Brain-based disorders in children, teens, and young adults: When to know there is a problem and what to do

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What is Neuropsychology?

- The study of how the brain affects behavior
- The study of how brain damage (or other brain conditions) and developmental conditions affect cognitive functioning
- The study of how behavior affects the brain (or of how psychological conditions can affect cognitive functioning)
Spectrum of Neuropsychology

- Personality
- Mood
- Behavior
- Language
- Memory
- Attention
- Executive Function
- QOL Social Function
- Visuo-spatial

Neuropsychological Function
Key Factors of a Neuropsychological Battery

- Objective cognitive instruments
- Objective and projective personality/psychopathology tests
- Established norms
- Quantification
- Standardization
- Reliability and Validity
- Patterns of results
COGNITIVE DOMAINS ASSESSED IN A CONCUSSION BATTERY

- Attention
- Learning and Retrieval (Memory)
- Information processing speed
- Visuospatial perception
- Executive Function
- Language/Verbal Skills
Report of Data

- Referral question
- Current complaint
- Background history
- Procedures
- Results (Standard Scores)
- Discussion and Conclusion
3 common conditions that affect cognitive functioning in children, teens, and young adults

- Attention-deficit/hyperactivity disorder (ADHD)
ADHD

Diagnostic Criteria:

- 6 or more symptoms of inattention:
  - Poor attention to detail
  - Poor sustained attention
  - Poor task completion
  - Poor organization
  - Procrastination
  - Distractibility
  - Forgetfulness

- 6 or more symptoms of hyperactivity/impulsivity:
  - Fidgeting
  - Leaving one’s seat
  - Behaving as “driven by a motor”
  - Excessive talking
  - Interrupting
  - Difficulty waiting one’s turn
ADHD

“Current Presentations”:
- Combined
- Predominately Hyperactive-Impulsive
- Predominantly Inattentive

Purely behavioral diagnostic criteria

NP testing can still be helpful:
- Differential diagnosis for several other conditions that can present as behaviorally similar to ADHD
- Identification of cognitive impairment and areas in need of remediation
Patterns of Cognitive Findings

- **Attention** – usually affected by ADHD, though perhaps not in testing environment
- **Learning and Memory** – typically learning affected by due to limited capacity typically consolidate and retrieve what was learned
- **Language** – no consistent deficit pattern
- **Executive Functioning** – deficits in flexible attention, working memory, problem solving, and inhibition (affecting planning and organization)
- **Visuospatial Functioning** – no consistent deficit pattern
- **Psychomotor speed and dexterity** – usually spared
- **Psychological functioning** – reduced motivation, irritability, emotional lability, impulsivity, poor emotion regulation
3 common conditions that affect cognitive functioning in children, teens, and young adults

- Attention-deficit/hyperactivity disorder (ADHD)
- Specific Learning Disorder (SLD)
Performance on a standardized measure of the academic skill in question is substantially below the level expected relative to the person’s age.

- Diagnostic specifiers are added to indicate the problem area(s).
SLD

- Most common SLD is Dyslexia
  - Problems with accurate and/or fluent word recognition
  - Problems with spelling and decoding (pronouncing nonwords)
- Phonological processing deficits are core cognitive difficulties
  - Poor phonological awareness (ability to identify and manipulate phonological parts of words)
  - Poor naming speed (difficulty rapidly retrieving basic names such as letters, numbers, colors, objects)
Patterns of Cognitive Findings

- Attention – can be affected due to high comorbidity with ADHD
- Learning and Memory – no consistent deficit pattern
- Language – test visually and orally skills such as single-word and non-word reading, fluency, spelling, PA, RN and comprehension
- Executive Functioning – can be affected due to comorbidities
- Visuospatial Functioning – no consistent deficit pattern
- Psychomotor speed and dexterity – no consistent deficit pattern
- Psychological functioning – can be affected due to comorbidities
3 common conditions that affect cognitive functioning in children, teens, and young adults

