Implications of Pediatric Brain-Related Disorders for the Clinical Psychologist

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What is Clinical Neuropsychology?

- Application of knowledge of brain-behavior relationships to understanding of problems in functioning (i.e., disorders in behavior or learning).
- Specialized methods of assessment, intervention, and research.
- Integration of assessment findings with medical/neurological data, psychosocial data, research literature in the neurosciences.
- Interpretation of findings in light of social, cultural, and ethical considerations.
Assumptions of Neuropsychological Assessment

● Multiple levels of analysis adds to understanding of behavior or learning problem: brain → cognition → function
● Types of underlying abnormality in brain and cognition help account for different types of functional problems.
● Contextual factors must also be taken into account (adjustment, motivation, learning history, current stresses and resources).

Brain-Related Disorders in Children

● Genetic and neurodevelopmental: Down Syndrome, Fragile X, Neurofibromatosis, Turner’s Syndrome, learning disabilities, ADHD, autism
● Perinatal insult: preterm birth, hypoxic ischemic encephalopathy, perinatal stroke, toxic exposures like fetal alcohol syndrome (FAS)
● Post-natal insult: traumatic brain injury (TBI), brain tumors or infections, stroke
● Medical conditions leading to brain insult: sickle cell disease, heart or kidney disease, radiation for leukemia
Relevance of Neuropsychology for Clinical Assessment and Therapy with Children

- Knowing about a brain disorder can suggest a possible cause and may point to a particular type of behavior problem.
- Knowing that there is a brain disorder may suggest the need to look out for other problems (e.g., in cognition).

Relevance--Continued

- Some forms of psychopathology are associated with cognitive deficits (e.g., ADHD with deficits in executive function; bipolar disorder with deficits in verbal memory and executive function).
- The behavior problems and co-existing deficits associated with a brain disorder helps guide treatment approaches.

Image courtesy of Dr. Frank Gaillard, Radiopaedia.org
Child with Extremely Preterm Birth

Implications of Preterm Birth

- Higher rates of ADHD-Inattentive, internalizing, poor social competence; learning disabilities especially in math; and deficits in executive function, perceptual-motor skills, and memory.
- Behavior problems may be related to cognitive deficits and learning difficulties.
- Important to consider all deficits in planning treatment and making recommendations (e.g., need for structure, special education, work on social competence).
Implications of Fetal Alcohol Syndrome (FAS) in Adoption Case

- Higher rates of ADHD, co-morbid learning difficulties and deficits in attention, executive function, memory.
- May explain slower than expected progress and limited response to typical interventions.
- Consider deficits in treatment planning--e.g., intensive special education, need for structure, modification in parent expectations.

Brain Regions Susceptible to Traumatic Brain Injury (TBI)

- **Frontal lobe**: executive function, behavior modulation, social-emotional perception and regulation
- **Temporal lobe**: memory and learning
- ** Corpus callosum and other white matter**: executive and visual-perceptual functions
- **Midbrain**: attention and arousal
### Implications of TBI

- Attention problems, poor behavior self-regulation, social problems; persistent deficits in executive function and memory; may have depressed mood.
- Behavior problems may be related to cognitive deficits by may also be direct result of injury to "social-emotional" brain regions.
- Consider deficits in educational planning and in approach to therapy (e.g., need for structure, accommodations, family interventions).

### Challenges in Evaluating Effects of Brain-Related Disorders in Children

- Often don’t know child’s brain status so have to make interpretations based on child’s history and assessments of behavior and cognition.
- Need to consider how environmental factors interact with brain-related disorders.
- Outcomes variable and related to severity of disease, risk and protective factors, and age (some problems becoming more or less pronounced over time).
Recommendations

- Inquire about developmental, neurological, and educational history so increase awareness of possibility of brain-related disorder; also be on look-out for emerging brain disorder.
- Consider possibility that cognitive deficits may contribute to behavior disorders.
- Develop working knowledge of principles of neuroanatomy and have access to texts on childhood genetic and acquired brain disorders.
- Consider cross-referrals with neuropsychologists.