

**STATEMENT OF
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Chairman Tillis, Ranking Member Gillibrand, and Members of the subcommittee; thank you for the opportunity to discuss the current state of research, diagnosis, and treatment for traumatic brain injuries (TBI). I am accompanied by Dr. David Cifu, Senior TBI Specialist for the Veterans Health Administration (VHA).

The Department of Veterans Affairs (VA) TBI/Polytrauma program delivers world-class medical and rehabilitation services for Veterans and Servicemembers with TBI and associated polytrauma. Through this program, VA continues to advance the diagnosis, evaluation, treatment, and understanding of TBI in a variety of ways, including: establishing standardized diagnostic and assessment protocols; developing and implementing best clinical practices for care; collaborating with strategic partners; educating and training in TBI-related care and rehabilitation; and conducting, interpreting, and translating research findings into improved clinical patient care and caregiver support.

Definition and Diagnosis of TBI

VA and the Department of Defense (DoD), collaboratively, have defined TBI as: a traumatically-induced, structural injury or physiological disruption of brain function from an external force as indicated by; a loss or alteration of arousal, a loss of memory, an alteration of mental state, new neurological deficits or an intracranial lesion.

TBI severity is determined at the time of the injury based on the individual's ability to respond to the environment and to questioning. The vast majority of TBI is categorized as mild. Mild TBI, which is commonly called concussion, is usually more difficult to identify than severe TBI, due to the lack of a visible head injury and non-specific symptoms, which can also be seen with other diagnoses, such as acute stress, depression, and Post Traumatic Stress Disorder (PTSD). The vast majority of individuals with mild TBI are symptom-free in two to four weeks, but a minority will experience ongoing symptoms, sometimes lasting for several months or longer.

The diagnosis of mild TBI is made historically, determined by the individual's loss or alteration of consciousness following the traumatic event. Efforts to develop

objective measures for a mild TBI diagnosis, including advanced imaging and biomarkers, are currently in the research phase and not yet useful in the clinical setting.

VA established a system-wide screening and assessment program in 2007 to identify Veterans with a history of TBI and persistent symptoms, so as to provide a definitive diagnosis and allow for the development of a treatment plan. This validated screening tool consists of questions that VA health care professionals must ask all Veterans, with a service separation date after September 11, 2001, when they are accessed for VA healthcare. Veterans who screen positive are offered follow-up evaluations with TBI specialists. Between 2007 and 2017, VA has screened over 1.1 million Veterans from Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn (OEF/OIF/OND); more than 213,000 of these Veterans screened positive for possible TBI and were referred for a comprehensive TBI evaluation. To date, over 93,000 of those Veterans with a positive screen were diagnosed with having sustained a mild TBI, and had an individualized rehabilitation and reintegration Treatment Plan of Care developed for their ongoing rehabilitation services.

Treatment

Evidence-based treatment following mild TBI is determined by symptoms. VA and DoD published Clinical Practice Guidelines in 2009 and updated them in 2016 for the management of mild TBI utilizing the highest level of medical evidence to guide care (<https://www.healthquality.va.gov/guidelines/Rehab/mtbi/>). Treatment includes a combination of therapy, including cognitive, physical, speech, and occupational therapy, along with medications to manage specific symptoms, such as headaches or anxiety. Individualized rehabilitation treatment plans are paramount to TBI care as they consider the impact of symptoms on functional abilities with active input from the individual and their caregiver to develop recovery goals.

The complexity of care needed for Veterans with TBI and polytrauma is best provided through an integrated medical system, as is available in VA's Polytrauma System of Care (PSC). Of the new cohort of Veterans with a TBI diagnosis, over 70 percent also have a PTSD diagnosis, and over 50 percent have both PTSD and Pain diagnoses, highlighting the importance of active integration of mental health and pain care providers in the care for individuals with TBI.

VA provides the full continuum of care for Veterans with TBI of all severity through its Polytrauma System of Care, a nationwide coordinated system of over 100 facilities providing specialized rehabilitation programs. Polytrauma, defined as two or more injuries occurring as a result of the same traumatic event that result in physical, cognitive, or mental health impairments and functional disability, is best served in an integrated medical system. VA's TBI/Polytrauma System of Care collaborates with primary care and other specialty services, such as mental health, complementary and alternative medicine, and vocational rehabilitation, to deliver integrated and innovative treatment options that promote Veterans' choice and support successful community

reintegration. VA strives to improve access to specialized rehabilitation services and programs for Veterans with TBI and Polytrauma. These nationwide programs include:

- Transitional Rehabilitation Programs, focusing on promoting independence, community reintegration and return to work after injury;
- Telehealth services for Veterans living at a distance from the medical centers;
- Assistive Technology Labs to maximize the functional status of Veterans with disabilities through the use of adaptive and assistive technology;
- Emerging Consciousness Programs serving Veterans who are slow to recover awareness after severe brain injuries.

VA also instituted long-term follow-up of Veterans with chronic problems related to TBI, initially for all those with moderate to severe initial injury, and now including those with mild injuries who fail to reintegrate successfully into the community. Understanding the multifactorial etiologies involved in chronic mild TBI, VA promotes health and wellness initiatives, including self-management with mobile technologies and collaboration with community partners to offer additional services in the areas of fitness and recreational activities.

