



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Neurocognitive and Psychological Health Outcomes Chronic Effects of Neurotrauma Consortium 3: Epidemiological Analysis Reveals Associations between Traumatic Brain Injury, Long-Term Outcomes, and Persistent Co-morbidities

The Chronic Effects of Neurotrauma Consortium (CENC) project, Epidemiology of mild traumatic brain injury (mTBI) and neurosensory outcomes, brings together researchers from the University of California, San Francisco (San Francisco, California), San Francisco Veterans Administration (VA) (San Francisco, California), University Health Science Center, San Antonio (San Antonio, Texas), South Texas Veterans Healthcare System (San Antonio, Texas), University of Utah (Salt Lake City, Utah), and the Salt Lake City VA (Salt Lake City, Utah), to investigate the relationship between mTBI and neurosensory and neurodegenerative outcomes.

The study team brings together data from over seven DoD, VA, and commercial medical databases and record sets.

When the researchers looked at associations of traumatic brain injury (TBI) and pain co-morbidities, they found that there were no clinically significant interactions between TBI alone and chronic pain (*Pugh et al. 2016*). However chronic pain and TBI were strongly associated with mental health diagnoses such as posttraumatic stress disorder (PTSD) or depression (*Pugh et al. 2016*). Researchers also found a strong association between mTBI and long-term clinical outcomes such as dementia (*Barnes et al. 2016, Barnes et al. 2017*). In these sub-studies, risk of incident dementia was increased by three-fold with TBI as compared to without TBI. The datasets were also interrogated for trajectories of persistent co-morbidities of mTBI. Researchers found strong associations between TBI and specific co-morbidities to include:

- Increased odds of tinnitus and hearing loss with co-morbid condition (*Swan, Nelson, Swiger, et al. 2017*)
- Vestibular dysfunction with blast exposure, when controlled for other comorbid conditions (*Swan et al. 2015, Swan, Nelson, Pogoda, et al. 2017*)
- An association between mTBI and mental health diagnosis and cognitive impairment (*Seal et al. 2017*)
- TBI as the most common co-morbid condition in the polytrauma clinical triad (TBI/pain/PTSD) (*Pugh et al. 2016*)

Existing information from medical databases and records of Service members and Veterans from Operation Iraqi Freedom, Operation Enduring Freedom, and Operation New Dawn can be used to look for correlations between mTBI injury and neurosensory and neurodegenerative outcomes (Figure 1).





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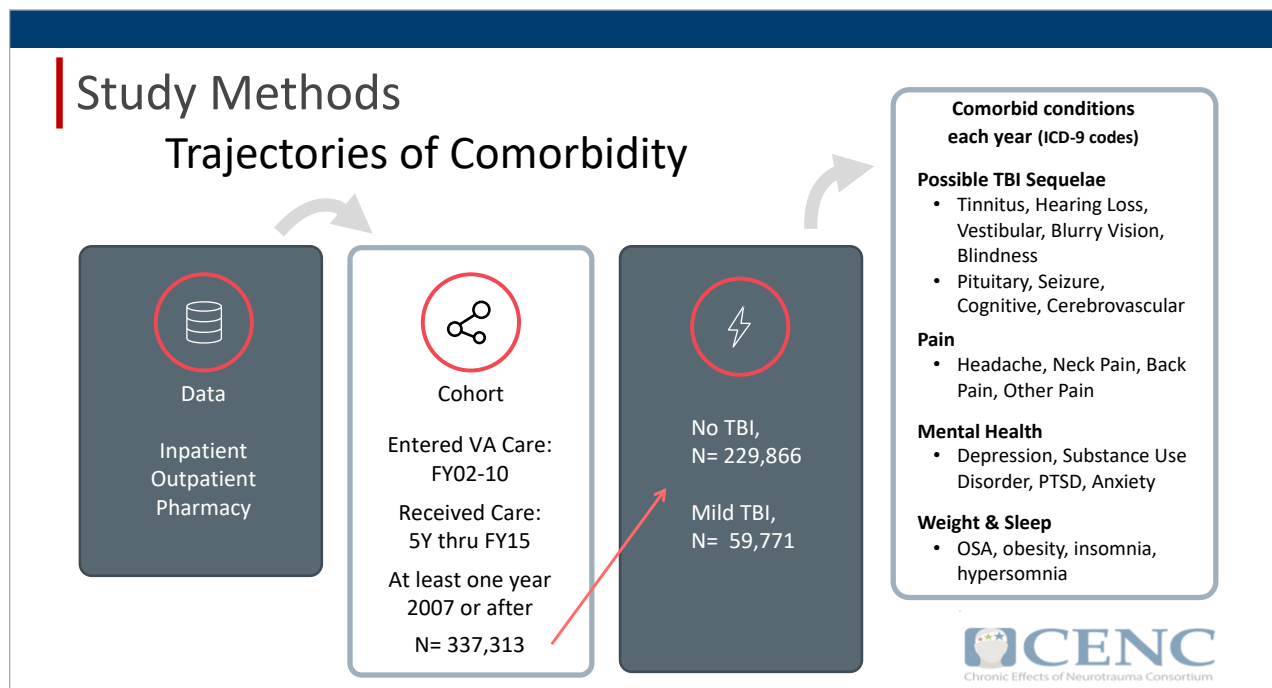


FIGURE 1: Study Methods Trajectories of Comorbidity. ICD-9: International Classification of Diseases—Ninth Revision (Figure used with permission from the authors)

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