unlike NIH, which effectively requires data sharing, VA does not allow sharing of individual-level genotype data from genome-wide association studies. Such barriers to data sharing have in effect excluded VA investigators from the large consortia that are necessary for genomic research. Addressing such barriers would help ensure progress in PTSD genomics research.

Prevention

Ideally the occurrence of PTSD should be prevented. Unlike other psychiatric disorders, PTSD results from a known event, and this allows for immediate intervention and possibly even the prevention of pathological symptoms. It remains unclear why some people are resilient to trauma whereas others develop PTSD. Clarifying the reasons for this difference might improve strategies for enhancing resilience and preventing the development of PTSD. Logistically, this research is challenging to conduct in humans, as it requires recruiting people into studies immediately after a traumatic event and following them longitudinally. Establishing best practices for recruiting people into studies immediately after trauma and improving basic research techniques for early behavioral or neural interventions could result in new methods to prevent PTSD symptoms.

The committee identified some research projects that explore methods for increasing resilience and reducing adverse effects after exposure, such as investigations of early interventions (for example, intervening in the emergency room or as soon as the event occurs), of early behavioral and pharmacological interventions and different delivery systems (for example, telephone or Web-based delivery), and of different populations at risk. An early-intervention study found that a course of three sessions of modified prolonged exposure (PE) therapy in an emergency department was associ-

ated with significantly less depression and PTSD at 1-month and 3-month follow-up than in those who received assessment alone, and the early intervention appeared to mitigate a genetic risk of PTSD (Rothbaum et al., 2014a).

Some research is being done on prevention, but it does not appear to be sufficient. DoD is implementing prevention and resilience training programs, but most of them have yet to be evaluated (IOM, 2014). The committee did not identify any service-specific research that assessed whether existing programs successfully minimize PTSD after trauma or prevent the reemergence of symptoms and other sequelae.

Advances in basic science and PTSD genetics could help to identify social, psychological, or biological markers that might indicate vulnerability to PTSD either before or after trauma exposure. Such research could help to identify modifiable risk factors that might be targets for prevention interventions and people who are at high risk for PTSD and might benefit from enhanced training or early interventions after trauma exposure. Equally important but less studied is the question of whether psychological, social, or environmental variables may increase or decrease the likelihood of PTSD.

Prevention research is examining risk and protective factors for the development of PTSD symptoms. There has been some progress since the committee's phase 1 report (Biehn et al., 2013; Goldmann et al., 2012; Goodwin et al., 2013a,b; Kok et al., 2012; LeardMann et al., 2013; Marshall et al., 2012, 2013; Walsh et al., 2013; Wilk et al., 2012, 2013), and research continues (see Appendix E). A challenge for research in this field is that although there are some commonalities in methods, in each study that the committee reviewed investigators focused on "innovative" risk or resilience factors; as a result, there were many factors peculiar to each study that cannot easily be translated among studies. In addition, the application of results to other populations—such as service members, veterans, or women—is questionable. This challenge could provide an opportunity for NIH, VA, and DoD to collaborate to support research that may help to actively build consensus around a specific prevention program, biomarker, or other scientific advancement. A notable gap is the absence of research that pools analyses or meta-analyses of extant studies.

Screening

The committee reviewed many research projects that might lead to advances in screening for PTSD and comorbidities (see Appendix E). A few studies were identified that screen for PTSD in high-risk populations, such as those with chronic pain, burns, mild TBI, accidental injury, and functional somatoform syndromes. New technologies and outreach approaches, such as automated telephone screening and the Army's Behavioral Health

Data Portal (described in Chapter 4), might increase the efficiency and reduce the cost of screening.

Screening serves different purposes and there is no “one-size-fits-all” formula for screening procedures. The type of screening to be conducted depends on the question of interest, for example, whether the intention is to compare those who have PTSD with those who are healthy or to distinguish those who have PTSD from those who have a related diagnosis, such as mild TBI. Research is needed to move beyond the traditional questionnaire-based screening methods to neurobiological and behavioral screening for PTSD. There is also a need for randomized controlled trials that prospectively assess whether large-scale screening results in greater benefits to the population than more traditional approaches.

Diagnosis

Much PTSD research has been directed toward improving the diagnostic precision of structured interviews or self-ratings. Those techniques not only assist in diagnosis but are valuable tools for promoting measurement-based care. Efforts that go beyond structured interviews and rating scales have been under way for many years and include the study of physiological measures, neuroimaging, genetic markers, and neurotransmitters; the goal is to enhance diagnostic processes by incorporating neurobiological measures.

The committee identified studies that apply biological measures to address PTSD diagnosis (see Appendix E). Examples are the differentiation between PTSD and mild TBI, identification of the new symptoms of PTSD as given in the *Diagnostic and Statistical Manual of Mental Health Disorders-Fifth Edition* (APA, 2013), and the characterization of speech patterns in people who have PTSD compared with those who do not have PTSD. The committee identified a research gap in the area of diagnosis—one potentially useful approach that is not being studied is the use of advanced statistical procedures, such as random forest classification and functional magnetic resonance imaging, to develop a neurobiologically based approach to diagnosis PTSD and to evaluate it against standard (that is, clinically based) diagnostic predictors.

Treatment

There are effective treatments for PTSD in civilians, as shown in the numerous meta-analyses and treatment guidelines that were described in the committee’s phase 1 report (IOM, 2012). However, although such treatments as PE, cognitive processing therapy (CPT), eye movement desensitization and reprocessing (EMDR), selective serotonin reuptake inhibitors, and

other pharmacotherapies are more effective than placebo or other controls in civilians, they do not work in all people with PTSD. Some patients show only a partial response, others show no response, and some relapse after an initially promising response. There are a limited number of studies that have investigated PTSD treatments in service member and veteran populations. Other treatment challenges include the delayed onset of therapeutic action and adverse effects. Better and safer treatments are needed, not just modifications of current ones.

Research targets for treatment (see Appendix E) include several that are innovative and promising. Some of the most promising research is the use of new technologies to improve the effectiveness and accessibility of treatment. The combination of various clinical approaches to address the complexity of PTSD issues (for example, concurrent treatment for PTSD and comorbidities or treatments that combine psychotherapies, pharmacotherapies, and complementary and alternative therapies) needs to be studied further in military and veteran populations. Overarching research considerations for PTSD treatment are discussed below.

Pharmacotherapies

Both preclinical pharmacotherapies (for example, pilot studies) and pharmacotherapies are being investigated in military and civilian populations (see Appendix E). New pharmacotherapies, such as endocannabinoids, are promising and important for research. The committee found research gaps in the study of preclinical pharmacotherapies, such as the use of oxytocin, to identify molecular markers of reconsolidation and of hippocampal adult neurogenesis as related to pattern separation and pattern completion.

A broad array of new and established pharmaceuticals are being studied; some are being given as monotherapy and some to augment other therapies. Some are believed to work through different neurotransmitter pathways and should add valuable information to the knowledge base on PTSD pharmacotherapy. Particularly promising are the clinical investigation of low doses of anesthetic drugs, such as ketamine, and the increasing evidence base on prazosin. For example, a study looking at treatment with prazosin in active-duty Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) soldiers found that prazosin was superior to placebo in measures of sleep and total PTSD symptoms (Raskind et al., 2013). This study is the first major placebo-controlled trial of pharmacotherapy in active-duty service members who had been exposed to combat.

On the basis of an extensive review of current studies and a brief review of research published since its phase 1 report (IOM, 2012), the committee identified several gaps in PTSD-treatment research. First, studies of drug

effects on brain structure and chemistry, such as effects of escitalopram on BDNF, are valuable, and more studies of this type are needed. Second, hydrocortisone holds promise both for the prevention of PTSD and the understanding of the neurobiology of PTSD; further studies of antipsychotics as a treatment for PTSD are needed. Third, pharmacotherapy for PTSD comorbid with bipolar disorder, attention deficit disorder, and mild TBI is not well studied but should be. Fourth, polypharmacy is a continuing concern; it may result in improvement in PTSD symptoms, but it can also result in more side effects and be a factor in noncompliance to treatment.

Psychotherapies

Research that compares the efficacy of new psychotherapies with that of established evidence-based treatments is essential for a high-performing system of PTSD management. It is important to continue to develop and evaluate new psychotherapy options because there is currently no evidence-based treatment that is effective for everyone who has PTSD and no treatment that is so appealing, engaging, and pragmatically deliverable to patients that it breaks down all barriers to care. Thus, the rigorous study of new psychotherapies is essential for maximizing the treatment options to address each patient's unique needs and preferences. Once efficacy is established, primary treatments can be studied in combination with other treatments to determine the added value of combination treatments or how treatment-protocol modifications can improve benefits.

Various treatment methods are being evaluated, most often to compare them with CPT or PE (see Appendix E for more detail). Rather than research gaps, there appears to be considerable diversity in the approaches being tested, including both trauma-focused and non-trauma-focused approaches. Examples are controlled studies to assess the value of adding components to evidence-based treatments. Various new treatments are being tested in randomized controlled trials, such as acceptance and commitment therapy, adaptive disclosure therapy, behavioral activation therapy, interpersonal psychotherapy, trauma-management therapy, and relatively new and untested cognitive training approaches to enhance modulation of emotion. The committee did not identify any studies of the value of combining cognitive training methods with traditional cognitive behavioral therapy (CBT) or exposure therapies, such as CPT, PE, and EMDR. That may constitute a research gap inasmuch as psychotherapy approaches may be more effective when combined to address both cognitive control of emotional regulation and extinction-based cognitive and behavioral concerns. Overall, current psychotherapy research reflects a diverse mixture of efforts. Some experimental methods for studying PTSD treatments involve computer-delivered approaches, which are discussed later in this chapter.

Combining Psychotherapy and Pharmacotherapy

The combined use of pharmacotherapy and psychotherapy is an important approach in the management of PTSD. A combined approach might result in greater therapeutic gains in two ways. In the first, a single dose of a drug is administered immediately before or after a psychotherapy session either to hasten the onset of therapeutic action or to produce greater therapeutic gains than psychotherapy alone. This model uses drugs that are cognitive enhancers—such as D-cycloserine (DCS), yohimbine, methylene blue, and hydrocortisone—or drugs that disrupt memory (such as propranolol) or facilitate therapy, such as 3,4-methylenedioxy-*N*-methamphetamine (MDMA or “ecstasy”). In the second, a drug is administered chronically with psychotherapy, and the combined treatment may result in a greater gain than either treatment alone. In this model, use of the drug might precede the introduction of psychotherapy, be started simultaneously, or be added after the start of psychotherapy. The antidepressant drug sertraline and the anticonvulsant drug zonisamide (see Appendix E) are being studied as enhancements of psychotherapy.

Several trials of medication-enhanced psychotherapy have been reported recently. For example, Oehen et al. (2013) investigated MDMA in association with psychotherapy in treatment-resistant noncombat PTSD patients; greater improvement was observed in the higher-dose group. The use of single-dose DCS in combination with PE therapy has also been studied; mixed results have been reported. Litz et al. (2012) compared DCS and placebo with behavior therapy in OEF veterans and found inferior results in the DCS groups. De Kleine et al. (2012) reported significantly greater improvements with DCS than with placebo in civilians but only in those who required more sessions; Difede et al. (2013) showed reduced anger and PTSD symptoms compared with placebo in civilians who were given DCS combined with virtual-reality exposure therapy. Rothbaum et al. (2014b) found no reduction in overall PTSD symptoms in OEF and OIF veterans who were given a combination of DCS and virtual-reality exposure therapy but did find a significant decrease in cortisol and psychophysiological startle response in general.

Somatic Treatments

Neurostimulatory treatments for depression and obsessive compulsive disorder have shown benefit in some people who are resistant to first-line treatments. The U.S. Food and Drug Administration has approved devices for the use of repetitive transcranial magnetic stimulation (rTMS) in treatment-resistant depression. More recently, the literature has shown promise for rTMS in treating PTSD (Karsen et al., 2014; Nam et al., 2013; Ozgur

et al., 2014; Watts et al., 2012). The committee identified several current studies that are funded by DoD, VA, and others to investigate rTMS, cranial electrotherapy stimulation, stellate ganglion block, trigeminal nerve stimulation, and bright-light therapy (see Appendix E). Those and other stimulatory and somatic interventions are promising treatments for PTSD and clearly warrant further study.

Couple Therapy

In the last several years, research projects have assessed the effectiveness of couple therapy for PTSD (Fredman et al., 2011; Meis et al., 2012; Monson and Fredman, 2012; Monson et al., 2009; Sautter et al., 2009; Taft et al., 2011). In a small randomized controlled trial of cognitive-behavioral conjoint therapy for PTSD, Monson et al. (2012) found that this couple therapy model reduced PTSD symptoms and enhanced relationship satisfaction. Schumm et al. (2013) reported similar findings in a small study of OEF and OIF veterans who had PTSD and their female partners. The veterans' PTSD symptoms and their partners' relationship distress were reduced. Meis et al. (2013) found that OEF and OIF veterans were more interested in couple therapy than veterans of Vietnam and Korea, although both groups wanted more partner involvement.

Complementary and Alternative Therapies

As part of its statement of task, the committee was asked to look at complementary and alternative therapies for PTSD, particularly animal-assisted therapy. Surveys have demonstrated that the use of complementary and alternative therapies is substantial in the U.S. population and in the military (see Chapter 7). The more frequently studied complementary and alternative therapies are meditation, acupuncture, yoga, and biofeedback. Less studied therapies include animal-assisted therapy, mantram repetition, and music therapy. The former studies are being conducted in a variety of PTSD populations, including veterans, and they are being evaluated in combination with treatment as usual. Their value as stand-alone treatments for PTSD is unknown.

The committee identified different types of meditation—including mindfulness-based, loving-kindness, self-compassion, and transcendental meditation—that are being studied for PTSD. Most such studies were being conducted as randomized controlled trials with either an active or an inactive control (see Appendix E). The committee found that there were as many mindfulness projects in the NIH RePORT database as there were projects for treating for PTSD with a combination of pharmacotherapy and psychotherapy approaches—an indication that research on mindfulness

is growing. There is a lack of well-controlled studies on animal-assisted therapy and on acupuncture for PTSD; more research is needed on both. The study of psychobiotics (for example, gut microbiota) is a new field of medicine that is relevant to stress and related psychological disorders. Some researchers have suggested that preclinical and clinical studies of psychobiotics could inform treatment for stress-related conditions (Burnet and Cowen, 2013; Dinan et al., 2013).

Models of Care Delivery

A high-performing PTSD management system should expedite the translation of positive research findings into practice. Optimally, the translation would take advantage of proven methods for the delivery of clinical services in a way that breaks down barriers to care. The best evidence-based treatments will have little value without a model for promoting their effective and widespread delivery.

New models for delivering evidence-based treatments that focus on improving access to care must take into account patients' sociocultural context as well as available technology-based delivery options. Research is being conducted on the structure or context in which evidence-based treatment is delivered, such as in primary care and in deployment settings (see Appendix E for more details) and on the use of technology to expand the reach and appeal of evidence-based treatment to maximize its clinical efficacy (see the section "Technology" below).

The committee identified a research gap with regard to the use of mobile communication devices and their applications. There appears to be little research to determine how much applications such as VA's PTSD Coach are used once installed and what effect they have on improving treatment outcomes and reducing barriers to care. However, considering the relatively recent availability and adoption of mobile devices and applications, it is perhaps understandable that they are the subject of little research.

Modality of Treatment Intervention

The committee identified several studies that focused on treatment modality—that is, whether a treatment is given in a group setting, a couple setting, or an individual setting. Varied treatment modalities are being tested, either by delivering treatment in groups or in conjoint therapy or by adjusting the pace at which treatment is administered (for example, moving from one session per week to two sessions per week). More research is needed to determine the characteristics of patients who can benefit from treatment delivered in a group or from combinations of individual and group or conjoint treatment. More research is needed to determine the

role of the family in different treatment settings and the benefits of family involvement. Research is also needed to determine whether providing more choices of treatment modalities for service members and veterans helps to reduce barriers to care. And research is necessary to understand whether a patient who has initial involvement in a group setting with a non-evidence-based treatment (such as yoga or psychoeducation) is more likely to engage in an evidence-based treatment later.

Treating Different Sex and Racial Groups

Sex, ethnicity, and culture can all affect the risk of PTSD, its presentation, a patient's (and the patient's family's) attitudes to treatment, the type of treatment that is preferred and received, and possibly the response to treatment. The committee identified current research that is aimed at assessing the potentially different needs of men and women who have PTSD and alcohol or substance use disorders, or who have experienced military sexual trauma. Some studies are focused on making PTSD treatment more accessible to members of minority groups, on adapting manualized PE for Hispanic patients, and on developing culturally relevant treatment for American Indians.

Concurrent Treatment of Comorbidities

As noted in Chapter 2, people who have PTSD are often diagnosed with one or more comorbidities, including other anxiety disorders, depression, and alcohol and substance use disorders (Brown and Wolfe, 1994; IOM, 2012; Jacobsen et al., 2001; Kaufman and Charney, 2000; Pompili et al., 2013). To better understand the pathophysiology of PTSD, some studies have focused solely on it as the primary diagnosis and often excluded patients from studies if they present with comorbidities. Excluding certain patients may be important for studying the psychopathology of PTSD itself, but research examining the interactions between the pathophysiology of PTSD and other psychiatric conditions is as important as research that explores the psychological and neural processes underlying the interaction of drug addiction or TBI with the development and treatment of PTSD. Not only can understanding how alcohol, drugs, and brain injuries may interact to alter the brain circuitry implicated in PTSD provide information on why PTSD is linked to addiction and TBI, but these types of studies might also help identify new PTSD treatments (Brady et al., 2013; Kaplan et al., 2010). Some literature published since the phase 1 report shows an improvement in PTSD symptoms and a reduction in comorbid alcohol use when the disorders are treated together. Foa et al. (2013) compared PE, both with and without naltrexone, with supportive counseling in patients

who had PTSD and alcohol use disorder, and found that participants who received naltrexone had fewer drinking days (those who received both PE and naltrexone had the lowest rate of posttreatment relapse), that all patients had a reduction in PTSD symptoms, and that PE did not exacerbate alcohol use disorder. Kaysen et al. (2014) observed that CPT was well tolerated in veterans who had PTSD and comorbid alcohol use disorders and that CPT treatment was associated with decreased symptoms of PTSD and depression.