- Attention-deficit/hyperactivity disorder (ADHD)
- Specific Learning Disorder (SLD)
- Traumatic Brain Injury (TBI; aka concussion)
TBI

- Alteration in brain function or other evidence of brain pathology caused by an external force
  - Loss of consciousness or altered mental status
  - Pre- or post-traumatic amnesia
  - Neurologic deficit
- Coup and contra-coup injury
- Diffuse axonal injury
- Common causes
  - Transportation falls
  - Assaults Sports
Patterns of Cognitive Findings

- Attention – usually affected by TBI
- Learning and Memory – typically learning affected by TBI, not necessarily consolidation, frequent retrieval deficit
- Language – typically spared except for fluency of language
- Executive Functioning – often implicated due to frontal-lobe involvement; reasoning, flexible attention, working memory, problem solving
- Visuospatial Functioning – result varies, can help detect ocular deficits
- Psychomotor speed and dexterity – usually affected by TBI
- Psychological functioning – increased anxiety and/or depression, apathy, irritability, emotional lability, impulsivity, poor emotion regulation, emotional detachment
When to refer

- Behavioral symptoms present?
- Academic performance not as expected?
- Difficulties with studying and test taking?
- Self-esteem being impacted by school struggles?
- Physical or cognitive problems persist after an injury?
- One subject or class causing real trouble?
- School just seem too tough?
Cognitive rehabilitation strategies can be divided into two broad categories:

1) Those that are compensatory in nature and seek to bypass deficits in cognitive function, and

2) Those that are restorative in nature and seek to improve basic cognitive processes.
Academic Accommodations

What are the most common in-classroom cognitive complaints/difficulties?

- Attention/concentration deficits
  - Drifting during lectures
  - Reduced sustained attention
  - Difficulty concentrating on dense/difficult material
  - Restlessness

- Memory dysfunction
  - Reduced learning ability and efficiency
  - Difficulty recalling previously learned/studied information
  - Short-term forgetfulness (e.g., homework assigned, due dates, etc.)
  - Forgetting conversation details
Academic Accommodations

- What are the most common in-classroom cognitive complaints/difficulties?
  - Reduced multitasking ability (e.g., managing auditory and visual stimulation)
  - Confusion about instructions
  - Reduced thinking/processing speed
  - Word-finding problems
  - Feeling less able to perform tasks
  - Difficulty reading
  - Difficulty with mathematics
Academic Accommodations

- What are the most common in-classroom emotional complaints/difficulties?
  - Change in social roles, identity, and self-esteem
  - Change in relationships with coaches, teachers, peers
  - Increased stress and emotional reactivity in the case of acute injury:
    - Lingering trauma due to uncertainty around injury, especially if LOC or pre/post trauma amnesia
    - Poor adjustment to change in abilities
    - Poor emotion regulation as direct symptom of injury
Academic Accommodations

- What are the most common in-classroom somatic complaints/difficulties?
  - Headache and other injury-related pain
  - Dizziness
  - Vertigo
  - Vision and/or hearing problems
  - Photophobia
  - Phonophobia
  - Insomnia/daytime fatigue
  - Medication-related side effects
Academic Accommodations

- Common accommodations include:
  - Gradual re-introduction to class attendance after injury
  - Gradual re-introduction to homework/assignments after injury
  - Extra time to complete assignments
  - Test taking in separate locations
  - Extra time for tests
  - Assistance (computers/calculators) during tests/classwork
  - Limited exposure to computer screens or flashing/bright presentations
  - Note-taking service/provision of lectures prior to class
  - Preferential seating in classroom
  - Permission to take breaks as needed
Conclusions

- Neuropsychological assessment provides valuable information regarding one’s cognitive and psychological functioning
- Psychological distress can exacerbate cognitive problems
- There are numerous treatment options for cognitive problems and co-morbid psychiatric disturbance.
- Use of individual-specific treatment strategies, including cognitive rehabilitation, can maximize cognitive recovery from a head injury
- Accommodation plans have to be tailored to each student and communication key