Brain Injury Basics

Offering help, hope, and a voice for people with brain injury and their families

Karen Keating, CBIS
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# Objectives

## What is brain injury?
- Definitions, causes, incidence
- Interconnections and parts of the brain

## What changes occur after a brain injury?
- Physical, cognitive, behavioral, and emotional challenges
- Strategies

## Accessing services
- Screening
- Care continuum and types of services

## Value of BIANC
- Resource for individuals with brain injury, families, and professionals
### Causes of Brain Injury

- Gunshot wounds
- Workplace injuries
- Toxic exposures (substance abuse, ingestion of lead, inhalation of volatile agents)
- Metabolic disorders (insulin shock, diabetic coma, liver and kidney disease)
- Neurotoxic poisoning (carbon monoxide poisoning, inhalants, lead exposure)
- Lack of oxygen to the brain (near drowning, airway obstruction, strangulation, cardiopulmonary arrest, hypoxia, anoxia)
- Falls
- Assaults
- Motor vehicle crashes
- Sports and recreation injuries
- Shaken baby syndrome/abusive head trauma
- Child abuse
- Domestic violence
- Military actions (blast injury)
- Stroke (hemorrhage or blood clots)
- Infectious disease (encephalitis, meningitis)
- Seizure disorders
- Electric shock/lightning strike
- Tumors (surgery, radiation, chemo)
Types of Brain Injury: *Acquired Brain Injury (ABI)*

- Umbrella definition
  - *external physical forces* applied to the head
  - *internal insults* to the brain
- Occurs after birth – is not:
  - hereditary, degenerative, or induced by birth trauma

Examples:
Stroke, aneurysm, infection to the brain, anoxia (a lack of oxygen to the brain), tumor, traumatic brain injury

- Results in a change in cells of the brain
  - Affecting physical, metabolic, or the functional ability of nerve cells
Brain Injury

Acquired Brain Injury

Non Traumatic Brain Injury
- Anoxia, infections, strokes, tumors, metabolic disorders

Traumatic brain injury
- Open Brain Injury
  - Penetrating injuries: assaults, falls, accidents, abuse, surgery

- Closed brain injury
  - Internal pressure & shearing: assaults, falls, accidents, abuse
Types of Brain Injury: Traumatic Brain Injury (TBI)

- An insult to the brain from an external force
- *May or may not* produce a diminished or altered state of consciousness
- Results in impairments of
  - Cognitive abilities, physical functioning, or disturbance of behavioral or emotional functioning
- Coup contre-coup injury
Causes of TBI

- According to the CDC, 2.5 million Americans sustained a TBI in 2010
- Males are about 1.5 times as likely as females to sustain a TBI
- Falls are the leading cause of TBI
  - Vehicle crashes most often result in hospitalization and moderate to severe TBI

Risk for injury

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>Risk Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second injury</td>
<td>3x</td>
</tr>
<tr>
<td>Third injury</td>
<td>8x</td>
</tr>
</tbody>
</table>

(CDC, 2016)
What do you get when you search "Brain Injury Sports gif"?
Classification of TBI

Mild TBI (mTBI)

- Also termed **concussion**
- Can have either brief or no loss of consciousness (LOC)
- May demonstrate vomiting, lethargy, dizziness, and inability to recall what just happened

Moderate TBI

- Marked by unconsciousness for any period of time up to 24 hours
- Neurological signs of brain trauma, including skull fractures with contusion or bleeding
- May have focal findings on an electroencephalograph (EEG)/computed tomography (CT) scan

Severe TBI

- Marked by a period of loss of consciousness of 24 hours or greater
Classification of TBI

- TBI classification:
  - Mild (80%)
  - Moderate (10-30%)
  - Severe (5-25%)

Severity → Injury sustained

Severity → Long-term challenges
Geography of the Brain

- **Spinal Cord**
  - Sensory & motor signals to the brain
  - Reflexes

- **Brain Stem**
  - Basic life functions (breathing, heart rate, etc.)

