

1. **Understand:** Research will address knowledge gaps in foundational science, epidemiology, and etiology of TBI and psychological health.
 - a. Understanding of pre-exposure risk, injury, and biological factors contributing to an individual's response, recovery, and long-term outcomes following a brain injury or traumatic event. Studies with a biomarker component are allowed. Research of interest includes, but is not limited to:
 - The role of psychological health conditions, genetics, endophenotypes, health demographics, previous injuries or repetitive exposures, pathophysiology, and environmental factors (e.g., extreme temperatures/pressures).
 - Contribution of pre- and post-injury patient, family, and caregiver education, as well as cultural, demographic, stigma, and bias factors that may relate to treatment seeking and adherence.
 - Computational models from clinical data to forecast the long-term and/or late effects of brain exposures, such as TBI, critical traumatic events, and co-occurring conditions.
 - b. Approaches for preclinical to clinical translation that expedite and advance prevention and treatment. Studies with a biomarker component are allowed. Research of interest includes, but is not limited to:
 - Pairing clinical populations to animal models in order to validate the clinical relevance and development of prevention and treatment solutions. Animal models should be well-justified, supported within the literature, and clearly align with clinical relevance.
 - Communication, tools/technology adoption, and identification of risk factors, educational barriers, social determinates of health, and other factors that may impede clinical translation.
 - c. Understanding the intersection of risk and protective factors in long-term psychological health outcomes. Research of interest includes, but is not limited to:
 - Mental health trajectories associated with trauma and suicidality that incorporate internal and external factors. For example, factors could include time course, demographic characteristics, career course, history of trauma exposure, and community and cultural factors.
 - Understanding the approach to psychiatric diagnosis in the military and the association of psychiatric diagnosis with occupational impairment and military separation.
 - d. Understanding sexual harassment and assault prevention, perpetration, victimization, and response. Methodologies that ensure anonymity for participants are encouraged. Research of interest includes, but is not limited to:
 - Understanding processes of shame, stigma, and institutional betrayal among sexual assault victims and their units/teams and evaluation of approaches to mitigate these experiences.

Experiences of marginalized groups, male victims, and victims of intimate partner violence are of particular interest.

- Understanding how organizational-level factors influence interpersonal and individual conditions, choices, and behaviors as they relate to sexual assault and harassment prevention and response. Measurement and analysis of organizational-level factors, such as culture and climate, beyond aggregating individual perceptions are encouraged. Research could include the progression from sexual harassment to sexual assault and factors influencing sexual harassment.
 - Understanding barriers to reporting sexual assault and factors that contribute to retaliation within units/teams and evaluation of approaches to mitigate barriers and prevent retaliation. Research could include data from influencers, bystanders, and perpetrators; environmental, structural, and demographic factors (e.g., workplace culture, climate, senior leader diversity, age, gender).
- 2. Prevent:** Research will address the prevention or progression of TBI or psychological health conditions through population, selective, and indicated prevention approaches. Efforts that focus on primary prevention (including protection), screening, diagnosis, and prognosis are within scope.
- a. Identification and validation of biomarkers or other objective markers for diagnosis, prognosis, or monitoring of psychological health conditions/brain injuries, repetitive exposures, and associated sequelae (e.g., chronic migraine, dizziness, neurocognitive symptoms, sleep, post-traumatic headache). When appropriate, the use of U.S. Food and Drug Administration (FDA)-approved devices is encouraged.
 - b. Approaches or tools to prevent or mitigate brain injuries or psychological health conditions and assess health status. Research of interest includes, but is not limited to:
 - Translation of environmental sensor outputs to conditions within the brain.
 - Development of innovative materials and technologies that can prevent or mitigate TBI.
 - Generation of physiological evidence regarding the safety, efficacy, and utility of candidate neuroprotective measures. Animal models, if used, should be validated and well-justified within the literature and should demonstrate clear alignment to clinical populations.
 - Validated, objective methods for assessing psychological health conditions such as posttraumatic stress disorder (PTSD), adjustment disorders (AdjDs), acute stress reactions (ASRs), major depressive disorder, substance use disorders, suicidality, comorbid conditions, or TBI, and real-time health status monitoring.
 - Evidence that existing symptom-based return to activity/duty guidelines protect against risk of persistent symptoms.
 - Development of clinical decision-making frameworks or tools that incorporate objective assessments and long-term outcomes to return to activity/duty decisions.
 - Development of injury thresholds and exposure standard.