Military and Veteran suicide rates are elevated compared to civilian rates and VA has made suicide prevention a top priority. Many Veteran patient populations are recognized to be at higher risk for suicide, including those with psychiatric conditions, and those living with a history of TBI. Veterans with mild and moderate to severe TBI who sought VA services, died by suicide at 1.8 to 1.3 times the rate of all Veterans using VA for healthcare. VA offers wide-ranging suicide prevention efforts, including the Veterans Crisis Line, suicide prevention coordinators, and the rollout of REACHVET, to identify those Veterans at greatest risk.

Research

VA research related to TBI is wide-ranging and is coordinated under the National Research Action Plan (NRAP) in response to Executive Order 13625, Improving Access to Mental Health Services for Veterans, Service Members, and Military Families. Under the NRAP, VA partners with DoD and HHS to coordinate research strategies to accelerate discovery and rapidly translate new knowledge into diagnostics and treatments of Servicemembers and Veterans with TBI. Among these NRAP-related goals, VA researchers are working: to shed light on brain changes in TBI; improve screening methods and refine tools for diagnosing TBI; and develop ways to treat brain injury. VA researchers are also designing improved methods to assess the effectiveness of treatments, and learning the best ways to help family members cope with the effects of TBI and support their loved ones. VA Research in mild TBI continues to grow. In FY2017, VA spent \$35.5 Million in TBI research on 164 projects, including 4 Research Centers. Also included in this investment is VA's \$5 million per year contribution to the NRAP-related VA/DoD Chronic Effects of Neurotrauma Consortium (CENC).

VA has several research centers that are working together to better understand TBI and translate findings to enhanced clinical care. These include, 1) the Translational

Research Centers for TBI and Stress Disorders, at the VA Boston Healthcare System and at the Michael E. DeBakey VA Medical Center in Houston, which study TBI and PTSD, 2) the Brain Rehabilitation Resource Center, at the Malcolm Randall VA Medical Center in Gainesville, Florida, that seeks to harness neuroplasticity to improve recovery, 3) The Research Center for the Prevention and Treatment of Visual Loss at the Iowa City VAMC that includes specific research in TBI and vision, and 4) The National Center for Rehabilitative Auditory Research at the Portland VAMC that includes specific research related to TBI and hearing loss.

As mentioned above VA is part of CENC, which is a coordinated, 30-center research collaboration between VA and DoD, centered at the Hunter Holmes McGuire VA in Richmond, Virginia. It has been jointly funded for \$62.2 million since 2013. The focus of CENC is to link basic, translational, and clinical neuroscience researchers from VA, the military, academia, and the private sector, to effectively address the diagnostic and therapeutic ramifications of TBI and its long-term effects. CENC's goal is to better understand the lifetime impacts of military service, combat-associated concussions (mild TBI), and being a Veteran, in particular with respect to the development of mental health disorders, Alzheimer's, dementia, and related neurodegeneration. Some early important findings from CENC include:

- In a cohort of more than 1,100 Veterans and Servicemembers with persistent difficulties after combat concussions and related issues, more than two-thirds are high functioning, employed and managing well in the community more than seven years after injury. The remaining one-third demonstrate ongoing and increasing difficulties that require significant health care utilization.
- Servicemembers and Veterans with combat-related concussions and associated conditions (PTSD, pain, depression, substance use, elevated suicide risk) represent a unique and high-risk population for long-term difficulties and decline.
- Using big data techniques, among 1.6 million Servicemembers and Veterans, linkages have been identified between elevated lifetime risks for neurodegeneration, including Alzheimer's dementia, for those with TBI.

VA tracks TBI rehabilitation outcomes of Veterans with TBI and compares them to those from the private sector, through collaborative research between the five VA Polytrauma Rehabilitation Centers and the National Institute of Disability, Independent Living, and Rehabilitation Research (NIDILRR) TBI Model Systems' 16-center database. Through fiscal year 2017, VA has enrolled over 1,000 Veterans in the study, generated 24 peer-reviewed scientific publications and delivered nearly 90 conference presentations. This Federal interagency collaboration enhances VA's ability to define the unique needs of Veterans following TBI and translate those findings into policy, to create continuous quality improvement for TBI rehabilitation within VA.

Evidence of VA's leadership in TBI research and clinical care has been highlighted in several recent special issues of medical journals, including: the September 2016 issue of *Brain Injury* covering results from CENC; the October 2017 issue of *Brain Injury* reporting on outcomes from VA's TBI State of The Art Conference;

and the July 2017 issue of the Journal of Head Trauma Rehabilitation showcasing results of VA's involvement in the Federal interagency TBI Model Systems program.

Mr. Chairman, thank you again for the opportunity to testify about the importance of TBI diagnosis, treatment, and research. We believe VA is a leader in each of these areas, delivering the best care available to our Veterans, and we welcome the opportunity to advance collaboration with our Federal and private partners. We also thank the subcommittee and Congress as a whole for their support of getting our Veterans the care they have earned and deserve. My colleagues and I would be pleased to answer your questions.