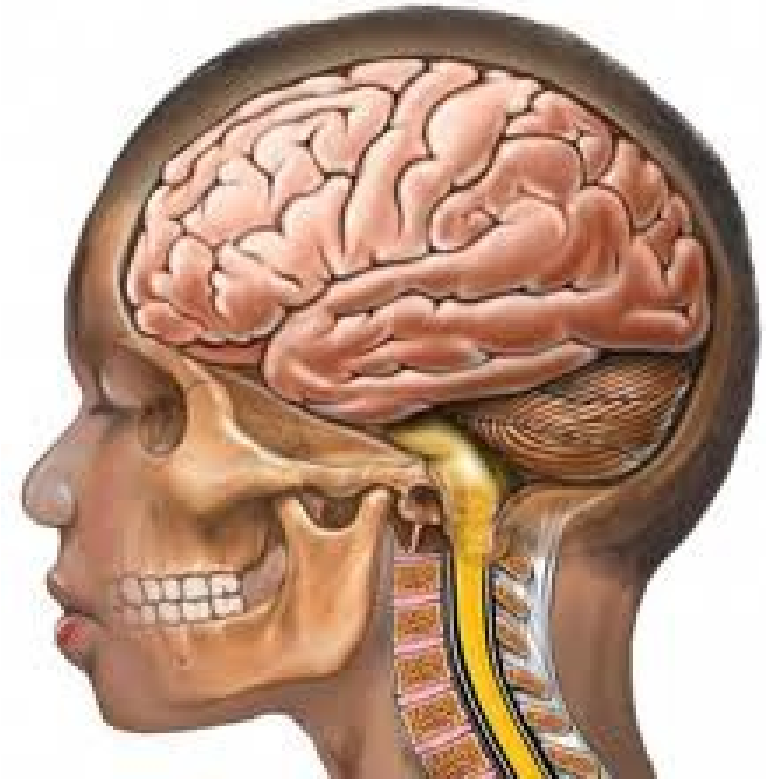
Neuropsychological Assessment with Children: Who, What, When, Where and Why?



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Objectives

- Who: To identify the expertise and background training of a clinical neuropsychologist
- What: Discuss the process of a neuropsychological assessment and its utility in clinical care
- When/Why: Discuss when a neuropsychological assessment might be indicated and the questions that can be answered by the assessment
- Where: Provide references for finding a neuropsychologist in your region
- Discuss a case example to exemplify the neuropsychological assessment process and how data can be interpreted and utilized.

Who is a Neuropsychologist?

- A neuropsychologist holds a doctoral level degree such as a Ph.D. or a Psy.D.
- Ph.D. degrees are earned in a Clinical or School Psychology program, with emphasis in neuropsychology (e.g. coursework, practica).
- Graduates of both types of degree programs are required to complete a 1 year clinical internship, often with a focus in neuropsychology.
- To further specialize in neuropsychology, a two year post-doctoral residency/fellowship in neuropsychology is required.
- Neuropsychologists might also be board certified (e.g. ABPP-CN), but this is not a requirement to practice as a neuropsychologist.

Who is a Neuropsychologist?

- Neuropsychology is the study of brain behavior relationships (i.e. how brain function relates to thinking and behavior).
- A pediatric neuropsychologist has knowledge in brain/cognitive development, brain organization, and the effects of various types of brain injuries (either acquired or congenital) on functioning.
- A pediatric neuropsychologist administers standardized tests and observes a child's behaviors in order to define a pattern of the child's cognitive functioning and identify areas of strengths and weaknesses.

What is a neuropsychological Assessment?

- The purpose of a neuropsychological (NP) assessment is to determine the current level of cognitive (i.e. thinking) functioning in the child and how this might impact them in every day life, and to provide recommendations to help the child improve daily functioning (particularly with schoolwork).
- NP assessment consists of several components:
  - Review of medical/school records by the neuropsychologist.
  - Clinical interview with parent and child to determine current concerns, history and goals of parents/child.
  - Neuropsychological test administration
  - Scoring and interpretation of test results
  - Feedback appointment with parents to discuss results and neuropsychologist's impressions (e.g. diagnoses, recommendations).
  - Neuropsychologist completes a comprehensive test report which is given to the parents (and usually to the referring provider as well).
- NP assessment is usually a whole day process which requires the child to miss school (test administration alone can take anywhere from 2-5 hours).

Components of NP Evaluation

Review of medical/school records by the neuropsychologist

- Provides neuropsychologist with background information with regards to medical history (e.g. birth/development history, surgeries, medical diagnoses, previous neuroimaging which provides information on any brain abnormalities on EEG, CT, MRI, SPECT, PET etc., intervention services such as PT, OT, SLT, and physician concerns and impressions).
- School records provide information regarding any previous school testing and findings, current services and supports provided to the child (IEP, BIP), grades, teacher impressions, early intervention services provided etc.
- These records provide important information to assist neuropsychologist in better understanding child's difficulties and how the NP exam can be helpful for the child, family, physicians and school.
- Parents should bring school/medical records to the evaluation.
- Parents might also be asked to sign a release of information so that neuropsychologist can obtain records from school and/or consult with school personnel.