- **Cerebellum**
  - Coordinated movements, posture, balance

- **Cerebral Cortex**
  - Frontal Lobe
  - Parietal Lobe
  - Temporal Lobe
  - Occipital Lobe
The Brain

- All sensations, movements, thoughts, memories, and feelings are the result of signals that pass through neurons
  - **Dendrites**
  - **Cell body**
  - **Axon & Sheath**
- Glial cells
- “Use it or lose it”
  - **Neuroplasticity**

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**Dendrites**
- Collect chemical signals through receptors

**Cell body**
- Integrates incoming signals and generates outgoing signal to axon

**Axon**
- Passes chemical signals to dendrites of another cell or to an effector cell
The Brain

- All sensations, movements, thoughts, memories, and feelings are the result of signals that pass through neurons
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The Brain

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The Brain: Neurotransmitters

- Neurotransmitters (NT): the chemicals that conduct the messages across the synapse (the meeting point of two neurons).

- When a signal arrives at the end of a neuron, the neurotransmitter spills into the synapse and crosses the gap to the next neuron.

![Diagram of synaptic transmission](image-url)
The Brain: Neurotransmitters (NTs)

- Malfunction in these NTs is found in many forms of mental illness
  - Not enough NT
  - Too much NT
  - Malabsorption of NT

- High stress levels may ‘trigger’ malfunctioning in NT in biologically vulnerable individuals
  - e.g. production of NT cannot keep up with the body’s demands or are not effectively removed from the system

-> High stress (e.g. environment)
The Brain: Neurotransmitters

- **Norepinephrine**
  - Alertness
  - Concentration
  - Energy

- **Dopamine**
  - Pleasure
  - Reward
  - Motivation/drive

- **Serotonin**
  - Obsessions & compulsions
  - Memory

- **Attention**

- **Mood Cognitive function**

- **Anxiety Impulse Irritability**

- **Appetite Sex Aggression**
Limbic System

- Located in the middle of the brain encompassing:
  - the thalamus (sensory input),
  - the hippocampus (memory),
  - the amygdala (emotions), and
  - the hypothalamus (elemental drives)

- *Fight or Flight* - survival instincts
  - May be constantly activated resulting in hypervigilence or panic attacks

- *Reward Pathway* – related to substance use and risky behaviors
  - High or low activation of dopamine
Cerebral Cortex

- Surrounded by cerebrospinal fluid
- Control Center for highest levels of thinking, moving, and behaving
- Right and Left Hemisphere
- Four Lobes
  - Frontal Lobe
  - Temporal Lobe
  - Parietal Lobe
  - Occipital Lobe
### Who are you?

- **Left Brain**
  - Analytical?
  - Process things linearly?
  - Use logic to solve problems?
  - Like things to be done in a certain order?
  - Look at the finer details?

- **Right Brain**
  - Creative?
  - Process information holistically?
  - Use your gut or intuition to solve problems?
  - Can move from task to task freely?
  - Look at more abstract concepts?
Right and Left Hemisphere

**Left Brain**
- Process info in a linear manner
- Identify important details
- Analytical
- Move in a sequential order
- Use logic to solve problems

**Right Brain**
- Process info holistically
- See end result with clarity
- Creative
- Move randomly from task to task
- Use intuition to solve problems

- Info processing
- Project engagement
- Perception
- Workflow
- Problem solving
Frontal Lobe

- Located in the front of the brain behind the forehead
Frontal Lobe

- Initiation
- Problem Solving
- Judgement
- Planning
- Organization
- Self-Monitoring
- Abstract Thought
- Attention/ Concentration
- Memory

Frontal Lobe

- Executive functioning

BI

- Damaged neurons and connections

Cognitive challenges

- Impulsivity
- Poor judgement
Parietal Lobe

- Located behind the frontal lobes at the top of the brain.
Parietal Lobe

- Controls sensation such as touch and pressure
- Visual spatial perception
- Integrating information, understanding what words mean and the surrounding world
Temporal Lobe

