NATIONAL CENTER FOR PTSD

Fiscal Year 2016 Annual Report

WOMEN'S MENTAL HEALTH

National Center for PTSD

POSTTRAUMATIC STRESS DISORDER

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CONTENTS

A version of the National Center for PTSD Fiscal Year 2016 Annual Report with all appendices, as well as each individual appendix, is available as a pdf document at http://www.ptsd.va.gov/about/mission/annual_reports/index.asp

Photos on cover, table of contents, and last page from AboutFace: https://www.ptsd.va.gov/apps/AboutFace/

Acronyms Used in the Text

13C-MRS
Carbon-13 Magnetic Resonance Spectroscopy

ACT
Acceptance and Commitment Therapy

CAP
Consortium to Alleviate PTSD

CAPS-5
Clinician-Administered PTSD Scale for *DSM-5*

CBCT
Cognitive Behavioral Conjoint Therapy

CBT
Cognitive Behavioral Therapy

CBTi
Cognitive Behavioral Therapy for Insomnia

COMT
Catechol-O-Methyl Transferase

CPT
Cognitive Processing Therapy

CSP
Cooperative Studies Program

DARPA
Defense Advanced Research Projects Agency

DoD
Department of Defense

DSM-5
Diagnostic and Statistical Manual of Mental Disorders-5th Edition

EMDR
Eye Movement Desensitization and Reprocessing

FKBP5
FK506 Binding Protein 5

fMRI
Functional MRI

GABA
Gamma-Aminobutyric Acid

HSR&D
Health Services Research & Development

ICD
International Classification of Diseases

IPV
Intimate Partner Violence

LATR
Later-Adulthood Trauma Re-engagement

LIGHT
Longitudinal Investigation of Gender, Health, and Trauma

MBC
Measurement-Based Care

mGluR5
Metabotropic Glutamatergic Receptor

MHS
Mental Health Services

MMPI
Minnesota Multiphasic Personality Inventory

MRI
Magnetic Resonance Imaging

MRS
Magnetic Resonance Spectroscopy

MST
Military Sexual Trauma

mTBI
Mild Traumatic Brain Injury

NEPEC
Northeast Program Evaluation Center

NHRVS
National Health and Resilience in Veterans Study

NIH
National Institutes of Health

NIMH
National Institute of Mental Health

NMDA
N-Methyl-D-Aspartate

OMHO
Office of Mental Health Operations

OXTR
Oxytocin Receptor Gene

PBIN
Practice-Based Implementation Network

PC-PTSD-5
Primary Care-PTSD Screen for *DSM-5*

PCL-5
PTSD Checklist for *DSM-5*

PDSI
Psychotropic Drug Safety Initiative

PE
Prolonged Exposure

PET
Positron Emission Tomography

PILOTS
Published International Literature on Traumatic Stress

PTG
Posttraumatic Growth

PTSD
Posttraumatic Stress Disorder

RDoC
Research Domain Criteria

RVHT
Responsive Virtual Human Technology

SERV
Survey of Returning Veterans

SGK1
Serum and Glucocorticoid-Regulated Kinase 1

SNP
Single Nucleotide Polymorphism

SPECT
Single-Photon Emission Computed Tomography

STAIR
Skills Training in Affective and Interpersonal Regulation

STRONG STAR
South Texas Research Organizational Network Guiding Studies on Trauma and Resilience

SV2A
Synaptic Vesicle Glycoprotein 2A

TBI
Traumatic Brain Injury

t-LLLT
Transcranial Low-level Light Therapy

TRACTS
Translational Research Center for TBI and Stress Disorders

TRAIN
TrainingFinder Real-Time Affiliate Integrated Network

USUHS
Uniformed Services University of the Health Sciences

VA
Department of Veterans Affairs

VALOR
Veterans After-Discharge Longitudinal Registry

VHA
Veterans Health Administration

WBI
Well-Being Inventory

WTC
World Trade Center

From the Executive Director


Paula P. Schnurr

As more and more women are entering the military — and taking on responsibilities that for most of history were reserved for men — the need for a better understanding of how posttraumatic stress disorder (PTSD) affects women is becoming increasingly critical. Since its beginning, the National Center for PTSD has been at the forefront of research focused on women, both during and after their military service, and the opening section of this Annual Report summarizes some of the important work that is being done in this area today.

Our work with women Veterans owes a tremendous debt of gratitude to Dr. Jessica Wolfe, whose vision and determination were central to the founding of the Women's Health Sciences Division, and who led the Division with great distinction in its early years. Under her leadership we were able to grow the portfolio of research and educate clinicians so that they are better able to meet the needs of women Veterans.

Jessica was succeeded by Dr. Patricia Resick, who led the Division for ten years and continued the pattern of excellence in research and education. The Division is now in the capable hands of Dr. Tara Galovski, who joined us in 2015. These dedicated professionals, and all the researchers who have been involved with the Division's work over the years, have contributed immeasurably to our understanding of women and PTSD, and to our ability to formulate approaches to addressing their needs.

There have been many other noteworthy accomplishments during FY 2016. Progress on the PTSD Brain Bank, under the direction of former National Center Executive Director Dr. Matthew Friedman, has continued to advance. The Bank now contains 149 PTSD and comparison brains, giving us an extraordinary opportunity to study how PTSD affects the structure and function of the brain.

The National Center has also built a network of relationships that enable us to draw on resources from around the country, collaborate with colleagues in many different specialties, and disseminate our findings to the broadest possible audience. In addition to our collaborations across our own seven centers of excellence across the United States, and our close relationships with clinicians throughout the VA, we often work on joint projects with researchers from other government agencies, medical centers, and universities. The Consortium to Alleviate PTSD, or CAP, is an example of an especially fruitful collaboration. It is a five-year project led by the National Center and the STRONG STAR Consortium at the University of Texas, that includes an array of cutting-edge clinical trials and biological studies. You will find more information on this and many other collaborative projects throughout this Annual Report.

We are proud of our staff and the work we do, and are especially gratified that our work helps to improve the lives of the brave women and men in our military.

Dr. Paula P. Schnurr
Executive Director

Dr. Paula P. Schnurr is the Executive Director of the National Center for Posttraumatic Stress Disorder; she served as Deputy Executive Director from the time of the Center's founding in 1989 to 2014. She is a Professor of Psychiatry at the Geisel School of Medicine at Dartmouth and Editor of the Clinician's Trauma Update-Online.

Women Veterans and PTSD: Leading the Way

At the time of the founding of the National Center for PTSD, experiences unique to women in the military were coming into focus for the first time. A key driver of the new interest in women Veterans was the National Vietnam Veterans Readjustment Survey, completed and published in the late 1980s. It was the first rigorous study of the psychological consequences of war by any country, and was the first to include results related specifically to women. Shortly thereafter the 1990-1991 Gulf War ushered in an era of high-tech warfare during which women played an increasingly vital role, serving closer to the front lines than ever before.

The National Center for PTSD was founded in 1989, and immediately took an interest in women's issues. In 1990, the Center's first full year of operation, researchers in the Behavioral Science Division in Boston began developing a Women's Wartime Exposure Scale, an initial step toward creating diagnostic instruments that would be valid for women. In 1993 the Women's Health Sciences Division of the National Center was established, led by Dr. Jessica Wolfe.

