

Traumatic Brain Injury Brief Overview



SANFORD SCHOOL OF MEDICINE

The University of South Dakota

CENTER FOR DISABILITIES

Definitions

Traumatic Brain Injury: An insult to the brain, not of a degenerative or congenital nature but caused by an external physical force, that may produce a diminished or altered state of consciousness, which results in an impairment of cognitive abilities and/or physical functioning. It can also result in the disturbance of behavioral or emotional functioning. These impairments may be either temporary or permanent and cause partial or total functional disability or psychosocial maladjustment.

As defined by the National Head Injury Foundation, now known as the Brain Injury Association of America



Definitions, continued

Acquired Brain Injury: (ABI) is an injury to the brain that has occurred after birth and is not congenital or degenerative. The injury commonly results in a change in neuronal activity, which affects the physical integrity, the metabolic activity, or the functional ability of the cell. The term does not refer to brain injuries induced by birth trauma.

As defined by the National Head Injury Foundation, now known as the Brain Injury Association of America



Causes of TBI/ABI

TBI

- Motor Vehicle Crashes
- Falls
- Gunshot Wounds
- Sports Injuries
- Workplace Injuries
- Shaken Baby Syndrome
- Child Abuse
- Domestic Violence
- Military Actions
- Other injuries caused by trauma

ABI

- TBI
- Tumors
- Blood Clots
- Strokes
- Seizures
- Toxic Exposures
- Infections
- Metabolic Disorders
- Neurotoxic Poisoning
- Lack of oxygen to the brain



Incidence and Prevalence

Incidence

Number of cases of a disease having their onset during a prescribed period of time.

Incidence rate of 506 per 100,000 persons.

1.4 MILLION people sustain a TBI in the United States every year. Of these, there are:

- 50,000 deaths
- 235,000 Hospitalizations
- 1,100,000 Emergency Room Visits

Prevalence

Number of cases of a disease present during a particular interval of time.

5.3 MILLION people in the United States live with a disability as a result of TBI.



Risk Factors



Sex

- Male
- Female



Race

- Caucasian
- African American
- American Indian



Age

- 0-4 years
- 5-9 years
- 10-14 years
- 15-19 years
- 20-24 years
- 25-34 years
- 25-34 years
- 35-44 years
- 45-54 years
- 54-64 years
- 65-74 years
- Over 75 years



Risk Factors

- SEX:** Males account for 59% of TBI's, females 41%. Males have 1.5 times higher the number of TBI's than females. Also, males have higher rates of hospitalization, ER visits, and deaths. This may be due to: fire-arm use, alcohol use, work related incidents (farm and construction), and participation in contact sports
- RACE:** African Americans have a higher incidence rate than whites/American Indians.
- AGE:** The highest incidence is 0-4 year olds, then 15-19 year olds, 5-9 year olds, and over 75 year olds.
- The highest rates of death occur in 75 and older group, followed by 20-24 year olds, and 15-19 year olds.
- The highest rate of hospitalization is 75 and older, than 15-19 year olds, and 20-24 year olds.
- The highest rate of Emergency Room visits were 0-4 year olds, 15-19 year olds, 5-9 year olds, and 10-14 year olds.

AFTER one TBI, the risk for a 2nd is 3 times greater. After 2 TBI's, the risk is 8 times greater.



Severity of Injury

| Degree of Injury | # | % | Definition | Glasgow Coma Scale | Signs | Symptoms |
|------------------|---|----------------------------------|---|--------------------|--|--|
| Mild | 290,000 hospital admissions each year | Up to 80% of injuries are mild | LOC for less than 30 minutes or no LOC | 13-15 | Amnesia may occur for less than 24 hours, temporary or permanent mental state | Post concussion symptoms |
| Moderate | No information | 10%-30% of injuries are moderate | Coma more than 20-30 minutes, less than 24 hours | 9-12 | Bruising and bleeding in the brain. Signs on EEG, CT, or MRI. | Some long term problems in one or more areas of life (home, work, community) |
| Severe | 50,000-75,000 persons sustain a severe TBI each year, and between 1/3 & 1/2 of them die | 5%-25% are considered severe | Coma longer than 24 hours often lasting days or weeks | 3-8 | Possible skull fractures with bruising and bleeding. Signs on EEG, CT, or MRI. | Long term impairments in one or more areas of life (home, work, community). |