- Located on the right and left side of the brain just above the ears
Temporal Lobe

- Memory
  - Working, short-term, long-term
- Hearing
- Understanding/producing language
  - Aphasia
    - Understanding vs. Production
- Organization and sequencing
- Ability to identify and sort new info
Occipital Lobe

- Located toward the lower back of the brain
Occipital Lobe

- Vision
- Ability to process visual information
- Ability recognize shapes, colors, letters, and words
There are numerous causes of brain injury and can happen to anyone

Severity does *not necessarily* correspond to long-term challenges

Brain injury can impact neurons, glial cells, neurotransmitters, or their connections – resulting in functional, cognitive, emotional, and behavioral changes

It can be important to understand the inter-workings of the brain in order to comprehend the impact of a brain injury
Changes from a Brain Injury

Emotional

Sensory/Physical

Behavioral

Communication

Cognitive
Physical Changes

- Weakness or paralysis
- Balance/coordination difficulties
- Sensory changes
  - (Smell, taste, vision, hearing)
- Headaches
- Changes in sleep patterns
- Fatigue
- Seizures
  - Alcohol increases the risk of seizures following a TBI
Physical Changes: Strategies

- **Accommodations**
  - Ambulatory aids (wheelchair, cane, etc.)
  - Specialized tools for daily living activities
  - Assistive technological devices including eye-tracking or voice-text software

- **Patience**

- **Create small goals rather than large unattainable ones**
Cognitive Changes (Thinking)

- Difficulty with:
  - Short-term memory
  - Attention/concentration
  - New learning
  - Initiating activities
  - Planning
  - Organization
  - Follow-through
  - Reasoning, problem-solving and decision-making

Executive functioning
Cognitive Challenges

Attention/Concentration
• To take in & identify stimuli

Information Processing
• To analyze and organize stimuli

Short- and long-term memory
• To store & retrieve stimuli

Cognitive Flexibility & Executive Functioning
• To have stimuli influence future behavior
Cognitive Changes: Strategies

- Use a planner, tape recorder, checklist, phone or tablet apps to remember appointments and meetings
- Use of timers, watch alarms, talking watches, phone or tablet apps for prompts regarding time to do activities
- Use of step-by-step written instructions and/or verbal instructions to complete tasks
- Post simple reminder signs for prompts
- Decrease distractions in the room

To Make PB&J
1. Get 2 slices of bread, peanut butter, jelly, and a knife.
2. Spread the peanut butter on one piece of bread using the knife.
3. Repeat on the other piece of bread with the jelly.
4. Put pieces of bread together and eat!
<table>
<thead>
<tr>
<th>Social Interaction and Communication Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Difficulty starting conversation</td>
</tr>
<tr>
<td>• Has a hard time finding words</td>
</tr>
<tr>
<td>• Struggles to follow conversation</td>
</tr>
<tr>
<td>• Overtakes the conversation</td>
</tr>
<tr>
<td>• Difficulty reading social cues/body language</td>
</tr>
<tr>
<td>• Unaware of personal space or boundaries of others</td>
</tr>
<tr>
<td>• Says exactly what is on their mind</td>
</tr>
<tr>
<td>▪ Impulsivity</td>
</tr>
<tr>
<td>• Diminished self-esteem and confidence</td>
</tr>
</tbody>
</table>
Social Interaction and Communication Strategies

- Tell the individual when you have difficulty following their conversation
- Model clear topic changes for the individual to observe
- Respectfully tell the individual of repeated the same comments or shared the same story several times
- Choose between open ended and yes-no questions
- Rephrase the question if the person is having difficulty understanding
- Wait and give the person time to respond
- You may be able to cue by giving the first sound of the word
- Subtle non-verbal cues
## Social Interaction and Communication Strategies