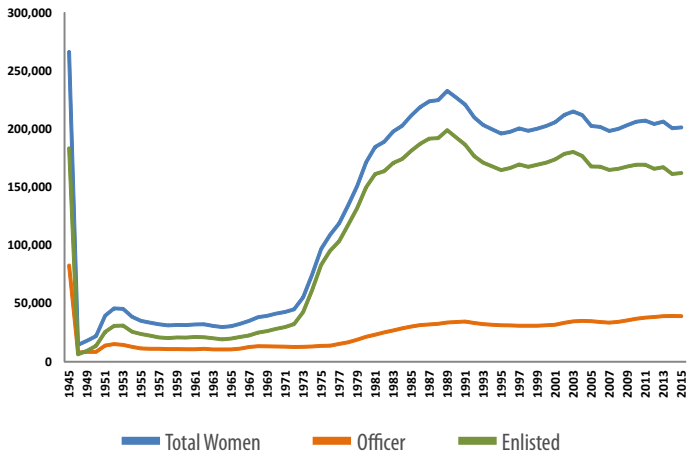
Today women make up more than 15% of active duty Servicemembers. Dr . Tara Galovski, the current Director of the Women's Health Sciences Division, says, "Women have been exposed to combat for a long time, but their service roles were limited compared to men. The rules have recently changed to expand the breadth and depth of service for women in the armed forces — for instance, in infantry and Special Forces — which creates more opportunities for the women, but also more potential for exposure to traumatic stress."

Today women make up more than 15% of active duty Servicemembers.

Women will continue to account for an increasing percentage of Veterans using the health care services of the Department of Veterans Affairs (VA) in the future: The number of women enrolled in VA healthcare increased

The number of women enrolled in VA healthcare is expected to continue to rise

Female Active-Duty Military Personnel: 1945 to 2015



Source: Department of Defense, Defense Manpower Data Center, Statistical Information Analysis Division. Prepared by the National Center for Veterans Analysis and Statistics.

by 84% from 2005 to 2015 and is expected to continue to rise. This situation has made it more critical than ever to confront the unique issues that women Veterans face. The sections that follow highlight some of the research on women that is currently underway at the National Center.

Treatment for PTSD

In 2007 the National Center published findings from a groundbreaking VA Cooperative Study that included almost 300 female Veterans and active duty personnel of all eras, ranging in age from 22 to 78. According to Dr. Paula Schnurr, the Center's Executive Director and the lead researcher on the project, "This study was the first treatment study focusing specifically on women Vets, and in fact it was the first VA Cooperative Study to focus on women for any condition." She is currently leading another VA Cooperative Study to compare the efficacy of the two most effective evidence-based treatments, Cognitive Processing Therapy (CPT) and Prolonged Exposure (PE), and to examine whether male and female Veterans differ in response to these treatments.

> We want women to feel less trapped, less alone, to know that there is a lot of help out there, and to know how to get that help.
>
> - Dr. Rachel Kimerling

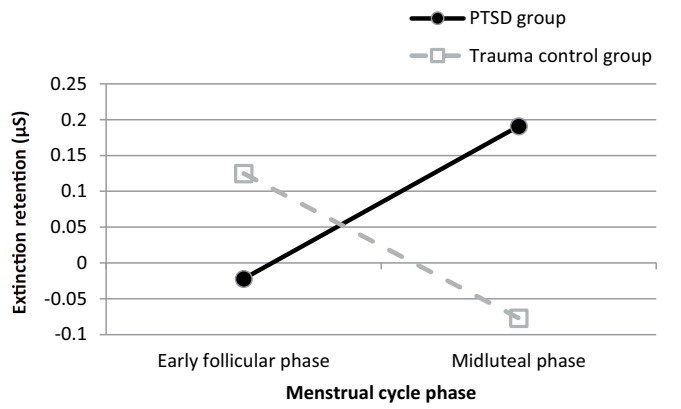
Today some of the National Center's researchers have turned their attention to developing a better understanding of engagement with treatment — that is, once a person has sought out treatment, how can clinics encourage them to stay with the treatment long enough to experience the positive effects? Dr. Rachel Kimerling of the National Center's Dissemination and Training Division explains, "We know that women are more likely than men to seek out mental health treatments, and psychotherapy instead of medications. One of the topics we have focused on is whether there is a need for separate clinics or services just for women," says Dr. Kimerling. "It's hard to get women to engage in care if they feel uncomfortable in a waiting room filled mostly with men, or if they feel out of place, or worse, unsafe."

Dr. Kimerling and her colleagues conducted a multisite study of women who came to the VA for primary care. They found that women who were experiencing PTSD and other mental health issues were much more likely to want care tailored specifically to the needs of women, such as women-only waiting rooms and women providers. In contrast, gender-specific options were not considered important in dealing with physical health problems such as pain.

"We are now developing a brief measure that can be used in the primary care setting," says Dr. Kimerling, "It's a way to let us know how to help Veterans engage with the kind of care they want and need." She thinks the benefits will extend beyond treatment of PTSD to issues like suicide or homelessness. "We want women to feel less trapped, less alone, to know that there is a lot of help out there, and to know how to get that help."

The Neurobiology of PTSD in Women

The National Center is a leader in research on the neurobiology of PTSD, studying how the structure and processes of the brain are affected by exposure to trauma and by the disorder itself. Researchers have followed many avenues of investigation in an attempt to discover whether there are sex differences in the underlying neurobiology of PTSD. One focus of this research has been on the relationship between PTSD and women's reproductive health. Women with PTSD are twice as likely to have preterm births and eight times more likely to suffer from premenstrual dysphoric disorder. Investigators have also found that PTSD symptoms differ across the menstrual cycle and throughout pregnancy .



Extinction retention as predicted by menstrual phase and PTSD group. Extinction retention is defined as differential SCR (measured in microSiemens [µS]) for the extinction retention phase minus differential SCR for the early extinction phase. Lower scores indicate better extinction retention. PTSD = posttraumatic stress disorder; SCR = skin conductance response.

Pineles, Nillni, King et al. (2016), *Journal of Abnormal Psychology, 126,* 349-355.

An example of a promising emerging target of research is the steroid allopregnanolone, produced naturally in the brain and adrenal glands, and its counterpart pregnanolone, collectively called ALLO. ALLO works on receptors in the brain to dampen stress reactions. Levels of ALLO in the central nervous system were found by researchers at the National Center to be dramatically lower in women with PTSD and to correlate with the severity of PTSD symptoms. The levels of ALLO in women with PTSD were 60% below levels in healthy women; in women with both PTSD and depression, levels were 80% below normal.

Researchers believe that low ALLO levels might also interfere with the retention of learning that occurs in PTSD treatment sessions; that is, a patient with PTSD may learn that it is safe to stop reacting to a particular reminder of a trauma, but the person may be unable to retain that learning over time.

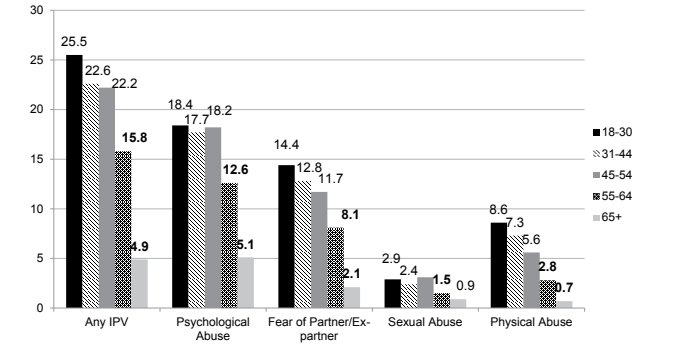
Dr. Ann Rasmusson, a leader in research on ALLO, believes "(d)eficiencies in ALLO production are related to both genetic factors and environmental influences, such as extreme stress. It would be very helpful to develop measurement and screening tools to identify people who are susceptible and to develop targeted treatments for them."