Systems of Care

Acute Hospital Care

Acute Rehabilitation

Skilled Nursing Facility

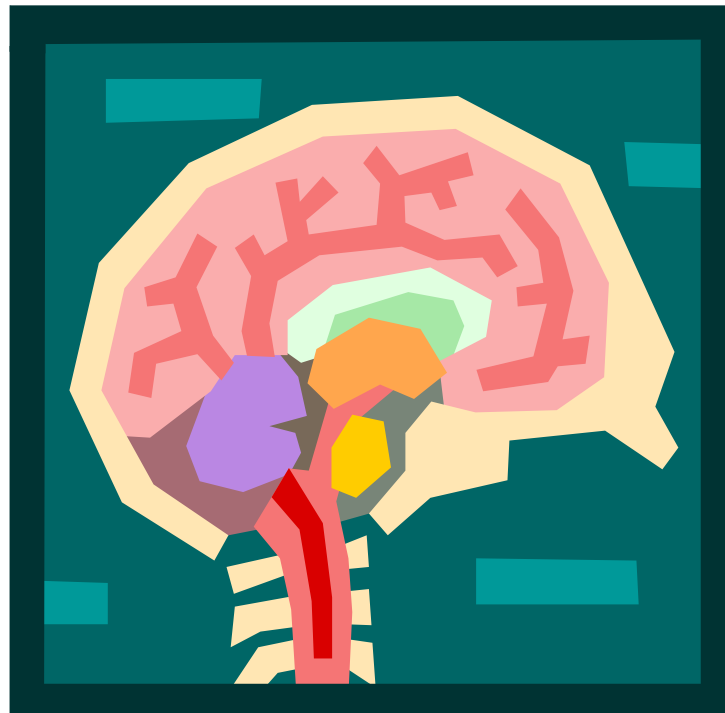
Post-Acute Rehabilitation

Outpatient Services

Supported Living

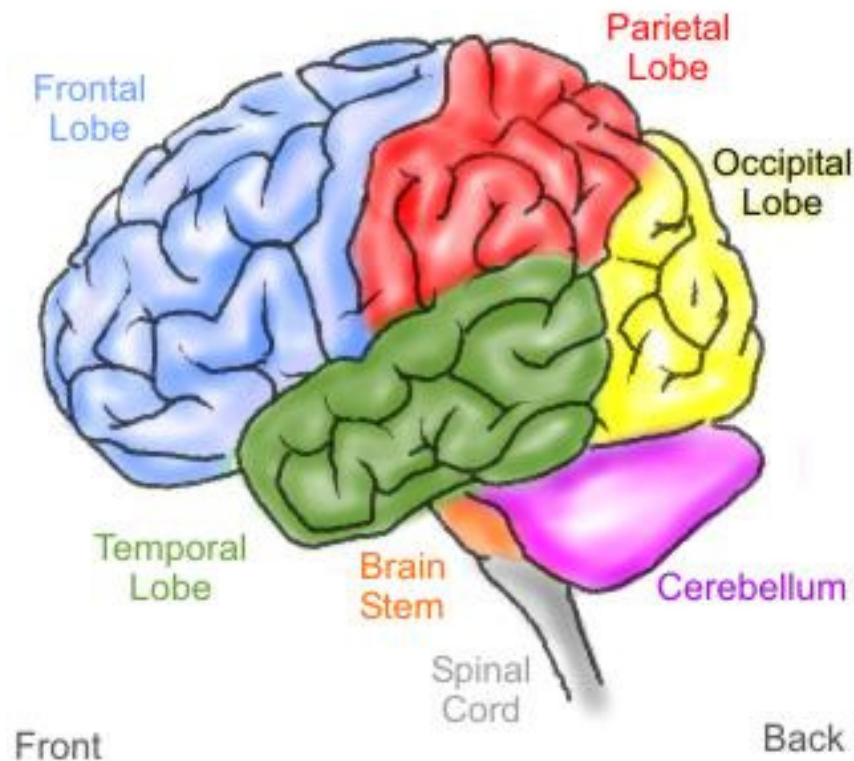


The Brain



Basic parts of the brain

Regions of the Human Brain



Frontal Lobe Functions

Initiation

Problem – Solving

Judgment

Inhibition of behavior

Planning/Anticipation

Self-monitoring

Motor planning

Personality/Emotions

Awareness of abilities/limits

Organization

Attention/Concentration

Mental Flexibility

Speaking



Temporal Lobe Functions

Memory

Hearing

Expressive and Receptive Language

Organization and Sequencing



Parietal Lobe Functions

Sense of touch

Differentiation of size, color, shape

Spatial perception

Visual perception



Occipital Lobe Functions

Vision



Brain Stem Functions

Breathing

Heart rate

Arousal/Consciousness

Sleep/Wake functions

Attention/Concentration



Cerebellum Functions

