

Brain Injury: Overview, Impact and Resources



Disclosures

- I have no relevant financial or nonfinancial relationship to disclose.
- Presenting as a volunteer on behalf of the Brain Injury Association of Missouri
- Presentation in partnership with the Missouri AgrAbility Project and DHSS/TBI Grant



Objectives

- Discuss causes, prevalence and types of brain injury
- Be aware of impacts of brain injury for clients, patients and consumers
- Identify community resources



Terminology

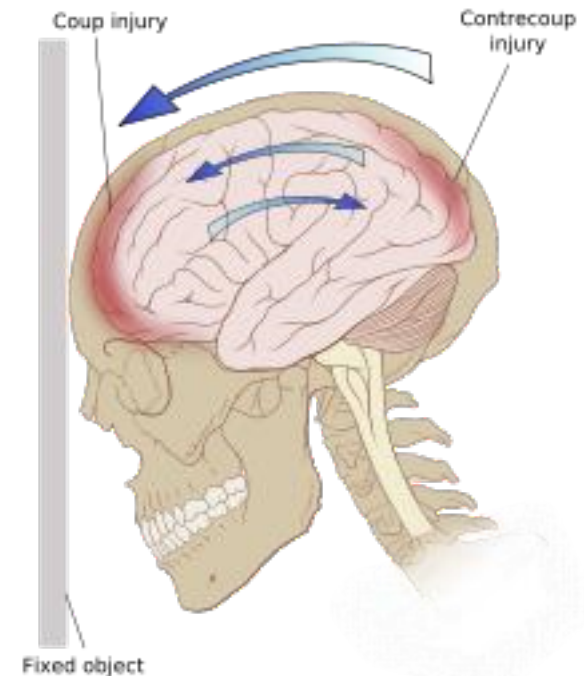
- “Brain injury” vs. “Head injury”
- Traumatic vs. Acquired

Traumatic Brain Injury

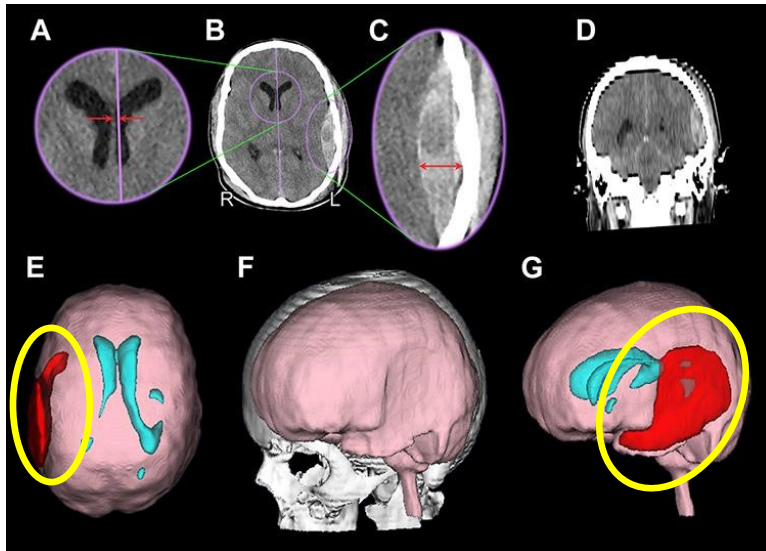
- What is a traumatic brain injury (TBI)?
 - ❑ A TBI is a blow or jolt to the head or body that interrupt the normal function of the brain
 - ❑ There are two basic types of Traumatic brain injury
 - ❑ Open head injuries
 - ❑ Closed head injuries
 - ❑ Brain injuries range from mild to severe

Closed Head Injury

- No penetration to the skull
- Resulting from falls, motor vehicle crashes
- Coup Contrecoup Injury



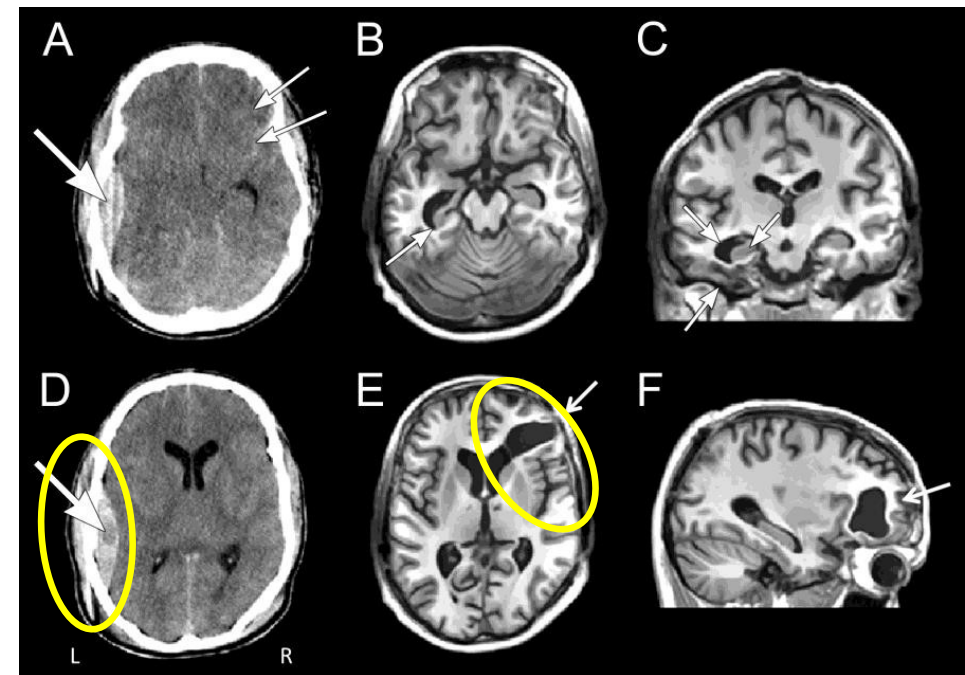
Coup Contrecoup



The initial site of impact (coup)