Military Sexual Trauma and Intimate Partner Violence

The National Center was one of the first organizations to study the effects of military sexual trauma (MST) on women (and men) and the connection between MST and the development of PTSD. VA defines MST as any unwanted sexual experience that occurred during deployment, ranging from verbal sexual harassment to sexual assault. VA screening data indicate that at least one in four women who served in the military have experienced MST.

Attending to these experiences among women Veterans is particularly important because, among all the possible traumatic events that can happen, rape carries the highest risk of leading to PTSD, higher than even combat experiences. Sexual trauma during a combat deployment

may be particularly difficult to cope with, since it is often impossible for a woman to avoid her aggressor in a military setting, especially if the aggressor is in a position of authority.



Prevalence of past-year intimate partner violence by age group among women VHA primary care users. Numbers in bold significantly differ from the preceding age group at $p < 0.05$.

Kimerling , Iverson, et al. (2016), *Journal of General Internal Medicine, 31*, 888-894.

The VA instituted a universal MST screening program in primary care and mental health settings in 2000. The program is intended to identify Veterans — both women and men — who have experienced any form of MST. Researchers at the Women's Health Sciences Division want to understand why MST is so prevalent, and what happens in the VA system after a person has been found to have experienced MST.

According to Dr. Amy Street, an expert in MST research, "(t)he military is a male-dominated culture, and male-dominated cultures have a greater prevalence of sexual harassment. General harassment, like yelling from a drill instructor, goes on all the time, so that aggressive behavior can begin to seem normal. And of course the military is more hierarchical, and higher-ranking people can tell you what to do and you have to obey. This can create an environment that is ripe for bad behavior."

Dr. Street notes that MST can result in significant losses for the military. "Women can be attracted to the military's structure and rules, especially women who come from more chaotic family environments. They feel very betrayed by the military when they experience MST, especially if the situation isn't addressed and the perpetrator isn't punished. When they have to make a choice between their safety and their career, they will often decide to leave the military."

As efforts to increase the implementation of IPV screening programs take place across the VA system, VA is likely to have the largest healthcare-based IPV screening program in the world.

Military women are also more likely than non-military women to experience violence at the hands of intimate partners during and after their military experience. VA has begun to use an intimate partner violence (IPV) screening questionnaire to identify women and men who have experienced IPV within the previous year. As efforts to increase the implementation of IPV screening programs take place across the VA system, VA is likely to have the largest healthcare-based IPV screening program in the world.

According to Dr. Katherine Iverson, one of the leading experts on IPV, "(a)t least one in four women Veterans who are in relationships have experienced past-year physical, emotional, or psychological violence at the hands of their partner, which is as much as twice the rate you would expect in the general population." The reasons for this are unclear, but it appears that women who have experienced sexual abuse as children or dysfunctional family situations are more likely to report IPV, and it is possible that women in these situations are more likely to join the military as a means of escape. It is also the case that the experience of

MST is another risk factor for recent IPV among women Veterans.

Drs. Street and Iverson are also working to improve how the VA system responds to women who reveal that they have experienced MST or IPV. For example, Dr. Iverson says "(w)e know that different resources are available in different settings, but at the very least the person who discloses IPV should get validation of their situation, information about effects, and referrals to a social worker, mental health professional, or community partner, depending on what's available at that specific VA facility." A new program called RISE (Recovering from IPV through Strength and Empowerment) takes a modular approach, recommending counseling that focuses on each individual's unique situation: Does she need safety planning? The location of local homeless shelters? Social support?

Division researchers are also studying ways to address barriers to disclosure of MST and IPV in the clinical setting. Patients can experience shame if they feel victimized or responsible in some way for their assault. Providers can similarly be uncomfortable talking about sensitive issues, or fear they will say something inappropriate. Resolving these issues requires consultation and training throughout the network of VA providers.

Well-Being After Military Service

National Center researchers are looking at Veterans' well-being in general, and identifying specific areas in which VA and Veteran service organizations can help Veterans during the transition to their post-military lives. One study on this topic focused on a sample of post-9/11 Veterans, identifying experiences they had when deployed in Iraq and Afghanistan, looking at their post-deployment mental health, and measuring the impact of these experiences on well-being. According to Drs. Dawne Vogt and Brian Smith, PTSD appears to have a similar impact on women's and men's work and family-related well-being overall, although some noteworthy gender differences were observed as well. For example, while PTSD had implications for reduced work functioning for both women and men, PTSD was associated with lower job satisfaction for women only.

The Well-Being Inventory (WBI) assesses not only mental and physical health, but also functioning related to vocations, finances, and social relationships.

Building on that work, Dr. Vogt has devised a measurement tool called the Well-Being Inventory (WBI) that assesses not only mental and physical health, but also functioning related to vocations, finances, and social relationships. A major ongoing project is using the WBI to look at military-to-civilian transitions among 9,600 individuals from the general Veteran population. Researchers are using this tool to survey these Veterans three months after they separate from military service, and will continue to follow up every six months for the next three years.

Dr. Vogt reports that initial findings have been encouraging. "Most of the Veterans we surveyed are actually doing quite well, particularly in the areas of employment, finances, and social relationships," she reports. "The one area where they are struggling is in the physical and mental health domain. Over half have some sort of ongoing physical condition, usually chronic pain or sleep problems. And about a third are reporting some mental health issues such as PTSD, general anxiety, or depression." Men and women are similar on most

measures of well-being. The one exception is in the area of employment: Women who have recently separated from military service are somewhat more likely to report trouble finding a job than men.

Researchers are also working to identify which particular elements of the transition and reintegration programs are being most heavily used, how they are being used, and what core components are common to programs that are working especially well. Ultimately they hope to incorporate the most successful components into future programs.

According to Dr. Vogt, "I'm very excited to be following the same cohort over time. We can learn so much by looking at how Veterans' needs vary across the transition process. Do they need financial literacy courses? Job-hunting skills? Mental health treatment? And when are these programs most useful? If we can find the point in that process when people benefit most from these programs, we can ensure that the support Veterans need is available when they need it most and help them have a successful reintegration."

> If we can find the point in that process when people benefit most from these programs, we can ensure that the support Veterans need is available when they need it most and help them have a successful reintegration.
>
> - Dr. Dawne Vogt

Looking Ahead

Many of the National Center's current research efforts are expected to have significant positive effects for women Veterans in the future. Research on neurobiological factors could lead to more effective treatments or preventive regimens. Data on women's needs and preferences for treatment will hopefully result in improvements in clinical settings that will encourage women to engage more effectively with their treatments.

Dr. Galovski is currently launching a major survey called LIGHT (Longitudinal Investigation into Gender Health and Trauma) that will gather information on the personal histories and experiences of a large cohort of women

Photo by Jackie Ricciardi for Boston University

and men, mostly recruited from communities exposed to high levels of violence — a population of Veterans that has gone understudied. The project is aimed at better understanding the implications of trauma and exploring gender differences in mental health issues, effects on reproductive health, and the prevalence of risky behaviors. "Everything we have learned so far is informing this survey," says Dr. Galovski, making it one of the most comprehensive studies of its type ever undertaken.

Dr. Iverson would like to see the results of research on IPV extended to an even broader population. "It would be great to have preventive care, with earlier interventions for women at risk for sexual violence." She adds, "(m)any segments of our society believe that violence against women is acceptable. Women need to know that it's not OK, and to hold people accountable for their behavior."

