National Center for PTSD

Fiscal Year 2017 Annual Report



BIOMARKERS



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Acronyms Used in the Text

AI

Artificial Intelligence

AIMS Anger and Irritability Management Skills

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

CBCT Cognitive-Behavioral Conjoint Therapy

CBT Cognitive-Behavioral Therapy

CBT-I Cognitive-Behavioral Therapy for Insomnia

CE Continuing Education

CPT Cognitive Processing Therapy

CSP Cooperative Studies Program

CTE Chronic Traumatic Encephalopathy

DoD Department of Defense

DSM-5 Diagnostic and Statistical Manual of Mental Disorders---Fifth Edition DSPS

Dissociative Subtype of PTSD Scale

EBP Evidence-Based Practice

EBT Evidence-Based Treatment

EEG Electroencephalography

EMDR Eye Movement Desensitization and Reprocessing

ENIGMA Enhancing Neuroimaging Genetics Through Meta-Analysis

EWAS Epigenome-Wide Association Study

FKBP5 FK506 Binding Protein 5

fMRI Functional Magnetic Resonance Imaging

GABAergic Gamma-Aminobutyric Acid-Ergic

GWAS Genome-Wide Association Study

HSR&D Health Services Research & Development ICD-11 International Classification of Diseases, Version 11

IPV Intimate Partner Violence

LATR Later-Adulthood Trauma Reengagement

LIGHT Longitudinal Investigation of Gender, Health, and Trauma

MBC Measurement-Based Care

mGluR5 Metabotropic Glutamatergic Receptor

MMPI-2 Minnesota Multiphasic Personality Inventory-2

MRI Magnetic Resonance Imaging

MST Military Sexual Trauma

MVP Million Veteran Program

NCPTSD National Center for PTSD

NDHS Neurocognition Deployment Health Study NEPEC Northeast Program Evaluation Center

NF-KB-activation Nuclear Factor Kappa-Light-Chain-

Enhancer of Activated B Cells

NHRVS National Health and Resilience in Veterans Study

NIH National Institutes of Health

NIMH National Institute of Mental Health

NPAS4 Neuronal PAS Domain Protein 4

OEF Operation Enduring Freedom

OIF Operation Iraqi Freedom

OMHSP Office of Mental Health and Suicide Prevention

OND

Operation New Dawn

OSI VERC Office of Strategic Integration Veterans Engineering Resource Center

PBI Network Practice-Based Implementation Network

PCP Primary Care Provider

PC-PTSD-5 Primary Care PTSD Screen for DSM-5 PCT Present-Centered Therapy

PDSI Psychotropic Drug Safety Initiative

PE Prolonged Exposure

PET Positron Emission Tomography

PGC Psychiatric Genomics Consortium

PILOTS Published International Literature on Traumatic Stress

PTSD Posttraumatic Stress Disorder

RNA Ribonucleic Acid

RTP Residential Treatment Program

SERV Survey of Returning Veterans

SGK 1

Serum and Glucocorticoid-Regulated Kinase

SPECT Single-Photon Emission Computed Tomography

STAIR Skills Training in

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

TMS Transcranial Magnetic Stimulation

TNF-α Tumor Necrosis Factor Alpha

TRAIN TrainingFinder Real-Time Affiliate Integrated Network

TVMI The Veterans Metric Initiative

UP Unified Protocol

UPS48 Ubiquitin-Proteasome System

USUHS Uniformed Services University of the Health Sciences

VA Department of Veterans Affairs

VALOR Veterans After-Discharge Longitudinal Registry

VHA Veterans Health Administration

WoVeN Women Veterans Network

WTC World Trade Center

From the Executive Director



Over the past three decades, great strides have been

made in understanding, diagnosing, and treating posttraumatic stress disorder (PTSD). The National Center for PTSD, through our seven centers of excellence around the

country, and through our collaborations with scientists in government, academia, and the medical community, has been responsible for many of the breakthroughs that have dramatically improved the lives of our nation's Veterans and other trauma-exposed individuals.

National Center investigators have been on the cutting edge of studying the biology of PTSD since the Center opened in 1989. In recent years, advances in technology have significantly enhanced our ability to study the biology of PTSD, and National Center investigators are leveraging many of these new approaches. Novel neuroimaging technologies have improved our ability to study the structure and function of the brain. Advances in genetics have led to a better understanding of how a person's DNA could affect their response to traumatic events. Large-scale projects, like VA's Million Veteran Program (MVP), are enabling investigators to do research with great precision on large samples. We are especially proud of the establishment of VA's National PTSD Brain Bank—spearheaded by National Center founder and former Executive Director Matthew Friedman.

Much of this work is focused on identifying biomarkers: measurable biological factors that can improve our ability to diagnose, treat, and even prevent PTSD. For example, a biomarker might be a specific gene or brain-activity pattern that predicts risk for PTSD, or the likelihood of responding to a particular treatment. The introductory section of this Annual Report highlights some of the research on biomarkers taking place in several of the National Center's Divisions, and provides a glimpse of what the implications might be for our Veterans, Servicemembers, and others affected by PTSD.

Other efforts, across all our Divisions, have led to additional important advances in PTSD research, education, and outreach. Within our research portfolio, we have devoted increased attention to the topic of PTSD and suicide, which was adopted in FY 2017 as one of our key operational priorities. Several studies have been completed and others are underway to better identify risk factors for suicide and targets for prevention efforts. Within our education portfolio, we have been especially active in using new communications technologies to reach clinicians and to communicate directly with Veterans including development of a variety of videos, web resources, and mobile apps. These efforts and many others are described more fully in the Major Research Initiatives and Promoting PTSD Education sections of this Annual Report.

We at the National Center are pleased and proud to be at the forefront of developing and disseminating tools and treatments that will improve the lives of the nation's Veterans, now and in the future.

Paula P. Schnurr, PhD

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 National 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.

Biomarkers: Using Biology to Better Diagnose, Prevent, and Treat PTSD

Throughout much of the history of our understanding of posttraumatic stress disorder (PTSD), the condition was viewed as a problem of psychological maladjustment, with little recognition of how the biology of the brain was contributing to or being affected by a person's reaction to traumatic stress. Over time, the biological underpinnings of PTSD have been increasingly recognized, including sleep cycle abnormalities, evidence of autonomic hyperreactivity, and dysregulation of hormones involved in the stress response.