The committee found a variety of current studies of psychotherapy, most of which are CBT-based, for PTSD and comorbidities. There is an emphasis on promoting adherence to treatment and maintenance of long-term treatment gains by using motivational interviewing and relapse-prevention strategies. There is little redundancy in the research being conducted in this area. The committee noted one study designed to generate comorbidity clusters to predict outcomes. Other treatment approaches included physiological response-tailored exposure therapy, imagery rehearsal with or without CBT, and group CBT. The diversity of the study targets and clinical approaches suggests that DoD and VA recognize the importance and challenge of treating for PTSD and comorbid conditions.

Barriers

Most research on barriers is related to individual, provider, and institutional obstacles to the delivery of high-quality, evidence-based PTSD care. It includes barriers to awareness, accessibility, availability, and acceptability; the role of leaders in reducing stigma; adherence to evidence-based treatments, and the dissemination of the outcomes. Two studies are looking at military culture, operational tempo, and institutional processes that impede research (for example, variations in institutional review board functioning and recruitment challenges). Two studies are identifying barriers to the delivery of such new treatments as acupuncture. Some studies ask about family functioning and a service member or veteran's relationships with his or her family, but only one study was identified in which the family is considered specifically as a barrier to or asset for PTSD treatment. There is no research on overcoming barriers to translation of basic research to treatment and clinical practice. The potential for new interventions (for example, Web-based approaches or after-care telephone monitoring) to break down access barriers is increasing (see the section "Technology"). The research portfolio is top-heavy with studies on OEF and OIF cohorts, including several studies of National Guard and reserve cohorts, but the committee identified very few studies that included Vietnam-era veterans.

Long-Term Outcomes

As noted in Chapter 2, PTSD can be a long-term, chronic, and even life-long disorder. Longitudinal studies can advance the understanding of how aging affects PTSD and comorbidities and can help to elucidate whether some interventions are beneficial in altering the course of the disorder. Thus, long-term follow-up of large DoD and VA cohorts might shed light on the effectiveness of prevention programs, early screening, and a variety of treatment interventions for PTSD. See Appendixes D and E for examples of long-term studies.

Intimate Partner Violence

Intimate partner violence is an often overlooked research topic with regard to PTSD, but it can have substantial impact on families. Some service members or veterans who have PTSD may perpetrate intimate partner violence (Meis et al., 2010), but what distinguishes those who do from those who do not is not fully understood. There is a continuing need to conduct research that identifies effective ways to assess intimate partner violence and to determine what factors encourage potential or actual perpetrators (or their partners) to seek access to mental health care. Several recent research efforts are designed to validate intimate-partner violence treatment interventions (Taft et al., 2013), but there are still few empirically supported interventions.

The committee identified promising innovative studies that focused on racial and ethnic factors associated with PTSD and intimate partner violence; the intersections of TBI, intimate partner violence, and PTSD; and the effects of PTSD and intimate partner violence on children in military and veteran families. Continuing research is needed to develop and validate couple, family, and group interventions that address intimate partner violence in military and veteran families.

Training

Provider training is important for diagnosing and for disseminating and implementing evidence-based treatments. The committee divided research on training into training providers to improve the diagnosis of and treatment for PTSD and administering training grants for career development (see Appendix E). The committee considered efforts to train providers to be particularly important. One innovative study is under way on the use of virtual patients for training providers. Another study is attempting to develop and evaluate a Web-based CBT training system that expands on existing content and incorporates live online training. Considering the need

for well-trained providers of evidence-based treatments and the ubiquitous penetration of high-bandwidth Internet connectivity, the absence of more studies on online clinical training appears to be a gap in research and practice. If current or recently completed studies on developing Web-based or new training curricula or tools are effective, they could be used to reach a larger audience.

TRANSLATING RESEARCH INTO PRACTICE

Translating research into practice can be thought of in different ways, depending on the context. For example, a laboratory scientist may be interested in how the basic science of cell lines or animals can be translated to humans. A researcher conducting a clinical trial may be interested in how the results in a controlled experimental setting are translated to the general population in a real-world setting. A health care administrator may be interested in taking a body of evidence and translating it to clinical practice guidelines. To distinguish between types and contexts of translation, investigators sometimes think of translation as a continuum of activities (see Table 9-3). All research does not have to go through each stage of translation, nor does the translation have to be linear; some research may move directly from an early stage to direct application.

The committee recognizes the importance of conducting basic research that translates from animal models to healthy humans and to clinical and trauma-exposed populations. Basic research on physiological and biologi-

TABLE 9-3 The Continuum of Translation Research

Translational Phase	Notation	Types of Research
1	Discovery to candidate health applications	Phases I and II clinical trials; observational studies
2	Health application to evidence-based practice guidelines	Phase III clinical trials; observational studies; evidence synthesis and guidelines development
3	Practice guidelines to health practice	Dissemination research; implementation research; diffusion research Phase IV clinical trials
4	Practice to population health impact	Outcomes research (includes many disciplines); population monitoring of morbidity, mortality, benefits, and risks

SOURCE: Modified from Khoury et al., 2007, with permission.

cal mechanisms potentially relevant to PTSD has used primarily animal models (Almli et al., 2014; Neumann et al., 2011; Pitman et al., 2012) because this research could not be ethically conducted in humans. These models are vitally important to understanding many of the neurobiological principles governing learning, memory, trauma, and stress. However, this research has limited usefulness if its applicability to and modification by the complex cognitive, social, and emotional factors typical of human experiences cannot be explored. Animal models also cannot capture the impacts of social factors, including such emotions as shame and guilt; social structures; cultural attitudes; or the complex cognitive abilities in people that may change the expression and persistence of PTSD symptoms. Basic research that explores the psychological and biological mechanisms of learning, memory, trauma, and stress in people should be expanded to include psychological and neurobiological mechanisms in healthy people and in trauma-exposed military populations. Unless a broad range of researchers can access relevant populations to conduct studies on how trauma exposure and PTSD influence the brain or behavior, the applicability of basic research to treatments for PTSD will continue to be limited. New research models—for example, pragmatic trials, practical clinical trials, and hybrid effectiveness–implementation trials—may be useful for addressing the common translational gap between randomized controlled trials and clinical practice (Curran et al., 2012; Tunis et al., 2003). Translational research can provide feedback from population-based studies of new interventions that lead to their modification and eventual implementation as evidence-based interventions for a variety of populations (Glasgow et al., 2012; Zatzick and Galea, 2007).

NIH has made an effort to streamline the translation of mental health research to the clinic. The NIMH Research Domain Criteria Project is defining functional dimensions, such as fear circuitry or working memory, that will be studied in multiple dimensions, including genes, neural circuits, and behavior. The project's goal is to translate progress in basic neurobiological and behavioral research to an improved and integrated understanding of psychopathology and the development of new and optimally matched treatment for mental disorders (NIMH, 2013a). In addition, NIH is revising its clinical trials process to make NIH-funded research more efficient, to encourage data sharing and publication, and to have a greater impact on the burden of illness. Emphasis is being placed on target validation and experimental therapeutic studies instead of traditional efficacy trials in an effort to identify new targets for treatment and to improve knowledge of the disease process (NIMH, 2013b). The committee commends NIH for these efforts, and it encourages DoD and VA to use best practices learned from NIH to improve the efficiency and transparency of their own mental

health research and to continue to use such collaborative mechanisms as the National Research Action Plan.

TECHNOLOGY

The last decade has seen a dramatic increase in the use of innovative digital technologies, such as mobile devices, high-speed network access, smart televisions, social media, hyperrealistic computer and video games, and new interaction and behavioral sensing devices. The power of these technologies to automate processes and create engaging user experiences has led to health care applications that leverage off-the-shelf technology and push the boundaries of new technological development.

An increased focus has been placed on the use of technology to enhance the management of and treatment for PTSD and comorbid health conditions. DoD and VA have driven advances in mental health care technology by supporting research to improve the delivery of evidence-based treatments for mental health conditions and to reduce barriers to care by investigating ways to improve the awareness of, availability of, access to, appeal of, acceptance of, and adherence to evidence-based treatments and services (IOM, 2012). Technology-based advances in mental health care include telehealth, informational and self-help websites, mobile smartphone applications, virtual reality and online virtual worlds, intelligent health care agents, and interactive clinical training systems.

Telehealth

One of the more widely studied applications of technology in mental health is the use of telehealth (sometimes referred to as teletherapy or telemental health) to expand the accessibility of and adherence to evidence-based treatments. Telehealth refers to an approach that uses technology (typically videoconferencing) for the delivery of clinical care by a provider who is geographically distant from the patient (Schopp et al., 2006). The number of published reports on telehealth outcomes has grown exponentially since 2000, and the number of trials continues to grow (Backhaus et al., 2012). Since the committee's phase 1 report, new studies have shown encouraging results (Backhaus et al., 2012; Strachan et al., 2012), and a substantial number of projects have been funded by DoD, VA, and others to investigate the telehealth delivery of both evidence-based treatment and emerging non-evidence-based interventions that target the needs of service members and veterans who have PTSD and comorbid conditions. The research needs to be assessed to determine whether telehealth approaches for both screening and treatment offer a preferable and cost-effective approach to PTSD care (Jones et al., 2012).

Self-Help and Informational Websites

DoD and VA have supported the development of online self-help and informational websites. These efforts are intended to break down barriers to care by building user awareness of PTSD and treatment options, promoting accessibility to care with self-help content, encouraging acceptance of seeking treatment with persuasive information, and enhancing adherence by providing self-help treatment options or between-session support. Receiving PTSD-relevant content privately via the Internet may encourage those who are initially reluctant to seek help to reach out eventually to a mental health care professional.

Another new form of online deliverable treatment is the use of computerized training programs to build the cognitive skills that may help to modulate emotions. Often termed cognitive remediation therapy, this approach is a standardized intervention that involves performing cognitive exercises to improve attention, processing speed, executive function, and memory through practice by using various software packages. The committee identified six projects that evaluate cognitive remediation therapy programs as an alternative intervention for PTSD in combat veterans. One study compared a commercial program called CogPack with playing Tetris. Two projects evaluated similar computer-based systems to retrain negative attentional bias in people who have a diagnosis of PTSD and to address comorbid mild TBI. All the cognitive remediation therapy projects test the hypothesis that this form of care will promote home-based practice by using cognitive training programs that are available online.

Other DoD and VA websites intended for service members, veterans, and their families present less structured treatment activities and are generally information-rich, reviewed, and regularly updated, and present a wide array of PTSD resources, including some self-assessment materials and information on where to access treatment. Examples of the sites are the VA's National Center for PTSD (<http://www.ptsd.va.gov>), the National Center for Telehealth and Technology (T2) (<http://www.t2.health.mil>), and T2's flagship PTSD and comorbidity AfterDeployment (<http://www.afterdeployment.org>). T2 also hosts the Moving Forward site (<http://startmovingforward.t2.health.mil>), an online educational life-coaching program focused on resilience and prevention for service members and veterans who are experiencing challenges but are not yet engaged in mental health care. DoD supports the wider-ranging Military OneSource site (<http://www.militaryonesource.mil>), and there are numerous private foundation "gateway" sites, such as the Dart Foundation's Gateway to Post Traumatic Stress Disorder Information (<http://www.ptsdinfo.org>). Screening for PTSD and other psychological disorders is available for all veterans through VA's My HealtheVet website (VA, 2013), which allows all registered users of VA

health care services to access their clinical records and provides a number of wellness and health-enhancement options.

Two novel online approaches leverage interactions with virtual human characters to engage users with PTSD-related content. One project is Kognito Interactive's site Family of Heroes (<http://www.familyofheroes.com>), which offers an interactive role-playing game that teaches motivational interviewing skills to family members and helps them to recognize when their service member or veteran is exhibiting signs of PTSD, depression, or suicidal ideation. A small randomized controlled trial showed that 22% of the veterans who were approached by their family members during the study sought help for postdeployment stress. Another virtual human site is the DoD-funded SimCoach (www.simcoach.org), which engages users in an interactive discussion to provide information, advice, and conversationally delivered self-assessment.

Considering the expense and effort of creating those websites, there is a lack of knowledge about how they are used and what outcomes they produce. However, because anonymity may be a primary selling point for the sites, researchers studying the sites need to ensure that real-world users' identities are protected. As the general population increasingly views the Internet as an acceptable and natural option for shopping, education, health care information, and social interaction and bonding, the committee believes that research will continue to focus on whether and how evidence-based mental health treatment can be delivered to service members and veterans via online tools and websites. Research needs to evaluate which treatments can be delivered to which patients who have which health conditions to maximize safe access to evidence-based treatment for service members, veterans, and their significant others.

Virtual Reality

DoD and VA have supported research to create and evaluate virtual-reality exposure therapy applications. Avoidance of trauma reminders is symptomatic of PTSD and some patients are unable or unwilling to visualize traumatic events and memories effectively (Difede and Hoffman, 2002). To address the avoidance issue, virtual reality delivery of PE is one way to immerse users in personalized simulations of trauma-relevant environments in which the emotional intensity of the scenes can be controlled by a clinician. Thus, virtual-reality exposure therapy offers a way to circumvent a natural avoidance tendency by directly delivering multisensory and context-relevant cues that aid in the confrontation and processing of traumatic memories.

Favorable outcomes have been reported in several PTSD populations treated with virtual reality therapy (Difede and Hoffman, 2002; Difede

et al., 2007; Gerardi et al., 2008; McLay et al., 2011; Miyahira et al., 2012; Reger and Gahm, 2008; Reger et al., 2011; Rizzo et al., 2010; Rothbaum et al., 2001, 2014b), and five randomized controlled trials of virtual-reality exposure therapy in active-duty service member and veteran populations are under way. Those studies are assessing virtual reality alone or in combination with other enhancing treatments, such as imaginal PE, DCS, and trauma management therapy (Beidel et al., 2011; Difede et al., 2013; Reger et al., 2011). In addition to providing more and better options for PTSD treatment, virtual-reality exposure therapy may be useful for overcoming barriers to care by improving treatment appeal, acceptability, and adherence. Young service members, many of whom have grown up with digital gaming technology, may be attracted to and comfortable with participation in virtual reality therapy (Reger et al., 2009; Wilson et al., 2008).

In spite of DoD and VA efforts to foster adoption of PE as a first-line treatment, its dissemination has been a challenge, in part owing to clinician hesitancy to adopt and use it (Becker et al., 2004; IOM, 2012). Virtual reality can also be used to help meet this challenge through the use of virtual reality systems that allow a mental health care provider to create customized simulated scenarios to support patient trauma narratives more easily with a computer control interface. DoD is supporting research on training social workers to work with military families using conversational interactions with life-size, voice-interactive, high-fidelity virtual military patients and is developing a toolkit for clinical educators so that they can create virtual patients for training others. Other virtual reality projects seek to train primary care providers to screen, treat, and refer patients who have PTSD using a series of challenging menu-driven, role-play conversations with virtual patients (Albright et al., 2012). However, the attraction and adoption of virtual-reality exposure therapy still requires controlled research to determine how and to what extent this approach may break down barriers to PTSD care and enhance treatment dissemination. It also requires research to determine best practices for training providers to use and to implement the technology in DoD and VA settings.

Mobile Applications

Mobile devices, including mobile telephones, tablets, computers, e-readers, and wearable body sensors that can record various physiological measurements, can be used to wirelessly deliver health care services. Mobile applications can potentially be used to motivate and inform people and to monitor and track health measures and activities. Many of the applications (such as fitness applications and calorie counters) focus on providing information to the end user, and others provide information to clinicians via a network connection. The availability of mobile health care applications

has grown at a dramatic pace, in large part owing to the massive adoption of smartphone and tablet technology and the ubiquitous access to network connections. DoD and VA have recognized that growth and produced several PTSD and other mental health–related applications, including PTSD Coach, PE Coach, Mood Tracker, Breathe2Relax, BioZen, LifeArmor, Positive Activity Jackpot, and Tactical Breather. All the applications attempt to extend the reach of currently used practices—such as self-monitoring, self-assessment, biofeedback, CBT tactics, and relaxation strategies—via mobile devices. T2 has worked with VA to develop, test, and conduct research on the PE Coach, a smartphone application. And the center is distributing the CBT-I Coach application as an adjunct treatment for the insomnia associated with PTSD (National Center for Telehealth and Technology, 2013) and the PTSD Coach application as an educational tool. Those programs require evaluation as they are further developed and disseminated.

VA is also investing substantial effort in its Mobile Health program to evolve its mobile application portfolio. It is piloting the use of iPads that have a suite of 10 applications to 1,000 seriously injured veterans (Miller, 2013). VA applications that are available or in development include CBT-I (insomnia-focused), Acceptance and Commitment Therapy Coach, Cognitive Processing Therapy Coach, Mindfulness Coach, and PTSD Family Coach. Although much of the content in the new mobile applications is similar to that on existing informational webpages, such as AfterDeployment and the VA's National Center for PTSD, research on their use and effectiveness in a mobile format is still needed. There are practical challenges to studying the use of the technologies in DoD and VA with regard to development, dissemination, sustainability, and privacy protection, but current research efforts fit in well with the DoD and VA visions for using mobile health technologies to expand care options for service members and veterans. The creation of engaging and effective mobile health technologies will require an interdisciplinary effort by clinicians, device manufacturers, application developers, communication service providers, and patient and consumer end users, who appreciate the need to integrate portable computing devices, cloud infrastructures, network capabilities, data analytics, and human factors.

Online Clinical Training and Virtual Patients

Although human “actor” patients are the gold standard for training in medical schools, such live standardized patients are rarely available for clinical training with psychologists, social workers, and other mental health care providers. In most training, direct patient-interaction skills are acquired via role-playing with supervising clinicians, fellow graduate students, and closely supervised “on-the-job” training. Virtual patient

systems offer a novel technological approach to address the training needs of health care providers, and these systems take many forms (Talbot et al., 2012). Basic applications can be as simple as providing trainees with static patient images and accompanying text-based case summaries and tests. Simple computer animations can also be used, with interactions driven by trainee menu choices. More recently, virtual human conversational agents have been created that can credibly fill the role of standardized patients by simulating diverse varieties of clinical presentations. These agents can be available for anytime–anywhere training via computer.

As mentioned in the section on training, DoD and VA are funding a few studies to assess the use of virtual reality for training (see also Appendix E). Such prototype systems, designed for interacting with highly realistic and natural-language-capable virtual patients, do not yet have an evidence base for their effectiveness for training. However, if found to be effective, virtual patient technology could have a considerable impact by supplementing existing in-person training approaches.

