Congressionally Directed Medical Research Programs

CDMRP

Department of Defense

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Epilepsy Research Program

The linkage between head injuries and post-traumatic epilepsy (PTE) has been evident since World War I. PTE currently affects an estimated 2,187 Iraq/Afghanistan Veterans, with a 5 times higher mortality than others receiving Department of Veterans Affairs care. Many of the pathological mechanisms linking traumatic brain injury (TBI) to PTE remain a mystery. Studies to understand the linkages between TBI and PTE are therefore needed to understand how brain circuitry is altered in response to TBI. There are also a number of prominent comorbidities, such as psychogenic non-epileptic seizures (PNES), that need to be better characterized. An improved understanding of the basic mechanisms of PTE and its comorbidities will ultimately result in better treatment, care, and prevention choices.

VISION

A time when post-traumatic epilepsy can be prevented or optimally managed

MISSION

To understand the mechanisms of post-traumatic epilepsy and associated comorbidities to improve quality of life, especially in Service Members, Veterans, and caregivers

PROGRAM HISTORY

The Department of Defense Epilepsy Research Program (ERP) was established in fiscal year 2015 (FY15) to develop an understanding of the magnitude of PTE within the military and to expand research into the basic mechanisms by which TBI produces PTE. Epilepsy is the fourth most common neurological disorder, with annual domestic healthcare costs of roughly $10 billion. Mild, moderate, and severe TBI are all linked to epilepsy, but the nature of the connection remains vastly unexplored. Mechanisms and markers of pathology and population-based research are needed in order to understand the connection between TBI and epilepsy. The ERP received $61.5 million from FY15 to FY21 to fund research in PTE, which has resulted in 48 awards.

PROGRAM PRIORITIES

- Improving PTE patient care and outcomes
- Paradigm-changing ideas
- Multidisciplinary collaborations
- Fostering new PTE Researchers

New funding opportunities are anticipated February 2022

ANTICIPATED ERP RESEARCH FOCUS AREAS AND MECHANISMS FOR FY22

Program Focus Areas

- Innovative Research
- Markers and Mechanisms
- Epidemiology
- Longitudinal Studies

Funding Mechanisms

- Virtual Post-Traumatic Epilepsy Research Center Leadership Award (Virtual P-TERC Leadership)
- Virtual Post-Traumatic Epilepsy Research Center Faculty Award (Virtual P-TERC Faculty)
- Idea Development Award (IDA)*
  **Post-doctoral Fellows are eligible to apply to this mechanism*
- Research Partnership Award (RPA)

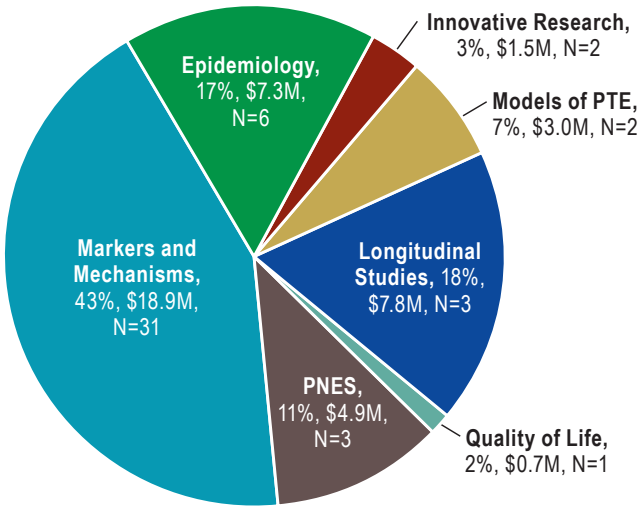
ERP RESEARCH INVESTMENT

The ERP uses Focus Areas to drive investment into specific program priority areas. The chart on the right displays the program's investment in these priority areas.

ERP STRATEGIC PLAN

At the start of FY18, the ERP developed a strategic plan to define the goals and direction of the program. The ERP strategic plan was developed in partnership with the ERP Programmatic Panel and outlines the near-, medium-, and long-term goals of the ERP. In addition, the strategic plan reviews the progress and investments made by the ERP through to the start of FY18 and emphasizes the ERP Focus Areas.

FY15–FY20 Investment by Focus Area



LEVERAGING EXISTING STUDIES TO ADVANCE PTE RESEARCH: THE TRACK-TBI EPILEPTOGENESIS PROJECT

Ramon Diaz-Arrastia, M.D., Ph.D., University of Pennsylvania

In order to advance our understanding of Post Traumatic Epilepsy, both basic and translational research are needed. Consortia such as the Alzheimer's Disease Neuroimaging Initiative (DOD-ADNI); Concussion Assessment, Research, and Education Consortium (CARE); and The Long-Term Impact of Military-Relevant Brain Injury Consortium (LIMBIC) have all investigated different perspectives of the long-term consequences of head injuries using systematic and harmonized approaches across multiple research sites to generate datasets that have a common architecture. These types of approaches allow investigators from both inside and outside the consortia to ask big questions and get answers that require large numbers of patient-centered data points. In an FY18 ERP funded study, a multi-institutional team of researchers lead by the University of Pennsylvania are engaging the Transforming Research and Clinical Knowledge in Traumatic Brain Injury (TRACK-TBI) consortium to answer several important questions in PTE research. Leveraging this on-going effort provides investigators access to a pre-existing cohort of more than 2,600 individuals with TBI and allows for more time to observe long-term consequences of TBI, such as PTE development, without having to recruit a new cohort. This large-scale effort will specifically look at neural networks that are disrupted in PTE, and may lead to improved diagnostics for patients at risk for PTE.

QUALITY OF LIFE RESEARCH FOR PTE

Barbara C. Jobst, M.D., Dr. Med., FAAN, FAES, Dartmouth-Hitchcock Medical Center

Elaine T. Kiriakopoulos, M.D., M.Sc., Dartmouth-Hitchcock Medical Center

PTE, even when effectively treated with current anti-seizure therapies, can present other symptoms that make the management of daily life activities difficult. Memory and behavioral challenges can put some independent daily activities out of reach for individuals living with PTE, as well as stabilize PTE symptoms, therefore, have the potential to strengthen relationships and allow individuals to once again enjoy activities that used to be part of their everyday lives, such as work or volunteering. One potential intervention recently funded by the ERP is called HOBSCOTCH (HOme-Based Self-management and COgnitive Training Changes Lives). HOBSCOTCH is a behavioral program that provides epilepsy education, problem-solving skills, self-awareness training, compensatory memory strategies, and quick relaxation exercises to assist patients with memory and the cognitive challenges. One of its great advantages is that it does not require a classroom setting. Participants can complete the intervention by telehealth in the comfort of their homes or other familiar surroundings. In this study, Dr. Barbara Jobst, of the Dartmouth-Hitchcock Medical Center, and her research team will examine, for the first time, whether HOBSCOTCH is effective in individuals living with epilepsy and cognitive challenges they acquired after TBI. The study will also assess the potential quality of life and health benefits for caregivers, as they will participate in the education and relaxation components of the HOBSCOTCH program. Dr. Jobst envisions that both the patient's and caregiver's perspective will be particularly critical to developing the patient/family education that accompanies the HOBSCOTCH PTE study intervention.