The second area of injury (contrecoup)

- The bouncing of the brain in the skull can result in injury in two sites



Open Head Injury

- Results from bullet wounds, motor vehicle crashes, falls
- Penetration of the skull
- Effects tend to be more focal





Statistics

- Every 18 seconds someone sustains a brain injury
- Of the 1.4 million people who sustain a traumatic brain injury each year:
 - ▢ 50,000 die
 - ▢ 235,000 hospitalized
- 118,000 individuals in Missouri are living with a long-term disability due to brain injury

Leading Causes of TBIs

- #1 Falls
- #2 Struck by or against an object
- #3 Motor vehicle accidents
- #4 Assaults



Other prominent causes include bicycle accidents and sports injuries

Prevalence of Traumatic Brain Injury

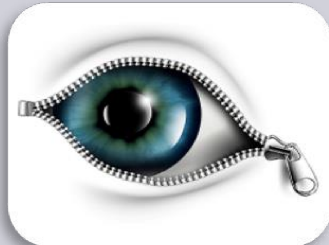


- Risk is highest among toddlers, adolescents, young adults, and individuals ages 65 and older
- Males are at twice the risk of females due to exposure and lifestyle
- Leading cause varies with age
 - ❑ Falls are the leading cause in persons aged 65 years and older
 - ❑ Transportation is the leading cause of injury in ages teenagers and young adults

TBI Severity Levels

- A mild brain injury: Brief, if any, loss of consciousness
- A moderate brain injury: period of unconsciousness up to 24 hours
- A severe brain injury: period of unconsciousness exceeding 24 hours (coma)

Glasgow Coma Scale

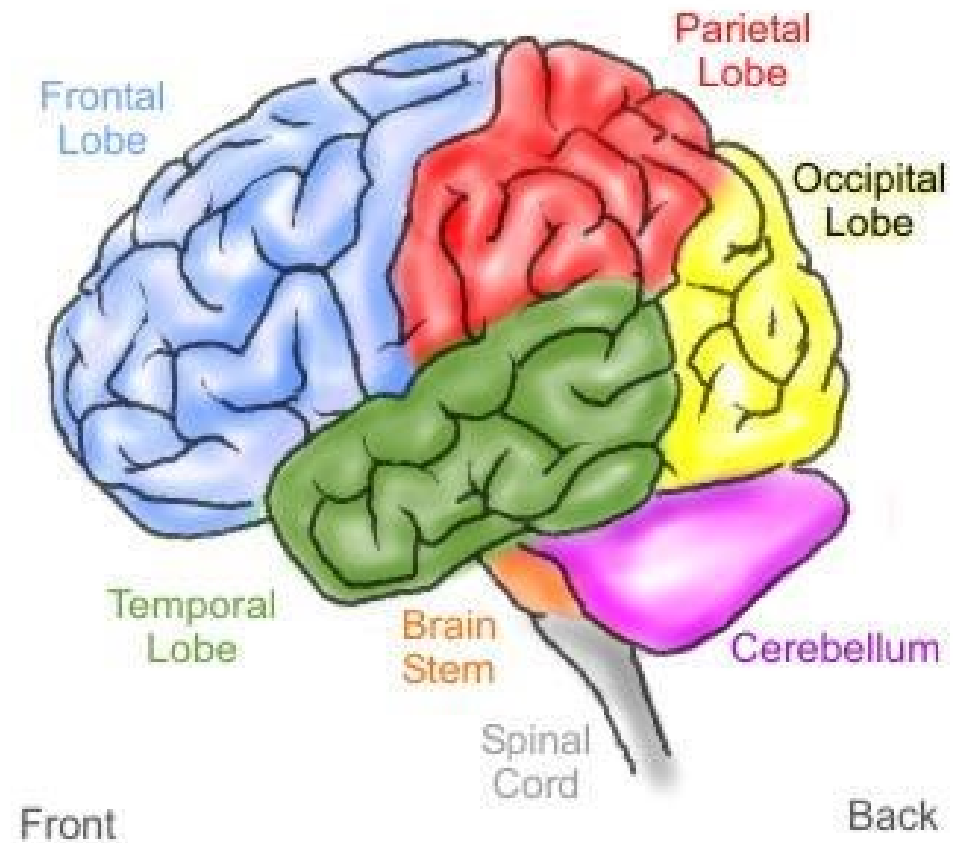
- A score of 13 to 15 correlates to mild TBI
- A score between 9 and 12 correlates to a moderate TBI
- A score below 8 correlates to severe TBI

Behavior	Response
	4 Spontaneously 3 To speech 2 To pain 1 No response
	5 Oriented to time, person & place 4 Confuses 3 Inappropriate words 2 Incomprehensible sounds 1 No response
	6 Obeys commands 5 Moves to localized pain 4 Flex to withdraw from pain 3 Abnormal flexion 2 Abnormal extension 1 No response

