

INVESTIGATOR'S DISPATCH



FAR-FORWARD BEHAVIORAL HEALTH

WRAIR PROTECTS YOUR SIX

Protecting your brain - the most important six inches on the battlefield
CENTER FOR MILITARY PSYCHIATRY AND NEUROSCIENCE



Blast Induced Neurotrauma and Neuroprotection



Sleep & Resilience



Team Performance and Mental Fitness



Military Psychiatry

Protecting the most important six microns between you and the threat of disease
CENTER FOR INFECTIOUS DISEASE RESEARCH

Vaccines & Entomology



Viral & Bacterial Diseases



Military HIV Research Program



Experimental Therapeutics & Emerging Infectious Diseases



WHETHER YOU'RE AT HOME STATION OR SIX THOUSAND MILES AWAY

WALTER REED ARMY INSTITUTE OF RESEARCH'S MISSION

Discover, design, and develop solutions for military relevant infectious disease and brain health threats through innovative research protecting and optimizing warfighter lethality.

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PROMOTED HASHTAGS

- #ArmyResilient #SoldiersConnect
- #WhatsImportantNow #MedFit
- #CompassionateCare #SmallTeams
- #GotYour6 #BeMindful



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OF RESEARCH IS A SUBORDINATE
COMMAND OF MRDC

The opinions or assertions contained herein are the private views of the author and are not to be construed as official.

WRAIR Is Discovering, Designing and Developing Solutions for Soldiers



Neuroprotection

Novel methods to improve brain injury assessment, neuroprotection and restoration.



Far-Forward Behavioral Health

Practical peer-based solutions for immediate interventions supporting behavioral health and optimizing care.



Sustained Performance

Techniques to optimize cognitive functioning, attention and recuperative sleep.



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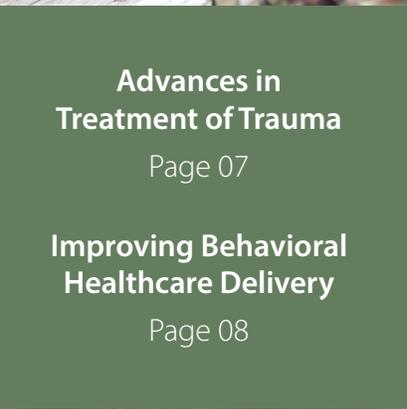


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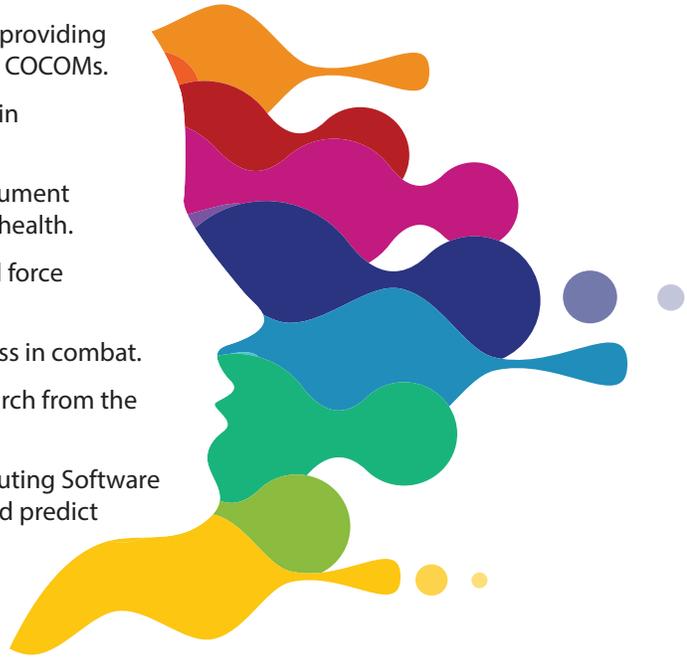
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Behavioral Health and Cognitive Performance