<table>
<thead>
<tr>
<th>Difficulty with word finding/production</th>
<th>Excessive communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid Player, Verbally, Communication board/book</td>
<td></td>
</tr>
</tbody>
</table>

**Difficulty with word finding/production**

- Grid Player
- Verbally
- Communication board/book

**Excessive communication**
Behavioral and Emotional Changes

- Anxiety
- Aggression and irritability
- Depression
- Self-centered thinking
- Difficulty controlling emotions – anger/ frustration
- Impaired self-awareness
- Paranoia, mania, hallucinations, delusions
- Inappropriate sexual behaviors
Mental Health, Behaviors, and Brain Injury

Concentration  
Production  
Comprehension

Thoughts create feelings

Ruminating ideas  
Disorganized  
Hypersensitive

Irritable  
Combative  
Isolated  
Impulsive

Behavior reinforces thoughts

Feelings create behavior

Anxiety  
Depression  
Psychosis  
Anger  
Guilt  
Embarrassment
Mood Disorders & BI

**Depression**
- A feeling of sadness, loss, despair or hopelessness that does not get better over time
- Cause for concern:
  - losing interest in usual activities and interfering with daily life
  - occurs at least several days per week and lasts for more than two weeks

**Most common physiological symptom after brain injury**

**Best predictor of psychosocial adjustment post-injury**
### Mood Disorders & BI

#### Symptoms of depression include:

<table>
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<tr>
<th>Feeling down, sad, blue or hopeless</th>
<th>Loss of interest or pleasure in usual activities</th>
<th>Feeling worthless, guilty, or that you are a failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in sleep or appetite</td>
<td>Difficulty concentrating</td>
<td>Withdrawing from others</td>
</tr>
<tr>
<td>Tiredness or lack of energy</td>
<td>Moving or speaking more slowly, or feeling restless or fidgety</td>
<td>Thoughts of death or suicide</td>
</tr>
</tbody>
</table>
Behavioral Strategies

- Do not ignore the behavior
- Never reinforce the behavior
- Provide on-the-spot feedback
  - Be specific about *why* change is needed
- Provide positive feedback
- Provide a positive model for behavior
- Teach social interaction skills
Emotional Strategies

- **Listening**
  - If trouble identifying or expressing, mention triggers you have noticed and validate their feelings.

- Pay attention to body language.

- **Asking** how to help.

- Patience and trying to understand their point of view.

- Avoid ignoring or judging negative emotions even if they make you feel uncomfortable.
Behavioral and Emotional Strategies

Medications
- Antidepressant/ anxiety medications

Psychotherapeautic (counseling)
- Cognitive-behavioral therapy or CBT
- Behavioral activation therapy

Combination of approaches
- Such as antidepressant medication plus sessions with a trained counselor to work on changing behavior

Other approaches:
- Exercise
- Acupuncture
- Mindfulness
- Biofeedback
- Yoga
- Brain injury support groups
### Key Ideas: Changes after a Brain Injury

#### Change
- **Affects of BI**
- Changes in brain structure (neurons & neurotransmitters)
- Could lead to mental illness and behavioral symptoms

#### Physical
- Changes in executive functioning
- Difficulty with impulse control and decision-making
- Changes in thought processes leading to behaviors

#### Cognitive
- Lifestyle and brain changes can lead to anxiety, depression, PTSD
- Use of drugs/alcohol as coping strategy
- Important to identify hidden emotions/thoughts and triggers

#### Emotional & Behavioral
TBI Screening

Currently being piloted at:

- Local Management Entities/Managed Care Organizations (LME/MCO)
  - Alliance Behavioral Health, Eastpointe, Cardinal Innovations Solutions, Trillium, Vaya Health, Partners Behavioral Health, Sandhills
- CommWell Federally Qualified Health Centers (FQHC)

Purpose: to investigate the number of individuals with TBI in North Carolina thereby affecting services and funding for individuals with brain injury
TBI Screening: Could be as Easy as 1, 2, 3