SUMMARY

Executive Order 13625 and *The National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families* established PTSD as a high national research priority. The committee found the ongoing PTSD research portfolios of DoD and VA to be broad, diverse, and complementary. Over the last few decades, the departments have spent hundreds of millions of dollars on PTSD research. Much of DoD's currently funded PTSD research centers on treatment, basic science, and prevention. VA's PTSD research portfolio focuses on treatment, barriers, and basic science. Those research priorities reflect the mental health needs of the service member and veteran populations that each department serves and are reflected in the types and numbers of studies that are funded (see Table 9-2). In DoD, PTSD research represents approximately 60% of the mental health research portfolio (Miller, 2014). VA funding for PTSD has been stagnant over the past 5 years (Gleason, 2012), despite the growing prevalence of PTSD in veterans seeking care in VA.

The committee identified areas of research that are critical to improving PTSD management for service members and veterans—basic research, use of technology, PTSD treatment, and overcoming system-level barriers. Much work is being accomplished in basic research, but the scientific community still lacks an understanding of the biological mechanisms that lead to PTSD, factors that may prevent or promote its development, and biomarkers that could improve PTSD prevention, diagnosis, and treatment.

PTSD researchers are trying to identify more and better treatments, such as psychotherapies, pharmacotherapies, combinations of therapies,

and complementary and alternative therapies. Identifying treatments for PTSD and any comorbidities is particularly important, considering the high prevalence of mental health disorders, such as depression and substance use disorder, and physical ailments, such as TBI and chronic pain, in many service members and veterans who have PTSD. Such comorbidities as cardiovascular disease, are likely to increase as the veteran population ages.

The use of technology to improve the management and treatment of PTSD has potential to improve treatment options, clinical practice, and real-time contact with service members and veterans. Technology is also expanding the use of system-wide approaches to better capture and monitor patient treatments and outcomes in a systematic and continuous manner, but questions remain as to whether such technological enhancements will achieve improved treatment delivery and outcomes.

Given the current and growing number of service members and veterans who have PTSD symptoms and the availability of effective treatments for PTSD, a topic of research that is often overlooked but would be beneficial in the short term is methods to overcome barriers that prevent the widespread use of effective treatments in DoD and VA health care systems. This may include research on health services, effective models for PTSD management, the establishment of evidence-based practice competencies, provider training, and the effective implementation and dissemination of evidence-based care. The committee encourages research on all those subjects and new efforts to be undertaken.

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10

Findings and Recommendations

Posttraumatic stress disorder (PTSD) has entered the national consciousness as one of the signature injuries of the conflicts in Afghanistan and Iraq. Almost daily newspaper accounts document the travails faced by service members and veterans as they attempt to deal with the nightmares, flashbacks, and isolation that PTSD can cause. Although many service members and veterans seek help for their symptoms, many do not, because they do not believe that they have a problem, they do not see their symptoms as something that can be treated, or they are reluctant to be labeled as having a mental health problem. It is clear that the number of service members and veterans who have symptoms of PTSD and the number in the subset who seek treatment in the Department of Defense (DoD) military health system and the Department of Veterans Affairs (VA) health care system have dramatically increased since the start of the conflicts in Afghanistan and Iraq. DoD and VA each have a responsibility to provide the best possible care for PTSD and to reach out to all who might need and benefit from it.

In its phase 1 report, the committee offered five overarching recommendations and seven more detailed recommendations for improving DoD and VA programs, services, and facilities for the prevention and diagnosis of and treatment for PTSD (see Chapter 1). The committee continues to believe that those recommendations are appropriate and supported by this phase 2 report and that their implementation would result in improvements in the PTSD management systems in both departments.

In the following sections, the committee presents its findings and recommendations, which build on those in its phase 1 report. The recommen-

dations in this report are informed by the committee's fact-finding efforts conducted during both phases of the study.

FINDINGS AND RECOMMENDATIONS

PTSD Management Strategies

Recommendation A: DoD and VA should develop an integrated, coordinated, and comprehensive PTSD management strategy that plans for the growing burden of PTSD for service members, veterans, and their families, including female veterans and minority group members.

The departments should coordinate their strategies and activities to encourage the use of best practices for preventing, screening for, diagnosing, and treating for PTSD and its comorbidities. The coordination should extend to ensuring continuity of care as service members transition from active duty to veteran status. This strategy should embrace a population-based approach to PTSD and be applicable to all service members and eligible veterans in a catchment area, not only those now receiving treatment in DoD and VA facilities.

Through its review, the committee found that PTSD management in DoD appears to be local, ad hoc, incremental, and crisis-driven with little planning devoted to the development of a long-range, population-based approach for this disorder by either the Office of the Assistant Secretary of Defense for Health Affairs [OASD(HA)] or any of the service branches. Each service branch has established its own prevention programs, trains its own mental health staff, and has its own programs and services for PTSD treatment. The under secretary of defense for personnel and readiness and the assistant secretary of defense for health affairs (ASD[HA]) have not developed a comprehensive plan for mental health generally or PTSD specifically. Although the ASD(HA) has issued some directives and instructions that apply to all service branches, implementation typically is at the discretion of each service branch's surgeon general, installation commander, or even military treatment facility (MTF) leaders. The committee recognizes that, in part, such stovepiping of responsibility is inherent in the organizational structure of DoD and serves a purpose, given the different mission and culture of each service branch, but these differences do not preclude a more systematic and integrated approach to PTSD management. Standardization and consistency of PTSD programs and services among facilities and service branches are not evident, and they often appear to have been developed and sustained at the local level without coordination with similar programs on other installations. Although the Defense Centers of Excel-

lence for Psychological Health and Traumatic Brain Injury should have a major role in cataloging and coordinating PTSD programs and services and in developing a comprehensive strategy for PTSD management among the service branches and at the OASD(HA), this has not been the case, and its effect on PTSD management in DoD appears to be minor.

The committee found that VA has a more unified organizational structure than DoD and is able to ensure a more consistent approach to PTSD management among all the veterans integrated service networks (VISNs) and down to the medical center level. VA uses its *Uniform Mental Health Services in VA Medical Centers and Clinics* handbook as a strategy document, but the handbook contains primarily program-specific requirements. The handbook does not address the need for new or expanded programs, such as those for female veterans.

VA does have 5-year strategic plans (2011–2015 and 2014–2020) to improve the quality and accessibility of its health care, and specifically mental health, in part by increasing capacity and outreach to veterans and their families and expanding care for both new and aging veterans. There are few data, however, to indicate that the five performance measures for mental health in the 2011–2015 plan are being met 4 years into the plan. Although improving mental health is one of VA's 16 major initiatives in the strategic plan, highlighting improved PTSD care as a specific major initiative might increase the visibility of this high-priority disorder and help to focus attention on the growing population of veterans who have it.

DoD and VA have been working together to improve integration and coordination of their mental health efforts, but much work remains to be done. One result of this collaboration is the 2011 DoD/VA Integrated Mental Health Strategy (IMHS), which has four strategic goals and 28 strategic actions; the latter include operating plans and performance metrics. Addressing these goals and actions may alleviate some of the communication and coordination issues between the departments. Although the IMHS was developed to provide a comprehensive public health approach to mental health management in DoD and VA, it is not PTSD-specific and the committee found little information and no formal reports on the status of the strategy's implementation.

DoD, VA, and other federal departments are also coordinating and collaborating on such other efforts as the *National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families*. The plan, discussed in Chapter 9, focuses on enhancing scientific research on mental health, fostering effective treatments, and reducing the incidence and prevalence of PTSD and other mental health disorders. Other coordinated activities include the development and updating of the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress* and locating VA liaisons on military installations to

assist service members as they transition from active-duty to veteran status. The committee acknowledges those efforts but finds that they fall short of an integrated, coordinated, and collaborative approach to PTSD management. The committee expects that the development and implementation of a DoD and VA comprehensive strategy for PTSD management will need to begin with and be sustained by the highest administrative levels in each department.

Leadership and Communication

Recommendation B: DoD and VA leaders, who are accountable for the delivery of high-quality health care for their populations, should communicate a clear mandate through their chain of command that PTSD management, using best practices, has high priority.

DoD and VA leaders set the priorities for PTSD care. If it does not have high priority for executive leadership, it will not have high priority for DoD and VA line staff. Authority, responsibility, and accountability for PTSD management should begin at the central office level (that is, at least at the level of the DoD ASD(HA) and the VA under secretary for health) and extend down to facility leaders and unit leaders. Only if local leaders are empowered can effective change occur, but the organizational environment embodied by executive leaders needs to encourage and reward such change. Leaders also should be responsible for all service members or eligible veterans in their catchment areas, not only those who are receiving treatment for PTSD in their facilities.

In DoD, and in each service branch, unit commanders and leaders at all levels of the chain of command are not consistently held accountable for implementing policies and programs to manage PTSD effectively. Furthermore, in each service branch, there is no overarching authority to establish and enforce policies for the entire spectrum of PTSD management activities (prevention, screening, treatment, and rehabilitation). Instead, prevention programs belong to the under secretary of defense for manpower and readiness. Mental health care belongs to medical commands under the office of the surgeon general in each service branch or the ASD(HA). Despite the recent creation of the Defense Health Agency to consolidate responsibility for health care, prevention programs remain under a different line of authority.

Leadership accountability encompasses both personnel and responsibilities. For example, in VA, leadership accountability includes the actions of PTSD program managers, directors of mental health departments, and facility, VISN, and central office leaders. In this capacity, leaders are responsible for diverse activities—from plans for managing the comorbidities of

aging veterans who have PTSD to establishing and maintaining standards of care from purchased care providers, using outcome data to improve care, and ensuring that PTSD management is population based.

The committee found that lack of communication among mental health leaders and clinicians in DoD and VA can lead to duplicative, expensive, ad hoc, and perhaps ineffective programs and services while other programs, that may be effective, languish or disappear. Variability in leadership engagement in PTSD management in both DoD and VA can result in similar variability in the types and quality of the PTSD programs and services that are available to service members and veterans. The committee found in its site visits that the installations and medical centers that had the most coordinated PTSD treatment and the most options for their patients appeared to be the ones that had strong leadership and excellent communication among providers and support staff.

Finally, effective leadership extends to supporting innovation in processes and approaches to treatment for PTSD. Results of such innovations should be measured and evaluated. Leaders (and their staffs) should not be penalized if well-designed and well-executed programs, services, and processes are not successful; however, if they are successful, leaders should be responsible for disseminating them.

Performance Measurement

Recommendation C: DoD and VA should develop, coordinate, and implement a measurement-based PTSD management system that documents patients' progress over the course of treatment and long-term follow-up with standardized and validated instruments.

The system should collect data to identify best practices along the spectrum of DoD and VA PTSD programs and services. Elements of this management system include:

- *Use of standard metrics to screen for, measure, and track PTSD symptoms and outcomes throughout DoD and VA. The departments together should work with the National Quality Forum to endorse consensus clinical measures and quality indicators.*
- *Health information technology that documents all the PTSD treatments that a patient receives and his or her progress in such a way that collected data are available in real time to the provider and can be aggregated at the provider (whether direct care or purchased care provider), program, facility, service, regional, and national levels.*

- *Performance measures to inform and improve the system via integrated feedback loops, which should be used by leaders at the local level (installation, MTF, medical center or community-based outpatient clinic [CBOC]), the regional level (service branch or VISN), and the national level (DoD and VA) to evaluate and improve PTSD management continuously.*

Given that DoD and VA are responsible for serving millions of service members, families, and veterans, the committee found it surprising that no PTSD outcome measures of any type are consistently used or tracked in the short or long term (with the exception in the specialized intensive PTSD programs [SIPPs] in VA). That is even more problematic inasmuch as both departments have expanded their provider workforce, begun to give priority to patient-centered and evidence-based treatments, and expanded access to care by using telehealth and other approaches. Without tracking outcomes, however, neither department will be able to ascertain the value of those actions or whether they are effective in providing appropriate or adequate care for PTSD. Furthermore, neither department currently uses continuous measurements of patient progress to guide and manage patient treatment. Reliable and valid self-report measures, such as the PTSD Checklist (PCL), are available and could be used to monitor patient progress, provide real-time response information to clinicians and patients, and guide modifications of individual treatment plans.

DoD is moving toward the use of a measurement-based PTSD management system, but progress has been slow, and implementation throughout the service branches is incomplete. The Army has developed and rolled out its Behavioral Health Data Portal (BHDP) in its MTFs, and the Air Force and Navy will also be using the portal to standardize data collection. One advantage of the BHDP is that service members will complete a PTSD assessment before each mental health appointment, and their responses will be available to their clinician during their appointments. The BHDP will provide real-time and aggregate data to clinicians and leaders; however, the system is in its infancy and no information on outcomes or provider and patient satisfaction has been reported. Moreover, no outcome data are available for any of the DoD specialized PTSD programs with the exception of a small amount of short-term outcome data from the National Intrepid Center of Excellence, which treats service members who have severe PTSD and traumatic brain injury.

VA is also expanding the PTSD treatment data that are captured in veterans' electronic health records. It is modifying the records so that clinicians are able to enter the types of psychotherapy that patients are receiving, but the committee is aware of no plans to include regularly administered outcome measures, such as PCL scores. The committee notes that through-

out the almost 4 years of its deliberations, implementation of the revised electronic health record system was reported by VA to be imminent but it had not occurred at the time of this report's publication. Although the committee was not asked to review or comment on the funding available for the technological improvements suggested in this recommendation, it recognizes that the costs of integrating, or even modifying, the DoD and the VA electronic health records are substantial. Both the President and Congress need to be aware of those costs as DoD and VA move forward with their efforts to manage PTSD. An integrated, comprehensive strategy promulgated by senior DoD and VA leaders regarding institutional priorities would help to address such issues.

Vet Center providers do not enter information to a veteran's electronic health records, although some providers are able to see sections of the veteran's VA record. The committee does not specifically include Vet Centers in this recommendation, but it hopes that this issue will be discussed by VA (with input from veterans) because approximately 46,000 veterans who have PTSD receive care in both a Vet Center and a VA medical facility.

VA has been collecting information on its specialized outpatient PTSD programs (SOPPs) and SIPPs for many years and compiles the data in its annual internal publication *The Long Journey Home*. Outcome data (such as PCL scores) are collected before and 4 months after treatment only for veterans in a SIPP, and it appears that on the basis of those data, many of the patients in those programs show little improvement after treatment. The committee does not endorse the continued use of these specialized programs without additional data on their effectiveness and sees no reason why such outcome data should not be collected.

Finally, most veterans who have PTSD receive care in generalized mental health clinic or primary care clinics. Data are lacking on how many of those patients receive the recommended course of an evidence-based treatment; whether patients can choose a preferred evidence-based treatment; whether the treatments are effective in the long term; or whether there are benefits to using other treatments, such as complementary and alternative therapies. That lack of information raises concerns inasmuch as VA reported that in 2013 only 53% of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans who had a primary diagnosis of PTSD received at least eight psychotherapy sessions within a 14-week period—far short of the target of 67%.

Workforce and Access to Care

Recommendation D: DoD and VA should have available an adequate workforce of mental health care providers—both direct care and purchased care—and ancillary staff to meet the growing demand for PTSD

services. DoD and VA should develop and implement clear training standards, referral procedures, and patient monitoring and reporting requirements for all their mental health care providers. Resources need to be available to provide the necessary infrastructure to facilitate access to mental health programs and services.

Such standards, procedures, and requirements will help to ensure that providers are trained in evidence-based treatments that are consistent with the VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress understand military culture, measure the progress of patients on a continuing basis, and, in the case of purchased care providers, coordinate with patients' DoD or VA referring providers regularly. DoD and VA should establish procedures, based on clinical status and patient preference, for referring patients to the most appropriate available purchased care providers. Activities to bolster the current mental health workforce might include:

- *Providing sufficient mentoring and supervision to trained staff to ensure that evidence-based treatments are delivered with fidelity to their manuals.*
- *Evaluating and improving incentives for recruiting and retaining mental health care workers—both direct care and purchased care providers—in an increasingly competitive hiring environment.*
- *Ensuring that DoD and VA staff have sufficient resources (such as space, time, equipment, and incentives) to provide high-quality PTSD care. That might mean expanded facilities, reduced provider workloads, and recruitment and retention incentives and benefits.*

DoD and VA have greatly increased the number of mental health care providers in their departments, including those who have been trained in evidence-based psychotherapies, typically prolonged exposure (PE) therapy and cognitive processing therapy (CPT). As of 2013, almost 5,000 VA providers had been trained in CPT, more than 1,800 in PE, and 1,200 in both. Despite these increases, DoD and VA data and the committee's site visits indicate that mental health staffing has not kept pace with the growing demand for PTSD services. Such staffing shortages can result in clinicians' not having sufficient time to provide the evidence-based psychotherapies readily and with fidelity.

Staffing shortages in DoD and VA have also resulted in increased use of purchased care providers. However, neither department appears to have formal procedures for evaluating the qualifications of those providers, mechanisms for determining the best purchased care provider for an indi-

vidual patient, or requirements that such a provider inform the referring provider about a patient's progress. The committee found this lack of oversight and standards of care for purchased care providers to be particularly problematic.

Efforts are under way in VA to coordinate and standardize the use of purchased care providers via the Patient-Centered Community Care initiative, which has been piloted for 4 years in four VISNs. The initiative requires that purchased care providers be screened to ensure that they meet or exceed VA standards for credentialing, licensing, and specialty care. It also requires that purchased care providers share their patient files with VA providers to ensure continuity of care. The program is in its initial implementation phase, so its impact on improving the quality of purchased care cannot yet be assessed. DoD does not appear to have a similar mechanism for ensuring that its purchased care providers are trained in and using evidence-based treatments or that service members are accessing the most appropriate providers.

Both departments offer training in military culture to direct care providers. DoD has recently issued guidance that requires all new hires, both direct care and purchased care providers, to be trained or have experience in military culture and terminology. VA does not have a similar requirement.

Recruiting and retaining mental health care providers can be challenging, especially in less than desirable areas and where there is competition from other health organizations. Both DoD and VA acknowledge that it can be difficult to hire and retain staff in underserved areas, despite targeted efforts to do so. DoD and VA can help to ensure a supply of providers through expanded formal training programs with academic institutions, whereby students train at the medical facilities and then may be recruited for permanent positions.

Mental health staff in the PTSD management system should be given appropriate recognition and rewards on the basis of identified goals (such as decreasing wait times, using evidence-based treatments, or being trained in a preferred modalities) to reinforce desired behaviors and outcomes. The corollary to such a reward system is the need to discourage the use of services or programs that lack an evidence base or whose evidence base has been eclipsed by research. Although the committee understands that it is difficult to change practice patterns, it believes that there are opportunities and strategies that DoD and VA can use to encourage and promote such changes.