Topline Messages

- WRAIR supports and leads the Mental Health Advisory Teams (MHATs), providing rapid feedback on emerging behavioral health priorities to leaders and COCOMs.
- WRAIR develops techniques to sustain and optimize behavioral health in far-forward environments.
- The Behavioral Health Readiness Evaluation and Decision-Making Instrument (B-REDI) augments clinician decisions on return-to-duty for behavioral health.
- Cognitive flexibility tools improve attention and interpretation in lethal force decision-making.
- Studies identify drug solutions for further testing to manage acute stress in combat.
- The WRAIR Sleep Research Center, DOD's largest sleep lab, moves research from the lab to the field.
- 2B-Alert, in collaboration with Biotechnology High Performance Computing Software Applications Institute (BHSAI), uses machine learning to personalize and predict cognitive function during periods of sleep restriction.
- Leader tools improve Soldier sleep and cognitive functioning.
- Transcranial electrical stimulation (tES) enhances recuperative sleep.



Relevance: Behavioral Health

Behavioral health problems are a leading cause of battlefield evacuation which disrupts readiness.

15%

of Soldiers have a behavioral health diagnosis.

15-20%

of Soldiers who have deployed to combat zones developed symptoms of PTSD.

20%

decline in cognitive functioning after sleeping less than five hours per day for five days, which is equivalent to operating with a .08 blood alcohol content.



Relevance: Performance

Military operations require significant loss of sleep, which can lead to a

45%

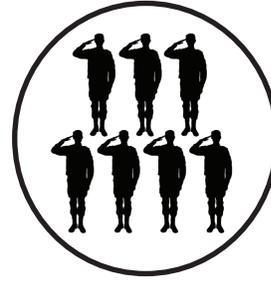
slower reaction time.

Cognitive Flexibility Challenges



Individual Readiness

Anxiety, stress, and hypervigilance degrade a Soldier's ability to be alert to signs of danger on the battlefield and increase the risk of PTSD.



Unit Readiness

Small-team cohesion is negatively impacted by Soldiers who tend to overreact to non-threatening events.



What This Means For Soldiers

- Soldiers who pay attention to threats at the right time and place have better behavioral health and performance.



WRAIR Delivers

- **Individual readiness:** WRAIR is partnering with the Israel Defense Forces.
- **Unit readiness:** WRAIR is partnering with the U.S. Army Research Laboratory to develop computer games that train Soldiers to respond less aggressively to frustrating social situations in order to counter threats to team cohesion.



Forging The Future

- Smartphone games will be developed, tested and delivered to Soldiers to increase cognitive flexibility.





US Army Photo by: Master Sgt. Michel Sauret

Emerging Behavioral Health Priorities

Challenges

- Commanders need, but often lack, accurate and real-time data on the behavioral health of their units across all environments.
- Decisions about where behavioral health support should be positioned need to be data driven.
- Existing clinical screens do not identify emerging behavioral health priorities that Commanders and medical leaders must address.

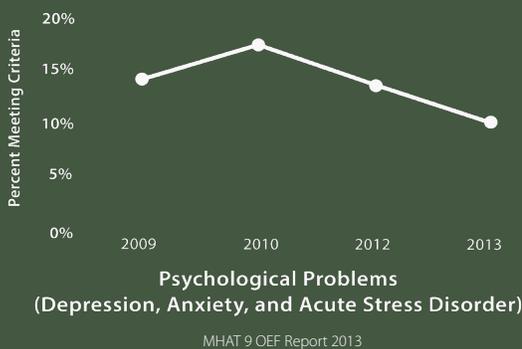
Partnerships

Army Public Health Command, Army G-1's SHARP Ready and Resilience Directorate (SR2D), Army Training and Doctrine Command, geographical combatant commands, Army Office of the Surgeon General.



What This Means For Soldiers

- Commanders with access to snapshots of their unit's behavioral health can adjust resources to optimize training priorities.