1. Have you ever hit your head or been hit on the head, including being told you had a concussion?

2. Did you lose consciousness or experience a period of being dazed and/or confused because of the injury to the head?

3. Have you ever had a period of time in which you experienced multiple, repeated impacts to your head (e.g. history of abuse, contact sports, military duty)?
Available TBI Screening Tools

- Ohio University TBI Identification Method
  - 3 steps
  - For all individuals

- Defense and Veterans Brain Injury Center (DVBIC) TBI Screening Tool
  - 3 questions
  - For service members
Ohio University TBI Identification Method

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong> any previous injuries to the head of neck.</td>
<td><strong>Step 2:</strong> any periods of loss of consciousness.</td>
<td><strong>Step 3:</strong> any situations that make vulnerable to repeated injury.</td>
</tr>
</tbody>
</table>

**Interviewer Instructions:**

**Step 1:**
- Ask questions 1-5 on the chart. Record answers. If the answer is "yes" to any of the questions in step 1, ask the following additional questions about each reported injury and add details to the chart below.

**Step 2:**
- Interviewer instruction: if the answer is "yes" to any of the questions in step 1, ask the following additional questions about each reported injury and add details to the chart below.

**Step 3:**
- Interviewer instruction: ask the following questions to help identify a history that may include multiple mild TBIs and complete the chart below.
# Ohio University TBI Identification Method

## Record Findings

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td><strong>Less of consciousness (LOC)/knocked out</strong></td>
</tr>
<tr>
<td>No LOC</td>
<td>&lt; 30 min</td>
</tr>
</tbody>
</table>

**Dazed/Mem Gap** | **Yes** | **No** | **Age** |

## Interpret Data

- **Worst**: One moderate or severe TBI
- **First**: TBI with loss of consciousness before age 15
- **Multiple**: 2 or more TBIs close together, including a period of time when they experienced multiple blows to the head
- **Recent**: A mild TBI in the last weeks or a more severe TBI in the last months
- **Other Sources**: Any TBI combined with another way that their brain function has been impaired

## If More Injuries with LOC

- How many?
- Longest knocked out?
- How many > 30 mins?
- Youngest age?

## Step 3

<table>
<thead>
<tr>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause of repeated injury</strong></td>
</tr>
<tr>
<td>Dazed/memory gap, no LOC</td>
</tr>
</tbody>
</table>

For more information about TBI or the OSU TBI Identification Method visit:

- Ohio Valley Center at OSU
  www.ohiovalley.org/informationeducation
- Brainline.org
  www.brainline.org
### 3 Question DVBIC TBI Screening Tool

1. **Did you have any injury(ies) during your deployment from any of the following?**  
   (check all that apply):
   - **A.** Fragment
   - **B.** Bullet
   - **C.** Vehicular (any type of vehicle, including airplane)
   - **D.** Fall
   - **E.** Blast (Improvised Explosive Device, RPG, Land mine, Grenade, etc.)
   - **F.** Other specify:

2. **Did any injury received while you were deployed result in any of the following?**  
   (check all that apply):
   - **A.** Being dazed, confused or “seeing stars”
   - **B.** Not remembering the injury
   - **C.** Losing consciousness (knocked out) for less than a minute
   - **D.** Losing consciousness for 1-20 minutes
   - **E.** Losing consciousness for longer than 20 minutes
   - **F.** Having any symptoms of concussion afterward (such as headache, dizziness, irritability, etc.)
   - **G.** Head injury
   - **H.** None of the above

   **NOTE:** Endorsement of A-E meets criteria for positive TBI Screen

3. **Are you currently experiencing any of the following problems that you think might be related to a possible head injury or concussion?**  
   (check all that apply):
   - **A.** Headaches
   - **B.** Dizziness
   - **C.** Memory problems
   - **D.** Balance problems
   - **E.** Ringing in the ears
   - **F.** Irritability
   - **G.** Sleep problems
   - **H.** Other specify __________________

