Invisible Wounds: Brain Injury in the Elderly

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BIA-NE Mission

To create a better future for all Nebraskans through brain injury prevention, education, advocacy, and support.
Nebraska Facts

• An estimated 36,000 Nebraskans are living with disability due to TBI.
• Over 8000 Nebraskans joined the Nebraska Brain Injury Registry July 2016 to Aug. 2017
• The highest number of TBI-related deaths and hospitalizations were among persons ages 65+ (Nebraska DHHS)
• Falls result in the greatest number of TBI-related emergency department visits and hospitalizations (Nebraska DHHS)
Statistical Increases

- From 2007-2013, of those 75 and older:
  - TBI related ED visits doubled.
  - TBI related hospitalizations increased more than 25%.

- The rapid rise in TBI related hospital visits among the oldest segment of the U.S. population exceeded population growth during this time frame.

- TBI incidence among older adults likely exceeds published reports.

Geriatric TBI: Epidemiology
4/2018
Leading Causes of Brain Injury

- **1\(^{st}\) - Falls** are the leading cause of TBI - 40%
  - Account for 55% of TBI in children 0-14 years old
  - Account for **81%** of TBI in adults aged 65 and older.
- **2\(^{nd}\) - Being Struck by or Against an Object or Person**
- **3\(^{rd}\) - Motor Vehicle Traffic Incidents**
- **4\(^{th}\) - Assaults**

Information shared by CDC
Interesting Comparisons

Comparison of Annual Incidence

Data compiled and arranged by the Brain Injury Association of America based on data from the Centers for Disease Control and Prevention, American Cancer Society and National Multiple Sclerosis Society.

- Traumatic Brain Injuries: 1,500,000
- Breast Cancer: 176,300
- HIV/AIDS: 51,334
- Spinal Cord Injuries: 11,000
- Multiple Sclerosis: 10,400

Brain Injury Alliance
Nebraska
Brain Injury – Defined

**Acquired Brain Injury-ABI**
- Injury to the brain, which is not hereditary, congenital or degenerative, that has occurred after birth.

**Traumatic Brain Injury-TBI**
- Injury caused by a bump, blow, or jolt to the head; or a penetrating head injury that disrupts the normal function of the brain. TBI includes concussion and shaken baby syndrome.
What this Might Look Like
Brain Atrophy – Loss or Damage of Brain Cells

- Beginning in young adulthood a cognitive healthy brain can shrink an average of 1.9% every 10 years.

- Rate of brain shrinkage increases with age and becomes more prominent at 60.

- As the brain decreases, the skull stays the same, increasing the amount your brain bounces around in your skull when you fall.

- Thus falls become more life threatening as we age.
Shrinking Brain Can Cause

- Memory problems
- Decreased mental sharpness
Frontal Lobes

- Judgment and Foresight
- Executive Functions
- Working Memory
- Emotions
- Humor
- Voluntary Motor
Temporal Lobes

- Memory
- Auditory Processing
- Language Comprehension
- Olfactory Processing
- Visual Perceptual Functioning
Distribution of Severity

- **Mild injuries = 80%**
  (Loss of consciousness < 30 min, Post traumatic amnesia < 1 hour). May not show up for hours or days.

- **Moderate = 10%**
  (LOC 30 min-24 hours, PTA 1-24 hours). Notice immediately and need urgent care.

- **Severe = 10%**
  (LOC >24 hours, PTA >24 hours) Notice immediately and need urgent care.
Red Flags for a More Severe Injury

Sudden onset of any of the following:

- Headaches that worsen
- Looks very drowsy/ can’t be awakened/changes in level of consciousness
- Can't recognize people or places
- Neck pain
- Seizures
- Repeated vomiting
- Increasing confusion or irritability
- Unusual behavioral change
- Changes on 1 side of the body
- Slurred speech
- Weakness or numbness in arms/legs
Mild Brain Injury (AKA Concussion)

- Mild TBI is often a preventable public health issue.
- 80-90% recover in 1-4 weeks.
- No obvious structural changes to the brain.
- People may also be completely unaware.
- Effects of TBI can have a significant effect on responsiveness/utilization of resources.
- Recognition and management is key.
Mild Brain Injury Myths