Solutions

- **Mental Health Advisory Team (MHAT):** WRAIR's capability includes deploying subject matter experts to benchmark behavioral health needs and threats to readiness while providing comparison data to place results in context. WRAIR uses cluster sampling to ensure accurate findings for senior leaders.
- **Behavioral Health (BH) Pulse:** A validated toolkit for assessing a unit's behavioral health compared to other units. Results can help guide leader decision making.



Forging The Future

- BH Pulse will be refined to include specific recommendation mapped onto a unit's response profile.
- BH Pulse will be integrated into a virtual platform.
- MHATs will be included in a decision support tool for senior leaders.

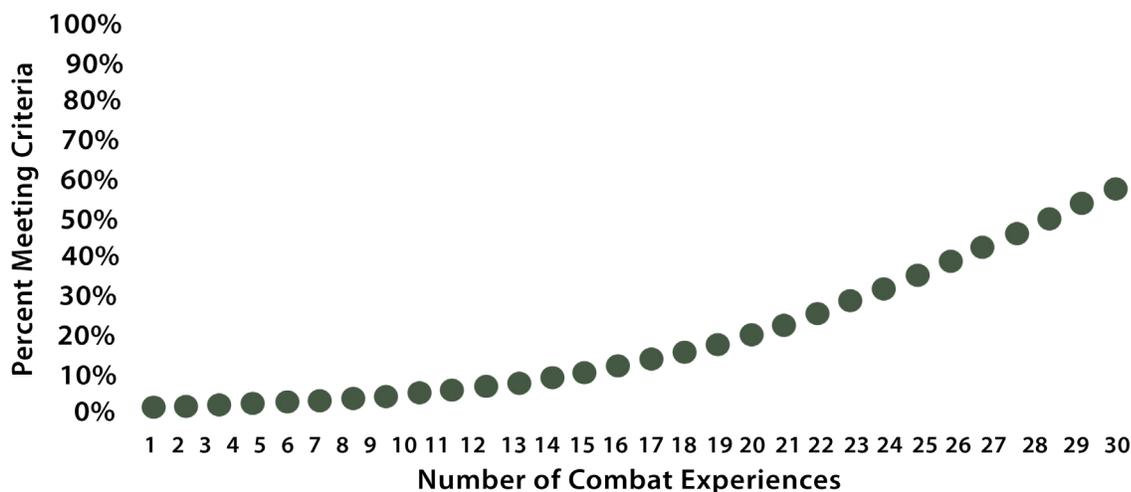
Far-Forward Behavioral Health

Challenges

- In Multi-Domain Operations (MDO), behavioral health casualty rates are expected to be high.
- WRAIR's MHAT data consistently demonstrate that greater exposure to combat is associated with greater risk of behavioral health problems.

Partnerships

WRAIR partners with the Army Office of the Surgeon General, U.S. Army Special Operations Command, Telemedicine and Advanced Technology Research Center (TATRC), Army Training and Doctrine Command, and MIT Lincoln Labs.



Relationship Between Number of Combat Experiences and Psychological Problems

MHAT 9 OEF Report 2013



What This Means For Soldiers

- In MDO, Soldiers may not have access to treatment from behavioral health specialists for acute stress or other behavioral health problems.
- Soldiers, medics, and small-unit leaders need to be prepared to provide unit members with behavioral health support.



Forging The Future

- WRAIR and TATRC investigators are developing a virtual health platform for far-forward behavioral health and integrating the platform with existing systems.
- WRAIR and MIT-Lincoln Labs are examining vocal features, acute sleep loss, and physical and emotional stress using a machine learning algorithm that will detect "danger levels" in vocal tract changes.
- WRAIR is leveraging changes to define risk for acute stress responses and cognitive decline.
- WRAIR is creating a suite of interventions for the far-forward environment.