The committee believes that each department can determine its own staffing needs—including how to allocate current and future staff, whether to hire more or different providers, whether to expand the use of purchased care providers, and how to determine training needs—to meet the goal of providing high-quality, evidence-based care to service members and vet-

erans who have PTSD. Therefore, it has not given specific staff-to-patient ratios or other metrics inasmuch as these may be interpreted as prescriptive and not simply as examples. Although it may be necessary to expand the number of staff to meet needs, it may be possible to achieve equal or better results with more efficient use of existing staff and with the use of more effective programs and services by that staff.

Evidence-Based Treatment

Recommendation E: Both DoD and VA should use evidence-based treatments as the treatment of choice for PTSD, and these treatments should be delivered with fidelity to their established protocols. If innovative programs and services are being developed and piloted, they should include an evaluation process to establish the evidence base on their efficacy and effectiveness.

DoD and VA should use their VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress to inform the delivery of all PTSD treatments. Existing programs and services that lack an evidence base should also be evaluated along with new programs.

The best available evidence should guide all DoD and VA PTSD treatment programs. The departments have expended considerable effort to develop, update, and disseminate the *VA/DoD Clinical Practice Guideline for Management of Post-Traumatic Stress*. The guideline presents algorithms for choosing an evidence-based treatment for PTSD, addresses the treatment of comorbidities, and discusses the evidence or lack thereof for psychosocial therapies and pharmacotherapies that do not rise to the level of a first-line treatment. The committee was concerned to learn that mental health care providers in both departments do not consistently provide evidence-based treatment at levels that would be expected in a high-performing PTSD management system. DoD and VA have policies that recommend that all service members and veterans who have PTSD receive PE and CPT (first-line treatments in the guideline).

There are many reasons why a service member or veteran might not receive a first-line psychotherapy including heavy workloads (both number of patients and ancillary duties), lack of time to schedule patients for the requisite number of visits in the recommended time, and patients' not being ready to engage in trauma-focused therapy. To help engage patients in treatment, DoD and VA are also integrating complementary and alternative therapies into some of their specialized PTSD programs. The effectiveness of these adjunctive treatments needs to be studied to ensure that their use does not deter patients from receiving first-line treatments.

In many cases, the committee was unable to determine what, if any, therapies most service members or veterans who have PTSD receive in any care setting and whether the care they receive results in improvements. Treatment options are not always consistent in installations within or among the service branches or in all VA medical centers, and it is not clear that treatment plans are based on patients' preferences. For example, although each VA medical center and large CBOC is required to offer PE and CPT, in 24 of 166 specialized outpatient programs only 10–30% of veterans who had PTSD received any type of treatment in 2012. Strategies for transitioning patients who have more severe PTSD from primary care or general mental health care to specialty care and back once treatment in specialty care has effectively intervened are also necessary.

Delivery of evidence-based treatment for PTSD is a concern for DoD and VA, and they are exploring approaches to deliver them more expeditiously. In some cases, that includes the use of technological applications that extend the reach of clinical care and service delivery. Some of the technologies being used include virtual reality PE, treatment sessions via videoconferencing, patient avatars for training clinicians, and mobile applications for patients and providers. The use of telehealth is expanding, but the committee cautions that pilot programs and studies need to be conducted to build the evidence base on their effectiveness.

Central Database of Programs and Services

Recommendation F: DoD and VA should establish a central database or other directory for programs and services that are available to service members and veterans who have PTSD.

Programs in the directory should be described (including current contact information), evaluated according to standardized measures, and updated routinely. This programmatic information should be readily available and easy to navigate for all stakeholders, including direct care and purchased care providers and families.

Currently, there is no single, central resource of PTSD programs and services that are available throughout DoD and only a limited directory of programs available in VA. In the absence of a central directory of programs and services, the committee found it impossible to compare programs and services, to identify the ones that are effective and use best practices, and to recognize the ones that need improvement or should be eliminated. The committee and other organizations have found the lack of a central resource to identify PTSD programs and services in DoD and, to a smaller extent, in VA to be frustrating. The frustration stems from an inability to identify

what PTSD programs and services are available in DoD and the service branches and, in VA, what resources each program has and whom it treats, and the goals of the programs and how they determine success.

DoD has a variety of PTSD programs in the service branches. However, many of the clinicians and other mental health care providers with whom the committee spoke seemed to be unaware of the range of programs to which they might refer service members who needed more PTSD care than they were able to provide. VA maintains a catalog of specialized PTSD programs with its *The Long Journey Home* annual report, but the report does not include all PTSD treatment settings, such as general mental health clinics and women's health clinics, and it does not contain descriptive information on any of the programs. Existing resources, such as the National Center for PTSD, could be leveraged to develop more comprehensive information about VA-wide PTSD programs and services (not just specialized ones) and include those of DoD.

The lack of information on existing programs and services and whether they are effective has led many caring and thoughtful clinicians to develop their own PTSD programs. In the absence of information on whether those programs are successful in treating for PTSD and of dissemination of that information outside a single location, best practices cannot be identified and communicated to a wider audience. For example, each service branch has developed and implemented a service-wide combat and operational stress control program without first piloting the program to determine whether it is effective in reducing stress reactions.

Family Involvement

Recommendation G: DoD and VA should increase engagement of family members in the PTSD management process for service members and veterans.

The DoD has a variety of resources to assist service members, their families, and others in their support networks to learn about PTSD, its diagnosis and treatment, and its impact on family and friends. Many support and prevention services are available to service members and their family members in military installations, such as chaplains, military and family life counselors, family advocacy programs, Marine Corps community services, Families OverComing Under Stress, Military OneSource, and peer support groups. Personnel in those programs and services are trained to recognize early symptoms of PTSD, provide nonclinical supportive care, and refer service members and their families to appropriate professional care. They can also deliver psychoeducation, training, screening, counseling, and social support for service members and their families as an adjunct to professional

mental health treatment. In many DoD mental health settings, couple or family therapy for service members who have PTSD and the family members they designate is provided by professional mental health care providers. These providers include clinical social workers, counseling and clinical psychologists, and marriage and family therapists. In spite of the variety of support services available on installations or in the community, family members—including spouses, partners, children, and parents—are often unsure of where to get information about PTSD, how to encourage a service member to seek treatment, and how to assist them with their treatments.

VA also has resources for families of veterans who have PTSD, such as the National Center for PTSD, but it does not provide health care for veterans' dependents. Some veterans have expressed great interest in having their partners involved in their PTSD treatment and the need for support groups for their partners. However, there is no formal VA-wide program for engaging family members in veterans' treatment, for providing psychoeducation in a facility, or for establishing support groups. In several VA mental health programs, veterans who have PTSD, their partners, and their children receive couple or family therapy from professional clinicians. In addition, VA provides peer support in its facilities and through the Make the Connection website. Peer counselors and peer support groups appear to be helpful in engaging veterans in treatment, reducing stigma, and promoting empathy, but data on the number of veterans who seek treatment as a result of peer counseling or who participate in support groups are not available. Finally, the committee learned that some VA facilities have too little space for support group meetings, potentially limiting the number of these programs that exist or could be created.

During site visits, service members and veterans stated that their spouses would benefit from PTSD education programs. They often expressed a preference for family-based PTSD interventions over individual treatment that excluded their family members. Only a few studies have examined whether family therapy improves PTSD outcomes in service members or veterans, but studies of couple therapy and family therapy are building the evidence base for their efficacy. Several studies on couple therapy for treating PTSD have found it to be effective in reducing PTSD symptoms and enhancing relationship satisfaction.

Research Priorities

Recommendation H: PTSD research priorities in DoD and VA should reflect the current and future needs of service members, veterans, and their families. Both departments should continue to develop and implement a comprehensive plan to promote a collaborative, prospective PTSD research agenda.

Given the high prevalence of PTSD in service member and veteran populations, both DoD and VA need to ensure that they are investing an appropriate portion of their research efforts in PTSD. The following should be major foci of PTSD-related research:

- *Increasing knowledge of how to overcome barriers to implementation, dissemination, and use of evidence-based treatments to improve the accessibility, availability, and acceptability of effective PTSD treatments for patients and their families.*
- *Increasing knowledge of basic biological, physiological, psychological, and psychosocial processes that lead to the development of more and better treatments for PTSD.*
- *Developing markers—biological, physiological, and psychological—to identify better approaches for PTSD prevention, diagnosis, and treatment.*
- *Preventing the development of PTSD before and after trauma exposure.*
- *Developing and rigorously assessing new interventions and delivery methods (pharmacological, psychological, somatic, technological, and psychosocial) for PTSD and comorbidities.*
- *Understanding the heterogeneity of PTSD presentations and predicting responses to treatment for them in different populations (such as populations that differ in sex, race, ethnic group, age, or cohort of service) and at different times in the course of the disorder.*
- *Improving the quality of mental health services, identifying effective care models, establishing evidence-based practice competencies, and developing methods to enhance effective training in and implementation and dissemination of those competencies.*

There can be substantial barriers to conducting PTSD research within and between the departments and in collaboration with academic and government organizations and private partners. There does not appear to have been a systematic effort by either department to identify those barriers or identify mechanisms to overcome them. Nevertheless, DoD and VA are funding broad PTSD research portfolios and are working collaboratively with the National Institutes of Health (NIH), other organizations, and academe to fill research gaps (for example, developing the joint *National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families* for improving access to mental health services), but much work remains to be done.

The committee conducted an in-depth review of the research being conducted by DoD, VA, and NIH, but it did not conduct a formal gap

analysis, nor did it seek to determine the quality and details of the research, for example, whether one drug should be studied more than another. In particular, research on treatment and technology is advancing rapidly and numerous studies are being conducted to identify new treatment modalities, new delivery methods, and mechanisms to reach a larger number of patients who might benefit from the treatments.

Although basic biological research will inform an understanding of the underlying mechanisms of PTSD development and response to treatment, it may take decades to translate the findings to clinical practice. Given the current and growing number of service members and veterans who have PTSD and the availability of effective treatments for it, a more immediate research effort that may prove to be beneficial in the short term is identifying methods for overcoming the barriers that prevent the wide use of those treatments in DoD and VA.

CONCLUSIONS

DoD and VA are focusing substantial efforts on addressing PTSD in service members and veterans. Those efforts have resulted in numerous programs and services and much research support in both departments for the prevention and diagnosis of, treatment for, and rehabilitation of PTSD and its comorbidities. However, in spite of well-intentioned and often innovative efforts to provide high-quality PTSD management, the committee found that neither department knows whether its many programs and services are effective in reducing the prevalence of PTSD in service members or veterans. It may be that current efforts are beneficial in the long term or that new approaches are necessary, but the committee believes that, until prevention and treatment outcome data are collected, analyzed, and evaluated at all organizational levels, it will be impossible to determine the success of any of those efforts.

The committee recognizes that DoD and VA are enormous, complex, and dynamic government organizations that have numerous responsibilities and obligations not only to service members and veterans—and in many cases, their families—but also to the President, who establishes their budgets; to Congress, which funds them and provides oversight; and to the American public. Both departments are capable of dramatic, and in some cases rapid change, but most changes must go through long, involved approval processes. Therefore, the committee tried to avoid being overly prescriptive in its recommendations in the belief that both DoD and VA should have flexibility in implementing them. Many of the administrative, technical, and scientific challenges that DoD and VA face in providing population health-based, high-quality PTSD management are not specific to them and may be found in other large health care systems, but that

does not mean that the departments cannot lead the way with regard to providing the best possible PTSD care. None of the challenges described in this report is insurmountable; in fact, both DoD and VA are working to overcome them. But gaps remain, and current efforts to address them can be confusing, cumbersome, and disjointed and can fall short of what would be expected of a high-performing PTSD management system. If the many dedicated and thoughtful mental health care providers and leaders that the committee spoke with during its site visits and open sessions are representative of the talent available in each department, improving short-term and long-term PTSD management for service members and veterans should be not only possible but probable.

The occurrence and impact of PTSD are not diminishing. On the contrary, PTSD prevalence is growing among the nation's service members and veterans. The committee hopes that leaders in Congress and throughout DoD and VA will consider the findings and recommendations in this report as part of an overall effort to make positive changes in the management of PTSD in both departments. Acting on the committee's recommendations can help ensure that the United States will be better prepared for the next generation of men and women who serve our country.

Appendix A

Committee Member Biographies

Sandro Galea (*Chair*) is Gelman Professor and chair of the Department of Epidemiology of the Mailman School of Public Health of Columbia University. He is a physician and epidemiologist. Dr. Galea is interested in the social production of health in urban populations. His primary focus is on the causes of brain disorders, particularly common mood-anxiety disorders and substance abuse. He has long had an interest in the consequences of trauma and conflict worldwide, including trauma resulting from the September 11 attacks, Hurricane Katrina, conflicts in sub-Saharan Africa, and the wars in Iraq and Afghanistan. Dr. Galea is an author of more than 450 journal articles, 50 chapters and commentaries, and 8 books. He is a past president of the Society for Epidemiologic Research and an elected member of the American Epidemiologic Society and of the Institute of Medicine (IOM). He served as a member of the IOM Committee on the Assessment of Readjustment Needs of Military Personnel, Veterans, and Their Families. Dr. Galea received his DrPH from Columbia University, his MPH from Harvard University, and his MD from the University of Toronto.

Kathryn K. Basham is a professor, codirector of the PhD program, and editor of *Smith College Studies in Social Work* at the Smith College School for Social Work. Her research focuses on couple and family psychotherapy for service members, veterans, and their families and survivors of childhood trauma. Dr. Basham has served on the IOM committees that prepared *Gulf War and Health: Physiologic, Psychologic, and Psychosocial Effects of Deployment-Related Stress* and the *Provision of Mental Health Counseling Services Under TRICARE*. She recently served on the Steering Committee

cosponsored by the Council of Social Work Education to set standards for accredited curricula for graduate-level education in military social work. Other subjects of teaching and research include posttraumatic stress disorder (PTSD) and gender, intimate partner violence, intercultural clinical practice, and pedagogy and diversity. In addition to her extensive record of publications and professional presentations, Dr. Basham has received the Distinguished Clinical Practitioner award from the National Academies of Practice. Dr. Basham received her PhD from Smith College.

Larry Culpepper is a professor of family medicine at Boston University School of Medicine. He has conducted federally funded studies of depression and anxiety and is a Primary Care Fellow of the federal Health Resources and Services Administration. He received the Society of Teachers of Family Medicine Excellence in Education Award in 1991, the NAP-CRG-STFM Career Research Award in 1997, and the North American Primary Care Research Group Maurice Wood Lifetime Research Award in 2010. Dr. Culpepper is a member of the IOM. He received his MD from Baylor College of Medicine and his MPH from Boston University.

Jonathan R. Davidson is an emeritus professor of psychiatry and for 20 years served as director of the Anxiety and Traumatic Stress Program of Duke University Medical Center. He has researched and used psychotherapy, pharmacotherapy, and holistic approaches to treat people for mental illnesses. His contributions to research have been recognized with the Adolf Meyer Research Award of the American Psychiatric Association and appointments as fellow of the American Psychiatric Association, the Royal College of Psychiatrists, the American Psychopathological Association, and the American College of Neuropsychopharmacology. Dr. Davidson has served on several advisory boards and committees, including the IOM Board on the Health of Select Populations, the National Institute of Mental Health study sections, the National Center for Complementary and Alternative Medicine advisory council, and the American Psychiatric Association's *DSM-IV* Work Group for Posttraumatic Stress Disorder as cochair. He received his MD from University College Hospital Medical School, London.

Edna B. Foa is a professor of clinical psychology in psychiatry and the director of the Center for the Treatment and Study of Anxiety of the University of Pennsylvania. She is an expert in the psychopathology of and treatment for anxiety disorders, specifically PTSD, obsessive compulsive disorder, and social phobias. Dr. Foa has been author of several books and several hundred journal publications. She was named 1 of the 100 most

influential people for 2010 by *Time*. She received her PhD in clinical psychology and personality from the University of Missouri, Columbia.

Kenneth W. Kizer is the director of the Institute for Population Health Improvement of the University of California, Davis, and Target of Excellence professor in the School of Medicine and Betty Irene Moore School of Nursing. His current research interests include health care quality improvement and patient safety, health care transformation, and veterans and military health issues. He served as the under secretary for health in the U.S. Department of Veterans Affairs (VA), where he was the chief architect of the transformation of the Veterans Health Administration in the late 1990s. He was the founding president and chief executive officer of the National Quality Forum and the director of the California Department of Health Services. Dr. Kizer is an IOM member and has served as a committee member on numerous studies during the past 25 years, including most recently the Committee on the Assessment of Readjustment Needs of Military Personnel, Veterans, and Their Families and the Committee on Smoking Cessation in Military and Veteran Populations. Dr. Kizer is an honors graduate of Stanford University and the University of California, Los Angeles, where he received his MD and MPH.

Karestan C. Koenen is an associate professor in the Department of Epidemiology of the Mailman School of Public Health of Columbia University. Her research focuses on the joint roles of genetic and environmental risk factors, especially in childhood, in the development and etiology of PTSD, using a developmental epidemiologic approach. Dr. Koenen is a co-investigator in the Army study to assess risk and resilience in service members, the largest study of mental health risk and resilience ever conducted among military personnel. The study is being conducted by the National Institute of Mental Health. In addition to her teaching and research, Dr. Koenen is an experienced clinician specializing in empirically validated short-term treatments for PTSD and was a Research Fellow in Psychiatric Epidemiology. In addition to her extensive publication record, she has received numerous awards for her work, including the Chaim Danieli Young Professional Award for Excellence in Service/Research in Traumatic Stress from the International Society for Traumatic Stress Studies, the VA Special Contribution Award, and a Citation Award from the American Sociological Association for work on psychologic risks for U.S. veterans of Vietnam. Dr. Koenen earned her PhD in clinical and development psychology from Boston University.

Douglas L. Leslie is a health economist and professor of public health sciences and psychiatry at The Pennsylvania State University. In addition to his experience in health services, economics, and pharmacoeconomics, Dr. Les-

lie has worked extensively with VA, in particular with data from its administrative claims database. The primary focus of his research is on the effects of managed care and other fiscal pressures on patterns of service use and costs for the mentally ill. His other research interests and expertise include the quality of mental health care, adherence to treatment guidelines, and the cost-effectiveness of antipsychotic medications. Dr. Leslie has published numerous scientific journal articles and has received several awards for his research, including an Excellence in Mental Health Policy and Economics Research Award from the International Center of Mental Health Policy and Economics. Dr. Leslie received his PhD in economics from Yale University.

