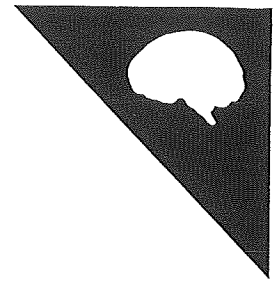


Answering Your Questions About Brain Research



Q: WHAT HAPPENS WHEN THE BRAIN IS INJURED?

Though encased in bone and cushioned by fluid, the brain is vulnerable to injury from without and within. Interruption of its blood supply — stroke — means subtle or devastating damage. And a blow to the head can cause traumatic brain injury (TBI).

Tissue destruction is not instantaneous. After ischemic stroke (the most common kind, caused by a blood clot), neurons completely deprived of blood die quickly, but a larger group are impaired but salvageable for hours, even days, until a complex chain of molecular events kills them. This is why immediate treatment is essential: Time lost is brain lost.

Better understanding this process, researchers hope, will provide tools to halt the cascade.

TBI initiates a similar chain of events. The role of astrocytes (brain cells that support and regulate neurons) and immune cells in both limiting and exacerbating damage has become evident, and manipulating them to improve outcome is a focus of research.

Memory problems, depression and neurological symptoms such as seizures have been linked to TBI, along with increased Alzheimer's risk. Repeated injury, as may be suffered by boxers or professional football players, can lead to chronic traumatic encephalopathy, a progressive degenerative brain disease.

Consequences of even mild TBI, including concussion, have only recently been recognized. Concussions too slight to cause loss of consciousness can still be destructive, and the repeated impact of head blows without concussion (e.g., "heading" the ball in soccer) may alter brain structure. Young, developing brains seem particularly vulnerable.

TBI research has led to rule changes in professional and amateur sports, and the development of blood tests to detect concussions that might otherwise be overlooked (by measuring compounds released by damaged neurons, for example).

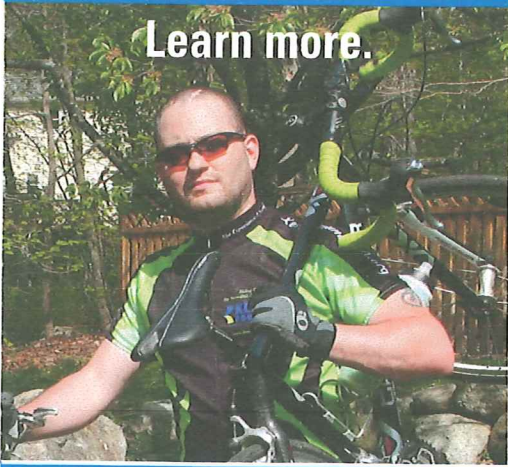
Brain cells killed by stroke or TBI can't be resuscitated, but the brain is adaptable: Other circuits reshape themselves to take over functions of damaged areas, and new cell growth — neurogenesis — replaces some tissue.

After stroke or TBI, the ability to regenerate transiently heightens, as growth factors and stem cells migrate to damaged areas. Rehabilitation works best in the first months post-injury, although further progress remains possible, for several years at least.

Researchers are looking further to the possibility of restoring the extraordinary neuroplasticity of early life "critical periods," when sensory, motor and language networks organize themselves in response to stimulation. Putting parts of the injured brain back in this mode (perhaps by manipulating neurotransmitters with drugs) might vastly enhance recovery.



Learn more.



Find help.



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#NotAloneinBrainInjury
www.biausa.org

BRAIN INJURY FACTS AND STATISTICS

- More than 3.5 million children and adults sustain an acquired brain injury (ABI) each year, but the total incidence is unknown.
- An ABI is any injury to the brain that is not hereditary, congenital, degenerative, or induced by birth trauma.
- Typical causes of ABI include:
 - Electric Shock
 - Infectious Disease
 - Lightning Strike
 - Near Drowning
 - Oxygen Deprivation (Hypoxia/Anoxia)
 - Seizure Disorders
 - Stroke
 - Substance Abuse
 - Toxic Exposure
 - Trauma
 - Tumor
- More than 12 million Americans live with the impact of ABI.
 - Traumatic brain injury (TBI) is a subset of ABI and is caused by trauma to the brain from an external force.
 - At least 2.5 million children and adults sustain TBIs in the U.S. each year:
 - 2.2 million are treated in emergency departments for TBI each year.
 - 280,000 are hospitalized for TBI each year.
 - 50,000 die because of TBI each year.
 - The number of people who sustain TBIs and do not seek treatment is unknown.
 - Every 13 seconds, someone in the U.S. sustains a TBI.
 - One of every 60 people in the U.S. lives with a TBI-related disability.
- Every day, 137 people in the U.S. die because of a TBI-related injury.
- There are many causes of TBI:
 - Falls – 40.5%
 - Struck by/against – 15.5%
 - Motor vehicle – 14.3%
 - Assaults – 10.7%
 - Unknown – 19%
- At least 5.3 million Americans live with TBI-related disabilities.
- When someone sustains a brain injury, many people are affected:
 - Survivors and their parents, spouses, siblings, extended families, and friends
 - Healthcare providers, including surgeons, physicians, counselors, rehab therapists, social workers, and personal care attendants
 - Insurance companies that issue auto accident, individual, and group health, disability, life and re-insurance policies
 - Attorneys of all types, including those who handle personal injury, insurance and disability claims, civil rights/discrimination, domestic actions, wills, estates, and trusts
 - Educators at every level, but especially special education teachers and those who prepare America's future healthcare workforce
 - Government agencies that administer health and social programs such as Medicare, Medicaid, State Children's Health Insurance Program (SCHIP), Supplemental Nutritional Assistance Program (SNAP), vocational rehab
 - Employers of all types