Brain Injury Basics

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An Invisible Epidemic

- 18,000 Ontarians sustain a brain injury each year (<u>www.obia.ca</u>)
- ABI patients have difficulty transitioning out of ALC acute care beds because of psychiatric issues, behavioural needs, medical /nursing needs, and substance use (rank ordered)." (ABI Systems Analysis - Synopsis-ALC and Wait Lists)
- Over half of Toronto's homeless population have suffered a brain injury, with 70 per cent of those sustained prior to living on the street (<u>http://cnw.ca/judi</u>)
- It's estimated 44% of prisoners in Canadian jails have an acquired brain injury (<u>http://biac-aclosca</u>)

ABI System Navigation of Southeastern Ontario

Regional Community Brain Injury Services Service Coordinators

- Accepts Individual Referrals
- Completes Intakes
- Consultation
- Community Connections

System Navigator

- Community Collaboration, Education
- Tracks Needs and Provides Advocacy

"System Navigation

is a function, fulfilled by different roles"

- Community and Health Services
- Providing Services in Areas of Own Expertise or Skill
- Seeks ABI Specific Support as Needed

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Access for All

- System Navigation provides a point of entry for all
- Ensures both clients and service providers have a comprehensive awareness of potential resources
- Ongoing support throughout the referral and needs assessment process to ensure needs are fully met

If you are wondering what to do, give us a call!



THE BRAIN STRUCTURE & FUNCTION



The Structure of the Human Brain

- 200 billion neurons (Nerve cells)
- 1350 1400 grams/ 3 pounds
- Each neuron connects (on average) to 50 other neurons
- Grey matter cell body or nucleus
- White matter connecting fibers (axons and dendrites)



The Structure of the Human Brain

CORTEX Largest part

Controls most thinking functions

Divided into left and right hemispheres as well as four "lobes" (frontal, temporal, parietal and occipital) which are specialized in certain skills or functions.





CEREBELLUM

Responsible for coordination, smoothness of movement.

BRAIN STEM

Life support system of the body Controls consciousness, breathing, blood circulation, swallowing and temperature regulation.

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Protection for the Human Brain Meninges

- Skull
- Meninges
 - Dura Mater
 - Arachnoid
 - Pia Mater
- Cerebrospinal Fluid



Dura mater -- outer layer lining skull Arachnoid (mater) -- contains blood vessels Subarachnoid space -- filled with CSF Pia mater -- covers brain



Function of the Human Brain

Control centre of the body

Receives information, interprets and responds to it.



Function of the Human Brain

- Motor System Brain to Body/Environment
- Sensory System Body/Environment to Brain
- Behavioural State System Brain to Brain
- Cognitive System Monitors, Organizes and Directs the Relationship between the Motor and Sensory System

Larry W. Swansor Brain Architecture

INJURY TO THE HUMAN BRAIN



Acquired Brain Injury:

Damage to the brain, which occurs after birth and is not related to a birth disorder or a progressive disease such as Alzheimer's disease or MS. The injury may be caused by a violent movement of the head (traumatic) or non-traumatic cause (e.g. tumour). A mild traumatic brain injury can occur even without the loss of consciousness although a brief loss of consciousness is common.



Acquired Brain Injury

Traumatic Brain Injury:

- Motor vehicle accident
- Falls
- Blunt impact
- Penetrating injury

Medical Etiology (non-traumatic):

- Stroke
- Hemorrhage/Aneurysm
- Tumour
- Infection
- Anoxia



Severity of Injury Related to:

Length of loss of consciousness (LOC) or post-traumatic amnesia (PTA)

Glasgow Coma Scale (GCS):

- Three categories: eye opening, best motor response, verbal response
- Scoring ranges from 3 to 15
- Measure of impaired consciousness in traumatic brain injury

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Severity of Injury

Severe: LOC and/or PTA > 24 hours, GCS: 3-8

Moderate: LOC and/or PTA > 30 min, <24 hours GCS: 9-12

Mild: LOC and/or PTA <30 min, GCS 13-15



Consequences of Injury to the Human Brain

- Motor strength, coordination, speed, balance
- Sensory sight, hearing, touch, proprioception, taste, smell, balance
- Cognition language, visual-spatial, attention, memory, processing speed, executive function
- Behaviour/Emotion strength, stability,



Recovery from Human Brain Injury

- Begins within 24 hours and continues for a lifetime.
- Brain chemistry returns to normal.
- Injured neurons sprout and establish new connections.
- Uninjured areas of the brain take over injured areas.

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Factors which affect Recovery

- Age
- Health
- Nature and extent of injury
- Quality of early medical care
- Length of coma
- Amount of time since injury
- Pre-injury personality and level of functioning
- Recovery is not enough; rehabilitation and support are also needed.



CONSEQUENCES OF INJURY TO THE BRAIN



Motor System Deficits:

- Weakness or paralysis
- Decreased control of movement
- Decreased balance
- Changes in muscle tone high or low tone
- Decreased range of motion
- Decreased endurance and strength
- Fatigue
- Perseveration of movement



Problems related to the Sensory System

- Visual difficulties
- Hearing difficulties
- Dizziness
- Pain



- Proprioception judging your body's movements
- Altered sensations of pressure, temperature, touch, taste and smell



PROBLEMS RELATED TO PERCEPTION

Perception is the integration of sensory impressions into psychologically meaningful information.