National Center Executive Director Dr. Schnurr sees great progress across many fronts. "I'm so proud of our entire portfolio of research on women and PTSD — screening, treatment, biology, and more. We've been able to learn a great deal about the particular issues faced by women Veterans. We also have learned that women may have unique needs, different from men, but that doesn't mean they are fragile or less resilient. The more we can further our understanding in this area, the better able we will be to meet their needs in the future."

Major Research Initiatives in Fiscal Year 2016

The National Center for PTSD is a leader in innovative research on the prevention, causes, assessment, and treatment of PTSD. Three years ago the National Center adopted five Operational Priorities, broad research topics that organize and focus research activities on those areas that are likely to have the greatest benefit to Veterans.

- **Biomarkers.** The establishment of biomarkers to predict who develops PTSD, to diagnose PTSD, and to predict and measure response to treatment.
- **Treatment.** Development of strategies to enhance the effectiveness of existing treatments, to enhance treatment engagement, and to develop more effective treatments.
- **Care Delivery.** Development of strategies to enhance access to treatment, measurement-based care, shared decision-making, and treatment for PTSD in primary care.
- **Implementation.** Development of research, strategies, and infrastructure to promote implementation of best practices.
- ***DSM-5.*** Implementation of research and education activities related to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (*DSM-5*).

Starting in FY 2017, the National Center will adopt a new Operational Priority: PTSD and Suicide, to investigate the relationship between PTSD and suicide and develop strategies to predict and prevent suicide among individuals with PTSD.

During FY 2016, researchers in the National Center led 100 funded studies, ranging from small studies at a single location to large multisite projects, often involving partner organizations in the government, universities, and agencies outside of the United States. Investigators published 234 print publications, including peer-reviewed journal articles, book chapters, and books, and had another 127 in-press and advance online publications.

The sections that follow highlight a few of the FY 2016 research initiatives that were undertaken to address the five Operational Priorities. A description of research projects that took place at each of the seven Divisions is provided in Appendix A.

Biomarkers

Advancing the understanding of the neurobiology of PTSD is critical to improving diagnosis, prevention, and treatment. The National Center established the first

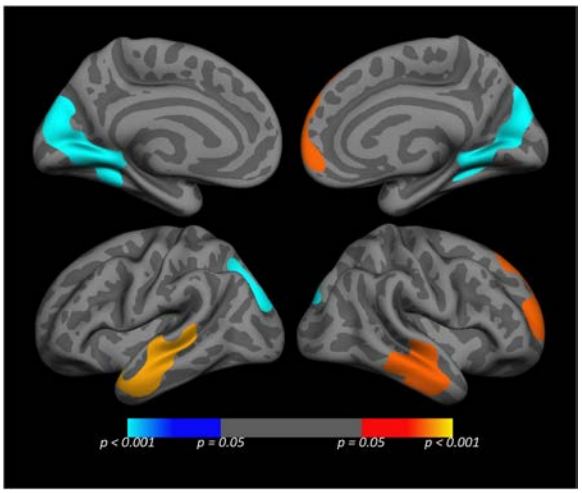
national PTSD Brain Bank in 2014 to support research addressing these topics. Led by Dr. Matthew Friedman, founding Executive Director and Senior Advisor to the National Center, the Brain Bank currently has an inventory of 149 PTSD and comparison brains. This number continues to increase as both Veterans and non-Veterans volunteer to be donors.

The first manuscript presenting Brain Bank data was published in FY 2016. The research revealed that a specific signaling protein involved in neuronal plasticity, called serum and glucocorticoid-regulated kinase 1 (SGK1), may be a molecular signature of PTSD. Additional research efforts utilizing Brain Bank data are underway, including DNA methylation analyses of several brain regions, development of a diagnostic biomarker panel using postmortem tissue and blood samples, and examination of the validity of postmortem diagnostic assessments of PTSD.

Support for cutting-edge clinical trials and biological studies is provided by the Consortium to Alleviate PTSD (CAP), a five-year, $45 million award to the National Center and the STRONG STAR Consortium at the University of Texas Health Science Center in San Antonio co-directed by Dr. Terry Keane. Currently in its third year, the CAP will be critical for learning more about the biology and physiology of PTSD, using response to treatment to inform subsequent diagnosis, enhancing prediction of symptoms over time, and developing new or improved treatment methods. Eleven CAP studies are currently underway. One particularly notable study is an examination of ketamine, a medication typically used for sedation that also has rapid antidepressant effects; researchers believe it could be an effective treatment for PTSD in active duty military personnel and Veterans who do not respond to conventional antidepressant treatment.

The Behavioral Science and Clinical Neurosciences Divisions continue to use novel neuroimaging techniques to analyze brain structure and function, hoping to identify specific signatures of PTSD that could be targeted by new treatments. Investigators at the Women's Health Sciences Division are examining stress-related biological factors that can be measured in blood and predict psychiatric, substance use, and medical conditions in Veterans with PTSD.

Finally, the National Center is forging valuable partnerships with other organizations — including the Psychiatric Genomes Consortium, a worldwide confederation of investigators — to increase access to the large sample populations that are required for genetics research. Findings from these partnered research studies include identification of a gene associated with reduced volume of certain brain regions in PTSD and evidence that PTSD is associated with accelerated aging at the cellular level.



Medial (top) and lateral (bottom) views of the whole cortex vertex-wise analysis of the rs977003 × PTSD diagnosis interaction. The cluster-wise significance for all clusters depicted was $p \leq 0.0051$. The temporal and frontal clusters (red/yellow) correspond to components of the default mode network modeled in the primary analysis. The blue cluster in the visual cortex, (which was opposite in direction relative to the temporal and frontal effects) was not detected in the primary analysis because it is not a component of the default mode network.

Miller et al. (2016), *Frontiers in Neuroscience, 10*, 299.

Treatment Efficiency, Effectiveness, and Engagement

Cognitive Processing Therapy (CPT) and Prolonged Exposure (PE) are two important evidence-based treatments for PTSD that have proven to be highly effective. They are not effective for all patients, however, and they require significant time and effort from both providers and patients.

To address these and many other issues related to treatment, researchers at multiple Divisions of the National Center have begun a groundbreaking Cooperative Studies Program investigation (CSP #591) to delve more deeply into CPT and PE. The study will enroll 900 male and female Veterans at 17 sites across the country; over 600 Veterans had been enrolled at the end of FY 2016. Findings will help VA leadership, clinicians, and Veterans make informed choices about the delivery of PTSD care in VA, and will also be broadly relevant to the scientific and clinical communities outside VA.

Other studies are examining more efficient ways to deliver treatment. For instance, one study is examining treatment formats for psychotherapies to determine if the treatments can be effective with less than the 12 sessions that trauma-focused therapy usually requires. In another effort, investigators at the Women's Health Sciences Division completed studies on the relative effectiveness of CPT delivered in a group versus individual format. The primary results revealed that PTSD symptoms improved in both groups, but participants who received individual therapy improved about twice as much as participants who received group therapy.

Enhancing access to evidence-based PTSD treatment is an important focus of National Center investigators. Dissemination and Training Division investigators are leading a large multisite clinical trial with women who are using public mental health clinics; the study is testing the effectiveness of a flexibly delivered PTSD skills training program combined with PE treatment.

Patients vary in their motivation and ability to engage effectively with mental health care, but to date there have been no brief measures of PTSD treatment engagement that can be used in clinical practice. To fill this gap, the Dissemination and Training Division is developing a measure to guide identification of service resources needed to engage Veterans with their care and promote successful treatment outcomes. Another study is exploring Veteran and provider perspectives regarding reasons for dropout from CPT and PE; the aim is to create an intervention that will increase rates of completion.