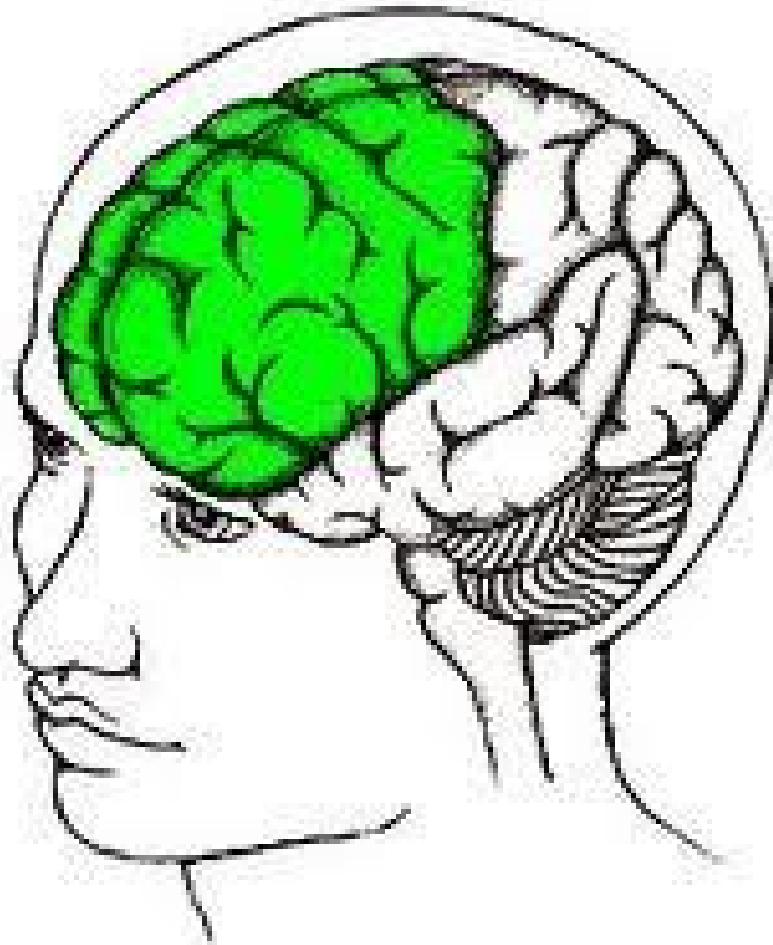
Simple Brain Anatomy and Function

Effects of brain injury are variable and are determined by the part of the brain that is damaged.

