

The National Center for Telehealth and Technology

Gregory Gahm, PhD

Since the National Center for Telehealth and Technology was established in 2008, it has led the development of web and mobile applications for behavioral health care, developed the foundations for a DoD telehealth strategy, delivered innovative clinical and self-help solutions, and contributed to the development of policies for addressing posttraumatic stress disorder, traumatic brain injury, and suicide in the military.



Federal Practitioner's 30th anniversary celebration comes to a close with the spotlight this month on the accomplishments of the National Center for Telehealth and Technology.

The country's focus on the invisible wounds of war for more than a decade has dramatically raised the awareness and care for the entire military community of service members, veterans, and their families. Technology innovations in behavioral health awareness, education, access, and therapies have brought greater acceptance of care by our military warriors who have historically avoided disclosing their need for behavioral health care.

The National Center for Telehealth and Technology (T2) was established in 2008 as a component center of the Defense Centers of Excellence (DCoE) for Psychological Health and Traumatic Brain Injury. The DCoE serves as the principal integrator and authority on psychologi-

cal health and traumatic brain injury (TBI) knowledge and standards for the DoD.

T2 develops and deploys technology-based solutions in mobile health and telehealth and explores emerging technologies in support of psychological health and TBI recovery for the military community. These solutions address the need for continuous access to care and expand the delivery of care to the white spaces, or time between medical appointments. The focus of T2 is on leveraging existing and emerging technology to improve access to care, quality of care, and the body of knowledge in the DoD.

Technology expands self-care and clinical treatment options, redefines delivery of care and improves how we collect, analyze, and share information. In the 5 years since T2 was established, the center has had the opportunity to lead the development of web and mobile applications for behavioral health care, developed the foundations for a DoD telehealth strategy, delivered innovative clinical and self-help solutions, and contributed to the development of policies for addressing posttraumatic stress disorder (PTSD), TBI, and suicide in the military.

MOBILE HEALTH

The proliferation of mobile platforms, particularly in the military population, provides an opportunity to improve access to education and self-care tools. Accessing online resources from the comfort of one's home eliminates concerns about the stigma associated with in-person care.

The perception of stigma was, and still may be, a serious barrier to mental health care in both the military and the civilian sector. Many service members believe that treatment for behavioral health problems could adversely affect their careers. Using the power of the internet provides a unique, personal, and confidential approach to help our global population.

T2 also collaborates with the Department of Veterans Affairs National Center for PTSD to create applications, which work seamlessly with military members and veterans.

T2 now has more than 600,000 downloads of its mobile apps for mobile devices, and information on them can be found at <http://www.t2.health.mil>. The apps are free on the Apple, Amazon, and Android marketplaces. T2's mobile apps cur-

Dr. Gahm is the executive director of the Department of Defense National Center for Telehealth and Technology, located at Joint Base Lewis-McChord in Washington.

rently include Breathe2Relax, Biozen, LifeArmor, mTBI Pocket Guide, PE (Prolonged Exposure) Coach, Positive Activity Jackpot, Provider Resilience, PTSD Coach, Tactical Breather, and T2 MoodTracker.

T2 also worked with a number of partners to develop a Congressionally-mandated web application called AfterDeployment.org in 2008 (<http://www.afterdeployment.org>). This was the first website in the Defense Department to provide a comprehensive array of resources for the behavioral health issues of combat veterans. Built on a foundation of evidence-based research, the modules provide anonymous and continuous access to education, assessments, skills-help exercises, change strategies, and interactive workshops. The modules can also augment face-to-face care. Some of the modules have been incorporated into professional medical training curricula and clinical studies.

The interactive self-care solution uses modularized content across a spectrum of postdeployment conditions (eg, combat stress and triggers, conflict at work, reconnecting with family and friends, depression, anger, sleep problems, substance abuse, stress management, kids and deployment, spiritual guidance, living with physical injuries, health and wellness). A pilot study supported its effectiveness for posttraumatic stress symptoms among veterans, and additional clinical trials are underway.