Far-Forward Intervention With iCOVER



- i** IDENTIFY Buddy in Need
- C** CONNECT
- O** OFFER Commitment
- V** VERIFY Facts
- E** ESTABLISH Order of Events
- R** REQUEST Action

Challenges

Acute stress can place the individual, team, and mission in jeopardy.

Solution

Partnering with the Israel Defense Forces, WRAIR developed iCOVER, a rapid peer-based intervention for team members experiencing acute stress.

Research

Ongoing studies with the Israel Defense Forces demonstrate that Soldiers trained in iCOVER report better knowledge and confidence in managing acute stress in combat.

Working in conjunction with the Naval Air Warfare Center Training Systems Division (NAWCTSD), WRAIR found Soldiers trained in iCOVER successfully applied the six steps during live-action, scenario-based training.



What This Means For The Soldier

- Before iCOVER, there was no systematic method to teach Soldiers what to do if a team member began exhibiting signs of an acute stress reaction.
- **1 in 12 Soldiers** reported being so mentally stressed during combat that they were unable to function for a period of time.



WRAIR Delivers

- Integrated into the Team OverMatch training platform.
- Provided to security forces assistance brigades.
- Training for military medical students.
- Developed and fielded training video.



Forging The Future

- WRAIR is conducting a randomized trial with deploying troops.
- iCOVER serves as a model for far-forward deliverables.

Advances In Treatment of Psychological Trauma

Challenges

- Acute trauma exposure disrupts performance and reduces Soldier readiness.
- Current treatments for post-traumatic stress disorder take four to six weeks and can have limited efficacy in some Soldiers.

Partnerships

WRAIR partners with Evren Technologies, Protagenic Therapeutics, Inc, and University of California-Irvine.

Solutions

WRAIR is developing drugs to mitigate acute stress:

- 1** Identify and test novel compounds for efficacy using a preclinical screen.
- 2** Advance candidate compounds for safety testing.
- 3** Advance candidate compounds for additional efficacy and safety testing using good laboratory practice.

FAST **PERFORMANCE** **ASSESSMENT &** **CHEMICAL** **EVALUATION**

WRAIR has a dedicated neurobehavioral lab and traumatic stress models to advance studies of candidate compounds.



What This Means For The Soldier

- There is no current drug to treat acute and chronic stress symptoms in the far-forward environment.



Forging The Future

- Test candidate compounds in first-in-human clinical trials.
- Re-purpose FDA-approved drugs for alternative use for traumatic stress and evaluate test efficacy.
- Pursue agreements/collaborations with key leaders in academia and industry.

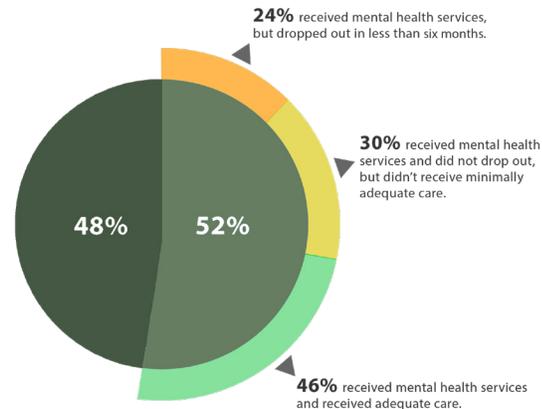


Improving Behavioral Health Care Delivery



Challenges

Often Soldiers don't seek the help they need for mental health problems; when they do, they drop out before receiving adequate care.



A Gap Between Need and Mental Health Problems

- Scored above threshold for PTSD but did not seek mental health services.
- Scored above threshold for PTSD and sought mental health services.

Partnerships

WRAIR partners with the Office of the Surgeon General's Behavioral Health Service Line.



What This Means For Soldiers

- Without an adequate "dose" of treatment, Soldiers won't be able to recover efficiently, delaying their return to full functioning and potentially impeding their unit's effectiveness.