   **NOTE:** Confirm F and G through clinical interview
Positive Screen – What Next?

Screening result ≠ Diagnosis of brain injury

- All involved with care should be notified of a positive screening and documentation should be obtained.
- Learn more about the person and their injury:
  - How it affects their daily life.
- Emphasize the use of compensatory strategies:
  - Apps, planners, timers, recorders, assistive technology, etc.
- Consult with other professionals to determine appropriate services.
Importance of TBI Screening

- Screening is essential in determining if a brain injury has occurred
- Some individuals may not realize they have sustained a brain injury
  - May go unnoticed in co-occurrence with mental illness
- Once an individual has a positive screening result, correct services can be determined and utilized – affecting understanding, health, and quality of life
Accessing Resources & Services in the Community

- Acute Care Rehabilitation
- Acute Medical, Polytrauma
- ED, ICU

Post-Acute Rehabilitative Trtmt
- Inpatient Rehab Hospital
- Sub-acute Rehab
- Transition Residential

Long-term home and Community
- Home
- Skilled Nursing Facility
- Outpatient & day services
- Home & community-based services
- Long-term residential
- School/vocational services
Local Management Entities/Managed Care Organizations (LME/MCO)

- Manages mental health, substance use and intellectual/developmental disability services
- Connect individuals and families to the help they need when they need it
- Responsible for managing state and federally funded services for people who receive Medicaid, are uninsured or cannot afford services
Hospitals & Rehabilitation

**Things to consider:**
- Amount of therapy
- Length of stay
- Insurance

**UNC Hospitals – Physical Medicine and Rehabilitation**
- Wake Forest Baptist ABI Program
- WakeMed Brain Injury Program
- Carolinas Rehabilitation
- Vidant Health
- Mission Health
Neurologist vs. Neuropsychologist

<table>
<thead>
<tr>
<th>Neurologist</th>
<th>Neuropsychologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>specialists who assess, diagnose and treat disorders of the nervous system. They help patients who have experienced injuries or trauma to the central nervous system</td>
<td>assessing and treating a wide range of neurobehavioral problems of the central nervous system</td>
</tr>
<tr>
<td>use a variety of tools to perform their jobs, such as MRIs, observation and examination to measure factors like a patient's reflexes, senses and brain function</td>
<td>treat the cognitive, mental and behavioral effects of brain disorders</td>
</tr>
<tr>
<td></td>
<td>perform neuropsychological evaluations and psychological tests as well as offer specific interventions based on the patient's concerns and problems</td>
</tr>
</tbody>
</table>
## Day Programs & Vocational

### Things to consider:
- Diagnosis
- Desire to work
- Location
- Funding

### Division of Vocational Rehabilitation
- Local departments throughout state
- Assist in employment

### Day Programs
- Community Partnerships, Gateway Clubhouse, Hinds Feet Farm, Lifespan Creative Campus – multiple locations
Residential

**Things to consider:**
- Amount of assistance needed (daily activities, health care needs, etc.)
- Amount of supervision
- Larger or smaller
- Behavioral challenges
- Funding

**Home Care**
- Lippard Lodge – Winston Salem
- ReNu Life – Goldsboro
- Learning Services – Raleigh & Creedmore
- NeuroRestorative – Raleigh
- Hinds Feet Farm – Hendersonville
The Value of BIANC
About Us

- Founded in 1982 by family members
- Non-Profit 501(c)3 organization
- Affiliate of the Brain Injury Association of America
- Governed by a Board of Directors
- Supported in part by federal and state grant contracts

“Offering help, hope, and a voice for people with brain injury and their families...”
Brain Injury Facts

- 201,800 people in North Carolina are living with long-term challenges due to TBI

Community
Health professionals
Significant others
Work/school
Family
Neighbors
Friends
Brain Injury Facts

- Only about 5% of individuals with severe TBI have funding for long term treatment
Regional Offices & Brain Injury Resource Centers