Investigators at the National Center for PTSD have long been at the cutting edge of research focused on the biology of PTSD. In the 1980s and 1990s, National Center investigators identified the first biomarker (measurable biological factor) in Veterans with PTSD: disturbances in neural signaling via norepinephrine. In 1989, the Center initiated the first adequately powered multicenter biomarker study of PTSD. This project, which evaluated heart rate increases in response to trauma reminders, was also the first VA Cooperative Studies Program (CSP) study of PTSD. Additionally, the National Center was the first to discover alterations in specific signaling molecules in the brain among Veterans with PTSD, using single-photon emission computed tomography (SPECT) and positron



The National Posttraumatic Stress Disorder Brain Bank is a human tissue bank that collects, processes, stores, and distributes research specimens for future scientific studies.

emission tomography (PET) technologies. In the 1990s, investigators were the first to observe that the volume of the hippocampus (a region of the brain associated with memory and fear) was smaller in PTSD patients. But, despite these early findings, many questions remained about what was happening in the brains of people with PTSD.



John Krystal, MD, Director, Clinical Neurosciences Division; Photo credit: Robert Lisak

Advances in technology over the past several years have greatly enhanced scientists' ability to answer those questions. In 2014, VA developed the first-ever National Posttraumatic Stress Disorder Brain Bank (PTSD Brain Bank). This is a human tissue bank that collects, processes, stores, and distributes research specimens for future scientific studies, giving scientists a powerful tool for directly examining the brain tissue of people affected by PTSD. Advances in genetics have created new pathways for exploration, leading to a better understanding of the role genetics plays in an individual's susceptibility to the disorder, as well as to how experiences such as traumatic stress can change the way a person's genes are expressed (a field called epigenetics). The continued development of imaging technologies such as magnetic resonance imaging (MRI) and PET has enabled investigators to better observe the brain at rest and in action as it processes and responds to specific tasks and information.

A major goal of this work is to develop biomarkers of PTSD risk and specific PTSD subtypes that will guide assessment, diagnosis, prevention, and treatment efforts. Dr. John Krystal, Director of the National Center's Clinical Neurosciences Division in West Haven, Connecticut, believes this work is valuable in several ways. "We want to use biology to inform diagnosis, prevention, and treatment of PTSD—for instance, how this knowledge can help us predict whether a person might respond to a particular treatment." He adds, "But we also want to use biomarkers to understand the underlying biology and figure out the *why*—that is, why a person responds in a particular way. Biomarkers are always expressions of something deeper."

The sections that follow describe some of the key research initiatives at the National Center aimed at identifying and understanding biomarkers for PTSD risk, resilience, and treatment response.

Genetics of PTSD

Not everyone who experiences a traumatic event will develop PTSD. Each person's brain responds to trauma in its own way, directed to some degree by that person's genetic code. In just the past 20 years or so, the field of genetics has advanced tremendously. National Center investigators have used these exciting new technologies to understand the role of genetics in PTSD. They have been aided in their quest by having access to data from the National PTSD Brain Bank and VA's <u>Million Veteran</u> <u>Program (MVP)</u>, which collects genetic and health data from Veterans (see sidebars).

The MVP provides scientists with the unprecedented capability to do in-depth genetic analysis due to the large number of Veterans participating. Data collection from





diabetes; PTSD is one of the highest priorities.

At present, over 600,000 Veterans have agreed to participate in the MVP, and data have been collected from more than 300,000 of them. Participation by Veterans is entirely voluntary and confidential, and the response has been extremely positive. Dr. John Krystal is excited about the possibilities opened up by this program. "For the first time we will have accumulated sample sizes large enough to see findings that are replicable."

The MVP is already generating promising avenues of research; Dr. Joel Gelernter's study of reexperiencing, for example, was able to utilize data from 150,000 subjects including genetic information and data from a lifestyle survey. It is hoped that research findings based on MVP will lead to new ways of preventing and treating illnesses in Veterans. Dr. Gelernter is enthusiastic about the possible avenues that will be opened up by the MVP. "MVP has turned out to be just as wonderful a resource as the most optimistic people predicted."



Joel Gelernter, MD, Investigator, Clinical Neurosciences Division

more than 300,000 Veterans has been completed, and analyses of these data are already underway. This high volume of data allows scientists to perform genome-wide association studies (GWAS), a powerful methodology for understanding the genetic basis of disorders.

Dr. Joel Gelernter, a psychiatrist and staff investigator at the Clinical Neurosciences Division, has been at the forefront of GWAS and highlights the importance of these types of studies. "In earlier studies, investigators might interrogate a small set of genes that they think are related to the syndrome of interest. But that approach is



Ronald Duman, PhD, Investigator and Rose Terwilliger, BS, Research Associate, Clinical Neurosciences Division

inherently limited by what you know beforehand. GWAS can look at markers that are dispersed throughout the human genome—typically looking at 250,000 or more markers—without being burdened by prior ideas." These studies can identify unanticipated aspects of PTSD biology and can find overlaps in genetics with other disorders such as depression.

In one of the first PTSD studies associated with the MVP, Dr. Gelernter identified genes potentially involved in the phenomenon of reexperiencing, in which a person has repeated disturbing memories, thoughts, and/or images that are so severe that the trauma appears to be happening again. Results of this study will be published in 2018. National Center investigators have also collaborated with the Psychiatric Genomics Consortium (PGC) PTSD Workgroup. GWAS analyses from PGC data suggested that differences in multiple genes contributed to the risk for PTSD. These analyses also suggested that PTSD had a relatively high degree of genetic overlap with schizophrenia, especially compared with the overlap with other disorders, such as depression, which were expected to share heritability.

Molecular Psychiatry



Duncan et al. (2018), *Molecular Psychiatry*, 23, 666–673. PTSD heritability for males (M) and females (F) separately and in comparison with other psychiatric disorders. BIP: bipolar disorder; LDSC: linkage disequilibrium score regression; MDD: major depressive disorder; SCZ: schizophrenia.

These findings highlight the likelihood that many genes play a role in the development of PTSD. According to Dr. Ronald Duman, a neuroscientist and staff investigator at the Clinical Neurosciences Division, "We are looking beyond the idea of finding one gene that is responsible for PTSD—that is too simplistic. It's clear now that the expression of many, many genes is involved, and that we need to look at the entire array to identify gene mutations that underlie psychiatric conditions."

In addition to specific genes that may make someone more or less likely to develop PTSD, traumatic experience itself may alter gene expression. Dr. Erika Wolf, a psychologist and staff investigator at the Behavioral



Science Division, has been studying epigenetic changes that is, changes that influence the degree to which a particular gene can be expressed to produce specific proteins. Her research has found a relationship between epigenetic changes and cellular aging: specifically, that the brains and bodies of patients with PTSD can age at a biological rate that is faster than the rate that might be expected from their chronological age. For these patients, the manifestations of aging, such as the onset of metabolic changes or cognitive decline, might be occurring prematurely.

According to Dr. Wolf, "Converging areas of our researchusing genetic, metabolic, inflammatory, and neuronal markers—provide evidence that PTSD is associated with accelerated aging. This is particularly concerning, given that much of our research has focused on young Veterans in their early 30s; and it highlights the need to better identify Veterans with an accelerated aging profile and to intervene early with them."