WRAIR Delivers

- **Dropout Reduction in Outpatient Psychotherapy (DROP) training:** A 75-minute interactive training given to Army behavioral health providers to address the problem of early treatment dropout.
- Clinician tool to enhance Soldier engagement in behavior health treatment. 97 % of providers found that the training was useful in their practice.
- **Behavioral Health Readiness Evaluation and Decision-Making Instrument (B-REDI) tool:** B-REDI Tool is a clinical assessment of behavioral health readiness to aid behavioral health clinicians in return-to-duty decision-making and help clinic leadership and Office of the Surgeon General understand return-to-duty decision-making in their clinics.



Forging The Future

- Assess training effectiveness to provide recommendations that will enhance and optimize Soldier readiness.
- Improve return-to-duty decision-making and follow-through with therapy sessions.

Mental Health in the OIF/OEF/OND Era

- The Military Psychiatry Branch studied prevalence rates in 18,305 U.S. Army Soldiers from four active component and two National Guard infantry brigade combat teams.
- Prevalence rates for PTSD or depression with serious functional impairment ranged between 8.5% and 14.0%, with some impairment between 23.2% and 31.1%.
- Due to the scarcity of transition time, suicide rates increased for both deployed and non-deployed personnel as well as mental disorder prevalence and treatment also increased.
- U.S. Army Soldiers' Utilization of Mental Health Services Military Psychiatry researchers found that mental health services utilization increased over the course of the wars in Iraq and Afghanistan.
- While increased use of services was a promising result, these findings indicated that a significant proportion of U.S. Soldiers meeting criteria for PTSD or MDD still did not utilize mental health services (Quartana et al., 2014).
- Military Psychiatry researchers (Toblin et al., 2014) found the prevalence of chronic pain (44.0%) and opioid use (15.1%) in this non-treatment-seeking infantry sample were higher than estimates in the general civilian population.



WRAIR Delivers

- Landmark Land Combat Study (LCS) identified Soldier risk and resilience markers, monitored emerging behavior health issues, and pinpointed intervention and policy targets.
- WRAIR's capability includes deploying subject matter experts to benchmark behavioral health needs and threats to readiness while providing comparison data to place results in context. WRAIR uses cluster sampling to ensure accurate findings for senior leaders.
- In addition to Iraq and Afghanistan, WRAIR has been asked to lead MHAT missions to benchmark rates of behavioral health disorders with Soldiers in Korea; Djibouti, Africa and the Defense Language Institute.



Forging The Future

- **BH Pulse:** Electronic BH Pulse is a validated toolkit for assessing a unit's behavioral health compared to other units. Results can help guide leader decision making.
- WRAIR maintains the MHAT capability to deploy subject matter experts to benchmark behavioral health needs and threats to readiness.



Behavioral Health of U.S. Soldiers: Past To Future

Challenges

- The impact of a global pandemic such as COVID-19 on the U.S. Army is not known, but poses a unique challenge to health and wellness including behavioral health.
- The prevalence rates of PTSD, substance abuse, and depression after returning from combat have been estimated to range as high as 31%. (Thomas et al., 2010)
- Army suicide rate in 2014: 23.8 per 100,000. (DOD SER)
- Attempts across DOD in 2014: 1,126 suicide attempts. (DOD SER)
- The nature of war and the expanding battlefield moving into the future will be characterized by reliance on small, disaggregated units and will present new behavioral health service delivery challenges.



What This Means For Soldiers

- Optimal behavioral health is a critical component of Soldier health, readiness, and effectiveness in combat.
- Psychological stress injuries are significant disruptors to individual readiness.
- Mental disorders are among most common reasons for lost work days, medical encounters, and hospital bed days. (MSMR, April 2015)
- It is essential to quickly identify factors that influence Soldier engagement in preventive health strategies and identify how a pandemic impacts Soldier behavioral health and readiness.
- Solutions for immediate and far-forward (field-capable) interventions supporting behavioral health and optimizing care and performance are needed.