Regions of the Human Brain

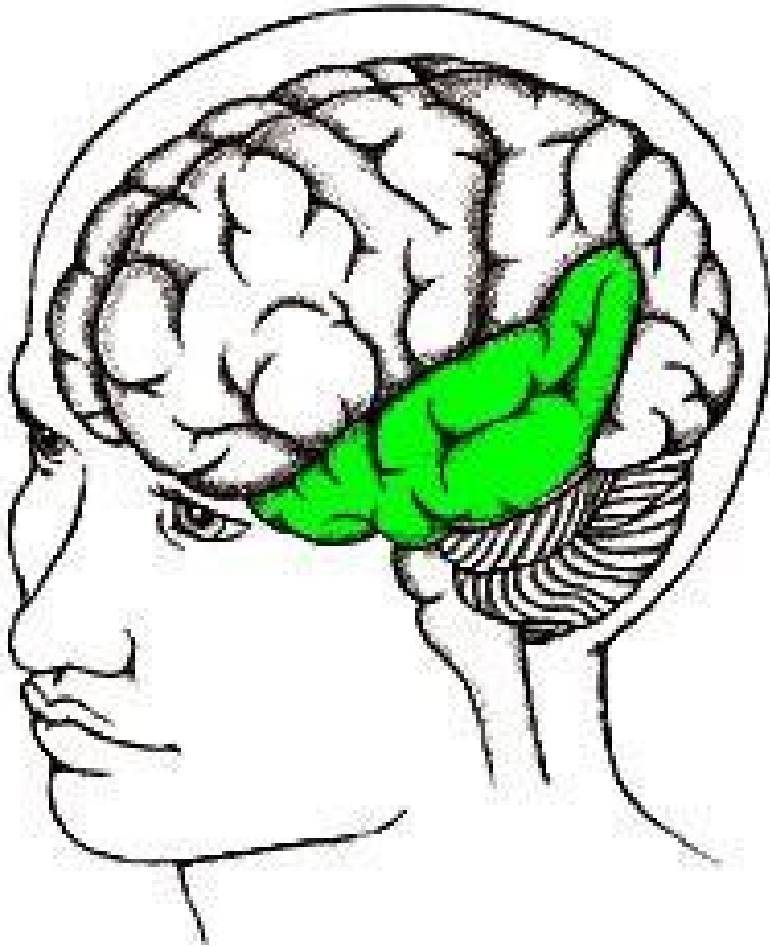


Frontal Lobe



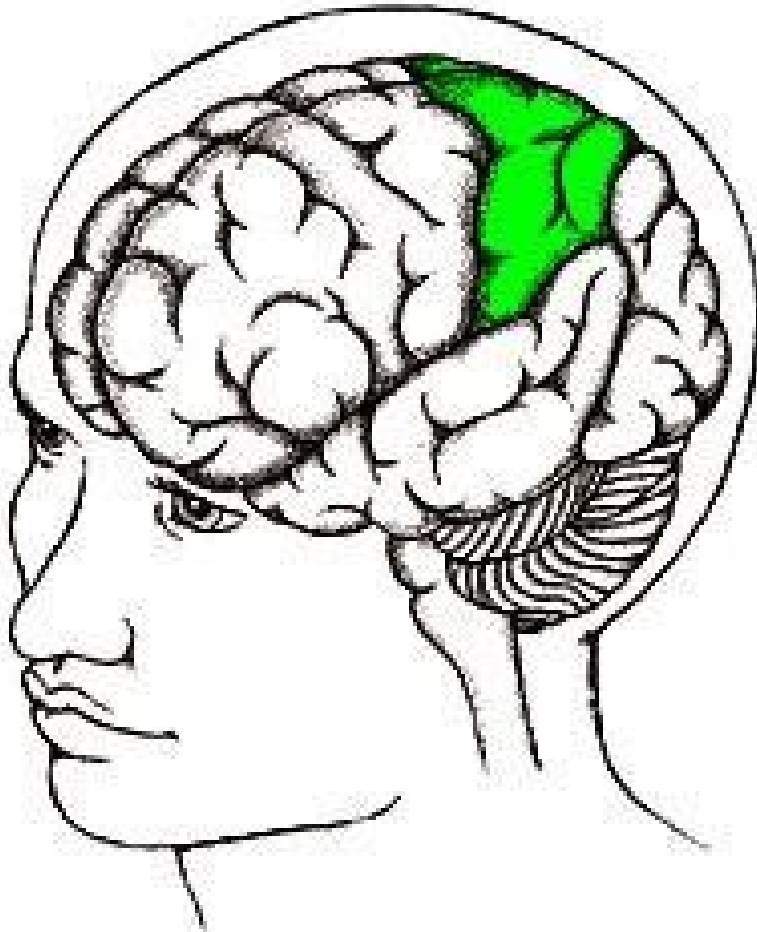
- Reasoning
- Planning
- Organizing thoughts
- Behavior
- Sexual urges
- Emotions
- Problem-solving
- Motor skills
- Verbal Expression

Temporal Lobe



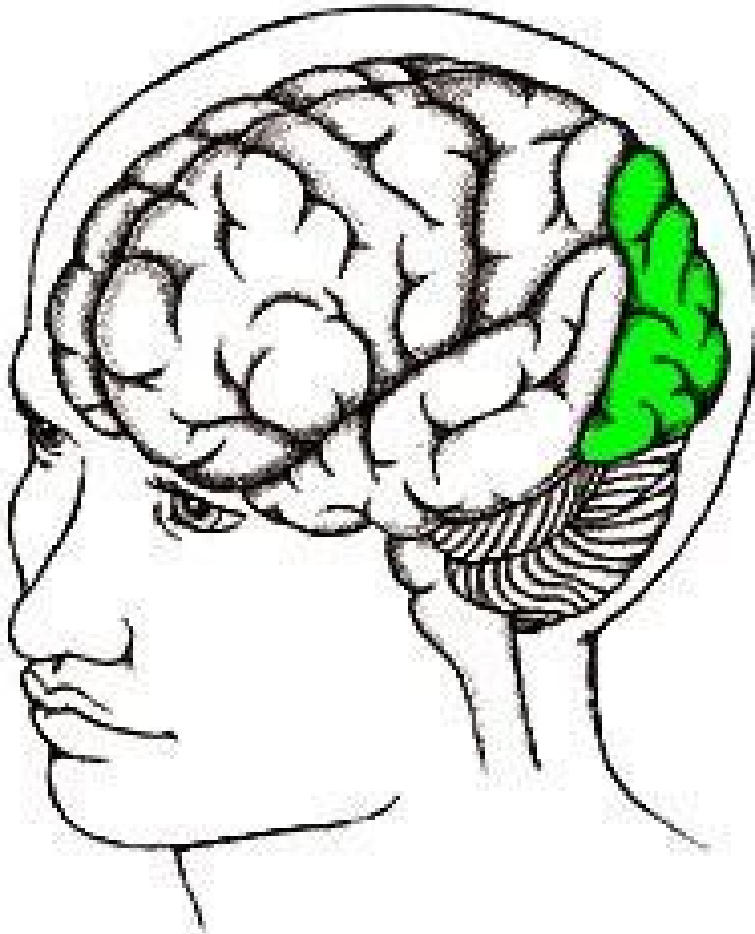
- Visual and verbal memory (hippocampus)
- Language Comprehension
- Emotional Responses
- Facial Recognition
- Selective Memory