Neural Connectivity in PTSD: From Synapse to Systems

Some of the earliest studies of PTSD focused on examining the volume and structure of specific regions of the brain, particularly areas such as the hippocampus and amygdala, which are involved in emotion and memory. Today, investigators are using sophisticated imaging techniques to look beyond that static picture and focus instead on connections and interactions within the brain-from the connections between individual cells to the connections between larger brain regions.

One promising avenue of study involves the neurons and synapses in the brain. Neurons are the main brain cells responsible for processing and transmitting information; they communicate with each other primarily through chemical connections (synapses). Each neuron could have as many as 10,000 synapses, and the synapses are constantly being created and eliminated based on life



Irina Esterlis, PhD, Investigator and colleagues, Clinical Neurosciences Division

experiences. National Center scientists are discovering that people with PTSD have decreased synaptic density—that is, a reduced number of synapses in various brain regions.

According to Dr. Krystal, "When you lose synaptic connectivity [density], the fidelity of communication decreases, and plasticity of the networks—or their ability to adapt—decreases. Things that are ingrained, like traumatic memories, can stay ingrained, and the person's ability to learn new adaptive strategies is compromised." It is also possible that reduced synaptic density is a precursor to PTSD, making a person more vulnerable to severe reactions to traumatic stress, which in turn reduces synaptic density even further. Finding ways to increase synaptic connectivity in PTSD patients may help treat the disorder; one medication that appears promising



Krystal et al. (2017), Curr Psychiatry Rep, 19, 74.

Increasing Synaptic Connectivity

for this purpose is ketamine, which has been shown to have antidepressant effects associated with increases in synaptic connectivity.

At the synapse, communication occurs when neurotransmitters released from one neuron bind to a specific receptor on a neighboring neuron. Dr. Irina Esterlis, a neuropsychologist and staff investigator at the Clinical Neurosciences Division, investigates receptors in the brains of people with mental illness. One receptor that may be critical in PTSD is called mGluR5 (metabotropic glutamatergic receptor 5), a synaptic receptor for glutamate, the predominant excitatory neurotransmitter in the brain. This receptor is involved in the brain's response to stress and anxiety, and helps regulate neural networks and synaptic activity in the brain. "We had been studying this [receptor] for several years in patients with depression or serious drug use problems," says Dr. Esterlis. "When we turned our attention to PTSD, we found a pattern that was very different from these other disorders." This finding suggests that there is something unique about the function of this receptor in patients with PTSD.

Examining neural connectivity at a broader level, National Center investigators are studying networks throughout the brain, or how specific regions of the brain work together to



Holmes et al. (2017), *Proc Natl Acad Sci U S A*, *114*, 8390-8395. mGluR5 availability in PTSD: PET findings. (A) Representative PTSD subject and healthy control subject. (B) mGluR5 availability in PTSD (n = 16) compared with HC (n = 16). (C) Correlation between mGluR5 availability in the dorsolateral prefrontal cortex and scores on the avoidance subscale of the PTSD Checklist.

respond to particular situations. For example, three areas of the brain—the amygdala, hippocampus, and prefrontal cortex—are involved in a person's ability to determine the difference between dangerous stimuli and safe stimuli in the environment. Imaging studies from the Clinical Neurosciences Division have shown that connectivity of the hippocampus with other brain regions is associated with the severity of PTSD. Other studies have shown abnormal decision-making and fear regulation in patients with PTSD.

With advances in neuroimaging, especially PET, much of the research on mGluR5 and other receptors can be done with living patients. Dr. Esterlis has found that the PTSD Brain Bank is very helpful in her work. "Our studies of live people give us great information. We can connect the findings to the person's symptoms, cognition, job performance, [and] many other functions. But you can't figure out why this is happening unless you can actually examine the tissue." Dr. Esterlis says she hopes to be able to study patients soon after their traumatic experience to observe the development of PTSD, and to determine whether mGluR5 function is indeed an accurate biomarker for PTSD.

Dr. Krystal predicts that a better understanding of mGluR5 can lead to the development of novel therapeutic approaches. "We are characterizing the uniqueness of PTSD as a disorder, as distinct from major depression, for the first time. Now we can say not just what PTSD is, but also what it is *not*. This is important, because until now every pharmacologic treatment approved for PTSD was a treatment for depression. The unique biology of PTSD will push us to think about therapies in new ways."

Dr. Chadi Abdallah, a psychiatrist and staff investigator at the Clinical Neurosciences Division, sees promising avenues for future examination. "We are discovering that there is a common pathology across many stress-related disorders including PTSD, depression, anxiety disorders, and others. But there are also significant differences. We need to work on identifying the specifics for each of these disorders, in order to develop more effective treatments."

Inflammation and PTSD

According to Dr. Mark Miller, a psychologist and staff investigator at the Behavioral Science Division, "PTSD is a psychiatric disorder that, when chronic, is associated

mGluR5 Availability

with a whole cascade of biochemical changes in the body. If these are not addressed and treated, they will exert neurodegenerative effects in the brain." He adds, "Mental illness can have an effect that remodels the brain, causing permanent alterations in structure and function that further promote illness and disability."

In the 1990s, investigators at the Clinical Neurosciences Division were the first to describe this paradoxical finding about patients with PTSD: these patients tended to show reductions, rather than the predicted elevations, in levels of the stress hormone cortisol. As cortisol is a key coordinator of inflammatory responses in the body, disturbances in cortisol release set the stage for considerations of disturbances in inflammatory response in PTSD.

Inflammation occurs when the body's immune system responds to an environmental attack such as an infectious agent. Environmental stress and PTSD may also stimulate the immune system and inflammation, and various genes and proteins are involved in that process. Research has consistently shown that PTSD patients have elevated levels of inflammation, as measured through blood work. Dr. Miller's work has demonstrated that inflammation occurs in the brain as well. Using tissue from the PTSD Brain Bank, his genetic studies have found elevated levels of inflammatory genes in the tissue of the prefrontal cortex of the brains of PTSD patients. Inflammation associated with PTSD may also contribute to the accelerated aging phenomenon.

If inflammation plays a significant role in developing PTSD and in the effects PTSD has on the body, it may be possible to develop medications to target these processes.



Mark Miller, PhD and Erika Wolf, PhD, Investigators, Behavioral Science Division; Photo credit: Derrick Morin



Chadi Abdallah, MD, Investigator, Clinical Neurosciences Division

Changes made to the patient's lifestyle, including better nutrition and increased exercise, could also be beneficial. PTSD patients often suffer from sleep disturbances; given that sleep plays an important restorative function that can counteract the effects of inflammation and oxidative stress, higher quantity and quality of uninterrupted sleep could be beneficial as well.

