



Understanding Brain Injuries: Traumatic vs. Non- Traumatic

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Definitions



▶ **Traumatic Brain Injury (TBI):**

- ▶ An alteration in brain function or other evidence of brain pathology caused by an **external physical force** (e.g., bump, blow, jolt, penetrating injury).

▶ **Non-Traumatic Brain Injury (NTBI):**

- ▶ A subset of **acquired brain injury (ABI)** caused by **internal factors**, such as lack of oxygen, aneurysm, or infection.

Examples



TBI

- ▶ Concussion
- ▶ Falls
- ▶ Motor vehicle accidents
- ▶ Sports injuries
- ▶ Assaults

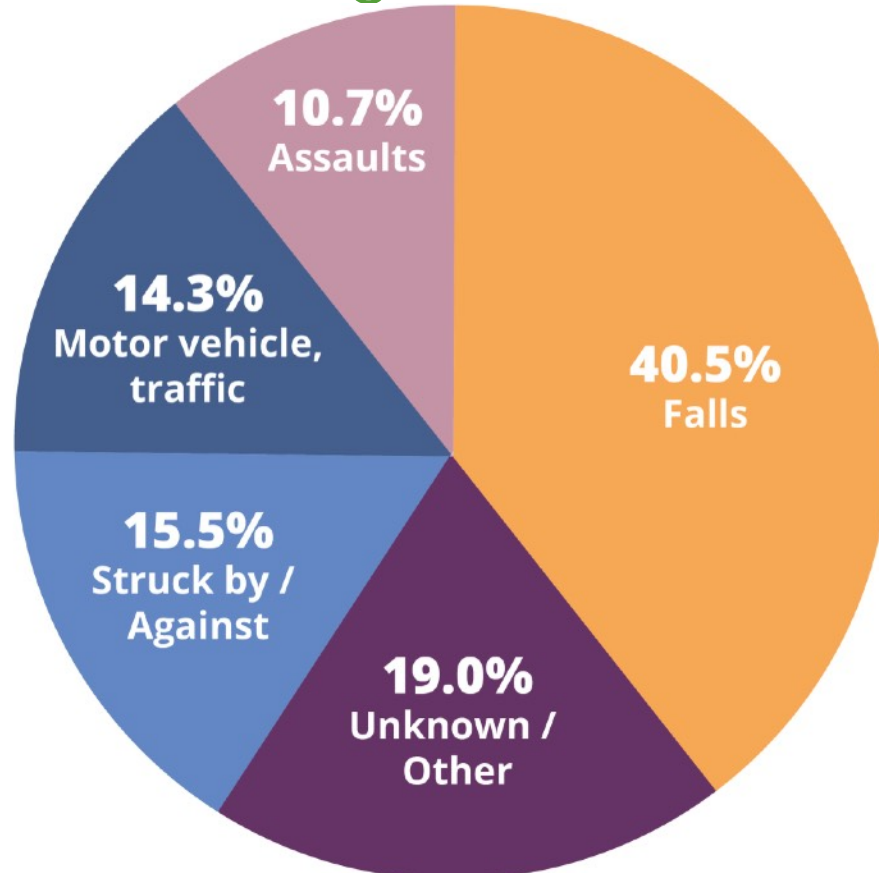
NTBI