It is how we understand and move through our daily world.





Perception Difficulties:

- Awareness/understanding of where the self is in relation to objects in the environment.
- Judging shape and size of objects.
- Judging depth and distance between objects and between objects and self.
- Understanding the concepts of right and left.
- Ability to distinguish the foreground or object from the background.
- Ability to find one's way from one place to another.
- Attending to all aspects of a task or object.
- Giving equal attention to all parts of the environment.
- Scanning the environment in an organized manner.



COGNITIVE SYSTEM





Attention

Paying attention is:

- Being able to listen or watch
- Concentrating, remain focused over time
- Doing more than one thing at a time
- Simple, complex, sustained or selective



Problems with Attention

- Difficulty in stimulating environments
- Distractible
- Trouble returning to task when interrupted
- Cannot do more than one thing at a time
- Cannot concentrate for long periods of time

How can you keep someone's attention? How can we focus our own?



Strategies for Attention

- Reduce level of stimulation
- Stay organized
- Do one task at a time
- Finish what you are doing before starting something else
- Get enough rest
- Take frequent breaks
- Avoid interruptions
- Work slowly
- Have others write things down





Memory

Memory is:

- Ability to remember things we see and hear
- Ability to recall things that have happened in the past
- Remembering to do things in the future
- Ability to learn new information





Problems with Memory

- Easily losing things
- Getting lost easily
- Lose track in conversations easily
- Forgetting important appointments or social outings
- Losing track of things to do in the future
- Not remembering if completed tasks that you started
- Takes longer to learn new things

Got any good memory tricks or tips?



Strategies for Memory

- Always keep things in the same place
- Keep important information together
- Use maps or written directions
- Carry a notebook to write things down
- Use a journal/calendar to keep track of appointments and dates
- Keep a schedule and plan ahead
- Develop routines and keep following them
- Have others repeat information or summarize it in writing
- Keep checklists and check things off when complete
- Use stick-it notes or signs to remind you of things to do



Executive Function

- Abilities that include planning, organizing, monitoring, initiating and sustaining performance
- Executive function requires attention
- It includes the ability to use imagined future consequences to guide present behaviour
- Executive function is the last of the cognitive abilities to mature



Executive Function

Executive Function is:

- Initiating getting started
- Sustaining keeping going
- Planning
- Organizing
- Self monitoring
- Self evaluating
- Getting realistic goals
- Judgment





Problems with Executive Function

- Have lots of ideas and things to do but cannot get started on them or finish them
 - Feeling disorganized and overwhelmed
 - Being unprepared for appointments and activities
 - Make mistakes without knowing it

- Make mistakes because working too quickly
 - Describe yourself differently than others do
 - Difficulty solving problems/making decisions
 - Set goals that you are unable to keep



Strategies for Executive Function

- Make "to do" lists, and check them off as you complete each task
- Use a schedule to keep track of activities
- Write a step by step plan for goals
- Set goals daily, weekly and yearly that are realistic and attainable
- Review goals frequently to update them
- Use a guideline for problem solving and decision making
- Stop and think before you do or say anything
- Work slowly and carefully
- Ask yourself "how am I doing?"
- Be open to feedback from others



Communication:

Aphasia (8% of people)

- Reduction in abilities of listening, speaking, reading and writing.
- Often know what they want to say, but have trouble putting the right words together
- Difficulties related to language content, form and use.
- "Communicate better than they talk"



Cognitive-Communicative Problems (90 + %)

- Reduction in abilities related to use of language (verbal/non-verbal)
- Related to cognition; If you have difficulty organizing your thoughts, your speech will be disorganized as well.
- Typically diffuse/widespread damage.
- "Talk better than they communicate"



Problems related to Communication

- Beginning a conversation
- Keeping a conversation going
- Ending a conversation
- Digress off topic or lack continuous flow of thoughts
- Ideas limited, unable to elaborate
- Not following socially accepted rules
- Poor turn taking skills
- Decreased active listening skills
- Difficulty finding right words
- Difficulty recognizing/using body language
- Lack or inappropriate facial expression
- Tone of voice



BEHAVIOURAL & EMOTIONAL SYSTEM



Strategies for Behavioural and Emotional Problems

Two ways: Changes to the Person and the Environment

Personal Changes through education and counselling to:

- Build self-esteem and recognize strengths
- Increase self—awareness
- Develop, encourage and support use of compensatory strategies.
- Take time to get used to "new" self and grieven the old self



Strategies for Behavioural and Emotional Problems

- Look at Environmental Factors:
- Precipitating events
- Triggers
- Your interactions (including verbal and non-verbal communication)
- Level of stimulation is it too loud, too busy, or gone on too long?
- A need for more structure and support



As if things weren't complicated enough...

- People don't only experience the consequences of brain injury, they react to those consequences.
- Depression, anger and frustration are all common.
- Drug and alcohol abuse are risks, especially if present before the injury.

But remember: Despite all the labels and diagnoses, these are people with normal wants and dreams.

By being patient, supportive and respectfu make a difference each day!



Your Chance to Share

- What experiences have you had in working with those with a brain injury?
- What did you find most challenging?
- How did you adjust the way you work to accommodate the deficits?
- Were there difficulties you weren't sure how to handle?





Questions? Comments?