- Not disabling or permanent.
- Severe brain injury means permanent disability. Mild brain injury means few, if any, problems.
- Physical recovery is a sign of full recovery.
- The effects of brain injury are immediate.
- Negative MRIs, CT scans and EEGs rule out brain injury.
- One must strike one’s head in order to suffer a brain injury.
- Loss of consciousness is necessary to sustain a brain injury.
Physical Effects of BI

- Balance and walking problems because of dizziness
- Headaches
- Fatigue
- Sleep disturbance
- Nausea/vomiting
- Visual Disturbances
- Sensitivity to light
- Ringing in the ears
- Disorders of taste and smell
Cognitive Effects of BI

- Attention and concentration problems
- Memory
- Slowed thinking (feeling foggy)
- Learning and memory problems
- Executive Function problems
  - Processing problems
  - Planning
  - Insight and Awareness
  - Sequencing
Social-Emotional Effects of BI

- Irritability
- Anxiety
- Depression
- Mood Swings
- Impulsivity
- Denial/lack of awareness

- Lack of motivation
- Lack of inhibition
- Aggression
- Self centeredness
- Social isolation
## Things You May Observe

<table>
<thead>
<tr>
<th>Category</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention and concentration</td>
<td>Why is it so hard for him to stay focused?</td>
</tr>
<tr>
<td>Executive function</td>
<td>Why can’t he figure out how to plan his day?</td>
</tr>
<tr>
<td>Distractibility</td>
<td>Why does he get so distracted?</td>
</tr>
<tr>
<td>Aggressive and low frustration tolerance</td>
<td>Why does he so irritable and explosive?</td>
</tr>
</tbody>
</table>

Branding: [Brain Injury Alliance Nebraska]
Risk Factors for Protracted Recovery

- HISTORY OF HEADACHE
- LOC/AMNESIA AT INJURY
- BEHAVIORAL MISMANAGEMENT/OVEREXERTION
- ENVIROMENTAL STRESSORS
- LD/ADHD
- AGE
- PRE-EXISTING DEPRESSION OR ANXIETY
- MORE SEVERE SYMPTOMS IN ACUTE PHASE
- FEMALE
Recognition and Screening

Screening

- OSU-TBI screen

2016 Pilot Project

- 15% of those in the pilot project screened positive for BI.
- 87% of those had not be previously identified.
- 37% of those had multiple BI.
- Training increased the likelihood to make BI referrals.
Why Screen for Brain Injury

- Not a visible disorder
- Some people may not know that they have had a brain injury
- Documentation of a history of may not be found in medical records
It’s not enough to simply know whether or not someone has had a brain injury

Better to know lifetime history:
- How many, of what severity
- When they occurred (developmental & how recent)
- What effect they had, or are having
Special Interviewing Issue: Multiple Mild Brain Injury

- They will have problems remembering the details of those injuries, including how many.

- It may be enough to know that there was a period like this, when it was, and how severe the worst injury was during this time.

- Note that some people may have had more than one of these periods in their life.

- Engage family in this conversation.
OSU TBI Identification Method

- Structured interview designed to elicit lifetime history of TBI.
- Avoids misunderstanding about what a TBI is by asking about injuries, then determining if TBI may have occurred.
- Provides richer information about history than simple “yes/no” (e.g., number, severity, effects, timing, etc.)
Diagnosis begins with talking to a healthcare provider about:

- How the injury happened
- The area of the injury with the degree of force
- Loss of consciousness or dazed; if so, how long
- Any changes in behavior, awareness, speech, or coordination
Comorbidities

- Comorbidities found in 40% of the elderly population.
- Those over the age of 65 when TBI occurs are often automatically branded with a diagnosis of dementia and the TBI diagnosis seems to fall off the clients medical record and they cease to receive appropriate care for TBI.
- The physiological properties of a comorbidity can reduce a persons cognitive reserve.
Comorbidities

Most common comorbidities
- Circulatory
- Endocrine
- Nutritional
- Metabolic
- Immune disorders
Individuals With BI are Overrepresented