Care Delivery, Models of Care, and System Factors

In addition to studying the effectiveness of the treatments themselves, the National Center is also working to develop strategies to facilitate shared decision-making between Veterans and their providers.

Executive Division investigators surveyed a national sample of adults with PTSD symptoms, half Veterans and half non-Veterans, to assess their decision-making needs and preferences for PTSD treatment. The published results are informing the development of the first publicly available online decision aid for PTSD, which will be available on the National Center's website in FY 2017.

The National Center is leading the way in developing technology-based interventions that increase access to care and reduce the burden on clinics and patients. Following two successful pilot studies of PTSD Coach, a mobile app that provides information and self-help skills, the Dissemination and Training Division will assess the efficacy of PTSD Coach compared to treatment as usual in reducing PTSD symptoms in Veterans in primary care. Several pilot studies of additional mobile phone apps are underway, including examinations of PTSD Family Coach, intended to reduce stress among family members of people with PTSD; Parenting2Go; Mindfulness; and Cognitive Behavioral Therapy for Insomnia (CBTi).

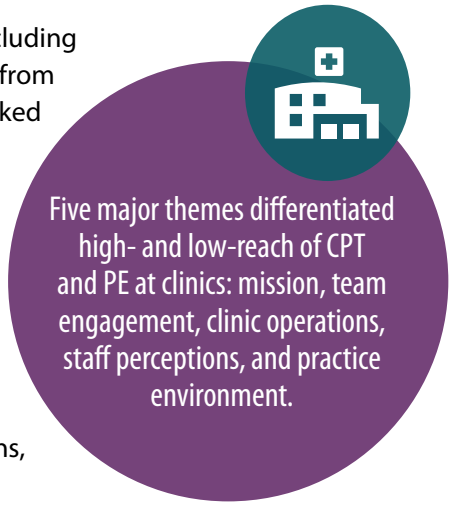
Finally, investigators continue to develop and test the utility of VetChange, an online program designed for combat Veterans who served in Iraq and Afghanistan and who report risky use of alcohol and PTSD-related distress. The initial randomized controlled trial produced evidence that VetChange is effective in reducing both drinking and PTSD symptoms. An enhanced mobile-friendly public website version is now under evaluation, and a pilot evaluation of a mobile app with key VetChange features will begin soon.

Implementation

The VA Uniform Mental Health Services Handbook recommends that all Veterans have access to CPT and PE, and these treatments are being implemented across VA. The National Center is actively assessing the rate at which the treatments are gaining acceptance and usage, as well as identifying both facilitators of and barriers to implementation.

A project focused on implementation of these treatments in VA residential programs for PTSD revealed that providers reported challenges in predicting patient readiness, which affected access to services; they also found barriers to implementation that included lack of dedicated time and resources. Support of clinic leadership was positively associated with high levels of implementation of both CPT and PE.

A team of investigators, including National Center personnel from multiple Divisions, has worked to identify organizational and clinic factors that promote high reach of CPT and PE. Five major themes differentiated high- and low-reach clinics: mission, team engagement, clinic operations, staff perceptions, and practice environment. These differences suggest that training clinicians is necessary but not sufficient; organizational barriers have to be addressed as well.



One ongoing project at the Dissemination and Training Division is evaluating competing strategies intended to enhance and sustain the delivery of PTSD treatment. One strategy emphasizes fidelity to the protocol through expert consultation, and another focuses on improving

fit of the intervention to the environment through continuous quality improvement. A second ongoing study is focused on increasing awareness of, receptivity to, and implementation of clinical practice guidelines for management of PTSD. A third study, near completion, is investigating the use of web technology to train clinicians in evidence-based interventions and to test whether variations in training procedures affect quality of skills in implementing the interventions.

Development of innovative strategies to improve patient access to care, including reduced patient wait times, is underway. In particular, investigators are testing the use of participatory systems dynamics, a collaborative stakeholder model in which data are used to identify specific system problems, propose changes, and measure the impact of those changes on outcomes.

Over the longer term, the National Center is working to develop a practitioner-based implementation network across both the VA and the Department of Defense (DoD) that will assess the benefits of the implementation of measurement-based care, specifically the use of symptom measures during the course of treatment to guide treatment planning.

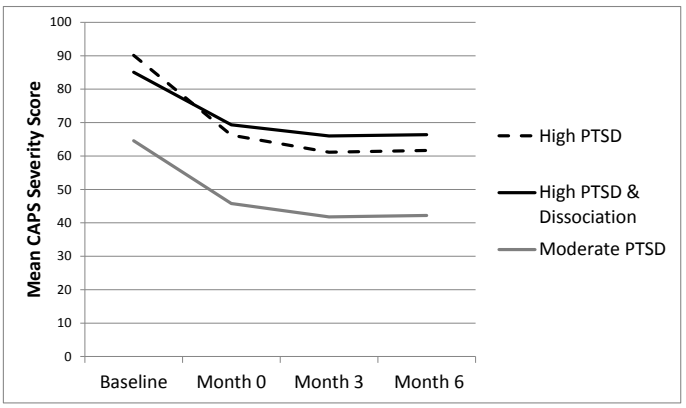
Diagnostic and Statistical Manual of Mental Disorders (*DSM-5*)

The National Center continued its leadership in development of diagnostic tools by spearheading efforts to update assessment instruments for the fifth edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (*DSM-5*). *DSM-5* is a classification and diagnostic tool that outlines the diagnostic criteria for all currently recognized

psychological disorders. Diagnoses made with *DSM-5* guide treatment recommendations, insurance billing, and other related factors.

The Clinician-Administered PTSD Scale (CAPS), developed at the National Center more than 20 years ago, has long been the gold standard diagnostic instrument. Investigators are currently testing the diagnostic accuracy of the CAPS-5, which was updated for *DSM-5*.

In other efforts, National Center investigators published evidence demonstrating the sound psychometric properties of the PTSD Checklist for *DSM-5* (PCL-5), a 20-item self-report measure of past-month PTSD symptoms; results also indicated the optimal cutoff for diagnosing PTSD with this scale. Another study is underway to examine the properties of the Primary Care-PTSD Screen for *DSM-5* (PC-PTSD-5). Finally, the Dissociative Subtype of PTSD Scale and the Dissociative Symptoms Scale have been published and are now available for download on the National Center's website.



The figure shows the estimated mean CAPS severity scores at pretreatment and follow-up assessments as a function of class assignment. PTSD = posttraumatic stress disorder; CAPS = Clinician Administered PTSD Scale.

Wolf, Lunney, & Schnurr (2016). *Journal of Consulting and Clinical Psychology, 84*, 95-100.

