Epilepsy and Neuropsychology

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Neuropsychology

- Specialty area of professional psychology concerned with learning and behaviour in relationship to the brain
- Primary clinical activities include assessment and consultation, occasionally treatment
- Related to but distinct from Clinical and School Psychology specialties

Neuropsychological Assessment

 To evaluate functions and skills associated with thinking and behaviour

 To measure and track abilities and disabilities in people with brain-related illness or injury

 To assist in identifying what part of the brain is affected by the illness or injury

 To assist in planning and evaluating treatments for people who have brain-related illness or injury

Neuropsychological Assessment

- Intelligence
- Attention
- Executive Function
- Language
- Visual Processing
- Learning and Memory
- Sensorimotor Skills/Fine-motor Skills
- Emotional and Social Behavior

Epilepsy and Thinking Functions

- •Type of seizure or epilepsy syndrome
- ·Location of seizures in the brain
- •Frequency and severity of seizures
- ·Length of illness
- Medication

The best predictor of the type or severity of thinking problems is the underlying cause of the seizures

Brain Areas and Seizures



Types of Thinking Problems Commonly Seen in Epilepsy

- Attention
- Executive Functions
- Learning and Memory
- Speed of Processing and Output
- Information Processing

Attention Problems in Epilepsy



Attention Problems in Epilepsy

- May be present in as many 40 60% of children with epilepsy
- Prevalence in adults is not well-established
- Problems can be seen in all areas of attention

 Seizures of frontal or temporal lobe origin have a high chance of causing attention problems

Executive Functions

Initiation (starting) Inhibition (stopping) Persistence (sustaining) Sequencing

Organization Planning Monitoring

Switching / Shifting

Executive Functions:

Assigns / Delegates Allocates Resources Prioritizes Evaluates Makes Decisions Develops Strategy



The CEO of the Brain

Executive Thinking Problems

- Difficulty getting started on tasks
- Difficulty finishing projects
- Impulsivity
- Messy
- Losing track of belongings
- Trouble multi-tasking
- Trouble working efficiently
- Procrastination

Attention and EF Are Controlled By the Frontal Lobe



Why are problems with Attention and EF Common in Epilepsy?

 Frontal Lobes are still developing into early adulthood

 Frontal Lobes have a lot of connections with other parts of the brain

 Problems with Attention and EF are also caused by fatigue, medication effects, depression, anxiety

Problems with Attention and EF undermine all other aspects of thinking

Learning and Memory

Types of memory

Procedural: Implicit memory of how to do things Episodic: Memory for events Semantic: Memory of general knowledge Autobiographical: Memory of personal events Working Memory: Very short-term memory

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How A Memory Is Formed

1) Encoding - Creating a new memory

2) Storage - Putting the memory into storage

3) Retrieval - Finding the memory at a later time

Forgetting - Decay of a stored memory over time

What Influences Encoding?

- Attention and Executive Functions
- Ability to understand the material presented
- The speed at which the information is presented and the amount of information presented
- Fatigue, Depression, Low Motivation

What Influences Storage?

- Sleep
- Seizures
- Hippocampus

Neuroanatomy of Memory



Neuroanatomy of Memory



Material-Specific Memory

LEFT Hippocampus

Language-based Memories (Verbal Memory) RIGHT Hippocampus

Picture-based Memories (Visual Memory)

What Influences Retrieval?

- Free Recall vs. Recognition
- Attention and Executive Functions
- Context
- Cues

Strategies for Attention and Executive Functions

- Increase structure and follow routines
- Clarify expectations and make sure they are reasonable
- Break big projects down into smaller parts and do a little bit at a time
- Apply organization strategies
- Give yourself extra time to get things done

Strategies for Learning and Memory

- Make it interesting
- Make it contextual: Relate it to something meaningful
- Rehearse, Repeat exposure, Practice
- Use mnemonic cues: rhymes, acronyms
- Visualization
- Pace yourself: Don't try to learn too much at a time
- Be active in your learning; don't assume you'll remember

Memory strategies only work if you use them!!

EF Strategies that Can Help Encoding

- Avoid multi-tasking, Minimize Distractions
- Pace yourself: Don't try to learn too much at once
- Be active in your learning; don't assume you'll remember

EF Strategies that Can Help Retrieval

- Keep a journal or use an electronic organizer
- Keep lists of things to do
- •Write down important information in a notebook or use a voice recorder

General Strategies for Optimal Thinking

Relax: Reduce your stress
Get a good night's sleep
Eat nutritiously
Exercise regularly

The End Thank You!