Implications for Veterans of Tomorrow

National Center investigators hope their exploration of the biology of PTSD will identify biomarkers that will improve clinicians' ability to diagnose and treat patients, and that might even be used to prevent the disorder. Biomarkers associated with PTSD might help clinicians make a definitive diagnosis of PTSD in complicated clinical situations or might assist with determining which treatment should be used for an individual patient. Biomarkers may help prevent PTSD by identifying individuals at high risk and providing targets for intervention to prevent onset of the disorder. Identification of biomarkers may also lead to the development of new treatments. According to Dr. Duman, "If we can get a biomarker for PTSD, leading to a new treatment, that would be a big home run."

The National Center's work on biomarkers has important implications for customized treatments, often referred to as "precision medicine." According to Dr. Krystal, "Right now we have one flavor of PTSD, but we might find that there are many varieties. This is important because some treatments are only going to work if the patient has the relevant abnormality in his or her biochemistry." For example, a recent study tested an anti-inflammatory medication for depression, but found that a patient had to have a particular biochemical signature for the treatment to be effective. "When we can bring these assessments to the level that we can use them to inform treatment," says Dr. Krystal, "we can do a better job in prescribing medications."

Genetic and epigenetic research can improve treatment in other ways as well. For example, Dr. Wolf says, "We hope to be able to use biological indices to see who should get what interventions. If we find that a person has a genetic risk or propensity for obesity, for instance, we might avoid medications whose side effects include weight gain. That person might be sent to an exercise intervention instead." Dr. Matthew Friedman, Senior Advisor to the National Center and Director of the PTSD Brain Bank, says, "The future of medicine will be pharmacogenetics. It won't be long before you can get a genetic workup just like you get blood work today, so that we can match the treatment with the particular person. The only way to do this is to understand how the brain is changing."

Dr. Krystal sees a complex road ahead. "Right now what we have is a jigsaw puzzle with a few randomly matched pieces in it. Seeing how all the different pieces come together, and therefore being able to see the ultimate picture, is still a long way away."

VA's National PTSD Brain Bank



VA's National Posttraumatic Stress Disorder Brain Bank (PTSD Brain Bank) was formally established in 2014, thanks in part to Congressional support led by U.S. Senator Patrick Leahy (D-VT). It is the first and only facility of its kind devoted exclusively to PTSD, and consists of a consortium of five VA Medical Centers as well as the Uniformed Services University of Health Sciences (USUHS). The PTSD Brain Bank is headquartered at the National Center's Executive Division in White River Junction, Vermont, and is under the direction of Dr. Matthew Friedman. Dr. Friedman is the former Executive Director of the National Center for PTSD and currently serves as a Senior Advisor to the National Center. He was a leader in establishing VA's National PTSD Brain Bank and serves as its Director.

The PTSD Brain Bank currently has 168 brains, including 56 PTSD brains, and has received commitments of more than 100 additional brains by the end of 2018. Donors can be either Veterans or non-Veterans. Because of the importance of acquiring suitable comparison tissue, the PTSD Brain Bank also collects tissue from donors who had no psychiatric illness during their lifetimes, or who suffered from a non-PTSD disorder such as depression.

Donations of tissue to the PTSD Brain Bank can occur in two ways. In many cases, consent for donation is obtained from next-of-kin shortly after their loved one dies. Other tissue comes from individuals who enroll in advance and personally consent to have their brain tissue go to the PTSD Brain Bank after death (called antemortem donors). The advantage of acquiring commitments from antemortem donors is that detailed data can be collected on their medical and psychological histories while they are alive.

The PTSD Brain Bank's physical hub is in Boston, where it is programmatically linked with the brain banks of VA Boston and Boston University, both of which are also dedicated to advancing the understanding and treatment of other illnesses including Alzheimer's disease, traumatic brain injury (TBI), chronic traumatic encephalopathy (CTE), and Gulf War Illness. Relationships with other brain banks can result in useful comparative studies, such as one study currently in process that is comparing data on suicide in individuals with CTE/TBI with individuals who have PTSD.

According to Dr. Friedman, "We can leverage these other resources to do things that would have been unimaginable. This is like a dream come true."

Pictured: Matthew Friedman, MD, PhD Director of VA's National PTSD Brain Bank, Senior Advisor to the National Center for PTSD, and former Executive Director of the National Center for PTSD

Major Research Initiatives in Fiscal Year 2017

The National Center's research activities are driven by operational priorities, first established in 2013, which help organize and focus research on areas most likely to have the greatest benefit to Veterans. Five priorities were initially set: biomarkers, treatments, care delivery, implementation, and the *Diagnostic and Statistical Manual* of Mental Disorders–Fifth Edition (DSM-5). A sixth priority— PTSD and suicide—was added in FY 2017 to reflect the critical nature of this area of research and the associated portfolio, which has recently grown in both size and scope.

During FY 2017, researchers at the National Center led 136 funded studies—ranging from investigations at a single location to projects across multiple sites—including partner organizations in the government, universities, and agencies outside of the United States. Investigators published 282 peer-reviewed journal articles, book chapters, and books; additionally, there were 140 in-press and advance online publications.

The sections that follow highlight some of the research initiatives undertaken during FY 2017 to address these six operational priorities. See Appendix A for a more complete description of research projects that took place at each of the National Center's seven Divisions (<u>Executive</u> <u>Division</u>, White River Junction, Vermont; <u>Behavioral</u> Science Division, Boston, Massachusetts; <u>Clinical Neurosciences</u> <u>Division</u>, West Haven, Connecticut; <u>Dissemination</u> <u>and Training Division</u>, Palo Alto, California; <u>Evaluation</u> <u>Division</u>, West Haven, Connecticut; <u>Pacific Islands Division</u>, Honolulu, Hawaii; and <u>Women's Health Sciences Division</u>, Boston, Massachusetts).

Biomarkers

The National Center is dedicated to research aimed at identifying biomarkers (i.e., measurable biological factors) that inform the prevention, diagnosis, and treatment of PTSD. Key aspects of this work from FY 2017 (i.e., genetics, neural connectivity, and inflammation) are highlighted in the section called "Biomarkers: Using Biology to Better Diagnose, Prevent and Treat PTSD." In addition, other important studies are underway. Investigators at the Behavioral Science Division have received funding to collect genetic information from saliva samples from individuals participating in <u>Project VALOR</u> (Veterans After-Discharge Longitudinal Registry), a longitudinal registry of over 1,600 male and female combat OEF/ OIF/OND (Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn) Veterans. Researchers



at the Clinical Neurosciences Division have conducted genome-wide genetic and epigenetic analyses on data collected from participants in the longitudinal National Health and Resilience in Veterans Study (NHRVS). Investigators at the Women's Health Sciences Division are continuing to conduct biomarker studies with particular relevance to women, including a study examining the role of neurobiological and psychosocial factors that impact negative pregnancy outcomes in women with PTSD.