- ▶ Stroke
- ▶ Brain tumor
- ▶ Meningitis
- ▶ Hypoxic/anoxic injury
- ▶ Aneurysm

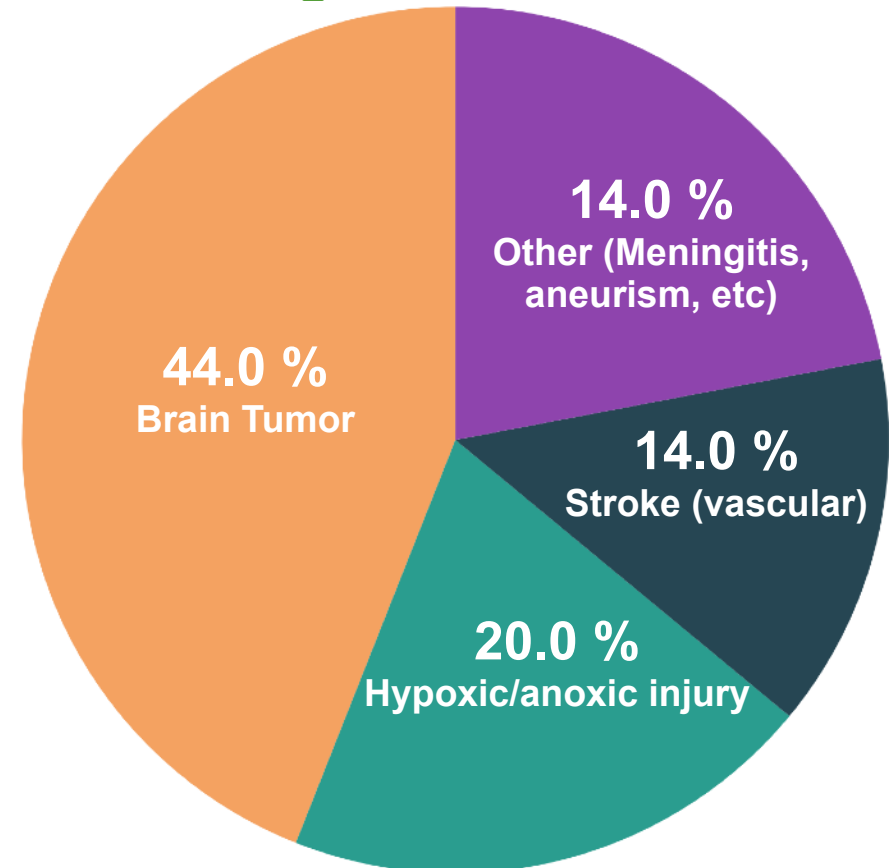
Examples



Leading causes of TBI



Leading causes of NTBI



Statistics and Impact



TBI in the U.S.

- ▶ ~2.5 million cases annually; over 200,000 hospitalizations; 60,000+ deaths; 80,000–90,000 individuals suffer long-term disability
- ▶ 5.3 million Americans living with TBI-related disability
- ▶ 75–80% of TBIs are mild (mTBI); 15% may experience prolonged disability

NTBI – specifically stroke in the U.S.

- ▶ ~795,000 stroke events per year in the U.S.
- ▶ Stroke remains a leading cause of adult disability and death