Richard A. McCormick is a Senior Scholar of the Center for Health Care Research and Policy of Case Western Reserve University/MetroHealth Medical Center. He served as director of mental health services for VA facilities throughout Ohio and adjoining areas of other states, as a commissioner for the VA Capital Assets Realignment for Enhanced Services Commission, and as cochair of the Active Duty Sub-Committee of the Department of Defense Mental Health Task Force. He is a consultant and scientific board member for two studies of returning National Guard and reserve force members and has served as a national consultant for Disabled American Veterans. His research interests include war trauma and related stress reactions, adherence to treatment among the seriously mentally ill who have comorbid medical problems, alcohol misuse and abuse, and other disorders of impulse control, such as pathological gambling. Dr. McCormick received his PhD in clinical psychology from Case Western Reserve University.

Mohammed R. Milad is an associate professor in the Department of Psychiatry of Harvard Medical School, and research scientist and director of the Behavioral Neuroscience Program of the Department of Psychiatry of Massachusetts General Hospital. His research focuses on the neural mechanisms of fear inhibition in the human brain through the use of functional magnetic resonance imaging studies and includes the role of meditation in fear modulation, the potential use of transcranial magnetic stimulation, and the role of sleep in the consolidation of fear extinction. Dr. Milad is also conducting translational research in rodents and humans to examine the influence of estrogen and other gonadal hormones on the neural circuits of fear extinction. He has been awarded the Positive Neuroscience Award by the Templeton Foundation and named a Kavli Fellow by the National Academy of Sciences. Dr. Milad was awarded his PhD *summa cum laude* in behavioral neuroscience from the Ponce School of Medicine in Puerto Rico.

William P. Nash is an assistant clinical professor of psychiatry at the University of California, San Diego, and an adjunct assistant professor

of psychology at Virginia Commonwealth University. He retired from the Navy Medical Corps with the rank of captain in 2008 after 30 years of service. He serves as a consultant in military and veteran psychologic health promotion and as the medical director of Semper Fi Odyssey, a nonprofit wounded warrior program affiliated with the Marine Corps. During his service in the Navy, Dr. Nash directed two psychiatry residency programs and clinical operations on the hospital ship USNS MERCY and served as a far-forward Operational Stress Control and Readiness program psychiatrist with the 1st Marine Division in Iraq during the 2004 Battle of Fallujah, for which he was awarded the Bronze Star. He has participated in a number of studies of combat-related PTSD and its prevention and treatment and is an author of numerous peer-reviewed articles and book chapters on military and veteran psychological health promotion. Dr. Nash received his MD from the University of Illinois College of Medicine.

Elizabeth A. Phelps is the Julius Silver Professor of Psychology and Neural Science at New York University and a research scientist at the Nathan Kline Institute. Her laboratory examines how the human brain processes emotion, focusing on three primary questions: how fear or threat responses are acquired and can be controlled or eliminated when they are no longer adaptive, how memories are altered by the emotional qualities of events, and how choices are influenced by affective responses. Dr. Phelps is a fellow of the American Association for the Advancement of Science, the Society for Experimental Psychology, and the American Academy of Arts and Sciences. She has served on the boards of directors of the Association for Psychological Science and the Society for Neuroeconomics and was a founding board member of the Society for Neuroethics. She has served as the president of the Society for Neuroeconomics and as the editor of the journal *Emotion*. She is the president of the Association for Psychological Science. Dr. Phelps received her PhD from Princeton University.

Elsbeth Cameron Ritchie is the chief clinical officer in the Department of Behavioral Health of the District of Columbia. She retired from the Army in 2010 after holding numerous leadership positions, including the position of psychiatry consultant. She trained at Harvard University, George Washington University, Walter Reed National Military Medical Center, and the Uniformed Services University of the Health Sciences (USUHS) and has completed fellowships in forensic psychiatry and preventive and disaster psychiatry. She is a professor of psychiatry at USUHS and Georgetown University. Dr. Ritchie is an expert in the management of disaster and combat mental health issues. Her assignments and other missions have taken her to Korea, Somalia, Iraq, and Cuba. She has more than 200 publications, mainly in forensics, disaster, suicide, ethics, military combat and

operational psychiatry, and women's health. Her major publications include the textbook *Combat and Operational Behavioral Health*, "The Mental Health Response to the 9/11 Attack on the Pentagon," "Mental Health Interventions for Mass Violence and Disaster," and the series in 2013 on the use of complementary and alternative medicines for the treatment of PTSD in military service members. She is currently the senior editor of the forthcoming *Forensic and Ethical Issues in Military Mental Health and Women at War*.

Albert Rizzo started the Virtual Reality Psychology and Social Neuroscience Laboratory at the University of Southern California (USC) in 1995 after practicing clinically for 9 years. He is associate director of the USC Institute for Creative Technologies and has research professor appointments with the USC Department of Psychiatry and the USC School of Gerontology. His research focuses on the design, development, and evaluation of virtual reality systems that target clinical assessment, treatment, and rehabilitation. His projects have focused on the creation of a virtual-reality exposure therapy system (Virtual Iraq/Afghanistan) for combat-related PTSD in Operation Enduring Freedom and Operation Iraqi Freedom service members and veterans. He is also working with a team that is creating artificially intelligent virtual patients for training novice clinicians in the skills required for challenging clinical interviews and diagnostic assessments related to sexual assault, resistant patients, suicide lethality, and so on. Dr. Rizzo is editor of a number of cognition and computer science journals, including *Presence*, *Media Psychology*, and *The International Journal of Virtual Reality* and has published extensively on the topic of clinical uses of virtual reality. He received his PhD in clinical psychology from the State University of New York at Binghamton.

Barbara O. Rothbaum is a professor and the director of the Trauma and Anxiety Recovery Program and associate vice chair of clinical research in the Department of Psychiatry and Behavioral Sciences of Emory University School of Medicine. Her research focuses on innovative cognitive behavioral treatments—including virtual reality, pharmacotherapy, and psychotherapy for PTSD and other anxiety disorders—and incorporates translational approaches and neurobiologic markers. She works with trauma survivors including war veterans, active-duty service members, rape survivors, and survivors of other civilian traumas. She treats chronic PTSD and intervenes in the emergency room in attempts to prevent the development of PTSD. Dr. Rothbaum has more than 200 publications, 8 books, and 2 patents and serves as an editorial board member and manuscript reviewer for more than a dozen journals. She serves on the Board of Directors of the Anxiety Disorders Association of America and is a past president of the

International Society for Traumatic Stress Studies. She received her PhD in clinical psychology from the University of Georgia.

Douglas F. Zatzick is a professor and associate vice chair for health services research in the Department of Psychiatry and Behavioral Science of the University of Washington, and serves on the research faculty of the Harborview Injury Prevention and Research Center, a level I trauma center. From 2009 to 2012, he served as chair of the National Institute of Mental Health Services in Non-specialty Settings Study Section. He has also served on the World Health Organization Stress Disorders Guideline Development Group. Over the past two decades, he has developed a public health approach to trauma-focused research that has emphasized clinical epidemiological, functional outcome, and early collaborative care intervention studies of PTSD and related comorbid conditions, including depression, alcohol and drug use problems, traumatic brain injury, and chronic medical conditions. Dr. Zatzick was formerly the chief resident in psychiatry at the Veterans Affairs Medical Center, San Francisco, and completed a VA-sponsored Robert Wood Johnson Clinical Scholars Fellowship at the University of California, San Francisco, in 1994–1996. He received his MD from the University of California, San Diego.

Appendix B

Congressional Legislation

National Defense Authorization Act for Fiscal Year 2010
Law #: Public Law 111-84
111th Congress (1st Session)

=HR2647 Skelton (D-Mo.) 10/22/09
Enrolled (finally passed both houses)

To authorize appropriations for fiscal year 2010 for military activities of the Department of Defense, for military construction, and for defense activities of the Department of Energy, to prescribe military personnel strengths for such fiscal year, and for other purposes.

SEC. 726. INDEPENDENT STUDY ON POST-TRAUMATIC STRESS DISORDER EFFORTS.

(a) Study Required.—The Secretary of Defense, in consultation with the Secretary of Veterans Affairs, shall provide for a study on the treatment of post-traumatic stress disorder to be conducted by the Institute of Medicine of the National Academy of Sciences or such other independent entity as the Secretary shall select for purposes of the study.

(b) Elements.—The study required by subsection (a) shall include the following:

(1) A list of each operative program and method available for the prevention, screening, diagnosis, treatment, or rehabilitation of post-traumatic stress disorder, including—

(A) the rates of success for each such program or method (including an operational definition of the term “success” and a discussion of the process used to quantify such rates);

(B) based on the incidence of actual diagnoses, an estimate of the number of members of the Armed Forces and veterans diagnosed by the Department of Defense or the Department of Veterans Affairs as having post-traumatic stress disorder and the number of such veterans who have been successfully treated; and

(C) any collaborative efforts between the Department of Defense and the Department of Veterans Affairs to prevent, screen, diagnose, treat, or rehabilitate post-traumatic stress disorder.

(2) The status of studies and clinical trials involving innovative treatments of post-traumatic stress disorder that are conducted by the Department of Defense, the Department of Veterans Affairs, or the private sector, including—

(A) efforts to identify physiological markers of post-traumatic stress disorder;

(B) with respect to efforts to determine causation of post-traumatic stress disorder, brain imaging studies and the correlation between brain region physiology and post-traumatic stress disorder diagnoses and the results (including any interim results) of such efforts;

(C) the effectiveness of alternative therapies in the treatment of post-traumatic stress disorder, including the therapeutic use of animals;

(D) the effectiveness of administering pharmaceutical agents before, during, or after a traumatic event in the prevention and treatment of post-traumatic stress disorder; and

(E) identification of areas in which the Department of Defense and the Department of Veterans Affairs may be duplicating studies, programs, or research with respect to post-traumatic stress disorder.

(3) A description of each treatment program for post-traumatic stress disorder, including a comparison of the methods of treatment by each program, at the following locations:

(A) Fort Hood, Texas.

(B) Fort Bliss, Texas.

(C) Fort Campbell, Tennessee.

(D) Other locations the entity conducting the study considers appropriate.

(4) The respective current and projected future annual expenditures by the Department of Defense and the Department of Veterans Affairs for the treatment and rehabilitation of post-traumatic stress disorder.

(5) A description of gender-specific and racial and ethnic group-specific mental health treatment and services available for members of the Armed Forces, including—

(A) the availability of such treatment and services;

(B) the access to such treatment and services;

(C) the need for such treatment and services; and

(D) the efficacy and adequacy of such treatment and services.

(6) A description of areas for expanded future research with respect to post-traumatic stress disorder.

(7) Any other matters the Secretary of Defense and Secretary of Veterans Affairs consider relevant with respect to the purposes of obtaining a comprehensive scientific assessment of—

(A) the incidence of post-traumatic stress disorder among members of the Armed Forces and veterans;

(B) the availability and effectiveness of various treatment programs and methods available for post-traumatic stress disorder;

(C) the current and future projected costs of such treatment programs and methods; or

(D) additional areas of needed research.

(8) Any other matters the entity conducting the study considers relevant.

(c) Reports.—

(1) INITIAL REPORT.—Not later than July 1, 2012, the entity conducting the study required by subsection (a) shall submit to the Secretary of Defense, the Secretary of Veterans Affairs, and the appropriate committees a report on the study.

(2) RESPONSE.—Not later than January 1, 2013, the Secretary of Defense and the Secretary of Veterans Affairs shall each submit to the appropriate committees a response to the report submitted under paragraph (1), including any recommendations on the treatment of post-traumatic stress disorder based on such report.

(d) Updated Reports Required.—

(1) UPDATED REPORT.—Not later than July 1, 2014, the entity conducting the study required by subsection (a) shall submit to the Secretary of Defense, the Secretary of Veterans Affairs, and the appropriate committees an update of the report required by subsection (c).

(2) UPDATED RESPONSE.—Not later than January 1, 2015, the Secretary of Defense and the Secretary of Veterans Affairs shall each submit to the appropriate committees a response to the updated report submitted under paragraph (1), including any recommendations on the treatment of post-traumatic stress disorder based on such updated report.

(e) Appropriate Committees Defined.—In this section, the term “appropriate committees” means—

(1) the Committee on Armed Services, the Committee on Appropriations, the Committee on Veterans’ Affairs, and the Committee on Energy and Commerce of the House of Representatives; and

(2) the Committee on Armed Services, the Committee on Appropriations, the Committee on Veterans’ Affairs, and the Committee on Health, Education, Labor, and Pensions of the Senate.

Appendix C

Phase 2 Open Sessions (in order by date)

August 27, 2012

NAS Keck Center, Washington, DC

- | | |
|-------------|--|
| 1:00 – 1:10 | Introduction to public session
<i>Dr. Sandro Galea</i> , Committee Chair |
| 1:10 – 2:00 | DCoE PTSD Initiatives
<i>CAPT Paul Hammer</i> , Director, Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury, DoD |
| 2:00 – 3:00 | Discussion and Lessons Learned from the RAND Review of DoD Programs for Psychological Health
<i>Dr. Carrie Farmer</i> , Policy Researcher, RAND Corporation |
| 3:00 – 4:00 | Programs for PTSD in the VA Mental Health Care System
<i>Dr. Antonette Zeiss</i> , Chief Consultant, Mental Health Services, VA |
| 4:00 – 4:15 | Public comment period (call-in number available upon request) |
| 4:15 | Adjourn open session |

October 15, 2012**William Beaumont Army Medical Facility**

Fort Bliss, Texas

All Day This open session consisted of a site visit.

October 16, 2012**Wellness Fusion Campus**

Fort Bliss, Texas

All Day This open session consisted of a site visit.

October 22, 2012**Blanchfield Army Community Hospital**

Fort Campbell, Tennessee

All Day This open session consisted of a site visit.

October 23, 2012**Behavioral Health Clinic**

Fort Campbell, Tennessee

All Day This open session consisted of a site visit.

December 10, 2012**NAS Keck Center, Washington, DC**1:00 – 1:10 Introduction to public session
*Dr. Sandro Galea, Committee Chair*1:10 – 2:10 DCoE Evaluation of DoD Psychological Health Programs
*CAPT Paul Hammer, Director, Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury, DoD*2:10 – 3:00 Tri-Service Integrator of Outpatient Programming
Systems Evaluation of Specialty Care Programs
*Commander Jerry O'Toole, Associate Director, DoD Deployment Health Clinical Center*3:00 – 4:00 Evaluation of Behavioral Health Programs in the VA
Dr. Mary Schohn, Director of Office of Mental Health Operations, VA

- 4:00 – 5:00 PTSD Research at the VA
Dr. Theresa Gleason, Office of Research and Development, VA
- 5:00 Adjourn open session

January 23, 2013**NAS Keck Center, Washington, DC**

- 11:30 – 1:30 Meeting with Wendy Funk, Kennell and Associates, to discuss data.

February 11, 2013**Naval Hospital****Camp Lejeune, North Carolina**

- All Day This open session consisted of a site visit.

April 8, 2013**Naval Hospital****Camp Pendleton, California**

- All Day This open session consisted of a site visit.

April 9, 2013**Naval Medical Center****San Diego, California**

- All Day This open session consisted of a site visit.

May 6, 2013**James J. Peters VAMC, Bronx, New York**

- All Day This open session consisted of a site visit.

June 4, 2013**VA Roseburg Health Care System, Oregon**

- All Day This open session consisted of a site visit.

July 9, 2013**VA Palo Alto Health Care System, California**

All Day This open session consisted of a site visit.

July 10, 2013**San Francisco VA Medical Center, California**

All Day This open session consisted of a site visit.

July 15, 2013**NAS Keck Center, Washington, DC**

8:00 – 8:05 Welcome and Introduction

Dr. Sandro Galea, Committee Chair

8:05 – 8:40 PTSD Overview in the Office of the Assistant Secretary
of Defense–Health Affairs

*CAPT Michael Colston, Director of Mental Health
Policy, Office of Clinical and Program Policy, Office of
the Assistant Secretary of Defense for Health Affairs*

8:45 – 10:45 Panel Discussion on Surgeon Generals' Strategy for PTSD
Care in the Services:

*Colonel John Forbes, U.S. Air Force
Colonel (ret.) Charles Hoge, U.S. Army
Commander Vincent DeCicco, U.S. Marine Corps
Dr. Keita Franklin, U.S. Marine Corps
Commander Barry Adams, U.S. Navy*

10:45 – 11:00 Break

11:00 – 12:00 National Guard PTSD Needs

RADM Joan Hunter

12:00 – 12:40 PTSD Research at National Institute of Mental Health

Dr. Thomas Insel and Dr. Farris Tuma

12:40 PM Adjourn Open Session

September 10, 2013

Edward Hines Jr. VA Hospital, Illinois

All Day This open session consisted of a site visit.

November 5, 2013

Langley Air Force Base

Langley, VA

All Day This open session consisted of a site visit.

November 6, 2013

Hampton VA Medical Center, Virginia

All Day This open session consisted of a site visit.

November 12, 2013

**National Intrepid Center of Excellence, Walter Reed National Military
Medical Center, Maryland**

Half Day This open session consisted of a site visit.