Parietal Lobe



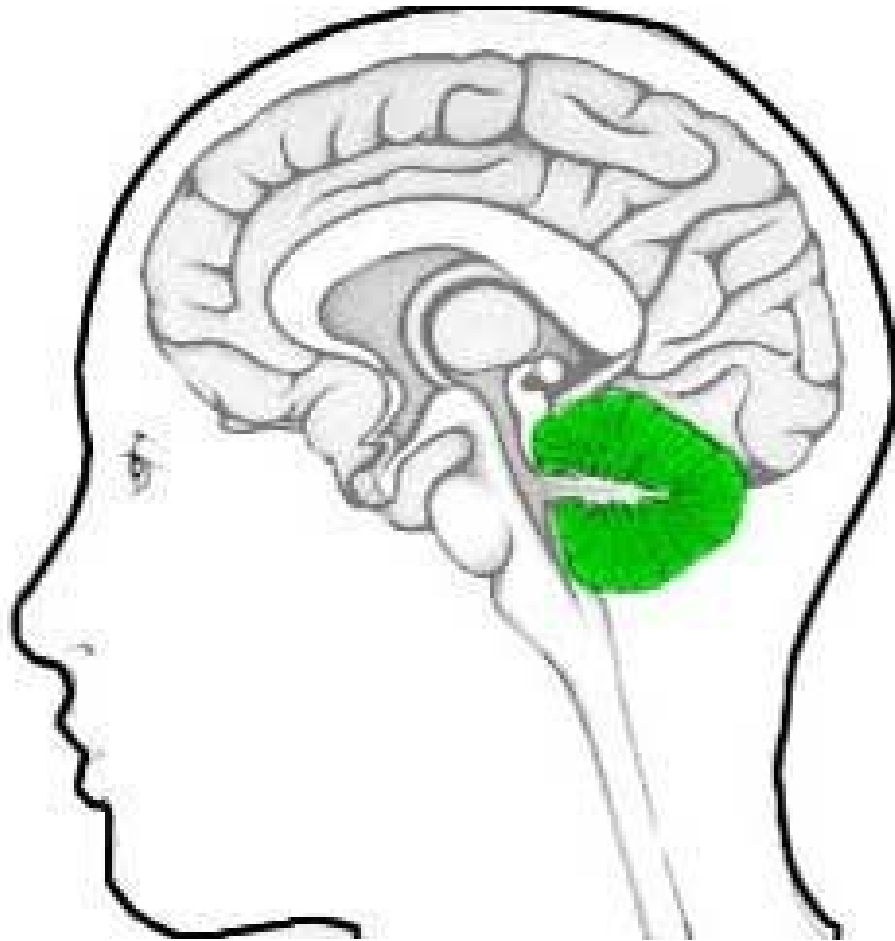
- Information processing
- Visual perception and differentiation
- Tactile Performance
- Spatial orientation
- Object Naming
- Memory
- Eye Hand Coordination
- Self-care
- Self-awareness

Occipital Lobe



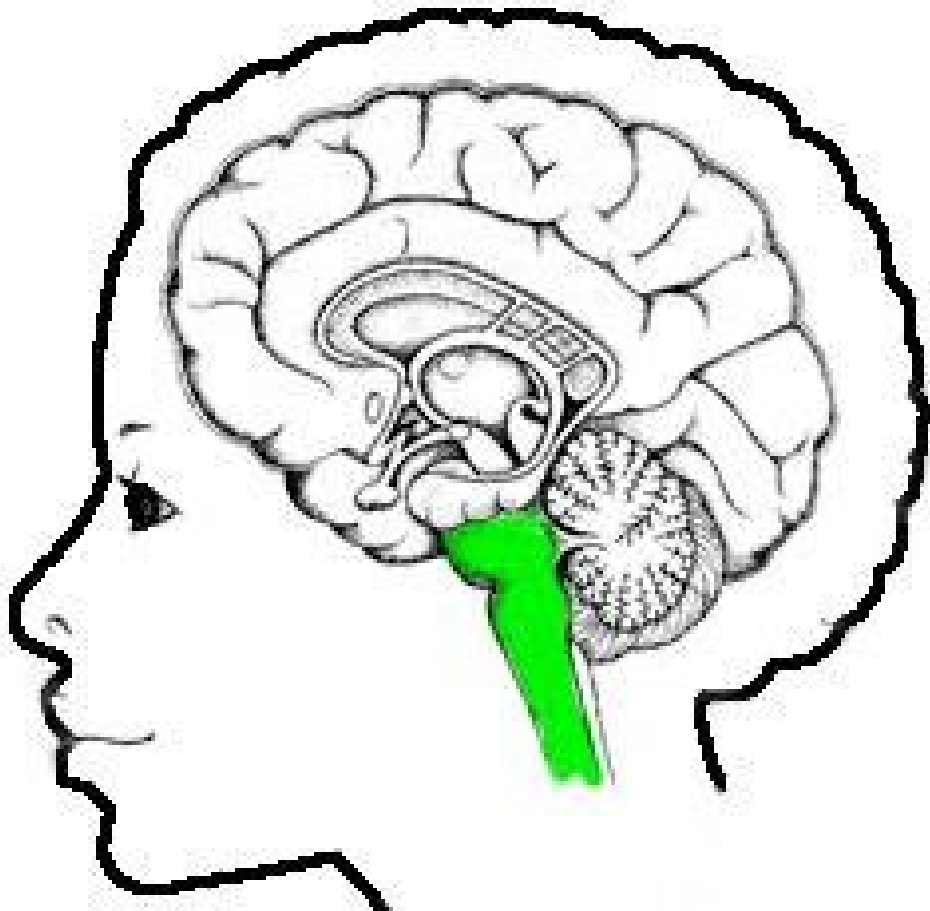
- Visual reception
- Visual-spatial processing
- Movement and color recognition