PTSD and Suicide

This new area of focus aims to better understand the relationship between PTSD and suicide, and to develop strategies to prevent suicide among Veterans with PTSD. An extensive amount of research has shown an association between PTSD and suicidal ideation and behaviors, most



recently among Veterans returning from combat in Iraq and Afghanistan. Over the past fiscal year, National Center investigators engaged in studies aimed at identifying risk factors for suicide and at developing interventions that may help prevent suicidal behavior.

During FY 2017, researchers at the National Center published studies that identified associations among suicidal ideation and completed suicide with PTSD reexperiencing and dysphoric arousal symptoms, alcohol misuse, and unplanned hospital discharge (i.e., against medical advice or patient-initiated discharge). Another study found gender differences including the finding that sexual harassment during deployment was a potential risk factor for suicidal ideation in women. Ongoing efforts to identify potential risk factors for suicidal behavior are utilizing large, longitudinal data sets in Veteran and non-Veteran populations; future work will leverage VA's <u>National Posttraumatic Stress Disorder Brain Bank (PTSD</u> <u>Brain Bank)</u> to identify neurobiological markers associated with suicide risk. Investigators at the Behavioral Science Division who are working on developing better suicide prevention strategies have shown that having high-quality safety plans may be a key strategy in suicide prevention. In a sample of Veterans at high risk for suicide, higher-quality safety plans were associated with fewer suicidal behavior reports; but, a significant minority of the sample had either an incomplete safety plan or no safety plan at all. At the Clinical Neurosciences Division, investigators are using brain imaging to assess neurobiological correlates of the acute anti-suicidal effects of ketamine in Veterans with PTSD. This work may help identify other brain-based targets for interventions aimed specifically at reducing suicide risk.

Treatment Engagement, Efficiency, and Effectiveness

The National Center has long been a leader in the development of evidence-based treatments (EBTs) and outcomes research. One of the most ambitious efforts is the groundbreaking Cooperative Studies Program investigation (CSP #591) of Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT). Nine hundred Veterans will be enrolled in this study, with recruitment expected to be completed in early 2018. 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. Another ongoing trial is evaluating two psychotherapies (PE and Seeking Safety) for comorbid alcohol use disorder and PTSD.



Erika Wolf, PhD and Denise Sloan, PhD, Investigators, Behavioral Science Division

Delivery of Care



Resick, Wachen, et al. (2017), *JAMA Psychiatry, 74*, 28-36. Change in PTSD measures across the study period. PSS-I: Posttraumatic Symptom Scale-Interview. PCL-S: PTSD Checklist-Specific. CPT: Cognitive Processing Therapy.

National Center investigators are also focused on developing strategies for enhancing engagement with care. Ongoing efforts include developing a self-report measure of patients' likelihood of engaging in care and in investigating reasons for premature dropout from treatment. In one study, investigators are identifying reasons why patients complete or drop out of PE and CPT, and are developing an intervention to improve retention.

Another area of focus is increasing efficiency and effectiveness in the delivery of care. In one study, researchers compared individual CPT with group CPT and found that both treatments led to improved symptoms, although individual CPT was more effective. A newly funded study with active-duty Servicemembers is comparing whether CPT delivered over five days is as effective as CPT delivered over six weeks. Other efforts include investigating strategies for maintaining therapyrelated gains after treatment completion.

The National Center is engaged in novel stand-alone and adjunctive treatments for PTSD and associated conditions. Psychotherapeutic approaches being tested include Written Exposure Therapy, a cognitive-behavioral intervention for trauma-related guilt and shame, and a brief counseling intervention designed for women Veterans who have experienced intimate partner violence (IPV). National Center investigators are also looking at complementary and alternative ways to treat conditions associated with PTSD, such as Tai Chi for pain.

Evidence-based pharmacologic interventions for PTSD are relatively limited, so National Center investigators are exploring approaches to treatment that have mechanisms of action different from existing PTSD treatments, including ketamine, ganaxolone (a steroid medication that may reduce anxiety), and focal brain stimulation. Adjunctive approaches being tested include ketamineenhanced PE and topiramate-enhanced PE. Treatment strategies in development include oxytocin-enhanced psychotherapy and neurofeedback.

Care Delivery, Models of Care, and System Factors

Improving access to PTSD treatments in many different settings, including in the home, is an important objective of the National Center. To this end, investigators are examining the delivery of care through the use of technologies such as telehealth, web-based interventions, and mobile apps. A recent trial showed that <u>PTSD</u> <u>Coach</u>, a mobile app that assists with self-management, led to greater reduction in PTSD symptoms compared with a control group. An ongoing study is assessing the adjunctive use of this app with evidence-based psychotherapy for PTSD. Another project involves



PTSD Coach Mobile App

Kuhn et al. (2017), *J Consult Clin Psych*, *85*, 267-273. Changes in PTSD symptoms measured with PCL in PTSD Coach group versus waitlist group.



modifying <u>VetChange</u>, a web-based intervention for alcohol use disorders, to include features that facilitate collaboration between providers and Veterans.

Other efforts are focused on testing approaches for improving care delivery across health care systems. One initiative is a large, multisite trial comparing two strategies for enhancing therapists' delivery of CPT. Each strategy involves placing therapists within therapist communities that utilize different approaches to ensuring



fidelity to the CPT protocol. Another study is focused on outpatient VA prescribing of benzodiazepines and atypical antipsychotics following academic detailing around best practices. National Center investigators are also developing tools that can be used in clinical settings to improve access to care. One study is examining participatory systems dynamics, a collaborative stakeholder model in which system problems are identified, changes are proposed, and the impact of the changes on the outcome of interest is predicted in a data-driven fashion. The study is testing whether the use of the model improves timely access to high-quality services in VA outpatient settings.

Implementation

The National Center is committed to developing research, strategies, and infrastructure to promote implementation of best practices. Investigators continue to be involved in the implementation of evidence-based screening and treatment across VA, including ongoing assessment of the rate at which PE and CPT are gaining acceptance and usage.

New studies at the Dissemination and Training Division include evaluations of methods for simplifying assessment of the quality of Cognitive Behavioral Therapy (CBT) for PTSD, and of competing strategies for enhancing and sustaining the delivery of treatment. These strategies attempt to optimize fidelity to the standard treatment protocol—through either expert consultation and online resources or continuous quality improvement approaches—to improve fit and address barriers to treatment delivery. Another new study aims to increase the use of evidence-based psychotherapy for PTSD in the military health system, and to identify barriers and

Practitioner Registry



* Active Registry clinicians can cross over to the Newsletter Only Control group at 12 months ** Newsletter Only Controls may opt to participate in Active Registry at 12 months



Tara Galovski, PhD, Director, Women's Health Sciences Division

facilitators of implementation in this setting. One study nearing completion focuses on assessing and increasing implementation of many core elements of the VA/DoD <u>Clinical Practice Guideline for PTSD</u> in three service delivery sectors: VA, DoD, and the general community.