Appendix D

Centers, Consortiums, and Collaborations for PTSD Research

Program Name	Operating Source	Objective ^a
Mental Illness Research, Education, and Clinical Centers (MIRECCs)		
Mental Illness Research, Education, and Clinical Centers (MIRECCs)	Department of Veterans Affairs (VA)	MIRECCs were established by Congress to generate new knowledge about the causes and treatments of mental disorders through research, apply new findings to model clinical programs, and widely disseminate new findings through education to improve the quality of veterans' lives and their daily functioning as they recover from mental illness. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp
VISN 1 MIRECC: Dual Diagnosis	VA VA Connecticut Healthcare System	The mission of the New England MIRECC is to improve services for veterans with histories of mental illness in combination with addiction problems. These veterans have unique needs, because having two types of illness makes it more difficult to recover from either one. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp
VISN 3 MIRECC: Serious Mental Illnesses	VA James J. Peters VA Medical Center	The focus of this MIRECC is to maximize recovery for veterans with serious mental illnesses by bringing research into practice. The goal of identifying the causes and most effective treatments for serious mental illnesses is accomplished through collaborations in four core domains: research, education, clinical interventions, and evaluation. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp
VISN 4 MIRECC: Comorbidity of psychiatric disorders with physical illness and/or substance use disorders	VA Philadelphia VA Medical Center and VA Pittsburgh Healthcare System	The focus of the center is the treatment and prevention of comorbid medical, mental health, and/or substance use disorders, with the aim of improving the mental and physical health, quality of life, and outcomes of health care services for veterans with mental illness. This is accomplished through translational neuroscience, other clinical research, and health services research; education and training programs; clinical programs built on research findings; and involvement of 10 VA medical centers. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp

- VISN 5 MIRECC: Severe and Persistent Mental Illnesses
- VA
VA Maryland Health Care System
- The purpose of the VA Capitol Healthcare Network MIRECC is to develop a center for research, training, and service for veterans with schizophrenia and their families. Their work, particularly in regard to substance abuse, and mental health service systems and health care economics, extends to veterans with other severe and persistent mental illnesses as well.
Source/Program website: <http://www.mirecc.va.gov/national-mirecc-overview.asp>
- VISN 6 MIRECC: Post-Deployment Mental Illness
- VA
Durham VA Medical Center
- The Mid-Atlantic MIRECC is organized as a translational medicine center in which the overarching goal is the clinical assessment and treatment of post-deployment mental illness and related problems, and the development of novel mental health interventions through basic and clinical research. This MIRECC aims to (1) determine whether early intervention in postdeployment mental health is effective in forestalling the development or decreasing the severity of postdeployment mental illness, (2) determine what neuroimaging, genetic, neurocognitive, or other characteristics predict the development of postdeployment mental illness, and (3) assess the longitudinal course of postdeployment mental illness.
Source/Program website: <http://www.mirecc.va.gov/national-mirecc-overview.asp>
- VISN 16 MIRECC: Serving Rural and Other Underserved Populations
- VA
The MIRECC has anchor sites at five medical centers in Houston, Jackson, Little Rock, New Orleans, and Oklahoma City
- The South Central MIRECC's organizational structure includes four major components: research, education, improving clinical care, and research training. It aims to improve access to evidence-based practices in rural and other underserved populations, especially for returning war veterans, veterans experiencing natural disasters, and vulnerable elderly veterans.
Source/Program website: <http://www.mirecc.va.gov/national-mirecc-overview.asp>

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Program Name	Operating Source	Objective ^a
VISN 19 MIRECC: Suicide Prevention	VA Eastern Colorado Health Care System	The mission is to study suicide with the goal of reducing suicidality in the veteran population. To carry out this mission, members of the Rocky Mountain Network MIRECC: (1) focus on cognitive and neurobiological underpinnings that may contribute to suicidality; (2) develop evidence-based educational and clinical materials to identify and optimally treat veterans who are suicidal; (3) provide consultation regarding assessment and treatment planning for highly suicidal veterans; (4) mentor researchers in the area of suicidology; and (5) collaborate with others in the study and treatment of veterans who are at risk of suicide.
VISN 20 MIRECC: Schizophrenia, PTSD and Dementia	VA VA Puget Sound Health Care System	Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp The Northwest MIRECC applies modern genetic, neurobiological, and clinical trial methodology to the discovery and development of new and more effective treatments for major and often treatment-resistant mental disorders afflicting veterans and the active-duty combat personnel. Translational research efforts focus on treatment for PTSD and its substance abuse comorbidities (alcohol and tobacco); the chronic behavioral consequences of mild traumatic brain injury (TBI) and its objective diagnosis through biomarkers; elderly veterans with agitated dementia; and schizophrenia and the adverse metabolic consequences of antipsychotic drug therapy.
VISN 21 MIRECC: PTSD and Dementia	VA Palo Alto VA Health Care System	Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp The mission of the Sierra Pacific MIRECC is to build an integrated system of clinical, research, and educational efforts to improve the clinical care for veterans with dementias and PTSD. Dementia and PTSD share common clinical symptoms, including cognitive difficulties, sleep disorders, and agitation. This MIRECC aims to evaluate current approaches and develop new treatments for these clinical problems.

Source/Program website: <http://www.mirecc.va.gov/national-mirecc-overview.asp>

VISN 22 MIRECC: Psychotic Disorders	VA Long Beach VA Healthcare System, Greater Los Angeles VA Healthcare System, San Diego VA Healthcare System	The mission of the Desert Pacific MIRECC is to improve the long-term functional outcome of patients with chronic psychotic mental disorders, including schizophrenia, schizoaffective disorder, and psychotic mood disorders. We approach this mission through an integrated program of research, education, and clinical programs aimed at translating findings from the research laboratory into improved clinical care. The program spans the spectrum from basic brain biology to the organization of services for veterans. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp
VA Centers of Excellence (CoEs)		
VISN 2: Integrated Health	VA Syracuse VA Medical Center	The center's principal focus is on colocated collaborative care where mental health providers (psychologists, social workers, or psychiatric prescribers) work side by side with medical primary care providers. The center works collaboratively with other VA centers that specialize in care management of mental health disorders to successfully blend the two components. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp
VISN 2: Suicide Prevention	VA Canandaigua VA Medical Center	The Suicide Prevention center is organized as a prevention and research center with the overarching goal of reducing the morbidity and mortality in the veteran population associated with suicide. To this end, the center's mission is to develop and study veteran-focused, evidenced-based, public health approaches to suicide prevention with broadly based population level interventions designed to reach all veterans, and targeted approaches to reach subpopulations of veterans at high risk for suicidal behaviors. This center seeks to meet this mission through serving as a national, regional, and local resource on suicide research and prevention and mental health through two key cores: the Epidemiology and Interventions Research Core and the Education, Training and Dissemination Core. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp

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Program Name	Operating Source	Objective ^d
VISN 17: Returning War Vets	VA Waco VA Medical Center, Texas	The Center for Excellence for Research on Returning War Veterans focuses on mental health/PTSD needs and enables VA to consolidate personnel, training, and specialized resources in an efficient manner to improve knowledge related to treatment, prevention, rehabilitation, and clinical services for veterans, with a particular focus on those veterans returning from Afghanistan and Iraq. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp
VISN 22: Stress and Mental Health	VA VA San Diego Healthcare System	This center consists of a multidisciplinary team of clinicians, educators, and researchers whose goal is to understand, prevent, and heal the effects of stress. Source/Program website: http://www.mirecc.va.gov/national-mirecc-overview.asp
National Center for PTSD	VA	The mission is to advance the clinical care and social welfare of America's veterans through research, education, and training in the science, diagnosis, and treatment of PTSD and stress-related disorders. The National Center has emerged as the world's leading research and educational center of excellence on PTSD. Its vision is to be the foremost leader in information on PTSD and trauma; information generated internally through its extensive research program; and information synthesized from published scientific research and collective clinical experience that is efficiently disseminated to the field. The center is organized to facilitate rapid translation of science into practice, ensuring that the latest research findings inform clinical care, and translation of practice into science, assuring that questions raised by clinical challenges are addressed using rigorous experimental protocols. The National Center provides a unique infrastructure within which to implement multidisciplinary initiatives regarding the etiology, pathophysiology, diagnosis, and treatment of PTSD. Source/Program website: http://www.ptsd.va.gov/about/index.asp

Department of Defense (DoD) Centers of Excellence (CoE)	
Defense Centers of Excellence (DCoE)	<p>DoD</p> <p>DCoE oversees three centers, each of which contributes unique insights, standards, clinical tools, and research products to the fields of psychological health and TBI: the Defense and Veterans Brain Injury Center, the Deployment Health Clinical Center, and the National Center for Telehealth and Technology. (Budget: \$168 million in 2010) Source/Program website: http://www.dcoe.health.mil/About_DCoE/Centers.aspx</p>
National Intrepid Center of Excellence (NICoE)	<p>DoD</p> <p>Located on the campus of Naval Support Activity Bethesda, and Walter Reed National Military Medical Center</p> <p>NICoE is the military health system institute for complex, comorbid TBI and psychological health conditions. It delivers comprehensive and holistic care, conducts focused research, and exports knowledge to benefit service members, their families, and society. The mission of the NICoE is to be a leader in advancing TBI and psychological health treatment, research, and education. This overarching mission is accomplished through three primary categories of activity: research, clinical, and education. (Budget: \$20.3 million in FY2010) Source/Program website: http://www.nicoe.capmed.mil/About%20Us/SitePages/Home.aspx</p>
Other	
VA Cooperative Studies Program	<p>VA</p> <p>Office of Research & Development</p> <p>This program is responsible for the planning and conduct of large multicenter clinical trials and epidemiological studies in VA. Its mission is to advance the health and care of veterans through cooperative research studies that produce innovative and effective solutions to veteran and national health care problems. Source/Program website: http://www.research.va.gov/programs/csp.</p>

continued

Program Name	Operating Source	Objective ^a
NIH Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative	National Institutes of Health (NIH)	The BRAIN Initiative is part of a new presidential focus aimed at revolutionizing understanding of the human brain. By accelerating the development and application of innovative technologies, researchers will be able to produce a revolutionary new dynamic picture of the brain that, for the first time, shows how individual cells and complex neural circuits interact in both time and space. Long desired by researchers seeking new ways to treat, cure, and even prevent brain disorders, this picture will fill major gaps in the current knowledge and provide unprecedented opportunities for exploring exactly how the brain enables the human body to record, process, utilize, store, and retrieve vast quantities of information, all at the speed of thought. (Budget: Approx. \$100 million total; NIH: \$40 million; Defense Advanced Research Projects Agency: \$50 million; National Science Foundation: \$20 million; plus more than \$120 million from private-sector partners) Source/Program website: http://www.nih.gov/science/brain
South Texas Research Organizational Network Guiding Studies on Trauma and Resilience (STRONG STAR)	DoD Psychological Health and Traumatic Brain Injury Research Program The University of Texas Health Science Center at San Antonio	STRONG STAR is a multidisciplinary and multi-institutional research consortium to develop and evaluate the most effective early interventions possible for the detection, prevention, and treatment of combat-related PTSD in active-duty military personnel and recently discharged veterans. The STRONG STAR Consortium brings together the expertise of military, civilian, and VA institutions and investigators and one of the largest populations of active-duty and recently discharged combat veterans in the nation. STRONG STAR investigators hope to improve countless lives by preventing the development of chronic PTSD in a new generation of veterans. (Budget: \$35 million) Source/Program website: http://delta.uthscsa.edu/strongstar/about.asp
Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS)	National Institute of Mental Health (NIMH) and the U.S. Army	Army STARRS is the largest study of mental health risk and resilience ever conducted among military personnel. Army STARRS investigators are using five separate study components—the Historical Administrative Data Study, New Soldier Study, All Army Study, Soldier Health Outcomes Study, and

Special Studies—to identify factors that help protect a soldier’s mental health and factors that put a soldier’s mental health at risk. Army STARRS is a 5-year study and will run through June 2014. Findings will be reported as they become available, so that the Army may apply them to its ongoing health promotion, risk reduction, and suicide prevention efforts.
(Budget: \$50 million)

Source/Program website: <http://www.armystarrs.org/about>

Injury and Traumatic
Stress (INTRuST)
PTSD and TBI Clinical
Consortium

University of California,
San Diego

The overarching goal is to combine the efforts of the nation’s leading investigators to bring to market novel treatments or interventions that will ultimately decrease the impact of military-relevant psychological health problems and TBI. The program hopes to improve the function, wellness, and overall quality of life for service members, as well as their families, caregivers, and the American public. INTRuST is a collaboration of numerous investigators and 10 clinical sites poised to conduct clinical trials of novel treatments for military-relevant PTSD and TBI.
(Budget: \$90 million)

Source/Program website: <http://intrust.sdsc.edu>

Consortium to Alleviate
PTSD

DoD and VA, led by
the University of Texas
Health Science Center,
San Antonio

Key priorities of this consortium are elucidation of factors that influence the different trajectories (onset/progression/duration) of PTSD and associated chronic mental and physical sequelae (including depression, anger/aggression, and substance use/abuse, etc.) and identification of measures for determining who is likely to develop chronic PTSD. The consortium works to improve prognostics, advance treatments, and mitigate negative long-term consequences associated with traumatic exposure. Focused scientific efforts to understand and treat PTSD have been supported by DoD and VA.
(Budget: \$45.336 million)

Source/Program website: <http://www.ConsortiumToAlleviatePTSD.com>

continued

Program Name	Operating Source	Objective ^a
Northern California Institute for Research and Education, Inc. –The Veterans Health Research Institute	Self-run 501(c)(3) nonprofit); operates on the campus of the San Francisco Veterans Affairs Medical Center University of California, San Francisco	The Veterans Health Research Institute is the leading nonprofit research institute in the United States devoted to advancing veteran health research. Northern California Institute for Research and Education pioneers new treatments and understanding of military medicine and care. Through new technologies, novel scientific insights, and international clinical collaborations, they strive to set a new standard of health care for veterans and military personnel. They provide care for veterans; discover and develop effective, safe, and practical treatments for military injuries and diseases, and deploy them worldwide; train new researchers in veteran health; and prepare new generations of providers to care for veterans in the years to come. (Budget: \$50 million)
Millennium Cohort Study	DoD Headquartered at the Naval Health Research Center in San Diego, California	Source/Program website: https://www.ncire.org/about_ncire The Millennium Cohort Study is the largest prospective health project in military history. It is designed to evaluate the long-term health effects of military service, including deployments. DoD recognized after the 1991 Gulf War that there was a need to collect more information about the long-term health of service members. The Millennium Cohort Study was designed to address that critical need, and the study was launched by 2001. Funded by DoD and supported by military, VA, and civilian researchers, it already involves almost 150,000 people. As force health protection continues to be a priority for the future of the U.S. military, the Millennium Cohort Study will be providing critical information towards enhancing the long-term health of future generations of military members. Source/Program website: http://www.millenniumcohort.org/aboutstudy.php

Million Veteran Program	VA Office of Research & Development	The goal of the Million Veteran Program is to partner with veterans receiving their care in the VA health care system to study how genes affect health. To do this, it will build one of the world's largest medical databases by safely collecting blood samples and health information from one million veteran volunteers. Data will be stored anonymously for research on diseases like diabetes and cancer and military-related illnesses, such as PTSD. Source/Program website: http://www.research.va.gov/mvp
Military Suicide Research Consortium	DoD Florida State University and the Denver VA Medical Center	As part of DoD's comprehensive suicide prevention strategy, the Military Suicide Research Consortium, will research the causes and prevention of suicide. Its research will assist in the development of more effective prevention interventions, risk assessment methods, and treatments to decrease the number of suicides. Findings will provide the scientific basis for suicide prevention policy recommendations and clinical practice guidelines. (Budget: \$30 million) Source/Program website: https://msrc.fsu.edu/about-msrc

^aText in the Objective column is pulled from the Source/Program website listed and may be verbatim.

Appendix E

Detailed Descriptions of PTSD Research in the Department of Defense, the Department of Veterans Affairs, and the National Institutes of Health

In the sections that follow, the committee provides a detailed summary of the studies it reviewed using the following sources of information: the VA Health Services Research and Development database, the National Institutes of Health (NIH) Research Portfolio Online Reporting Tools (RePORT) database, ClinicalTrials.gov, and information provided from the Department of Defense (DoD).¹ After identification of relevant research projects, it categorized those projects based on 10 research categories that parallel the major topics of the committee's phase 1 report and Table 9-2 in this report. The committee tried to qualitatively describe the kind of post-traumatic stress disorder (PTSD) research currently being funded and who is funding that research. For each research target in the categories below, the committee presents the percentage of studies undertaken (and in some instances funded) by DoD, the Department of Veterans Affairs (VA), the National Institute of Mental Health (NIMH), other NIH institutes, or other sources (Other). The studies are described to the extent possible, given the available information in each database. Some studies could have been considered under multiple categories but were counted only in the most relevant category to avoid an overestimation of studies. There were also numerous studies that were funded by more than one organization. The committee tried to identify the main funding source so that the study would be counted only once, but this was not always possible and some studies, particularly studies funded jointly by DoD and VA, were counted twice. A

¹ A list of these studies can be obtained by contacting the National Academies Public Access Records Office.

detailed discussion of the committee's approach and search strategy can be found in Chapter 9.

PHYSIOLOGY, NEUROBIOLOGY, AND BEHAVIOR

Target A: Mechanistic Research on the Process from Trauma Exposure to PTSD

Target A.1: Neural Circuitry, Neural Connectivity, Brain Regions Involved in PTSD Pathogenesis, and Neuronal Plasticity

DoD = 9; VA = 0; NIMH = 28; Other NIH Institutes = 6; Other = 10

The committee identified numerous studies that were a mix of research across species and methodologic designs including:

- Studies investigating neural correlates associated with basic mechanisms of fear learning and extinction, including in PTSD patients, and some efforts to computationally characterize that circuitry.
- Studies examining details of components of the fear learning circuitry (for example, subdivisions of the basolateral regions of the amygdala) or examined circuitry that overlaps with other behavioral paradigms (for example, responding to ambiguous faces).
- Studies related to cognitive techniques for controlling emotion and several studies that examined details of the circuitry that may be involved in the control of emotion.
- A few projects comparing other anxiety disorders such as social anxiety disorder with PTSD to understand the similarities and differences in the mechanisms underlying the pathophysiology across the different disorders.
- Projects investigating the mechanisms of the stress response and the hypothalamic pituitary axis, its neural circuitry, and factors that modify that circuitry.
- Relatively few studies on techniques linked to the development of resilience.
- A few projects examining circuitry in patients with PTSD.
- A few studies on sleep abnormalities and the interactions between sleep deprivation and PTSD pathophysiology.

Target A.2: Neuropeptides, Neurotransmitters, Cytokines, and Specific Receptors that Play a Role in PTSD Pathology and Symptoms

DoD = 4; VA = 1; NIMH = 38; Other NIH Institutes = 4; Other = 3

A large number of the studies funded under this category and target area were focused on basic mechanisms by which stress interacts with fear memories and resilience. A range of tools were used, including standard molecular tools, lesions and electrophysiology, and optogenetics. The experimental procedures used most often were fear conditioning and extinction, exposure to predators, and other stress models.

- Most of the studies were focused on the amygdala circuit and its interaction with the hippocampus and medial prefrontal cortex.
- Several studies focused on the hypothalamic pituitary axis, specifically the corticotrophin-releasing factors and corticotrophin-releasing hormone, associated receptors, and how those enhance fear memory consolidation.
- A few studies focused on the selective serotonin reuptake inhibitors (SSRIs) and interactions with brain-derived neurotrophic factors and their receptors.
- A few studies focused on neurosteroids, such as allopregnanolone and progesterone.
- A few studies that investigated the bed nucleus of the stria terminalis or the locus coeruleus.