In 2011, we launched MilitaryKidsConnect (<http://www.militarykidsconnect.org>) to address the unique challenges of military life on children and addressed the combined effects of frequent combat deployments, living with parents who are struggling with behavioral issues, and living in communities that have little understanding of their military lifestyles.

MilitaryKidsConnect expanded our resources to military families. The site provides a moderated social media channel for children to discuss their parental separation and military adjustment issues and to safely share coping strategies that have worked for them with a worldwide community of their peers.

MilitaryKidsConnect also provides specially developed resources to help children and parents better understand and discuss the effects of PTSD and TBI in their families. The site has resources for educators to better understand how the military culture affects behavior and lifestyle. Teachers have lesson plans and in-service training sessions to help military children fit in to schools in civilian communities. This is particularly useful for the children of the Reserve and National Guard whose parents are called to duty from communities with little or no military connections.

T2 further expanded resources for military families to include a training course for parenting skills (<http://www.MilitaryParenting.org>) and for problem solving (<http://www.StartMovingForward.org>). These courses address the wider lifestyle issues that contribute to the psychological health of our military members and their families.

EMERGING TECHNOLOGIES

Emerging technologies may provide opportunities to reach the technologically savvy military population through culturally relevant media that may reduce stigma and provide helpful affordances for treatment and self-care. T2 has developed innovative approaches to delivering psychological support services through a variety of emerging technologies. For example, a pilot application called the Virtual Lifestyle Coach is funded

by the Military Health Systems Innovations Program and will create a low-cost, broad-reach resource for weight management in our military population. The project will create a foundation for digitally mediated behavior change that is adaptable to a variety of psychological issues.

Technology Enhancement Center

It is essential that software development efforts ensure that proposed solutions are intuitive, usable, and satisfying for users. Therefore, usability testing is a critical step in the production of mobile apps, websites, and virtual reality tools. By applying rigorous and repeated instrumented testing in a controlled environment, usability testing is the most effective way to be certain that users will understand, interact with, and benefit from technology as designed.

T2's Technology Enhancement Center allows testing and evaluation at every stage of the development lifecycle and helps developers optimize the user experience through input from representative end-users. In this way, technology development is more efficient and the product is more useful to our warrior and veteran populations.

T2 consulted with some of the industry's most accomplished design engineers to ensure the utility, flexibility, and longevity of the new facility. The result is a state-of-the-art testing, observation, and monitoring facility. Through this service, T2 is delivering technological solutions using industry-standard best practices.

RESEARCH

T2 prioritizes research and evaluation efforts to ensure that applications are effective and helpful to the military community. T2 has published over 93 scientific papers contributing to

the body of knowledge on psychological health and TBI. Some examples of our clinical trials include comparing Virtual Reality Exposure Therapy to Prolonged Exposure Therapy for the treatment of PTSD; delivery of in-home telemental health treatment for depression; and Caring Letters, a multisite study of e-mail for patients at a high risk of suicide. The first study has completed recruitment of participants and is under analysis. The latter study is currently recruiting participants.

T2 has completed a number of studies examining the effectiveness of web applications, smartphone apps, emerging technologies, and telehealth solutions. In general, these studies support the promise of providing technological solutions consistent with T2s while also helping rule out ideas that do not warrant further investment.

DOD SUICIDE EVENT REPORT

Historically, all the military service branches used idiosyncratic suicide

surveillance systems. T2 led the development of the DoD Suicide Event Report (DoDSER) system in collaboration with the military services in 2008 as a DoD solution to standardize surveillance for all branches of the military. This web application provides a unified reporting system for a variety of suicide behaviors, including suicides, suicide attempts, and other suicide-related behaviors.

Following a suicide behavior, each service conducts a professional review of records and conducts interviews where appropriate. Information entered into the DoDSER data collection website enables a review of data across the DoD and the ability to continuously analyze and report on suicide factors. T2 has published DoDSER annual reports since 2008.

LOOKING FORWARD

The warriors and veterans served struggle to restore their lives from the psychological health and TBI chal-

lenges they live with every day. As the scope of the needs grow, T2 is committed to supporting the advancement of excellence in prevention and care and helping each one build the life he or she wants. ●

Author disclosures

The author reports no actual or potential conflicts of interest with regard to this article.

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