Recovery Outcomes

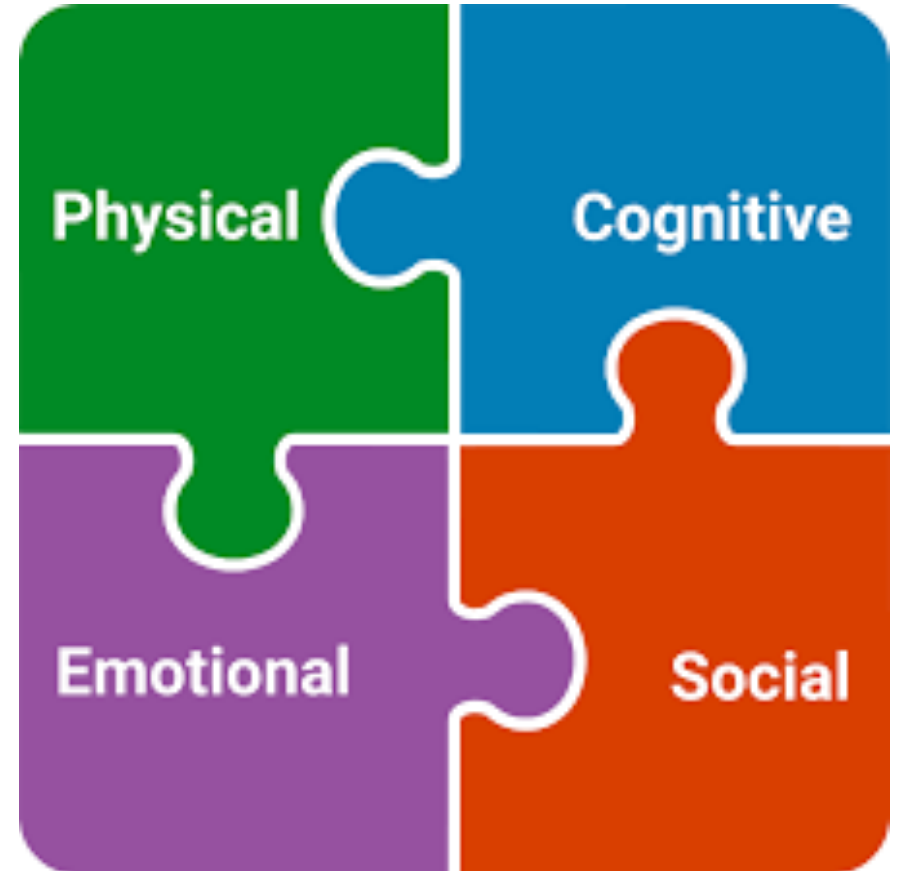


- ▶ **mTBI:**
 - ▶ 85–90% recover fully within 3 months; a minority experience lingering symptoms (post-concussion syndrome)
- ▶ **Moderate–Severe TBI:**
 - ▶ At 2 weeks post-injury, most have moderate-to-severe disability
 - ▶ by 12 months, about **50%** of severe TBI survivors and **75%** of moderate TBI survivors achieve functional independence
 - ▶ ~19% of severe cases report no disability at one year
- ▶ **Stroke (NTBI):**
 - ▶ Recovery often follows the Brunnstrom stages of motor recovery
 - ▶ greatest improvements typically occur in the first 3–6 months, though rehabilitation can extend beyond due to brain plasticity
 - ▶ Multidisciplinary rehab (physical, occupational, speech therapy, cognitive and emotional support) is crucial for recovery and quality of life

Common Challenges Shared by TBI & NTBI Survivors



- ▶ Cognitive issues:
 - ▶ Memory
 - ▶ attention
 - ▶ information processing
- ▶ Physical and emotional effects:
 - ▶ Fatigue
 - ▶ mood changes
 - ▶ Headaches
 - ▶ sensory sensitivity



TBI as a Stroke Risk Factor



► Risk:

- Hemorrhagic stroke risk over 6× higher after TBI
- Ischemic stroke risk nearly doubled
- Source: <https://pmc.ncbi.nlm.nih.gov/articles/PMC8193616/>

► Timeline:

- The stroke risk is especially high in the first few months post-TBI but remains elevated for years or even decades.

► Why TBI may lead to stroke? What is the mechanism?

- Vascular injury
- blood vessel constriction
- inflammatory swelling
- arterial dissection.

Summary



► Takeaways:

- TBI and NTBI have different causes but can result in similar symptoms and needs.
- Recovery varies by type and severity, but rehabilitation and support make a difference.
- Empathy and inclusion strengthen the brain injury community.

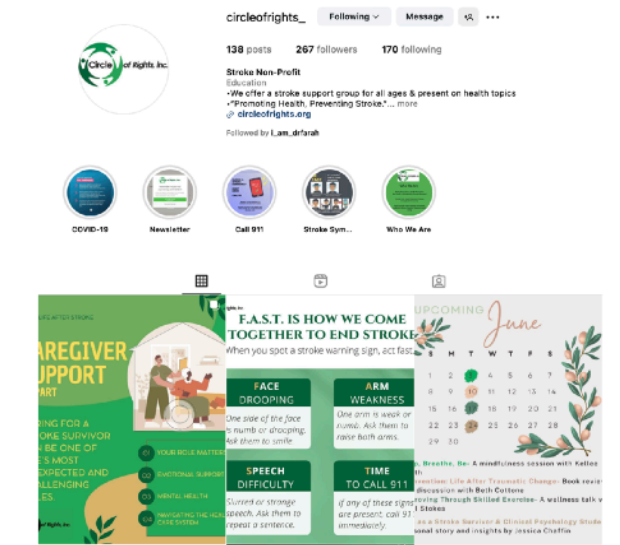
► Resources:

- Brain Injury Association of America
- American Stroke Association
- Local rehab and peer support services

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