- c. Development, evaluation, and implementation of cross-cutting prevention approaches targeting upstream factors or leveraging communities and peers to address multiple adverse outcomes such as suicide, multiple forms of violence, and alcohol and substance misuse. Examples of upstream factors could include social connectedness, inclusiveness, culture, problem-solving, emotional regulation, communication, underlying health disparities, and financial stability. Research of interest may include, but is not limited to:
- Optimized messaging for successful dissemination and implementation.
 - Inclusion of families and evaluation of impacts thereon. “Family” should be broadly defined to include not just spouses, but also parents, significant others/fiancés/partners, children, caregivers, or close friends.
- d. Solutions to increase readiness and resilience in individuals, small teams, and families to ameliorate the potential negative impacts of specific military and life stressors. Research of interest includes, but is not limited to:
- Effective pharmacologic or non-pharmacologic prevention interventions. Solutions for prevention of ASRs and PTSD may be proposed.
 - Preparation of Service Members and units for missions and to help reset between deployments within the Sustainable Readiness Model¹.
 - Effective solutions to support relationships and parenting, prepare families for potential secondary trauma exposure, and empower families to access tailored support and resources. “Family” should be broadly defined to include not just spouses, but also parents, significant others/fiancés/partners, children, caregivers, or close friends.
- e. Solutions to address aspects of workplace culture and climate (e.g., leadership attitudes, group characteristics, group identification factors) that are associated with increases in harmful behaviors. Research of interest includes, but is not limited to, solutions to provide and incentivize positive options and substitutes for alcohol and substance use and promote pro-social behavioral norms.
- 3. Treat:** Research will address immediate and long-term treatments and improvements in systems of care, including access to and delivery of healthcare services. Treatment topics may include novel treatments and interventions, personalized medicine approaches, length and durability of treatment, rehabilitation, relapse, and relapse prevention.
- a. Interventions that promote sustained functional recovery, including interventions administered acutely, during the post-acute phase, or during the chronic phase of injury. Research of interest includes, but is not limited to:
- Interventions focused on sensory and locomotor dysfunction after brain injury.
 - Interventions that address cognitive functioning and reserve.

¹ https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ARN9412_AR525_29_FINAL.pdf

- Personalized medicine approaches to treatment that may include tailoring treatment to the biological and endophenotypic elements present. Studies may consider how TBI, PTSD, depression, or other psychological health conditions are interrelated.
 - Rapid assessments and treatments for psychological health conditions. Interventions addressing AdjDs, ASRs, and PTSD may be proposed.
 - Effective assessments and interventions for delivery in rural or other resource-limited environments (e.g., far-forward military environments), and/or by non-clinicians (e.g., peers, teams, first responders/medics).
 - Considerations for sequencing and optimal combinations of pharmacologic and non-pharmacologic interventions.
- b. Treatments that promote recovery and improve long-term outcomes. Research of interest includes, but is not limited to:
- Responders versus non-responders to treatment and rehabilitation.
 - Novel therapeutic candidates based on evolving changes of pathophysiology and/or theoretical mechanisms of TBI and psychological health.
 - Focus on long-term outcomes such as dementia/neurodegeneration, psychological health, family, and well-being are encouraged.
 - Interventions emphasizing community-driven participation, inclusion of caregivers/family, and education to facilitate improved functional outcomes are encouraged.
- c. Validated individual-, peer-/unit-/team-, leader-, family-, caregiver-, community-, and enterprise-level methods for reducing barriers to care for TBI or multiple mental health challenges (e.g., PTSD, suicidal ideation or behaviors, alcohol and substance use, anxiety, depression) and understanding mechanisms of change in help-seeking behavior.
- d. Implementation, follow-up, and services research to increase provider adoption and availability of evidence-based treatments, as well as treatment engagement, follow-up care, and understanding of long-term outcomes. Research of interest includes, but is not limited to:
- Clinical effectiveness studies comparing new/novel capabilities to existing evidence-based treatments and/or the standard of care.
 - Optimized messaging for successful dissemination and implementation of interventions.
 - Understanding mechanisms of action for existing evidence-based treatments is also of interest.
- e. Effective community-level postvention strategies to address social connectedness during reintegration of individuals into teams following a sexual assault or suicide event. Proposed research should prevent subsequent suicides or other counterproductive behaviors among individuals and community members.