

The Traumatic Brain Injury Model Systems

National Institute on Disability and Rehabilitation Research

An estimated 1.56 million Americans sustain a traumatic brain injury (TBI) requiring medical attention each year. A TBI is defined as damage to the brain caused by an external force as evidenced by altered consciousness and impairment of brain functioning. After the initial medical crisis, TBI presents significant challenges to the individual, family, and society. An injured person may experience a wide range of physical, cognitive, emotional and behavioral changes that affect their ability to function. Financial hardship, substance abuse, anxiety and depression are some of the common problems experienced by individuals following a TBI.

The Traumatic Brain Injury Model Systems (TBIMS) Program began in 1987 with funding from the National Institute on Disability and Rehabilitation Research (NIDRR), U.S. Department of Education, to improve care and outcomes for individuals with TBI. Currently, there are 16 TBIMS centers, each providing a multidisciplinary system of rehabilitation care, including emergency medical, acute medical, and post-acute services. In addition to providing direct services, these centers play a pivotal role in building the national capacity for high-quality treatment and research serving persons with TBI, their families and the communities in which they reside.

Some of the TBI Model Systems' accomplishments include:

- Development of practice guidelines in important areas of medical care for people with TBI (e.g., management of post-traumatic seizures, spasticity, and post-traumatic agitation).
- Development of innovative approaches and procedures for rehabilitation immediately after injury.
- Creation of new diagnostic procedures and assessment tools for complications that previously were difficult to measure objectively.
- Identification of common long-term problems that follow TBI and persist after rehabilitation and reasons they occur.
- Development and validation of new assistive technologies for use by people with cognitive impairments to help them live independently.
- Description of how people with TBI recover in the first years following injury.

Research

Almost 500 peer-reviewed publications have resulted from TBIMS research, including 6 special issues of leading journals in the field of rehabilitation.

To ensure research is translated into practice, NIDRR separately funds a Model Systems Knowledge Translation Center that promotes the adoption of research findings by stakeholders, including rehabilitation professionals, policy-makers and family members of persons with TBI.

Twenty-four site-specific and four multi-center (module) studies are currently underway. TBIMS Centers may also compete for an additional collaborative grant that supports studies of outcomes, rehabilitation interventions, and service delivery. Currently there are two 5-year collaborative research grants.

Each of the 16 centers, as well as previously funded centers, contribute follow-up data to the TBIMS National Database, a longitudinal database begun in 1988 that includes information on over 9,000 individuals who were admitted for inpatient acute TBI rehabilitation. This database is the largest longitudinal study of TBI in the world and includes data on pre-injury, injury, acute care, rehabilitation, and outcomes at one, two and five years post injury and at every five years thereafter.

National Summary Data on TBI

The following information is based on data from the TBIMS National Database:

- Demographic characteristics: average age = 39; male (74%); minority population (33%); high school education or less (64%).
- Cause of injury: vehicular (55%), followed by falls (21%) and violence (13%).
- Average treatment costs: \$8,034 per day for acute care; \$2,227 per day for inpatient rehabilitation.
- Level of disability and functional ability: improvements are most pronounced during the first year after injury.
- Employment: 63% employed at time of injury; 28% employed 1 year post injury.

TBI Partnerships

The TBIMS is engaged in several research initiatives with federal agencies, including the Department of Veterans Affairs (VA), the Department of Defense and the National Institutes of Health. For example, in recent years injuries incurred during military conflicts in the Middle East have elevated the awareness of TBI, resulting in an interagency agreement between the VA and NIDRR. The agreement created two projects: a VA TBI Database for VA Polytrauma Rehabilitation Centers that includes the same variables included in the TBIMS National Database, and a congressionally-mandated TBI Veterans Health Registry. These partnerships increase the overall impact of research, information dissemination, and training of clinicians, researchers, and policy makers with the goal of improving outcomes for persons with TBI.

For more information:

Traumatic Brain Injury Model Systems – <http://tbimodelsystems.org>

Model Systems Knowledge Translation Center (MSKTC) – <http://msktc.washington.edu/>

Traumatic Brain Injury Model Systems National Database – <http://www.tbindsc.org>

Center on Outcome Measurement in Brain Injury (COMBI) – <http://www.tbims.org/combilindex.html>