Cerebellum



- Balance
- Visual Perception
- Coordinating muscle movements

Brain Stem

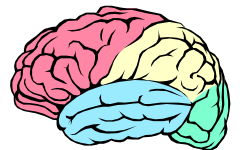
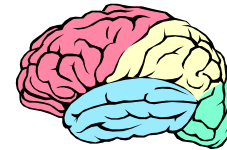
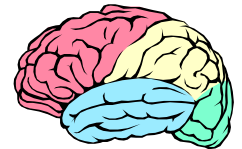
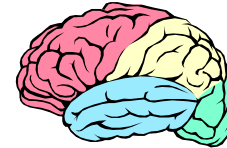
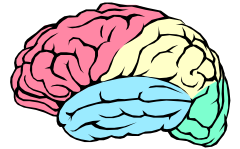


Controls basic life functions:

- Breathing
- Blood pressure
- Heart rate

Common Effects after Brain Injury

- Cognitive
- Physical
- Perceptual/Sensory
- Psychological/Emotional



Cognitive Impairments



May include:

- Attention and Concentration
- Short-term Memory
- Sensory Processing
- Organization
- Problem-Solving/Reasoning
- Executive Function
- Communication and Language

Cognitive Impairments: Attention and Concentration



- Difficulty paying attention
- Longer to organize thoughts
- Affects all other areas of cognition

Cognitive Impairments: Attention and Concentration

Subtypes of Attention	Descriptions	Examples
Focused Attention	Selecting one source of information (i.e., stimulus) while withholding responses to irrelevant stimuli	Responding to pain; Turning to see a loud sound behind you
Sustained Attention	Maintaining attention to complete a task accurately and efficiently over a period of time	Reading a book; Watching a TV show; Listening to a presentation
Selective Attention	Maintaining attention in the presence of distractions	Focusing on the presenter at a conference while ignoring others talking outside; Studying while music is playing
Alternating Attention	Shifting between tasks that demand different behavioral or cognitive skills	Reading a recipe and stirring a pot; Filing and answering the phone
Divided Attention	Requires the ability to respond simultaneously to multiple task demands while maintaining speed and accuracy	Driving and talking on the phone; Cooking multiple courses at the same time

Cognitive Impairments: Attention and Concentration



Strategies

- Minimize distractions
- Reduce demands
- Perform tasks when attention is best
- Take rest breaks as needed
- Break important tasks down into small and achievable steps
- Use a “cover sheet” for focusing attention while reading

Cognitive Impairments: Short-Term Memory



- Difficulty retaining information
- Longer to grasp new ideas
- Repeats questions/stories

Note: difference between
short term memory and *working memory*

Cognitive Impairments: Short-Term Memory

Strategies

Internal Memory Strategies

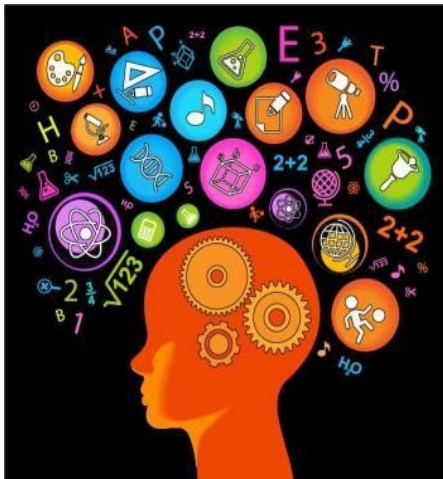
- Repetition
- Visualizations
- Associations, Grouping

External Memory Strategies

- Written information (signs/post-its)
- Calendar
- Memory Book
- Smart Phone

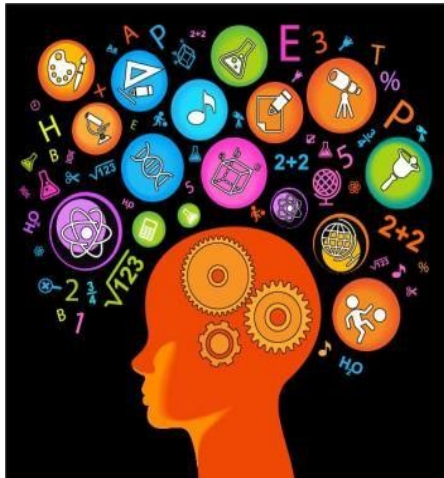


Cognitive Impairments: Sensory Overload



- Difficult to learn
- Distracted easily
- Not able to filter outside voices and movements

Cognitive Impairments: Sensory Overload



Strategies

- Desk partition
- Simplifying environment
- Ear plugs/Noise cancelling headphones

Cognitive Impairments: Organization



- Disorganized surroundings
- Difficulty with relationships
- Difficulty at work
- Confusion and agitation

Cognitive Impairments: Organization

Strategies



- Make the environment as organized as possible
- Labeled drawers, cabinets, labeled storage bins
- Routines very important

Cognitive Impairments: Organization



Strategies

- Break big categories into smaller subsets to help think more clearly (recipes, cleaning the house)
- Make written or picture time line, story sequence
- Daily calendar or cell phone apps
- Before speaking, think first, then follow a mental outline
- Provide transition cues during conversation for the partner

Cognitive Impairments: Problem-Solving/Reasoning



- Difficulty with simple problem solving
- Impairments in sequencing
- Impulsivity
- Not “thinking through” options and consequences

Cognitive Impairments: Problem-Solving/Reasoning



Strategies

- Know strengths and limitations and provide supervision/guidance accordingly
- As long as it's safe, allow for errors and failures
- Impulse control
- Encourage “thinking through” a problem; discourage impulsive thinking