Awards Received by National Center Staff in FY 2016

Lynnette Averill, PhD

2015 Woman Breaking the Silence Against Mental Illness Investigator

Research Partner's Program (NARSAD) and NY Women's Committee

Lynnette Averill, PhD

New Investigator Award

International Society for CNS Clinical Trials and Methodology

Nancy Bernardy, PhD and Macgregor Montano, PharmD, BCPP

VHA Communications Award for Health Communications

Department of Veterans Affairs, VHA Office of Communications

Marcel Bonn-Miller, PhD

Researcher of the Year

Americans for Safe Access

Terry Keane, PhD

Jerilyn Ross Clinician Advocate Career Award

Anxiety and Depression Association of America

Terry Keane, PhD

John Blair Barnwell Award for Outstanding Achievement in Clinical Science

Department of Veterans Affairs, Office of Research & Development

Terry Keane, PhD

Lifetime Achievement Award

Canadian Psychological Association, Trauma Section

Terry Keane, PhD

Outstanding Scientific Achievement in Trauma Psychology

American Psychological Association, Division of Trauma Psychology

John Krystal, MD

E.M. Jellinek Award for Alcohol Research

E.M. Jellinek Foundation

Paula Schnurr, PhD

Lifetime Achievement Award

International Society for Traumatic Stress Studies

Jillian Shipherd, PhD

Carol Weisman and Gary Chase Gender-Based Research Award

The Women and Gender Health Interest Group of Academy Health

Denise Sloan, PhD

Distinguished Mentor Award

International Society for Traumatic Stress Studies

Team Award:

Peggy Willoughby; Rebecca Matteo, PhD; Carol Sevick; Jeremy Tevis & Kevin Lai

VHA Communications Award for Web Research

Department of Veterans Affairs, VHA Office of Communications

Erika Wolf, PhD

Presidential Early Career Award for Scientists and Engineers

The White House, Office of Science and Technology

National Center researchers have received many professional awards and honors, and a list of those received in FY 2016 is included above. Please see Appendices A (Research Narrative) and B (Funding) at the back of this Annual Report for a complete listing of research projects, key investigators, collaborating/partner agencies, and associated funding sources.

Promoting PTSD Education: Training, Dissemination, Communication

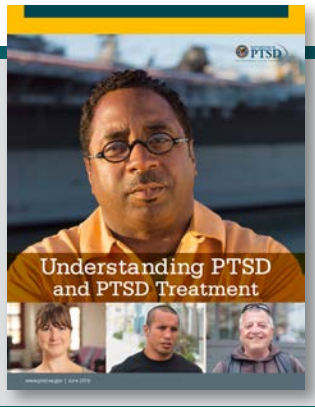
The National Center maintains an extensive array of educational products and programs, aimed at ensuring that the most current understanding of PTSD reaches the people who need it most: the Veterans themselves and the clinicians who are entrusted with their care. The two-way communication between researchers and VA clinicians offers opportunities for National Center professionals to both teach and learn from providers in the field. The multisite structure and collaboration with government agencies, universities, and health care organizations provide a network of contacts that can be used to disseminate the latest knowledge to the many constituencies that are involved in PTSD care.

During FY 2016 National Center staff members published hundreds of articles in scholarly journals, delivered dozens of talks and workshops, and responded to requests for consultative support from organizations and individuals throughout the US and around the world. In addition, the National Center remains active in the use of new technologies in its educational efforts, including a vast collection of online resources and mobile apps.

PTSD Awareness and Engagement in Treatment

The first step to encouraging people to seek treatment for PTSD is helping them recognize that they may have a problem that treatment can solve. AboutFace is an award-winning website that features short videos by dozens of trauma survivors talking about how they successfully overcame the perceived stigma of PTSD and other obstacles to seeking help. In FY 2016 AboutFace added digital storytelling, which utilizes video, text, and photos to recount the stories of two Veterans who received evidence-based PTSD treatment in VA. Many of the Veterans interviewed in AboutFace are also featured in Understanding PTSD and PTSD Treatment, a new brochure that clearly explains the causes of PTSD and describes the available treatments.

Understanding PTSD and PTSD Treatment is a new brochure that clearly explains the causes of PTSD and describes the available treatments.



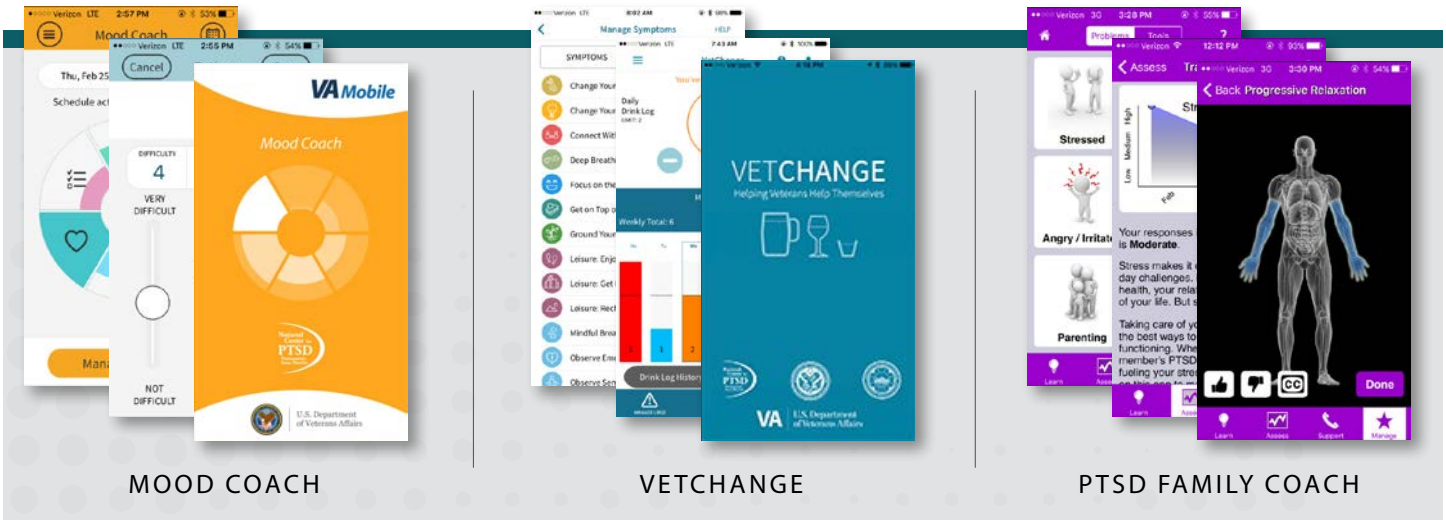
Choosing among those treatments can be complicated, however, because there is no single treatment that works for everyone and little guidance on which treatments best address individual patients' needs. The online PTSD Treatment Decision Aid, completed in 2016, helps patients learn about the benefits and risks of evidence-based treatment options and guides them in clarifying their preferences and treatment goals.

Self-Help and Treatment Companion Resources

The National Center, in partnership with the Department of Defense (DoD), launched the first publicly available VA mobile app in 2011: the award-winning PTSD Coach. Since then the National Center has launched fourteen mobile apps in total, all available to the public free of charge. Three new apps were launched in FY 2016: Mood Coach, which encourages people to engage in the activities they enjoyed in the past as a way to boost mood; VetChange, which targets problem drinking patterns and PTSD symptoms; and PTSD Family Coach, designed to support family members of people with PTSD. Developers also continued to improve existing apps, updating their content and functionality and releasing Android versions of apps previously only available for Apple devices.

Research has shown that Veterans who struggle with problem drinking often have PTSD symptoms as well. VetChange, available both as an app and in a desktop version, is a self-management program for Veterans that addresses both issues. Research on an initial version of VetChange showed that it helped many Veterans reduce both their alcohol consumption and PTSD symptoms, and the National Center has since developed a more robust version of that original program. The site was visited by more than 7,000 users in FY 2016, with more than 400 Veterans creating user accounts. It is currently available on a non-VA server but will be moved to a VA server in 2017, a change that is expected to markedly increase usage by Veterans.

Cognitive Processing Therapy (CPT), Prolonged Exposure (PE), and Eye Movement Desensitization and Reprocessing (EMDR) have long been the leading evidence-based interventions for PTSD. Increasingly, however, providers and patients are looking for treatments that target symptoms that may not be central to the disorder but are often troubling to patients. STAIR (Skills Training in Affective and Interpersonal Regulation) is intended to enhance patients' emotion regulation and interpersonal functioning. An online STAIR training for providers was launched in 2013, and development continued in FY 2016 on a self-help version of the intervention that will debut on the National Center's website in 2017.