National Center investigators are also testing and disseminating practices for addressing family violence. The <u>Strength at Home</u> protocol for reducing and preventing IPV is being rolled out across eight VA Medical Centers, and is also being evaluated in a sample of active-duty Servicemembers and their partners. Investigators at the Women's Health Sciences Division are identifying best clinical practices for screening programs on IPV within VA women's health primary care settings, with the ultimate goal of disseminating these practices to all VA primary care clinics.

The National Center is also helping to develop the infrastructure for implementation science research. Investigators across multiple Divisions are playing key roles in the VA Measurement-Based Care (MBC) initiative, which will generate data that can be used in future investigations of treatment planning, treatment response, and use of evidence-based practices (EBPs). Another approach includes developing a practitioner-based implementation network across VA and DoD.

DSM-5

The Diagnostic and Statistical Manual of Mental Disorders– Fifth Edition (DSM-5) is an established classification and diagnostic tool that specifies the diagnostic criteria for all currently recognized psychological disorders. During FY 2017, the National Center continued to update PTSD assessments for the DSM-5 and to explore the utility of



the *DSM-5* PTSD criteria. One study involved establishing reliability and validity of the <u>Clinician-Administered</u> <u>PTSD Scale for DSM-5</u> (CAPS-5) in a Veteran population. Investigators also compared the *DSM-5* PTSD criteria to the proposed PTSD criteria in the International Classification of Diseases, Version 11 (*ICD-11*) and found that the *DSM-5* criteria were more effective in diagnosing PTSD in Veterans. Another ongoing effort is aimed at continued validation of the *DSM-5* version of the <u>Primary Care PTSD</u> <u>Screen (PC-PTSD-5)</u>, which is mandated for PTSD screening in VA primary care clinics.



Honors and Awards Received by National Center Staff in FY 2017

Cassidy Gutner, PhD

Women's Health Sciences Division

Outstanding Reviewer, Behavior Therapy

Jasmeet Hayes, PhD

Behavioral Science Division

Best Abstract in Neurotrauma Research, International Brain Injury Association

Early Career Investigator Award, International Brain Injury Association

Adrienne Heinz, PhD

Dissemination and Training Division

Best Poster Award, Experiential Technology Conference

Brian Marx, PhD

Behavioral Science Division

Outstanding Contributions to the Science of Trauma Psychology, APA Division 56

Carmen McLean, PhD

Dissemination and Training Division

Anne Marie Albano Early Career Award for Excellence in Science and Practice Integration, Association for Behavioral and Cognitive Therapies

PTSD Clinicians Exchange Team including: Josef Ruzek, PhD; Erica Simon, PhD; and Kile Ortigo, PhD

Dissemination and Training Division Communicator Award (Websites-

General-Health), Academy of Interactive & Visual Arts W3 Silver Award, Academy of Interactive & Visual Arts

Lauren Sippel, PhD; Jeremy Tevis, BFA; Margaret Willoughby, BA Executive Division

First Place, VHA Communications Award for the FY 2015 Annual Report: Implementation Science

Denise Sloan, PhD

Behavioral Science Division

Toy Caldwell-Colbert Award for Distinguished Educator in Clinical Psychology, APA Division 12

Fellowships and Travel Awards

Thomas Adams, PhD

Clinical Neurosciences Division

Travel Award, American College of Neuropsychopharmacology

Lynnette Averill, PhD

Clinical Neurosciences Division

Travel Award, American College of Neuropsychopharmacology

Cassidy Gutner, PhD

Women's Health Sciences Division NIH Implementation Research Institute Fellow

NIH Clinical Research Student Loan Repayment Award

Kate Iverson, PhD

Women's Health Sciences Division

NIH Implementation Research Institute Fellow

Lindsey Zimmerman, PhD

Dissemination and Training Division

2017 System Dynamics Society Summer School Scholarship, MIT Sloan School of Management

Promoting PTSD Education: Training, Dissemination, and Communication

Since the National Center's inception, education and dissemination efforts have been part of the organization's mission. The National Center uses a variety of channels both to inform and to obtain feedback from Veterans, clinicians, and the public at large, including initiatives ranging from face-to-face training programs to published literature to the latest technologies. These efforts are facilitated by the extensive network of partnerships among professionals at the seven National Center Divisions and clinicians throughout VA, other government agencies, academia, and the mental health community.

The sections that follow describe some of the many avenues the National Center follows to help ensure that the most up-to-date research knowledge and the best clinical practices are made available as efficiently as possible to help Veterans and others with PTSD. We are proud early adopters of technology—from databases to social media, from apps to avatars—yet we never lose sight of the value in developing relationships with professionals and the public that evolve into long-lasting connections.

PTSD Awareness and Engagement in Treatment

Now more than ever, people with PTSD have a variety of effective treatments to choose from. Whether they opt for trauma-focused psychotherapy—the proven first-line treatment for PTSD—or medications, patients should have an expectation for recovery and for relief of symptoms. At



Current research may soon yield clues about which PTSD treatments are best for which patients.



present, however, research that would help match patients to specific treatments is still in its early stages, so choosing among the various options can be challenging.

Research such as VA's Cooperative Studies Program (CSP) #591—a study comparing the effectiveness of two types of evidence-based psychotherapy-may soon yield clues about which PTSD treatments are best for which patients. Currently, a shared decision-making process, in which the patient and provider collaborate to decide on a treatment plan, is the best practice for choosing a treatment. The PTSD Treatment Decision Aid, a free online tool launched by the National Center in FY 2016, was designed as an element in this process. Users answer questions that help them clarify their treatment goals, watch videos of providers explaining each treatment, and compare treatments using an interactive chart. Afterward, patients can print a summary of their symptoms, goals, and preferences that they can discuss with their providers as part of the shared decision-making process. In FY 2017, the Decision Aid was updated to correspond to the 2017 VA/DoD Clinical Practice Guideline for PTSD. An accompanying Clinician's Guide (PDF) has useful tips for



providers who incorporate the Decision Aid into their practices.

The recommendations in the VA/DoD Clinical Practice Guideline for PTSD are also reflected in an infographic developed by the National Center in FY 2017, called <u>The</u> <u>Best Treatment for PTSD: The Evidence is In (PDF)</u>, which conveys the message to patients that trauma-focused psychotherapy has the best evidence for successfully treating PTSD. With eye-catching graphics and a direct message, the infographic is a quick way for Veterans to learn about treatment options. A second infographic, called <u>Primary Care: The Best Treatment for PTSD Starts</u> with You (PDF), was developed for primary care providers (PCPs).