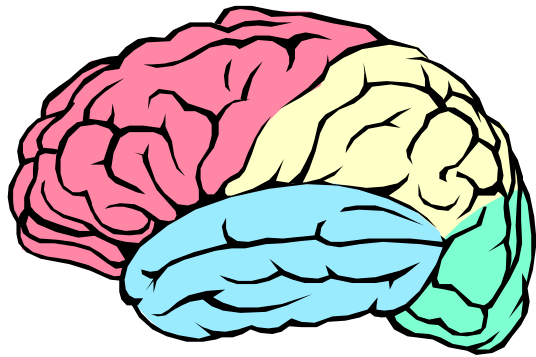
Cognitive Impairments: Problem-Solving/Reasoning

Strategies

- Break large problems into smaller “pieces” and think about it one “piece” at a time
- Forward Chaining

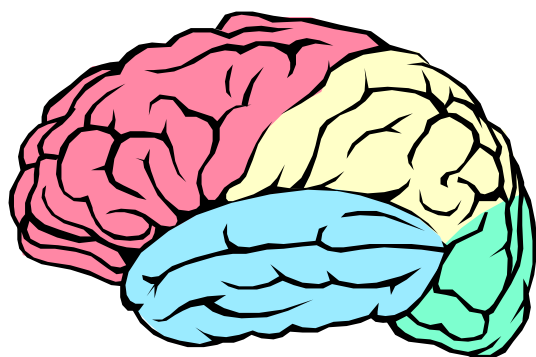


Cognitive Impairments: Executive Function



- Self awareness
- Self monitoring and inhibition
- Impulse control
- Cognitive shift
- Initiation
- Goal setting
- Planning

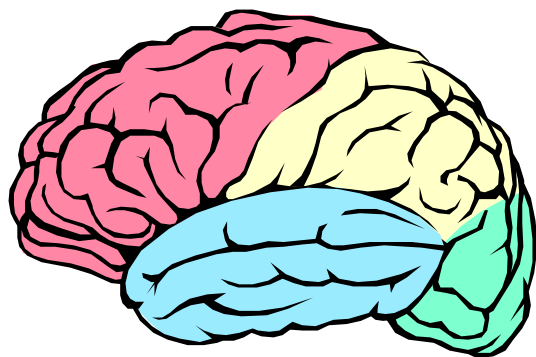
Cognitive Impairments: Executive Function



Strategies

- Awareness Training
- Therapeutically Confrontational
- Impulse Control

Cognitive Impairments: Executive Function



Strategies

- Breaking tasks into smaller pieces that are easier to complete
- Checklists for to-do's and to measure completion
- Goal Setting Training
- Planning

Cognitive Impairments: Communication



- Aphasia
- Oral apraxia
- Dysarthria
- Impairments as a result of attention
- Nerve damage

Cognitive Impairments: Communication



Strategies

- Short, direct sentences
- Eliminate distractions
- Directions presented one at a time
- Allow time for reduced processing speed
- Face the person and make eye contact, use gestures

Cognitive Impairments: Communication



Strategies

- Determine person's best way of communicating
- Slow rate of speech
- Increase volume and pronunciation

Cognitive Impairments: Smartphone Apps



- Scheduling/Organizing
 - Cozi Family Organizer
 - Evernote
 - Pill Monitor
- Financial Management
 - Intuit
 - Mint
 - Count Money

Cognitive Impairments:

Cognitive Retraining Apps/Games

- Dialsafe Pro
- CogniFit
- iMazing
- Matrix Game
- n-Back
- Lumosity (\$5 per month with 2 year subscription)
- Constant Therapy (\$20 per month)
- FitBrains (\$3 per month with 2 year subscription)
- Spaced Retrieval TherAppy (\$3.99)
- AARP.org/stayingsharp



Physical Impairments



- Motor and physical skills
- Endurance/fatigue
- Dysautonomia (Autonomic Storming)
- Pressure Injuries

Physical Impairments



- Sensitivity to light
- Chronic Pain/Persistent headaches
- Seizures

Physical Impairments



- Cardiopulmonary
- Gastrointestinal/Nutritional
- Dysarthria
- Dysphagia
- Bowel/Bladder

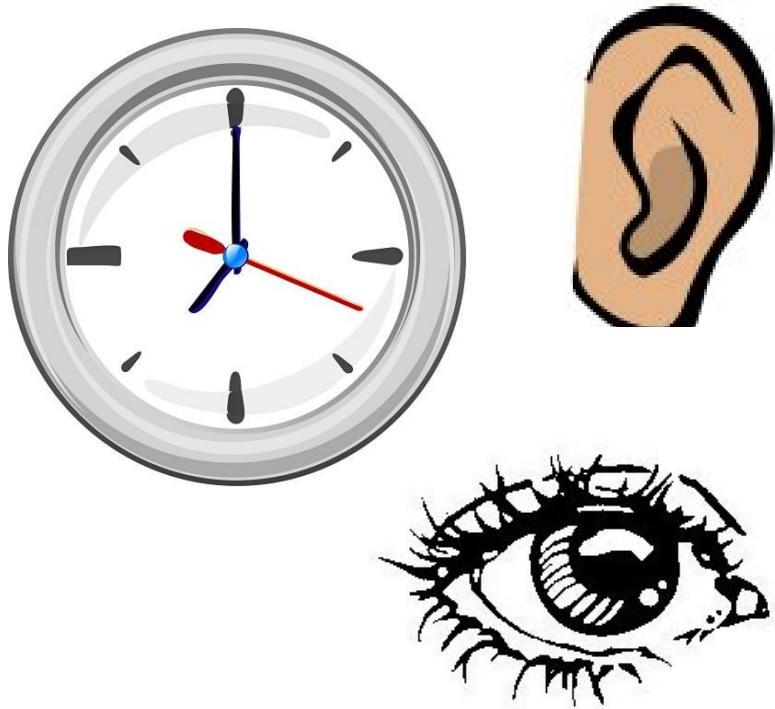
Physical Impairments

Strategies



- Home Safety and Accessibility preparations
- Patient/Family Education
- Energy Conservation/Work Simplification
- Work closely with the medical team to assist with the management of all medical issues