WRAIR Delivers

- COVID-19 Behavioral Health Advisory Team (BHAT).
- Mental Health Advisory Teams (MHAT) and Land Combat Study.
- Combat theater and garrison assessments of mental health.
- Far forward behavioral health delivery platform.
- Mental health assessment and mitigation tools for large-scale combat operations.
- A partnership with the Army Public Health Center.
- Research advances and policy recommendations for substance use disorders, and military family functioning.



Forging the Future

- Continued detection of emerging Soldier behavioral health needs with electronic BH Pulse and BHAT eSurvey platforms.
- Development of field-appropriate behavioral health management training for medics for large-scale combat operations.
- Development of cutting-edge behavioral health service delivery systems for far-forward environments.
- Development of assessment and treatment guidelines for far-forward environments.
- Recommendations to support health-promoting behaviors in units and mitigation of behavioral health problems during public health threats.
- Developing innovations in detecting substance use disorders and promoting early intervention.
- Identifying strategies to foster a supportive environment for military families.

COVID-19 Behavioral Health Advisory Team

Challenge/ Background Information

- The impact of a global pandemic on the U.S. Army is not known.
- Given the nature of this uncharted territory, and immediate relevance to the entire military community, it is essential that we swiftly identify factors that influence Soldier engagement in preventive health strategies.
- There is a need to identify how this pandemic is impacting Soldier behavioral health.