Target A.3: Pathways to Understand Comorbidities and Overlapping Pathways Between PTSD and Comorbidities

DoD = 7; VA = 4; NIMH = 4; Other NIH Institutes = 11; Other = 1

A quarter of the studies in this section examined the mechanisms that underlie alcoholism and PTSD, and one examined cocaine. A few examined the relationship between stress, PTSD, and depression. Others examined the relationship between the neural circuitry or traumatic brain injury (TBI) and fear control techniques in PTSD. Additional projects examined overlap in the circuitry between stress and chronic fatigue syndrome and stress and sleep impairments. Most of the projects funded by DoD under this category were focused on the interactions between TBI and blast injuries, with few exceptions (one on depression and PTSD and another on epilepsy and PTSD). Individual studies in this area included the following:

- A project to explore the relationship between combat history, stress-induced drinking, and PTSD. The first aim was to explore the effect of combat trauma history on stress reactivity using subjective, neuroendocrine, and physiologic measures of stress. The second aim examined the effect of combat trauma history and subsequent drinking behavior and subjective response to alcohol.
- A project to evaluate if a dose response relationship existed between level of exposure to stressors and functioning over time; to understand the role of resilience and psychopathology in level of functioning; and to understand the role of healthy coping strategies and social supports as associated with functioning.
- A project to examine the relationship between combat-related PTSD and alcohol use over time; to test theorized (self-medication and social learning theory) PTSD and alcohol use associations; to examine the effect of length of time postdeployment on PTSD and alcohol use associations; and to examine associations between self-medication and concurrent functioning.
- A project to examine the prospective influences of pre-trauma adolescent and family risk factors and alcohol and drug problems, and to disentangle the directions of influence among traumatic stress, PTSD, and problematic alcohol and drug use. A goal was to determine the extent to which PTSD and alcohol share common developmental antecedents.
- A project to explore whether ecologic stressors influence the risk of PTSD and drug abuse and dependence among residents of Detroit, Michigan.

Target A.4: Memory, Fear Memory, and Memory Processing

DoD = 4; VA = 1; NIMH = 33; Other NIH Institutes = 5; Other = 1

Some of the projects in this section overlap with those captured under Target A.1 because some fear control techniques are essentially manipulating learning and memory. For instance, projects on reconsolidation were included under this target area because they involved memory manipulation, whereas projects on extinction were included under both this target area and target area A.1. Both the extinction and reconsolidation studies mostly examined models of conditioned fear as the learning task. Other studies under this category with no overlap included the following:

- Studies on conditioned fear generalization, trace fear conditioning, safety learning, and the impact of sleep. These projects spanned

techniques from studies of cellular and molecular mechanisms to animal models of neural circuits to human systems.

- A few studies examined other types of memories as they are influenced by trauma or stress and a few examined sleep, traumatic memories and emotion, and episodic memory.
- A few studies were focused on the effects of sleep deprivation on fear learning and fear extinction, and others focused on appraisal and neurocognition in relation to PTSD.

Several projects that examined basic memory processes that were not specifically related to fear, emotion, trauma, or stress were identified. However, many of them investigated topics such as mechanisms of memory plasticity or altering memory consolidation that could be relevant to PTSD, including creating and understanding new interventions.

Target A.5: Neurobiology Underlying Gender Differences

DoD = 0; VA = 1; NIMH = 5; Other NIH Institutes = 1; Other = 0

There were a few studies that could be categorized under this target research area. The studies that did fall into this area focused on the influence of stress and norepinephrine on fear responses; sex differences in corticotrophin releasing factor in the prefrontal cortex; adenylate cyclase-activity polypeptide, its antagonists, and its interaction with the bed nucleus of the stria terminalis during fear learning; and morphological differences (gross differences or at the synaptic levels in the prefrontal cortex) between males and females.

Target B: Genomics of PTSD

DoD = 6; VA = 6; NIMH = 20; Other NIH Institutes = 3; Other = 1

Examples of studies under this target included those to identify genes or epigenetic modifications or changes in gene expression after trauma that are associated with an increased or decreased risk for developing PTSD. Studies were carried out *in vitro*, in rodent models, and in humans.

In vitro studies included the following:

- Studies that focused on understanding genetic changes and mechanisms related to stress, such as a sequencing study to examine the effects of early stress on histone and DNA modifications and a study on GluR2 gene transcription and consequent alterations in learning-induced synaptic plasticity.

- Studies to determine the role of epigenetic markers in the regulation of corticotrophin-releasing hormone, to identify peripheral markers of PACAP/PAC1 pathway activity to act as a biomarker for PTSD, and to identify epigenetic mechanisms that control the differentiation of Th1/Th2/TH17/Treg cells of the adaptive immune response.
- One study to determine how variations in acute tryptophan deletions affect emotional processing as a function of serotonin transporter genotype and one study to identify rare coding and noncoding serotonin transporter sequences.

Most of the rodent animal models under this research target were concerned with identifying and understanding mechanisms of resilience, memory formation, fear responses, and learned fear.

- Two rodent models were used to identify genetic and biologic factors that may influence risk for PTSD and comorbid alcohol use disorders.
- One study to advance the ability to manipulate gene expression within subsets of neurons, specifically the adrenergic, dopaminergic, serotonergic, and orexinergic systems.
- One study used a mouse model to examine whether the GIT2 gene is involved in susceptibility to PTSD.
- One study used a rat model to validate peripheral biomarkers of PTSD.
- One study used a rat model to identify genes in the brain that are differentially expressed in relation to a rat model of PTSD. This study was extended to examine how these genes are differentially expressed after cortisol administration in the posttrauma period. It has translational implications, as acute cortisol administration is viewed as having potential for PTSD prevention.

The studies in adult humans include both civilian and military populations. One goal of many of those studies was to understand the way in which candidate genes may or may not be associated with the development of PTSD. A further goal was to gain a better understanding of the relationship between genetics and the environment and how that relationship could be influenced by the development of PTSD. Many of the studies integrated information from a variety of sources such as brain imaging, human genotyping, neuropsychological measurements, and clinical assessments. Three genome-wide association studies of PTSD were identified, one of which was used primarily in a veteran population. Some additional studies included the following:

- Studies to examine the way in which patterns of DNA methylation vary by TBI diagnosis and severity of the disease.
- Studies to identify genetic pathways implicated in PTSD.
- Studies to identify genetic and epigenetic changes associated with the disorder.
- A feasibility study to determine whether a sample of 1,000 veterans could be obtained for the purpose of examining the relationship between genes and PTSD.
- One study to examine epigenetic patterns associated with PTSD and other disorders and to examine whether epigenetic patterns change during psychotherapy.
- One study to examine the role of SLC6A3/SLC6A4 in PTSD symptoms, comorbidity, and treatment outcome.

Target C: Differential Responses to Treatment

DoD = 6; VA = 2; NIMH = 1; Other NIH Institutions = 0; Other = 6

The goal of the studies that were categorized under this category was to examine how people respond to PTSD treatment.

- One study used functional magnetic resonance imaging (fMRI) before and after cognitive processing therapy (CPT).
- One study used fMRI to compare psychiatric patients (including those with PTSD) to people without a psychiatric diagnosis to examine trust and interpersonal dysfunction before and after treatment.
- One study used pictures from the International Affective Picture System and investigated mildly painful skin sensations to predict response to treatment with quetiapine.
- One study looked at assessments across all of the South Texas Research Organizational Network Guiding Studies on Trauma and Resilience trials to examine predictors (that is, moderators and mediators) of response to treatment.
- One study examined if paroxetine changed fMRI responses in veterans with PTSD.
- One study aimed to develop psychophysiological, neuropsychological, and self-report models to predict PTSD symptom response to pharmacotherapy, psychotherapy, and combined pharmacotherapy and psychotherapy in veterans with PTSD.
- One study used a fear learning-extinction paradigm with fMRI and skin conductance response among civilian patients with PTSD.

- One study used fMRI to predict response to prolonged exposure (PE) therapy in a mixed group sample with PTSD.
- One study looked at neurobiology and neuropsychology as predictors of intervention efficacy in veterans with both TBI and PTSD.
- One study investigated how brain activations in PTSD predicted therapeutic responses to seroquel XR pharmacotherapy using pictures from the International Affective Picture System.
- One study looked at changes in psychological symptoms and gene expression in war veterans after emotionally focused therapy.

Target D: Preclinical Studies of New Pharmacotherapies

DoD = 4; VA = 3; NIMH = 5; Other NIH Institutes = 2; Other = 1

In its search of upcoming PTSD research, the committee found several novel and promising preclinical studies of new pharmacotherapies.

- One study examined brain pH and acid sensing in depression-related behaviors (for example, fear conditioning and acid-sensing ion channel 1a/ASIC1a). The investigators were trying to determine how this molecular model may be related to and may modulate fear and anxiety.
- One study examined the role of the immune system and T-cells in anxiety and stress.
- Several projects aimed to understand new molecules and targets, including arginine vasopressin, 1a receptor antagonists, an α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptor modulator called CDPPB, cannabinoids, corticotropin-releasing factor, and transcranial direct current stimulation.

PREVENTION

DoD = 21; VA = 9; NIMH = 18; Other NIH Institutions = 4; Other = 8

The committee identified several studies that investigated the prevention of PTSD through stress-management interventions and pharmacological interventions. Some of those studies included the following:

- Several studies investigated the development of or severity of PTSD symptoms when substances such as hydrocortisone, oxytocin, diazepam, and polyunsaturated fatty acid were administered around the time of the trauma.

- Several studies examined research protocols and other interventions that aim to reduce anxiety in first responders after experiencing a traumatic event.
- One study delivered depression and anxiety reduction treatment in military personnel at Bagram Air Base, Afghanistan.
- One study investigating physiologic reactivity to virtual reality environments that depict common Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) combat scenarios.
- One cognitive-bias assessment used a recognition memory paradigm in Army National Guardsmen prior to deployment.
- Two predeployment resiliency interventions were tested: heart rate variability biofeedback and cognitive bias modification training.
- One study investigated the effectiveness of the stress resilience training system program at reducing perceived stress, PTSD symptoms, depression, anxiety, sleep quality, coping, attrition, and class and operational performance among U.S. Navy service members.
- One study examined preventive narrative exposure therapy (Pre-NET) in members of the Burundian Army and the joint African Union and United Nations peacekeeping mission in Somalia.

In addition to the above studies that focused on preventing PTSD by administering interventions before trauma exposure or immediately following trauma exposure, the committee identified several studies that focused on identifying early markers of the development of PTSD after trauma. Those studies examined general biomarkers for stress (sweat and saliva) and epigenetic markers for PTSD. Two studies explored potential genetic, neuroanatomical, and behavioral markers of resilience and one looked at neuroimaging and cerebrospinal fluid markers to distinguish PTSD from TBI and neurodegeneration following TBI. Others studies described the development of tools using single-photon emission computed tomography imaging and novel positron emission tomography tracers that may be used in the future to explore biomarkers for PTSD. Of those studies, there was one study that was focused on developing biomarkers that are specific to women. The committee also identified several studies that investigated modifiable factors that promote or prevent the development of PTSD. Some of the specific studies in this area include the following:

- One study focused on predicting mental health and substance abuse service needs in OEF and OIF military personnel within the first 12 months of returning from deployment.
- One study focused on the associations among military sexual trauma, PTSD symptoms, health behaviors, and physical health problems in male and female marine recruits.

- Two studies were components of the Marine Resiliency Study which aims to understand risk and resilience in a cohort of about 2,500 marines through an integrated series of three prospective, longitudinal, and interrelated projects. One of the projects aimed to identify individual and contextual factors that predict trajectories of PTSD and other mental health problems postdeployment. A second study was in the pilot phase and aimed to identify biomarkers of PTSD risk and chronicity among marines using genomic and other biologic and cognitive data collected predeployment.
- Two epidemiologic studies of National Guard and reserve personnel. One study focused on the Ohio National Guard and on identifying risk and protective factors for the development and course of psychopathology over a decade of follow-up. The other was a national sample of National Guard and reservists to identify factors associated with health service utilization.
- One study followed marines to identify predeployment and postdeployment factors that predict the development of psychopathology.
- Several studies investigated the role of early-life stress using a rat model.
- Several studies investigated brain indices that predict the development of acute or delayed-onset PTSD.
- Several studies investigated factors that predict risk of and response to military sexual trauma in active-duty personnel.
- One study used a population-based registry of combat veterans with PTSD and followed the cohort longitudinally to examine the role of risk factors and the progression, remission, and outcomes of veterans who have PTSD.
- One study examined the time of day of a trauma exposure in relation to risk of developing PTSD, with a specific interest in the role of cortisol diurnal variation.
- One study examined psychological mechanisms of resilience in combat veterans.

SCREENING

DoD = 4; VA = 5; NIMH = 3; Other NIH Institutes = 0; Other = 0

The studies in this target area were mostly focused on screening for PTSD, mild TBI, PTSD comorbid with substance abuse, cognitive symptoms of PTSD, interpersonal violence, or exposure to military sexual trauma. Most of the studies were conducted in veterans of OEF and OIF, with a small number in Gulf War veterans. A few were gender specific

(that is, restricted to women or men). Methods of screening included computer-assisted testing, health information technology, automated telephone screening, use of administrative data to develop algorithms, and use of compensation and pension reports to develop concept-based indexing. Four studies specifically examined the following:

- A new observer-rated screening interview for embedded professionals in the Marine Corps.
- A procedure to detect neurological impairment following combat.
- A questionnaire to screen for PTSD following road traffic accidents.
- Assessment of whether screening was associated with better PTSD outcomes.

DIAGNOSIS AND DETERMINING SYMPTOM SEVERITY

DoD = 5; VA = 5; NIMH = 1; Other NIH Institutes = 0; Other = 0

In this target area, several studies were identified that investigated tools for diagnosing PTSD and determining PTSD symptom severity.

- Two studies used positive emission tomography to investigate objective biologic markers, one used positive emission tomography for a limited aspect of PTSD, negative expectancies, and another used it to study region-specific metabolic changes to identify differences between mild TBI and PTSD.
- One study used text-mining to distinguish PTSD with TBI from PTSD without TBI.
- Several studies used prosodic and acoustic speech analysis to compare PTSD and non-PTSD groups and the use of electroencephalography, advanced brain imaging, and magnetoencephalography to differentiate those with mild TBI, PTSD, or acute stress disorder, or those with TBI and orthopedic controls.
- One study examined longitudinal PTSD Checklist scores in the VA to enhance its use.
- One study used the neurobehavioral symptom inventory to predict delayed-onset PTSD in those with subsyndromal PTSD and evaluate postconcussive symptoms in those with mild TBI and PTSD, mild TBI alone, PTSD alone, and subjects without mild TBI or PTSD.
- One study focused on quality of life and the development of a better instrument for assessing functional daily life activities of people who have PTSD.

TREATMENT

Target A.1: Pharmacotherapy

DoD = 11; VA = 13; NIMH = 2; Other NIH Institutes = 1; Other = 33

The pharmaceutical studies identified by the committee involved a broad spectrum of drugs with different mechanisms of action and novel methods of administration. The following types of studies were categorized under this target area:

- Three studies formed part of the Injury and Traumatic Stress consortium (a PTSD and TBI clinical consortium). These studies considered the relationship between pharmaceutical agents and PTSD or pharmaceuticals and variables that may effect PTSD (including rapid eye movement sleep, amygdala metabolism, medial prefrontal response to stress with positron emission tomography, pain, and memory).
- Several studies investigated specific pharmaceutical agents in OEF and OIF veterans, including the use of a single intravenous dose of ketamine versus midazolamanalgesic, tramadol, ganaxolone (a neurosteroid), galantamine, methylphenidate, nopicastat (an inhibitor of dopamine-beta-hydroxylase), riluzole (a glutamate modulator), fluoxetine (an SSRI), paroxetine, sertraline, mirtazapine, escitalopram (a neurokinin-1 antagonist) GSK561679, PRX-03140, carvedilol, oxytocin, mifepristone, pregnenolone, intranasal neuropeptide-Y, and tetrahydrocannabinol.
- Several studies investigated antipsychotic drugs, including risperidone augmentation versus placebo in partial responders to SSRIs, risperidone augmentation of sertraline, iloperidone versus placebo, and asenapine open-label augmentation of SSRIs. Other drugs under study included lithium augmentation of SSRIs for its effects on hyperarousal and modafinil versus placebo augmentation.
- Several studies investigated propranolol to block memory consolidation and physiological hyperresponsivity and reduce symptoms of PTSD.
- Some studies investigated at over-the-counter natural products such as omega-3 fatty acids, N-acetylcysteine, and dehydroepiandrosterone.
- Two studies focused on 3,4 methylenedioxy-N-methyl amphetamine (MDMA) as an augmenter of psychotherapy, either to evaluate a single dose or to compare low- versus high-dose effects of the drug.

- Hydrocortisone is under study in four trials to evaluate different aspects of its action, such as effects on PTSD and physiological response after memory activation, brain imaging effects (hippocampus, amygdala, medial prefrontal cortex), and effects on fear extinction and memory.
- Two studies assessed aspects of sleep in PTSD. In one study, a single education session followed immediately by the option to use lorazepam was compared with an educational session with instructions to avoid sleep the first night after exposure to trauma. Another study of continuous positive airways pressure was investigated in patients with PTSD and sleep-disordered breathing as determined by polysomnography.
- Two studies examined prescribing patterns to treat PTSD. One study used a VA data set to examine prescribing patterns for new antipsychotic medications. A second aimed to intervene with care providers to improve evidence-based practices by reducing the number of benzodiazepine prescriptions to PTSD patients.

Target A.2: Somatic Treatments

DoD = 2; VA = 2; NIMH = 0; Other NIH Institutes = 0; Other = 6

The committee identified several studies that explored surgical treatment approaches or the use of stimulatory devices. Examples include the following:

- Two open-label pilot studies evaluated stellate ganglion block, a surgical procedure, for PTSD.
- Six studies used transcranial magnetic stimulation (TMS), including the evaluation of laterality (left versus right), dose (low or high frequency), “deep” TMS, the use of TMS for flashbacks, and the use of TMS to reduce relapse rates compared to treatment as usual.
- Bright light and trigeminal nerve stimulation were two other novel treatments under exploration, each in randomized controlled trials.