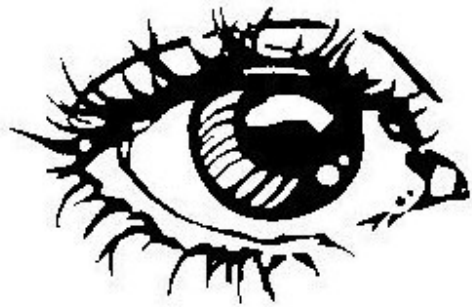
Perceptual/Sensory Impairments



Difficulty with:

- Hearing
- Touch
- Balance
- Time and space orientation

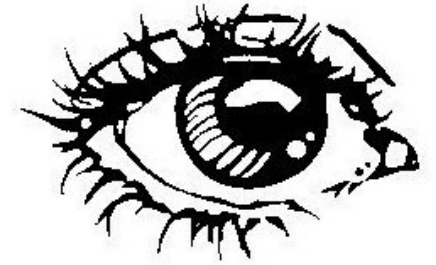
Perceptual/Sensory Impairments



Vision and Perception

- Diplopia
- Visual Field Cut
- Visual Spatial Neglect
- Convergence Disorder
- Visual Midline Shift Syndrome

Perceptual/Sensory Impairments



Strategies

- Education
- Brock String
- Ready Look Touch Back
- Laser Pointer
- Prism Adaptation Treatment
- Prisms
- Bi-Nasal/Partial Nasal Occlusion Taping
- Referral to Neuro-Optometry

Psychological/Emotional Impairments



- Depression/Anxiety
- Emotional and Behavioral Control
- Social Cues
- Personality Changes
- Dependence/Independence
- Self-awareness
- Irritability, Impatience
- Impulse control
- Auditory/visual hallucinations
- Paranoia
- Suicidal thoughts

Psychological/Emotional Impairments: Depression/Anxiety



- Common among survivors
- No set period of occurrence

Psychological/ Emotional Impairments: Depression/ Anxiety



Strategies

- Seek help from physician, counselor, psychologist
- It is important to not ignore symptoms

Psychological/ Emotional Impairments: Emotional and Behavior Control



- Lack of thought of consequences
- Emotional Lability

Psychological/ Emotional Impairments: Emotional and Behavior Control



Strategies

- Patient/Family Education
- Anticipate situations
- Recognize triggers/antecedents

Psychological/Emotional Impairments: Social Cues



- Disinhibition
- Lack of ability to recognize emotions in others
- Lack of conversational turn-taking
- Lack of ability to recognize nonverbal cues from others

Psychological/Emotional Impairments: Social Cues



Strategies

- Simulated community re-entry in structured settings
- Reminders about turn-taking
- Teach and practice social cues

Brain Injury Resources



- Brain Injury Association of Missouri
 - ❑ Support
 - ❑ Education
 - ❑ Recreation
 - ❑ Advocacy
- Brain Injury Association of America



Brain Injury Association of Missouri: Support

- Support Groups
- Information & Referral Service
 - 1-800-444-6443
 - biamo.org

Brain Injury Association of Missouri:

Education



- Survivor and Family Seminars
 - ❑ Southwest
 - ❑ Western
 - ❑ Eastern
- Annual Professional Development Conference
- Sports Concussions Seminars
- Educational Presentation

Brain Injury Association of Missouri: Recreation

- Donald Danforth Jr. Wilderness Camp
- Social Recreational Activities

Brain Injury Association of Missouri:

Legislative Advocacy

- Legislation efforts
- Advocacy Alerts
advocacy@biamo.org

Brain Injury Resources:

Government Programs

- Department of Health and Senior Services
- Department of Mental Health

Brain Injury Resources:

Employment Programs

- Missouri Vocational Rehabilitation
 - ▣ Employment
- Missouri AgrAbility Project
 - ▣ Farming
 - ▣ Ranching

In Summary

- Brain injury ranges in severity and results in a variety of deficits depending on area and nature of damage, as well as the person's premorbid level of functioning.
- Recovery from brain injury can be very difficult and survivors and families often face a lifetime of challenges.
- As clinicians, it is our responsibility to set our clients up with appropriate strategies, assistance and resources in order to allow them to reach their fullest potential.

For More Information, Contact



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**BRAIN INJURY
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Resources

- Missouri Green Book: Living with Brain Injury; Dept of Health and Senior Services. Online version:
<http://health.mo.gov/living/families/shcn/pdf/TBIGuideGreenBook.pdf>
- Brain Injury Association of America
<http://www.biausa.org/>
- American Academy of Certified Brain Injury Specialists Trainer Course
- Padula Institute of Vision Rehabilitation
- Brain Injury Association of Missouri
<http://www.biamo.org>
- Missouri AgrAbility Project
<http://agrability.missouri.edu/>



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