- Among the Incarcerated
- Among the Homeless
- In Addiction Services
- In Mental Health Services
- Among those who serve/have served in the armed forces

Individuals with a History of TBI are at risk of:

- Developing psychosis
- Suicide
- Being unemployed or underemployed
Medically Based Treatment

Hospital and Outpatient based treatment

- Assessment
- Interdisciplinary Therapy
- Follow-up
# Brain Injury Treatment Team

<table>
<thead>
<tr>
<th>Profession</th>
<th>Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCP</td>
<td>health history; basic medicine</td>
</tr>
<tr>
<td>Neuropsychologist</td>
<td>cognitive function; brain/behavior relationship, behavioral treatment</td>
</tr>
<tr>
<td>Physical Therapist</td>
<td>“below the waist”; motor systems; balance</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>&quot;above the waist&quot; adaptive behavior; functional assessment</td>
</tr>
<tr>
<td>Speech- Language Pathologist</td>
<td>speech and language assessment; language rehab including cognition related to language</td>
</tr>
<tr>
<td>Audiologist</td>
<td>vestibular system; auditory inputs</td>
</tr>
<tr>
<td>Psychologist</td>
<td>Therapy, sleep hygiene, anxiety management</td>
</tr>
<tr>
<td>Neurologist</td>
<td>brain structure and function; diagnose disease</td>
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</tbody>
</table>
Medically Based Treatment Outcomes

Older adults have:

- higher mortality
- slower rates of functional and cognitive recovery
- worse functional outcomes
- bear higher cost during hospital stay in cost-analysis models
- higher rate of rehospitalization

Because of this, elderly patients tend to be treated less aggressively.
Neuroplasticity is the brain's amazing capacity to change and adapt. It refers to the physiological changes in the brain that happen as the result of our interactions with our environment. The connections among the cells in our brains reorganize in response to our changing needs. This dynamic process allows us to learn from and adapt to different experiences.
Beyond the Hospital

- Individuals and families need help in overcoming the adjustment to the new normal.

- Small environmental supports can make a big difference.
Visual Processing

- Sunglasses inside
- Provide soft lighting and a quiet place for relaxation
- Assist with computer and paperwork
Learning and Memory Adjustments

- Write things down
- Shorten instructions
- Model tasks
- Check in for comprehension
Processing Speed & Fluency Adjustments

- Complete paperwork in quiet, distraction-free room
- Don’t put on the spot
- Provide cues for time sensitive tasks
- Create an environment that is conducive to asking for help and acknowledging any cognitive or emotional difficulties
Emotional/Interpersonal Difficulty

- Communication should be direct, not subtle
- Nonjudgement, noncritical, supportive feedback
- Remain calm to reduce others’ agitation
- Recognition that self-awareness and/or awareness of deficits may be low or nonexistent
Survivor Tips for Coping

- Write things down
- Develop a routine
- Keep a steady pace, take breaks as needed
- Focus on one thing at a time
- Perform tasks in quiet, non-distracting areas
- If irritable or angry, try relaxation techniques
- Get plenty of sleep
- Don’t self medicate
Fall Prevention

- Screen
  - Identify risks for falls
- Assess
  - Identify modifiable risk factors
- Intervene
  - Use effective clinical and community strategies which can include:
    - Have health care provider review medicines
    - Encourage individual to exercise to improve strength and balance
    - Have eyes and feet checked
    - Make home safer (remove tripping hazards, install handrails, etc.)
How common is falling for the elderly and following brain injury?

- One out of 3 adults age 65 and older falls each year.
- Fifty percent of the people who experience stroke are at risk for falling.
- Although there are no national statistics on the rate of falls for people who have had a traumatic brain injury, many of the symptoms associated with TBI are known causes of falls.
Risk Factors

- Fallen in past year
- Need help getting dressed
- Afraid of falling
- Need help with bathing
- Take many different medications
- Difficulty paying
- Dizziness
- Do risky thin
- Poor balance
- Use a wheelchair, walker, or cane
- Difficulty walking
- Feel unsteady getting out of bed or chair
- Feel unsteady sitting or standing
How can we **reduce** the risk of falling?
See the Doctor

- Physicians can examine your vision, strength, walking, and balance and refer you for therapies that can improve your functioning.
- Can identify if there are having problems with sadness, anger, and poor attention and memory.
- If possible, it is best to seek treatment from a doctor or therapist associated with a rehabilitation program who can address all aspects of recovery.
See the Doctor, cont.