Whiteboard Videos





Three new animated videos were then developed in response to the updated Guideline, building on an <u>earlier whiteboard series</u>. The videos—on Eye Movement Desensitization and Reprocessing (EMDR), medications supported by the Guideline, and PTSD and the brain—will debut on the National Center's website in FY 2018.

One of the most successful ways the National Center has promoted the understanding of the impact of treatments is through an online gallery called <u>AboutFace</u>, which debuted in 2012. Videos on the site feature Veterans, family members, and providers who all talk directly about how treatment for PTSD has turned Veterans' lives around. Topics focus on how treatment has reduced Veterans' symptoms, improved their quality of life, and helped them forge better relationships with friends and family members. The site was completely redesigned in FY 2017, and now gives viewers better access to the videos and enables filtering and searching by topic.

Self-Help and Treatment Companion Resources

The National Center has long been at the forefront in creating tools that people can use to support their mental health and well-being, either on their own or with the assistance of a provider. Since the launch of the award-winning <u>PTSD Coach</u> in 2011, the National Center has released 15 mobile apps, all available for free to users worldwide.

Two new <u>apps</u> were released in FY 2017: the AIMS (Anger and Irritability Management Skills) app (<u>Apple</u> | <u>Android</u>), based on the VA online course Anger and Irritability Management Skills, can be used by anyone coping with anger problems. <u>STAIR Coach</u> is an app for people participating in Skills Training in Affective & Interpersonal Regulation (STAIR), an evidence-based psychotherapy designed to improve emotion regulation. Also released were next-generation versions of PTSD Coach, PE Coach, and CBT-I (Cognitive-Behavioral Therapy for Insomnia) Coach. In a continuing effort to establish parity among platforms, four mobile apps were released on the Android platform in FY 2017.

The Military Sexual Trauma (MST) Recovery App is under development by a team of investigators from the Women's Health Sciences Division in Boston, Massachusetts, and the Dissemination and Training Division in Palo Alto, California. This app is designed for both male and female survivors of MST experiences and is focused on promoting recovery.



Margaret "Peggy" Willoughby, Associate Director for Information and Communication, Executive Division, and Amy Street, PhD, Deputy Director, Women's Health Sciences Division



Although not intended as a replacement for mental health care, the app can be used independently or in conjunction with psychotherapy.

In parallel with the development of the STAIR app, National Center experts built WebSTAIR, a free online site that guides users through a range of tools designed to enhance communication skills, improve emotion regulation, and address interpersonal relationship problems. National Center investigators are recruiting study participants to determine WebSTAIR's effectiveness with varying levels of coaching support. Recruitment efforts are focusing on women Veterans with MST living in rural areas. The project is being evaluated in terms of effectiveness and implementation. A public version of the site is expected be available on the National Center's website in FY 2018.

Two new online courses designed to help family members have been completed and are also expected to be released in FY 2018. These courses are adaptations of CRAFT (Community Reinforcement and Family Training), an empirically supported treatment that is intended to help family members cope more effectively with a Veteran's symptoms of PTSD and addiction, respectively, and to help them encourage their loved one to enter treatment.

The National Center for PTSD's efforts to foster self-help and to improve interpersonal relationships also extend to face-to-face programs. WoVeN (Women Veterans Network), led by the Women's Health Sciences Division



in collaboration with the Boston University School of Medicine, aims to create a sustainable network for women Veterans that focuses on fostering personal connections. WoVeN also launched a <u>website</u> in FY 2017. In addition to community-building activities, the site includes educational content relevant to women Veterans who want to learn more about mental health and ways to get care including information about PTSD and MST. WoVeN is funded by a Walmart Foundation grant to the Boston University School of Medicine.

Educational Resources for Professionals

The PTSD 101 series has long been the National Center's flagship <u>continuing education (CE)</u> offering. The series, which offers free CE credits, comprises more than 30



Margaret "Peggy" Willoughby, Associate Director for Information and Communication and Cybele Merrick, MA, MS, Associate Director for Education, Executive Division

hour-long courses. Four new courses were created in FY 2017 and will be live in FY 2018: Shared Decision-Making for PTSD, Cognitive-Behavioral Conjoint Therapy for PTSD, Treating PTSD and Suicide Risk, and PTSD: From Neurobiology to Treatment. Many National Center CE courses are available through <u>TRAIN (TrainingFinder</u> <u>Real-time Affiliate Integrated Network</u>), thus enabling investigators and providers who work outside the VA system to access the courses as well and to earn CE credits.

For providers within VA, the National Center partnered with Women's Health Services to create Providing Trauma-Sensitive Medical Care to Women Veterans. Available as a 60-minute course or as a brief overview, the course covers ways traumatic experiences can affect women Veterans' presentation in the medical setting, some unique issues



The PTSD 101 series comprises more than 30 hour-long courses and offers free CE credits.

they may create for their medical care, and steps medical providers can take to become more sensitive to traumaspecific needs. The course also covers issues such as how to respond to disclosure of trauma, and strategies for preventing and managing trauma-related reactions during appointments.

The National Center also released three toolkits for professional audiences:

- <u>The Police Officer Toolkit: PTSD and Military Veterans</u> aims to help police officers interact more effectively with Veterans who have PTSD. The toolkit also offers strategies for coping with traumatic stress in oneself or when dealing with colleagues in law enforcement.
- The <u>Clergy Toolkit</u> is a resource for those who provide pastoral care to Veterans with PTSD.
- The <u>Provider Self-Care Toolkit</u> includes education and resources to help mental health care providers deal with professional burnout and secondary traumatic stress. Related information is available in a companion course, <u>Provider Strategies for Coping with Burnout</u> and Secondary Traumatic Stress.

During FY 2017 the <u>Community Provider Toolkit</u> was enhanced with sections focusing on using technology in care and on treatment of <u>Lesbian, Gay, Bisexual</u>, and <u>Transgender</u> (LGBT) Veterans. User research and concept development for a revised version of the Community Provider Toolkit was also completed in FY 2017.

PILOTS (Published International Literature on Traumatic Stress)

The Published International Literature on Traumatic Stress (PILOTS) 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 provides free, online access to an international, cross-disciplinary collection of journal articles, reports, books, and dissertations on psychological trauma and its consequences. Although the primary audience for PILOTS is clinicians and investigators, the database is also used by students, the media, and the general public. Users can download the full text of articles written by National Center staff members, which also serves to increase the reach of the Center's research.