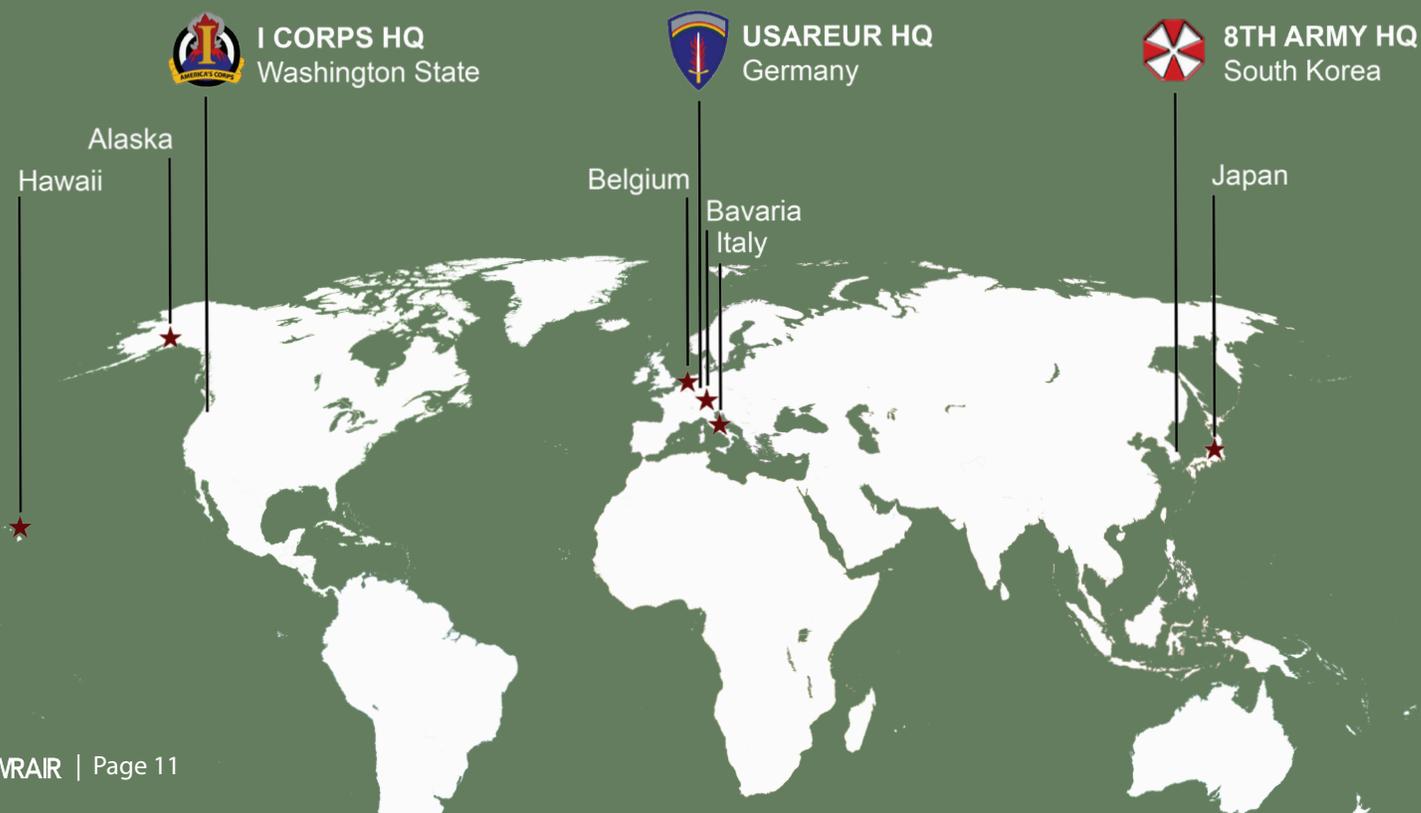
WRAIR Delivers

- Delivered a snapshot of community behavioral health in the context of the COVID-19 pandemic, highlighting key potential targets of intervention.
- Provided feedback for APHC on risk communication and recommendations for Army leaders to support health-promoting behaviors in units and mitigation of behavioral health problems.
- Developed a WRAIR/APHC e-Survey tool for use with future pandemics to quickly capture behavioral health information impacting the force.



Forging The Future

- Multiple time-wave follow-on assessments of Soldiers to continue to monitor behavioral health effects.
- New initiatives about COVID-19 impact with special populations like health care providers, spouses, families, National Guard Soldiers, and reserve component Soldiers.



Developing Military-Specific Measures

Challenges

Established measures from the civilian clinical and research community often must be adjusted for military populations. For example, established cut-offs for the three-item Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) may over-estimate prevalence of “hazardous and harmful alcohol use”, particularly when used in survey research. Moreover, validation research to assess appropriate cut-points for detecting hazardous and harmful alcohol use, specifically in serving military populations is warranted. Likewise, standard measures of impairment used in general or chronically ill populations contain many items not suitable for military populations.



WRAIR Delivers

- Identification of rates of substance use problems and associated high-risk substance use related behaviors.
- The Walter Reed Functional Impairment Scale (Herrell et al., 2014) became the gold standard scale of impairment in U.S. Soldiers.
- Development of the WRAIR Leadership Scale (Lopez et al., 2018) that demonstrated the relationship of leadership to unit climate and subordinate health.



Forging The Future

- Revisions are needed for current methods of scoring the AUDIT-C among Army populations.
- Notwithstanding, replication of these cut-scores in other military and civilian populations, as well as in general and clinical settings are warranted.
- Working with NATO allies in the United Kingdom and Canada to compare rates.



Mental Health In Military Families

- The demands of Army life can challenge the well-being of spouses. Understanding the factors than can foster their well-being can have direct effects on Soldier well-being.
- For male Soldiers deployed to Afghanistan or Iraq, rates of marital quality decreased over time, whereas the rates of infidelity and separation/divorce intent increased over time.
- Research supports that the longer the deployment during these wars, the more likely the military member's family would experience a range of difficulties affecting their dependent children, such as PTSD, depression, sleep disorders, marital stress, and divorce. (Negrusa et al., 2014, Tanielian and Jaycox, 2008).
- Deployment was associated with increased parent stress, child behavior problems, health care utilization, and child maltreatment.



WRAIR Delivers

- Spouse deployment cycle resilience training.



Forging The Future

Next steps:

- Further research is needed to delineate what makes for a supportive Army community.
- Key modifiable recommendations for increasing community support for spouses is necessary.