- Materials available for survivors, family members, and professionals
- Information and referrals
- Training opportunities
- Community partnerships
Carrying Out Our Mission

- Education & Training
- Outreach & Support
- Awareness & Prevention
- Advocacy & Involvement
Education & Training

- Family Conference
- Professional Conference
  - 2017 Asheville, NC
- Certified Brain Injury Specialist (CBIS) classes
- Monthly e-Blasts
- Specialized trainings
- Quarterly “Starting Point” Newsletter
- Printed brochures & materials
Outreach & Support

- Facilitate connections to appropriate services
  - Help survivors and families find the resources and support they need in their community
- Free, one year complimentary memberships available

Support Groups

- More than 30 groups statewide
- Pediatric and adult-focused options
  - Survivors and carepartners
- Led by community professionals and volunteers
Resource Categories

- Abuse Support
- Advocacy
- Assistive Tech
- Caregiver Support
- Counseling
- Day Programs
- Educational
- Financial
- Guardianship
- Legal
- LME/MCO
- Neurology
- Neuropsychiatry
- Neuropsychology
- Pediatrics
- Recreational
- Rehab Physicians
- Rehab Services
- Residential
- Respite Care
- Speech Pathology
- Substance Abuse
- Support Groups
- Veteran Services
- Vision
- Vocational Rehab
### Outreach & Support: Events

#### Recreational Events

- Regional events are planned through the year to encourage wellness, exercise, and fun!

#### Annual BIANC Camp

![Image of people canoeing]

![Image of people participating in an event]

![Image of people enjoying water activities]
Awareness & Prevention

- Skill Packs
- Media Connections
- Social Media
- Community Partnerships

- Conferences
- Exhibits
- Walk & Roll-athon
- Strikeout Concussions
- Highland Brewery & Conscious Brews
Advocacy & Involvement

- Brain Injury Awareness “Day on the Hill” in D.C.
- Governor’s Brain Injury Advisory Council
- North Carolina Legislative Day
- Rehab Providers Meetings
- Gfeller-Waller Law
- Proclamation
- TBI Medicaid Waiver
Important Things to Remember

Brain injury is unpredictable in its consequences.

Brain injury affects who we are, the way we think, act, and feel.

It can change everything about us in a matter of seconds.
Important Things to Remember

- The effects of a brain injury are:
  - Complex
  - Vary greatly from person to person
  - Depend on such factors as cause, location, and severity
- No two brain injuries are exactly the same
  - When you’ve seen one brain injury, you’ve seen one brain injury
- A person with a brain injury is a person first
Contact Us

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Raleigh, NC 27615

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<table>
<thead>
<tr>
<th></th>
<th>Karen Keating</th>
<th>Sandie Worthington</th>
<th>Sally Rickard</th>
<th>Kitty Barringer</th>
<th>Lauren Costello</th>
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<tbody>
<tr>
<td>Areas</td>
<td>Asheville &amp; Western areas</td>
<td>Greenville &amp; Eastern areas</td>
<td>Charlotte &amp; surrounding areas</td>
<td>Winston-Salem and Triad surrounding areas</td>
<td>Raleigh &amp; Central areas</td>
</tr>
<tr>
<td>Phone</td>
<td>828-337-0208</td>
<td>252-717-3347</td>
<td>704-960-0561</td>
<td>336-713-8582</td>
<td>919-833-9634 x 7010</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:Karen.keating@bianc.net">Karen.keating@bianc.net</a></td>
<td><a href="mailto:Sandie.worthington@bianc.net">Sandie.worthington@bianc.net</a></td>
<td><a href="mailto:Sally.rickard@bianc.net">Sally.rickard@bianc.net</a></td>
<td><a href="mailto:Kitty.barringer@bianc.net">Kitty.barringer@bianc.net</a></td>
<td><a href="mailto:Lauren.costello@bianc.net">Lauren.costello@bianc.net</a></td>
</tr>
</tbody>
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