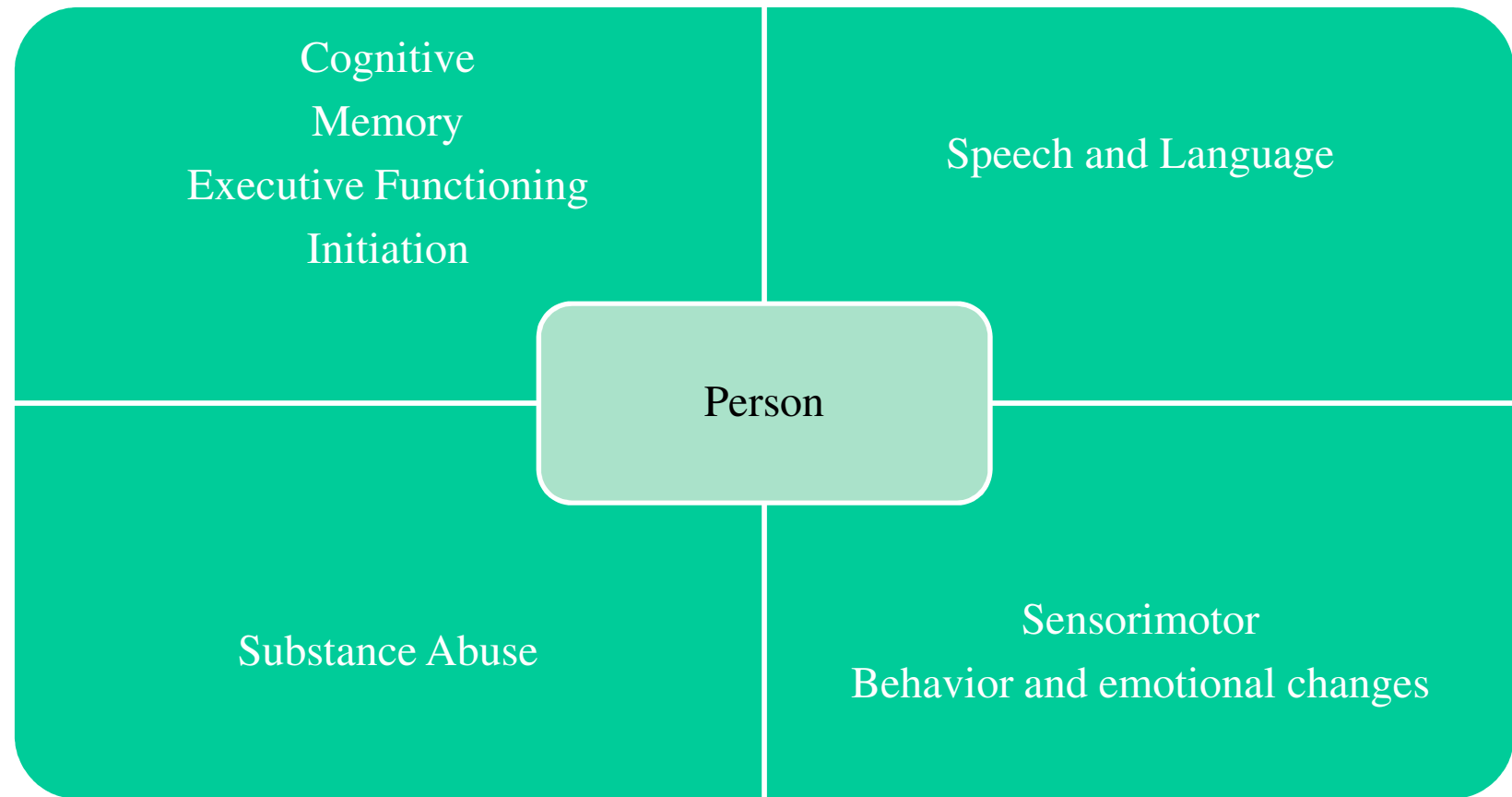
Balance

Coordination

Skilled motor activity



Lifelong Difficulties



Communication do's and don'ts

DO:

- Be accepting
- Take every issue seriously
- Address people age appropriately
- Convey respect
- Assist them in problem solving
- State relevant facts to those that need to know
- Remember that you don't know how they feel
- Get all the facts
- Be their equal
- Be sincere

DON'T:

- Be blame/fault finding
- Ignore an issue
- Talk down to anyone
- Patronize
- Take responsibility for their situations
- Gossip
- Say "I know how you feel"
- Make promises you can't keep
- Dominate



For more Information on services available at the Center for Disabilities, please contact us at 800-658-3080, visit our website at www.usd.edu/cd, or email at cd@usd.edu.



Cited Resources

The Essential Brain Injury Guide Edition 4.0
by the Brain Injury Association of America
Michigan Department of Community Health
Traumatic Brain Injury Provider Training
Manual