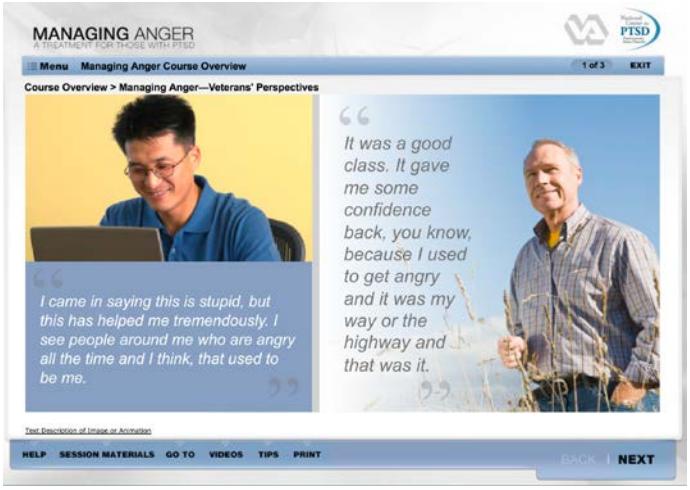


Three New Apps Launched in FY 2016

Educational Resources for Professionals

The core of the National Center's continuing education offerings is the flagship PTSD 101 series, which offers a collection of more than 30 hour-long courses. Five new courses were added in FY 2016: The Dissociative Subtype of PTSD; Practical PTSD Assessment; Engaging Patients in PTSD Treatment; Understanding Pathways from Trauma Exposure to Physical Health; and Impact of Deployment-Related Risk and Resilience Factors on Postdeployment Mental Health.

Web-based continuing education offerings have been expanded in recent years to include advanced multi-module courses on specialized treatment approaches. These courses incorporate video vignettes, step-by-step guidance, and patient materials that can help providers integrate the interventions into their practices. Current courses include STAIR, Managing Anger, and Assessment and Treatment of Sleep Problems in PTSD. Offerings have also been available through TRAIN (TrainingFinder Real-time Affiliate Integrated Network) since 2015. This forum reaches a wide audience, including community-based providers, trainees, and researchers. TRAIN also makes it easy for all learners — both within VA and in the community — to earn free continuing education credits.



During FY 2016 National Center staff, in response to requests from clinicians, researchers, and disability raters, worked on developing a comprehensive online training on the Clinician-Administered PTSD Scale-5 (CAPS-5).

The course, which will launch in 2017, gives learners a full understanding of the requirements for administration and scoring of the instrument. The National Center plans to develop an additional course that uses cutting-edge Responsive Virtual Human Technology (RVHT).

The Published International Literature on Traumatic Stress (PILOTS) online database was created at the National Center in 1989, shortly after the National Center was founded and well before the Internet was established as a research tool. PILOTS is a cross-disciplinary index that has grown to include 56,000 items, providing free access to the world's scholarship on psychological trauma and its consequences. While providers and researchers are the main audience for PILOTS, it is also available to students, the media, and members of the general public who have an interest in PTSD. The system also allows users to download the full text of articles written by National Center staff members, thereby increasing the reach of the Center's research. In FY2016 users ran more than 28 million searches in the database.[1*]

Support for Providers in the Field

The National Center is committed to supporting clinicians in the field, providing them with information, training, and resources to help them find the best ways to help the Veterans in their care. Over the past decade, VA has trained more than 6,300 mental health clinicians throughout the Veterans Health Administration (VHA) in CPT and PE. To increase familiarity, acceptability, and uptake of a range of recommended practices, the National Center has created

[1*] Beginning in FY 2016, the Resource Center has been able to obtain improved usage statistics from the database vendor. Therefore, this number cannot be accurately compared to prior years' figures.

the PTSD Practitioner Registry, which links participating providers in VA, DoD, and the community with practical information related to 25 best practices, including CPT and PE.

The PTSD Consultation Program began in 2011 with the mission to connect VA providers with expert PTSD consultants. The program was expanded in 2015 to offer consultation and resources to community providers outside VA who see Veterans with PTSD. The program's consultants are available via phone or email, answering questions and providing information about treatments. The effort to reach more providers has been supported by a targeted web-based marketing campaign. Consultation requests from community providers more than doubled last year, while requests from VA providers continued to grow as well. The program responded to an average of 114 requests per month, with almost a third of all requests coming from outside VA.

PTSD Consultation Program requests from community providers more than doubled last year, while requests from VA providers continued to grow as well.

Beginning in 2008 with the CPT and PE national training initiatives, the National Center launched the VA PTSD Mentoring Program. The program connects program directors with seasoned PTSD professionals within their regions who act as mentors. This year the Mentoring Program developed the PTSD Clinical Team Manager Toolkit, an online course designed to promote best practices in the clinical and administrative components of specialty care.

Complementing these national efforts, the Executive Division of the National Center has received funding from the VA Office of Rural Health to use academic detailing to improve the treatment of Veterans in Vermont and New Hampshire. In this program a clinical pharmacist works one-on-one with prescribing clinicians to foster

Increasing Referrals to Psychotherapy and Reducing the Prescribing of Benzodiazepines for PTSD

The Executive Division of the National Center received funding from the VA Office of Rural Health to use academic detailing to improve the treatment of Veterans in Vermont and New Hampshire. Three of the infographics developed through this program were awarded first place in the VHA Communication Awards in 2016.

the provision of evidence-based PTSD care, including increasing referrals to psychotherapy and reducing the prescribing of benzodiazepines for PTSD. Three of the infographics developed through this program were awarded first place in the VHA Communication Awards in 2016. The program has also developed an online tool to help providers safely taper patients off benzodiazepines.

Implementation of best practices requires moving beyond targeting individual providers to looking at facilitators and barriers at the organizational level. Researchers from the National Center and the Chronic Disease Outcomes Research Center have collaborated to examine organizational factors that influence the usage of these treatments in ten PTSD clinics. They found that successful teams — those that routinely used evidence-based treatments with more than 40% of their patients — were organized around a primary mission to deliver time-limited treatments, and they had leadership support, clinic operations, and team cultures that facilitated delivery. The findings have been shared with VA mental health leadership, and are informing continuing efforts to advance the delivery of these treatments to Veterans.

The PBI Network provides a way to pilot new approaches and derive lessons learned before moving to nationwide implementation.

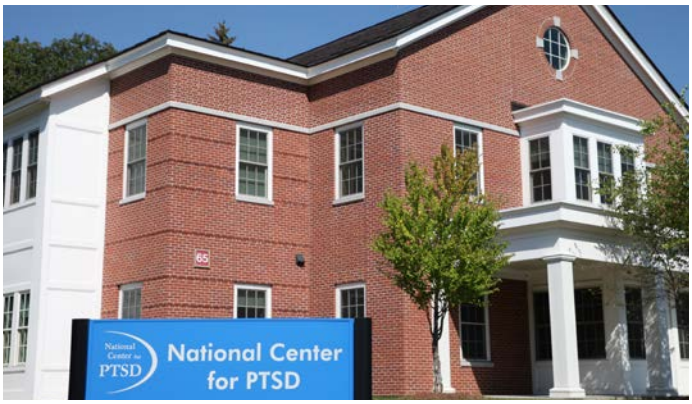
The Mentoring Program has also addressed organizational issues. Mentors work with program directors to help them meet the increased demand for treatment by restructuring existing programs and implementing best practices. An in-person meeting held this year gave program participants an opportunity to discuss the impact of the Measurement Based Care initiative on clinic practices. Next year's face-to-face meeting will focus on building organizational structures to foster the provision of evidence-based PTSD care.