- Can prescribe a home safety evaluation (if applicable) to help determine how to make your home a safer place.

- Inform each of your doctors about all of the medications an individual takes, including over-the-counter medications. The doctor needs to know this so he/she does not prescribe something that will make the individual dizzy, drowsy, or weak, which will increase the risk of falling and possible injury.

- If taking blood thinners, a fall can be particularly dangerous because of the increased likelihood of bleeding.
Use Good Judgment

- Use things as they are intended. For example, use a step stool and not a chair if you need to reach for something. Better yet, ask for help!
- Concentrate on one task at a time and be sure to walk slowly.
- Don’t attempt things you know you shouldn’t do.
- Follow basic safety precautions: clean up spills, remove clutter, etc.
- Over-the-counter medications, specifically cold and flu remedies, can increase dizziness and fall risk. Use them only after consulting with your doctor!
- Consider getting a Medic Alert System if you live alone or are alone for extended periods of time.
Use Assistive Devices

- Wear prescription glasses, if you have/need them.
- Be sure to use walkers or other assistive devices if you need them.
- Use assistive devices correctly. For example, lock the wheelchair before standing or transferring. Don’t try to go down stairs with a walker.
- Use reachers, transfer devices, and bath aids as instructed by your therapist. If you have never talked with a therapist about these devices, ask your doctor for a referral.
Make the Environment Safer

- Proper lighting is important. If it is dark, turn on a light. Don’t try to find what you need, such as your robe or the way to the bathroom, in the dark.
- Remove throw rugs, extension cords, furniture, or other obstacles that may make you trip from hallways and other much-used pathways.
- Be aware of surface changes, such as going from the carpet to a hardwood floor or tile, or from pavement to grass, and try to avoid them if possible.
- Use slip-resistant strips on bathroom and kitchen floors or slippery hardwood floors.
- Be aware that having a pet such as a dog or cat under foot increases the likelihood of falling.
Exercise

Exercise is effective in reducing falls in the spectrum of people who range from relatively fit and well and community dwelling to cognitively intact people living in residential care facilities.

A successful exercise program:
- Has sufficient intensity to improve muscle strength.
- Is regular and sustainable (long-term intervention/participation).
- Includes dynamic balance training activities (eg, Tai Chi techniques).
- May be performed at a center/clinic or home; group or individual.
- Is simple, easily instituted and low cost.
Exercise, cont.

**Resistance**
- Concentrate on strengthening LEs, especially the ankle, and trunk/core muscles affecting motor control.
- Reduce joint pain/instability.
- Correct postural faults.

**Balance**
- Begin with controlling the center of gravity (COG) over the base of support (BOS).
- Progress by challenging the regulation of balance and postural stability specifically engaging visual, vestibular, somatosensory and cognitive systems.
- Elicit postural reactions and ankle, hip and step strategies by altering stimuli, surfaces, secondary tasks to mimic functional activities, resistance, direction and velocity of movement.
- Consider Tai Chi. An eastern exercise form that has been simplified and adapted to emphasize balance, weight shifting, coordination, and postural training with significant benefits to many populations at risk for falls.
Professional Behavior

- Relationships matter
- Staffing patterns matter
Brain Injury Specific Resources

- **CDC**
  - STEADI (Stopping Elderly Accidents, Deaths and Injuries)
  - [https://www.cdc.gov/steadi/about.html](https://www.cdc.gov/steadi/about.html)

- **Brain Injury Alliance of Nebraska**
  - Resource facilitators help individuals and their families identify and access brain injury information, services, and supports.
  - [www.biane.org](http://www.biane.org)

- **NCOA**
  - Falls Prevention Guide for caregivers

- **American College of Rehabilitation Medicine**
  - Brain Injury Special Interest Group

- **American Physical Therapy Association**
  - [http://www.apta.org/BalanceFalls/](http://www.apta.org/BalanceFalls/)
Thank You!

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