In FY 2017 PILOTS had over 59,000 records, and users ran more than 20 million searches in the database

PILOTS offers a custom thesaurus focused on PTSD and trauma, and thorough notation of psychological scales and measures, enabling searchers to efficiently and precisely navigate the abundant scholarly literature related to PTSD accessible through the database.

In FY 2017 PILOTS had over 59,000 records, and users ran more than 20 million searches in the database. To keep pace with the growth of academic publishing, PILOTS began adding in-process records, allowing new records to be uploaded and searched prior to full indexing. The Resource Center staff, which produces the PILOTS database, also began offering weekly email alerts to VA employees of new PTSD publications, thus saving clinicians' time as well as assisting VA staff in staying up-todate with the latest literature.



Support for Providers in the Field

Beginning in 2008 with the national training initiatives for CPT and PE, the National Center launched the VA PTSD Mentoring Program, designed to promote best practices in the clinical and administrative components of specialty care. The program connects PTSD program directors with seasoned PTSD professionals within their regions who act as mentors. This year the Mentoring Program developed the online PTSD Clinical Team Director Course (available in <u>TMS</u>) to foster the utilization of effective practices on the administrative side of PTSD clinics. Through this new initiative, Mentoring Program staff work with program directors to help them meet the increased demand for treatment by restructuring existing programs and implementing best practices.

Complementing these national efforts, the Executive Division in White River Junction, Vermont, with support from VHA Office of Rural Health, is expanding its program that uses academic detailing and facilitation to improve the treatment of Veterans in rural New England (VISN 1).

The Executive Division is expanding its program that uses academic detailing and facilitation to improve the treatment of Veterans in rural New England.



Benzodiazepines & PTSD: Do you know about this risky combination?

VA

In FY 2017 a clinical pharmacist and psychologist started working on disseminating the recommendations in the revised VA/DoD Clinical Practice Guideline for PTSD to prescribing clinicians. The goal is to foster the provision of evidence-based PTSD care including increasing referrals to effective psychotherapy and reducing the prescribing of benzodiazepines for PTSD. The program is also developing an online rural provider dashboard and a rural provider

Treating Veterans with PTSD?

Consult with expert PTSD clinicians for FREE today!



toolkit to support VA providers working in rural clinics.

The <u>PTSD Consultation</u> <u>Program</u> began in 2011 with the mission

2011 with the mission of connecting VA providers with expert PTSD consultants via phone or email, and was expanded in 2015 to offer consultation and resources to community providers outside VA who see Veterans with PTSD. The effort to reach more providers has been supported by a targeted webbased and direct mail marketing campaign. **Consultation requests** from community and VA providers grew by 50 percent in the past year, with a total of over 2,100 consultations completed; approximately a quarter of all requests came from outside VA. The Consultation Program continues to offer a well-attended monthly webinar series with topics based on questions coming into the program.

Practice-Based Implementation Network



The Practice-Based Implementation Network (PBI

Network) is a network of VA PTSD field sites and individual clinicians collaborating with the National Center to test new practices and approaches to implementation. In FY 2017 the PBI Network piloted a learning collaborative to train and support clinicians as they integrated new phone and internet technologies into their practices. The Technology Community of Practice developed for the initiative brought together providers and experts in both mobile apps and online programs, and in December 2017 will become an ongoing resource for providers across VA.

Monthly calls highlight new releases, such as the updated version of CBT-I Coach and a clinical dashboard to support care, and allow providers to ask experts questions as well as share their own experiences and knowledge. The development of additional implementation materials such as handouts for family members supporting loved ones in therapy—is underway in an effort to continue to respond to provider requests and to improve implementation with Veterans.

The PTSD Clinician's Exchange, the National Center's practitioner registry, continues to link participating treatment providers in VA, DoD, and the general community with practical training and resources related to 25 best practices. The goal is to increase providers' familiarity with these practices and enhance their perceptions of benefit to patients. In the past year the registry has also been accessed by a network of subject matter experts to respond to clinician inquiries about specific best practices.

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The PTSD Clinician's Exchange links participating treatment providers in VA, DoD, and the general community with practical training and resources.

The National Center partnered with quality improvement programs in the Office of Mental Health and Suicide Prevention and with the Office of Strategic Integration | Veterans Engineering Resource Center (OSI|VERC) to develop Modeling to Learn, a nationwide online quality improvement training program for multidisciplinary frontline addiction and mental health teams. The aim of the program is to expand Veterans' access to treatments most likely to prevent chronic impairment, relapse, suicide, and overdose. Modeling to Learn empowers teams to evaluate tradeoffs among critical priorities and to identify local quality improvement strategies that best utilize existing staff resources. The program includes an online SharePoint site with tools to review team data and online system dynamics models that help teams develop improvement plans. Another key component is a workshop series that enables participating psychiatrists, psychologists, social workers, nurses, counselors, and certified peer support specialists to earn CE credits in their field of practice.

Modeling to Learn

Experiments that empower effective action



About the National Center for PTSD



History

The National Center for PTSD was created in 1989 within the U.S. 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 National 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 initially established the National 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. Two Divisions are located in Boston, Massachusetts; two in West Haven, Connecticut; one in Palo Alto, California; and one in Honolulu, Hawaii. Each contributes to the overall Center mission through specific areas of focus.

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



Leadership in Fiscal Year 2017



Paula P. Schnurr, PhD

Executive Director, Executive Division, VT

Professor of Psychiatry, Geisel School of Medicine at Dartmouth



Rani Hoff, PhD, MPH

Division Director <u>Evaluation Division</u>, CT

Director of the Northeast Program Evaluation Center

Professor of Psychiatry, Yale 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



Terence M. Keane, PhD

Division Director Behavioral Science Division, MA

Professor of Psychiatry and Assistant Dean for Research, Boston 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



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



Tara E. Galovski, PhD Division Director Women's Health Sciences Division, MA

Associate Professor of Psychiatry, Boston University School of Medicine



Josef Ruzek, PhD

Division Director <u>Dissemination and Training Division</u>, CA

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

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Boston University School of Health

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

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David S. Riggs, PhD

Center for Deployment Psychology, Uniformed Services University of the Health Sciences

Available Appendices

APPENDIX A Fiscal Year 2017 Research Narrative

APPENDIX B Fiscal Year 2017 Funding

APPENDIX C Fiscal Year 2017 Publications

APPENDIX D Fiscal Year 2017 In Press and Advance Online Publications

APPENDIX E Fiscal Year 2017 Scientific Presentations

APPENDIX F Fiscal Year 2017 Educational Presentations

APPENDIX G Fiscal Year 2017 Editorial Board Activities



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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

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EVALUATION DIVISION (NEPEC)

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

PACIFIC ISLANDS DIVISION

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WOMEN'S HEALTH SCIENCES DIVISION

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