The Practice-Based Implementation (PBI) Network is a standing network of VA PTSD field sites that are collaborating with National Center researchers to test new practices and find ways to achieve their implementation. The PBI Network provides a way to pilot new approaches and derive lessons learned before moving to nationwide implementation. The PBI Network has been used to accelerate uptake of Measurement-Based Care, and is now helping clinicians integrate phone and Internet technologies into care.

Fiscal Year 2016 Stats at a Glance

7.8 M Website Visitors	137,993 Facebook Likes	28,686 Twitter Followers	161,477 Newsletter Subscribers (PTSD Monthly Update)	39,710 Newsletter Subscribers (CTU Clinician's Trauma Update)	45,791 Newsletter Subscribers (PTSD Research Quarterly)	170,511 Downloads of 14 Mobile Apps

About the National Center for PTSD



History

The National Center for PTSD was created in 1989 within the Department of Veterans Affairs in response to a Congressional mandate (PL 98-528) to address the needs of Veterans and other trauma survivors with PTSD. The Center was developed with the ultimate purpose of improving the well-being, status, and understanding of Veterans in American society. The mandate called for a center of excellence that would set the agenda for research and education on PTSD without direct responsibility for patient care. Convinced that no single VA site could adequately serve this unique mission, VA established the Center as a consortium of five divisions.

Organization

The National Center now consists of seven VA academic centers of excellence across the United States, with headquarters in White River Junction, Vermont. Other divisions are located in Boston, Massachusetts; West Haven, Connecticut; Palo Alto, California; and Honolulu, Hawaii; and each contributes to the overall Center mission through specific areas of focus.

The National Center for PTSD is an integral and valued component of the VA's Mental Health Services (MHS), which itself is within the VHA. MHS and the Center receive budget support from VA, although the Center also leverages this support through successful competition for extramural research funding.

The National Center for PTSD was formed in 1989.

The staff is comprised of top professionals in the field, located in seven divisions across the US.

100 externally funded studies and 361 publications in FY 2016.

National Center for PTSD Quick Facts

Leadership in Fiscal Year 2016

Paula P. Schnurr, PhD

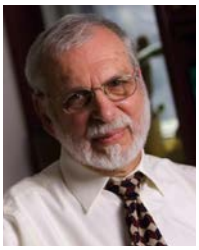
Executive Director,
Executive Division, VT

Professor of Psychiatry, Geisel School of Medicine at Dartmouth

Terence M. Keane, PhD

Division Director
Behavioral Science Division, MA

Professor of Psychiatry and Assistant Dean for Research, Boston University School of Medicine



Matthew J. Friedman, MD, PhD

Senior Advisor and Founding Executive Director
Executive Division, VT

Professor of Psychiatry and of Pharmacology and Toxicology, Geisel School of Medicine at Dartmouth

John H. Krystal, MD

Division Director
Clinical Neurosciences Division, CT

Robert L. McNeil, Jr. Professor of Translational Research and Chairman of the Department of Psychiatry, Yale University School of Medicine

Jessica L. Hamblen, PhD

Acting Deputy Executive Director and Deputy for Education
Executive Division, VT

Associate Professor of Psychiatry, Geisel School of Medicine at Dartmouth

Josef Ruzek, PhD

Division Director
Dissemination and Training Division, CA

Professor (Clinical Professor-Affiliated), Stanford University; Associate Professor, Palo Alto University

Rani Hoff, PhD, MPH

Division Director
Evaluation Division, CT

Director of the Northeast Program Evaluation Center

Professor of Psychiatry, Yale University School of Medicine

Tara E. Galovski, PhD

Division Director
Women's Health Sciences Division, MA

Associate Professor of Psychiatry, Boston University School of Medicine

Advisory Boards

Fiscal Year 2016 Scientific Advisory Board

Chair: John Fairbank, PhD
National Center for Child Traumatic Stress, Duke University Medical Center

COL Carl A. Castro, PhD
Center for Innovation and Research on Veterans and Military Families; University of Southern California

Bradford L. Felker, MD
VA Puget Sound Health Care System; University of Washington School of Medicine

JoAnn Kirchner, MD
VA Mental Health Quality Enhancement Research Initiative, Central Arkansas Veterans Healthcare System; University of Arkansas for Medical Sciences

Karestan Koenen, PhD
Columbia University Mailman School of Public Health

Alfred Montoya, MHA
White River Junction VA Medical Center

Thomas C. Neylan, MD
San Francisco VA Medical Center; University of San Francisco School of Medicine

Alan L. Peterson, PhD, ABPP
University of Texas Health Science Center

Barbara O. Rothbaum, PhD, ABPP
Emory University School of Medicine

Farris Tuma, ScD
National Institute of Mental Health

Robert Ursano, MD
Uniformed Services University Medical School

Ex-Officio: Theresa Gleason, PhD
VA Clinical Science Research & Development

Fiscal Year 2016 Educational Advisory Board

Chair: Dean Kilpatrick, PhD
National Crime Victims Research & Treatment Center, Medical University of South Carolina

COL Dave Benedek, MD, LTC, MC, USA
Uniformed Services University of the Health Sciences

Thomas J. Berger, PhD
Vietnam Veterans of America

Craig Bryan, PsyD, ABPP
National Center for Veterans Studies, The University of Utah

Ann Feder, LCSW
James J. Peters VA Medical Center

Michael Fisher, MSW
Readjustment Counseling Services, Department of Veterans Affairs

Michael R. Kauth, PhD
VA South Central MIRECC

Jackie Maffucci, PhD
Iraq and Afghanistan Veterans of America

Lisa A. Marsch, PhD
Center for Technology and Behavioral Health, Dartmouth Psychiatric Research Center, Geisel School of Medicine at Dartmouth

David S. Riggs, PhD
Center for Deployment Psychology, Uniformed Services University of the Health Sciences

Available Appendices

APPENDIX A
Fiscal Year 2016 Research Narrative

APPENDIX B
Fiscal Year 2016 Funding

APPENDIX C
Fiscal Year 2016 Publications

APPENDIX D
Fiscal Year 2016 In Press and Advance Online Publications

APPENDIX E
Fiscal Year 2016 Scientific Presentations

APPENDIX F
Fiscal Year 2016 Educational Presentations

APPENDIX G
Fiscal Year 2016 Editorial Board Activities

National Center for PTSD

POSTTRAUMATIC STRESS DISORDER

EXECUTIVE DIVISION
VA Medical Center (116D)
215 North Main Street
White River Junction, VT 05009

BEHAVIORAL SCIENCE DIVISION
VA Boston Healthcare System (116B-2)
150 South Huntington Avenue
Boston, MA 02130

CLINICAL NEUROSCIENCES DIVISION
Psychiatry Service (116A)
VA Medical Center
950 Campbell Avenue
West Haven, CT 06516

DISSEMINATION AND TRAINING DIVISION
VA Palo Alto Health Care System
Building 334-PTSD
795 Willow Road
Menlo Park, CA 94025

EVALUATION DIVISION (NEPEC)
VA Connecticut Healthcare System (182)
950 Campbell Avenue
West Haven, CT 06516

PACIFIC ISLANDS DIVISION
3375 Koapaka Street
Suite 1-560
Honolulu, HI 96819

WOMEN'S HEALTH SCIENCES DIVISION
VA Boston Healthcare System (116B-3)
150 South Huntington Street
Boston, MA 02130