Target A.3: Psychotherapies

DoD = 4; VA = 12; NIMH = 6; Other NIH Institutes = 2; Other = 20

The committee found numerous treatment studies that were psychotherapy-specific. The following types of studies were identified in this target area:

- Two studies related to variations and extensions of cognitive behavioral therapy (CBT)-focused treatment. One examined cognitive training in working memory and executive function to strengthen the frontal areas of the brain that might serve to modulate limbic-driven emotional responding.
- One study compared interpersonal therapy (adapted for PTSD) with PE therapy and an active control receiving relaxation therapy.
- One study investigated an evidenced-based combination trauma intervention for veterans with depression, substance use disorder, and trauma exposure with and without PTSD.
- One study focused on an approach called expressive writing that appeared to have a writing component that is similar to CPT. The approach was delivered in an online format.
- One randomized controlled trial compared the impact of trauma management therapy on PTSD and social and emotional function compared with PE and psychoeducation. The study also investigated resource and cost outcomes.
- One study compared adaptive disclosure with CPT.
- Three studies examined the value of manipulating elements of PE to improve efficacy.
- One study investigated the potential to augment any evidence-based treatment with an additive CBT module designed to specifically address issues related to killing in a war zone.
- One study compared PE with a non-trauma-focused present-centered psychotherapy approach called Trauma Affect Regulation: Guide for Education and Therapy (TARGET). In a separate project CBT was compared with present-centered therapy for PTSD caused by military sexual trauma.
- One study investigated the enhancement of eye movement approaches with interactive personal guidance, referred to as accelerated resolution therapy. Non-trauma-focused approaches were also directly tested in three trials (behavioral activation, interpersonal psychotherapy, and an early intervention for sexual trauma using a psychoeducation video).
- Two trials specifically focused on military sexual trauma. One was open to male or female veterans of any war era (CPT versus present-centered therapy) and the other (psychoeducational video approach) was open to both civilian and female service members.
- One study compared attention bias modification treatment to a control scenario.
- One study conducted a feasibility trial of cognitive remediation therapy using a computer-based program that delivered cognitive exercises to improve attention, processing speed, and memory

through practice as a way to reduce PTSD via better cognitive modulation of emotion.

- More than 10 studies were identified that were conducted outside of the United States and primarily in civilian populations. Treatments were varied and included attention bias modification treatment, rescripting and reprocessing therapy, CPT, gestalt therapy, narrative exposure therapy, eye movement desensitization and reprocessing, skills training in affective and emotional regulation, trauma-focused CBT, imagery rehearsal, supported employment, and interpersonal therapy.

Target A.4: Combining Psychotherapy and Pharmacotherapy

DoD = 4; VA = 4; NIMH = 8; Other NIH Institutes = 0; Other = 6

A few studies were identified that investigated the effectiveness of combining psychotherapy and pharmacotherapy treatments for PTSD.

- One study tested methylene blue to enhance PE therapy.
- Several studies combined a pharmaceutical agent (D-cycloserine, sertraline, or hydrocortisone) with PE therapy (one with virtual reality exposure therapy and two with standard PE therapy) to enhance or accelerate treatment response.
- Several studies investigated MDMA-assisted psychotherapy and augmentation of psychotherapy with D-cycloserine, hydrocortisone, yohimbine, or zonisamide.
- Two studies investigated patient-centered collaborative care with drug and psychotherapy versus treatment as usual.

Target A.5: Complementary and Alternative Treatments

DoD = 15; VA = 14; NIMH = 0; Other NIH Institutes = 4; Other = 12

The committee identified a range of complementary and alternative medicine studies, including those that focused on mindfulness, relaxation, yoga, mantram repetition, acupuncture, acupressure, biofeedback, and guitar music therapy. Specific studies in this category included

- Different forms of meditation, such as mindfulness-based, loving-kindness, self-compassion and transcendental meditation, were found most often in randomized controlled trials with either an active or inactive control. These studies are distributed across a wide range of populations with PTSD, including some in veterans.

- A randomized controlled trial to compare a 12-week acupuncture treatment program with a treatment-as-usual for both PTSD and TBI.
- A randomized controlled trial of thought field therapy in Rwandan subjects.
- Animal-assisted therapy was studied in two trials with veterans.
- A randomized controlled trial of the relaxation response using hyperbaric oxygen.
- The use of narrative writing to reduce PTSD symptoms.
- An open-label protocol using Sentra—a complex of various amino acids and herbal substances—for PTSD and comorbid fibromyalgia.

Target A.6: Different Models for the Delivery of PTSD Care

DoD = 24; VA = 19; NIMH = 4; Other NIH Institutions = 2; Other = 10

The committee identified several projects that tested new technologies to deliver telehealth using a remotely located clinician, to provide supplementary self-help material via websites, to monitor patient reactions using patient-worn sensors connected to mobile devices between sessions, and to use interactive voice response telephone monitoring systems to maintain patient engagement. Some of the studies in this area included the following:

- Three projects that focused on primary care settings, including ways that the primary care model could maximize accessibility of care and the added value of an array of technologies to improve the stepped care model.
- Four projects examined the relative efficacy of telehealth approaches for delivering care compared with in-person approaches. Two directly compared PE delivered in each format, and a third project explored the delivery of CPT conducted in an online group format. One telehealth approach examined early intervention for PTSD and comorbid insomnia in a group format.
- Two projects tested the use of virtual reality to deliver exposure-based treatments.
- Two studies focused on the use of technology (telephone-based pre-CBT treatment and Internet-based virtual reality) to deliver treatment to civilians who have PTSD.
- Several studies evaluated the use of computerized cognitive training programs for building cognitive skills that could be helpful in modulating emotion. One study tested cognitive remediation therapy as an alternative intervention for PTSD. Two other projects used similar computer-based systems to retrain attentional bias in

individuals with PTSD and to specifically address comorbid mild TBI. All of these cognitive remediation therapy projects test the rationale that computer-delivered cognitive training programs will promote access via home-based practice.

- Several studies tested the use of computer-based and web or mobile technology to deliver psychosocial self-care and symptom management, and to engage significant others in the care process.
- Three studies investigated evidence-based treatments (two CPT and one PE) delivered online via video teleconference, and one examined outcomes from the delivery of expressive writing online.
- Two studies that did not use technology-based approaches examined the use of patient and provider collaborative-care models to enhance clinical service in primary care.
- One study compared DESTRESS-T (telephone therapy plus intensive telephone care management) to optimize usual care.
- Nine telehealth studies were identified: One focused on PE, three tested CPT, one tested an Internet writing intervention, two tested a behavioral activation approach, and two tested general CBT approaches.
- Five virtual reality exposure therapy projects were identified: One studied the development of a virtual reality exposure therapy system, one dismantled the virtual reality component of the therapy to see if showing only still images would be sufficient for reducing PTSD symptoms, and the other three compared virtual reality exposure therapy with traditional PE (one of which also tested the interaction with D-cycloserine).
- The largest project (\$14.8 million) was on enhancing non-technology-related care. The study compared the stepped enhancement of PTSD and depression services using a primary care (STEPS UP) intervention.

Target A.7: Modality of the Treatment Intervention

DoD = 4; VA = 6; NIMH = 2; Other NIH Institutions = 0; Other = 3

The committee identified a few studies that investigated the modality of the treatment intervention—that is, treatments that are given in group, couple, or individual settings.

- One study examined the way in which family involvement could enhance PTSD treatment.
- Three projects examined conjoint couple therapy for PTSD, three

of which were with veterans. A mix of treatment approaches was used, including mindfulness training

- Four studies investigated ways to enhance the efficiency of established evidence-based treatments, specifically PE and CPT. One focused on comparing efficacy of massed versus spaced trials for PE therapy delivery in recently returned active-duty service members. Another PE study compared delivery in a traditional PE one-on-one format versus cognitive behavioral conjoint therapy for PTSD, which is a trauma-focused approach designed to be delivered in a couples format to produce greater improvement in intimate relationship functioning. Two CPT projects were funded—one tested the efficacy of CPT delivered in groups to determine if it could be delivered more efficiently than one-on-one treatment, and the other was a randomized controlled trial that compared traditional delivery in an office with face-to-face delivery in the home.
- Four studies focused on testing group therapy as a mechanism for delivering treatment. Three used veteran samples and one was open to both active-duty service members and veterans. One compared group exposure therapy with treatment as usual in veterans. Another compared group CBT with emotional freedom techniques in veterans. An open trial tested the efficacy of group CBT in veterans. One investigated structured group therapy compared with unstructured group therapy in both service members and veterans.
- Three projects focused on couple therapy for veterans. Two tested a newer approach called structured approach therapy, which is specifically designed for PTSD treatment. A third project tested the efficacy of a CBT couples approach.

Target A.8: Treating Different Gender and Racial Groups

DoD = 2; VA = 3; NIMH = 4; Other NIH Institutions = 3; Other = 1

The committee identified a few research studies that were focused on women and minority populations.

- In the studies on women, the focus was primarily on alcohol, depression, early sexual assault, and interpersonal violence. A number of studies had large sample sizes and most combined treatments that are usually implemented in isolation (for example, relapse prevention with PE, and skills training in affective and interpersonal regulation plus modified PE); one study tested online treatment formats for rape victims and survivors.

- In the studies of minority populations, one addressed ways to improve medication prescribing, and the other focused on the tailored delivery of standard CBT.
- A few studies investigated the value of combining treatments and tested ways to make current treatments more accessible in female and minority populations.
- Two projects relied on secondary analyses of existing databases to compare differences in male and female PTSD mental health care service needs and to examine differences in comorbid substance abuse in male and female veterans. The aim of these studies was to determine if there were differences in the mental health needs across gender in veterans with PTSD and substance use.
- One study focused on the translation and cultural adaptation of the PE manual to better meet the needs of Hispanic veterans with PTSD.
- One project focused on testing a manualized approach that combines three treatment approaches in a group format for women.
- One study focused on American Indians and investigated a culturally relevant form of therapy, which involved indigenous healers compared with standard treatment.

Target A.9: Concurrent Treatment of Comorbidities

DoD = 12; VA = 28; NIMH = 5; Other NIH Institutes = 14; Other = 13

Most of the studies in this target area focused on PTSD and alcohol or substance use. Other areas of research were PTSD and depression, suicide, other mental health disorders, interpersonal violence, sleep disturbances, pain, and irritable bowel syndrome. Some of the treatment approaches in this research category were tailored exposure, imagery rehearsal with or without CBT, and cognitive behavior social rhythm therapy in groups. There were also a few studies related to pharmaceutical agents, technological applications, and yoga. Examples of specific studies included the following:

- A study examined prescribing patterns for PTSD and bipolar disorder to better characterize and understand prescribers' decision making.
- A study secondarily analyzed data gathered from the STRONG STAR cohort to investigate pain and sleep with an existing sample of PE or CPT participants.

- One study examined thermal imaging as a way to measure the central nervous system to aid in the assessment of PTSD and to support therapy.
- Several studies evaluated the treatment of PTSD and smoking. These included the use of a nicotine patch versus placebo patch along with CBT and bupropion; integration of smoking cessation treatment with CBT for PTSD versus smoking cessation treatment alone; varenicline and smoking cessation versus varenicline; smoking cessation versus PE; use of supplemental nicotine administration prior to quitting; use of CBT for insomnia in subjects with PTSD, smoking, and insomnia; and the use of mobile text messaging for integrating CPT and smoking cessation treatments.
- A group of studies assessed the treatment of PTSD and severe insomnia or comorbid primary or secondary insomnia disorder. These included a comparison of prazosin, placebo, and CBT as augmentation to SSRI drug therapy; mindfulness-based mind-body bridging versus zolpidem treatment for primary and secondary insomnia; evaluation of short-term CBT for chronic insomnia; CBT for insomnia in survivors of interpersonal violence who have PTSD, depression, and insomnia; CBT for sleep in subjects who have PTSD and insomnia; and cognitive behavioral group therapy for sleep and nightmare problems in veterans who have PTSD and insomnia. One study assessed the effects of treating sleeplessness with CBT versus wait list on blood pressure and other cardiovascular indices.
- Other studies of comorbidity include narrative exposure therapy versus treatment-as-usual for PTSD with borderline personality disorder; tailored CBT treatment of PTSD in conjunction with serious mental illness such as psychosis and bipolar disorder; treatment of PTSD with panic attacks or panic disorder with multiple channel exposure therapy; and the use of repetitive transcranial magnetic stimulation for suicidality in those who have PTSD, depression, and mild TBI.
- Several studies investigated treatments for patients who have PTSD and depression using quetiapine, aripiprazole, vilazodone, and prazosin. One study compared metacognitive therapy with regular CBT for PTSD with depression or other anxiety disorders.

BARRIERS

DoD = 10; VA = 37; NIMH = 5, Other NIH Institutes = 2; Other = 0

Fifty-four projects refer to barriers to care. Several studies focused on barriers as the main purpose of the project and others included them as subsidiary goals (for example, in studies of treatment or the design of a new procedure to enhance care).

With respect to target populations, the largest group was of OEF and OIF veterans. There were also two studies of predominantly Vietnam-era veterans, nine that either did not specify the population of interest or studied veterans of all eras, and six that were limited to National Guard and reserve service members. Some examples of studies categorized in this area included the following:

- Studies that evaluated outcomes such as dropping out of treatment, acceptance of treatment, adherence to antidepressants in older patients, and adherence to PE or CBT.
- Studies on overcoming a barrier to treatment, such as the use of Web-based interventions, supportive education, buddy-to-buddy contact, telephone monitoring aftercare, and attitude-modifying interventions.
- Studies on barriers related to geographic determinants and ambulatory care.
- Studies focused on identifying barriers to care such as stigma and knowledge of types of treatment in active-duty and veteran populations.

Nearly all studies appropriately pertained to research on individual, family, provider, and institutional barriers to the delivery of evidence-based care. However, there were two studies that investigated variations in institutional review board functioning, one study that focused on transitioning care from DoD to VA, and two studies that were focused on identifying barriers for delivering novel treatments, such as acupuncture.

LONG-TERM OUTCOMES ASSOCIATED WITH PTSD

DoD = 9; VA = 10; NIMH = 4; Other NIH Institutes = 5; Other = 0

The committee identified several studies that investigated long-term health outcomes in people who had a diagnosis of PTSD. The studies varied widely and some considered such topics as the following:

- PTSD as a risk factor for cardiovascular disease and metabolic syndrome.
- A lifespan model looking at health outcomes with increasing age.
- Early detection and intervention in relation to later substance abuse and attrition from the military.
- Exposure to trauma cues and later risk taking.
- Factors determining long-term outcome following sexual trauma.
- A 6-year follow-up study to investigate how new stress impacts the trajectory of those who have PTSD and a comorbidity.
- One study to investigate reactions to extreme stress and biomarkers (for example, heart rate variability and endothelial function) in a Danish population.
- A long-term follow-up cohort of OEF and OIF National Guard personnel who are over 50 years old.
- Two studies to evaluate aspects of fibromyalgia, specifically its prevalence and impact on PTSD in active-duty service members.
- One study was a long-term follow-up of male and female veterans that assessed risk factors for missed diagnoses.
- As part of the RESTORE project, there were five protocols related to long-term outcomes. Three of the protocols were Web-based interventions (two randomized controlled trials of acceptance and commitment therapy and accelerated resolution therapy and an assessment of rates of high-risk behavior), one was a study of health outcomes in female veterans, and one was a randomized controlled trial of telemedicine for mild TBI.

INTIMATE PARTNER VIOLENCE

DoD = 0; VA = 4; NIMH = 2; Other NIH Institutes = 2; Other = 1

The committee identified a few studies that included reference to associations between PTSD and intimate partner violence.

- One study focused on mental health and physical health of men who sustain partner violence and their children.
- One study focused on racial and ethnic differences in the daily dynamics of PTSD, sexual risk, and substance abuse. It explored the mechanisms by which intimate partner violence may increase the risk of substance abuse and risky sexual behavior.
- One study assessed the longitudinal course of women who differed in intimate partner violence exposure and the emotional and behavioral problems of their children, to assess the additive and interactive effects of recent intimate partner violence and non-

intimate partner violence on PTSD and depression; and to assess the additive or interactive effects of maternal attachment on PTSD and depression symptoms and biomarkers of allostatic load.

- One study in OEF and OIF veterans tested the hypothesis that TBI and executive functioning deficits moderate the impacts of PTSD symptoms and cognitive deficits and biases on the intimate partner violence outcomes.
- One study aimed to provide data to support the associations between PTSD and heightened rates of intimate partner violence in a veteran population. The primary objective was twofold: to describe the differences and examine factors that facilitate the detection by providers of intimate partner violence perpetrated by veterans and to describe and examine what variables might promote accurate detection.
- One study was a pilot program to treat 15 cases using a model for PTSD-focused CBT for partner violence.

TRAINING

Target A: Training Providers

DoD = 6; VA = 2; NIMH = 4; Other NIH Institutes = 0; Other = 3

The research in this target area included of primary care providers; mental health clinicians and trainees; clinical psychology graduate students; military, VA, and community mental health care providers; and primary care physicians. Some of the studies in this area included the following:

- Development and testing of a computer-based simulation training program.
- Development of a virtual patient for the identification and treatment of trauma-related mental health and health disorders in primary care of traumatized, low-income, culturally diverse patients with low English proficiency.
- Develop and test a Web-based system for training in CBT for social anxiety disorder and PTSD.
- Develop and mentor trainees in screening and intervention procedures to target PTSD and related conditions after injury.
- Create a PE computer-assisted therapy program to assist clinicians in implementing PE in real time.
- Development of a curriculum that provides clinical psychology graduate students with a broad training in exposure-based therapy for anxiety disorders.

- Teach a Seeking Safety program to 36 clinicians and a randomized controlled trial to randomly assign 100 clinicians to a Web-based PE refresher course for clinicians trained in PE versus clinicians not trained in PE.
- Whether supervision is required for PE.
- Use of a virtual patient and online course to train graduate students in motivational interviewing.
- Teach military primary care physicians how to interview following a postdeployment health reassessment.
- Web-centered supervision with internet training in VA and for community clinicians.
- Web-based training to help primary care physicians detect and treat PTSD.
- Development of a continuing medical education course based on PTSD treatment guidelines.
- Examining 120 Canadian clinicians and their PTSD patients and the importance of post-workshop support (6-month duration) on clinicians' competence in CPT and patient symptoms.
- Document outcomes of CBT interventions delivered by credentialed, but not licensed, trainees treating a range of disorders.

Target B: Research or Training Grants for Career Development

DoD = 0; VA = 1; NIMH = 13; Other NIH Institutions = 8; Other = 0

The committee identified several k-awards or training grants in the NIH RePORT database. Some of the major topic areas of these awards and grants included the impact of PTSD on older veterans; laboratory methods for PTSD; the molecular basis of emotional learning; the use of fMRI for emotional memory research in PTSD; olfaction and PTSD; the neural basis of safety learning and fear inhibition by safety; and the genetic and environmental etiology of depression, anxiety disorders; s and PTSD. The impact of individual career development awards cannot be determined from the committee's review of the databases. However, the committee acknowledges that grants aimed at training the next generation of researchers and clinicians in empirically supported methods are of utmost importance.