Components of NP Evaluation

Clinical interview with parents and child

- Explain purpose of evaluation and what it consists of. Obtain consent.
- Clarify what parent/child concerns are pertaining to the child's academics, cognitive functioning and behavior.
- Obtain further background information including: developmental, medical, psychiatric, school, social, family and previous testing history.
- Clarify with parents what they would like to obtain from evaluation and what their goals are for the evaluation (e.g. to obtain a diagnosis, to rule out a diagnosis, to understand how they can help child do better in school, develop realistic expectations for child etc.)

Components of NP Evaluation

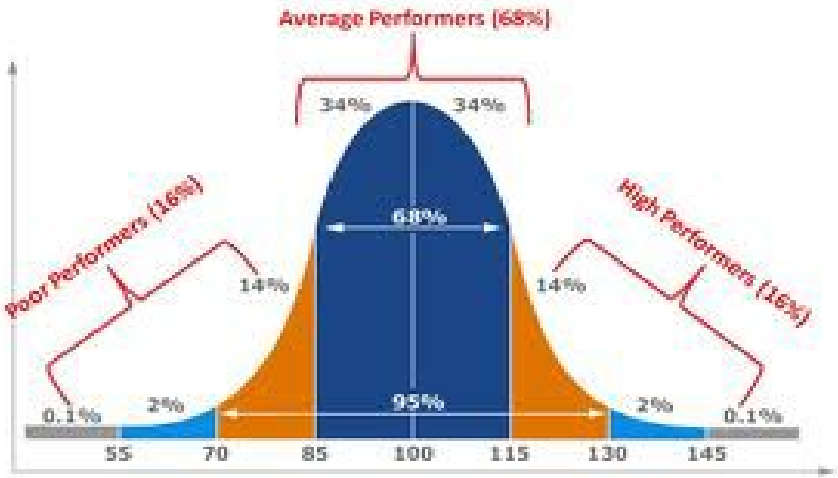
NP Test Administration

- Standardized tests administered in numerous cognitive domains including:
  - Intellectual Functioning
  - Academics
  - Attention
  - Executive Functioning (working memory, planning, organization, problem solving, cognitive flexibility, and inhibition)
  - Learning and Memory
  - Language
  - Visual-spatial Skills
  - Motor skills
  - Behavioral, Emotional and Adaptive Functioning

Components of NP Evaluation

Scoring and interpretation of results

- Most tests administered are standardized, meaning the child's performance is compared to that of other children his/her age.



Components of NP Evaluation

Scoring and interpretation of results

- The normative approach compares children to their peers to determine whether their performance is average, high average, superior, mildly impaired etc.
- The ipsative approach identifies strengths and weaknesses within the child's performance (e.g. if a child performs within the impaired range on most measures, but performs within average range on a measure of receptive language, then this would be a relative strength for the child).
- Process approach (Kaplan, 1988) refers to the child's approach, process or style to completing test items and can answer questions related to *why* a child might have obtained a particular score.
- Neuropsychologist integrates all obtained information to conceptualize what difficulties child experiences, why they might experience these difficulties, what diagnosis/diagnoses the child's pattern of performance is consistent with, and what recommendations would be helpful for the child and their family or school.

Components of NP Evaluation

Feedback appointment with parents

- Purpose is to communicate results of evaluation with parents (i.e. how the child performed across different cognitive domains, highlight strengths and discuss weaknesses, how this might relate to observed difficulties reported by parents, discuss services and supports that might be helpful for the child and family, provide referrals for services).
- Feedback usually scheduled for a different day and can last for approximately 1 hour. Child may or may not need to be present (depending on child's age, insurance, availability of child care etc.)

Components of NP Evaluation

Comprehensive Test Report

- Usually sent to parents several weeks after the testing appointment. Referring clinician usually also receives a copy of the report. Any other reports provided would require a release of information signed by parent or legal guardian.
- Consists of a history section, test results section, conceptualization/conclusions section (including diagnoses) and a recommendations section.
- Length of recommendations section varies. Some reports include lengthy recommendation section while others try to provide a more brief recommendation section (but that still adequately meets individual needs of child).
- Recommendations should also be practical and take into consideration the child and family's environment and availability of resources.

Clinical Utility of NP Evaluation

- NP evaluation can characterize cognitive and behavioral effects of a brain disorder or injury (e.g. traumatic brain injury, encephalitis, epilepsy etc.).
- Can monitor improvement/decline following an injury which can help guide medical treatment. Can provide "baseline" functioning estimate prior to initiation of medical/surgical treatment.
- Can assist with lateralization/localization of brain dysfunction which is of particular importance when surgical treatment is being considered (e.g. with epilepsy).
- Can clarify how psychiatric symptoms might affect cognitive and behavioral ability such as self-regulation/attentional/executive functioning abilities.
- Can also monitor how medications might affect cognitive ability.

When/Why Consider an NP Assessment Referral?

- When parent, school or clinicians request information regarding the child's cognitive/behavioral/emotional functioning in order to understand observed learning or behavioral difficulties and develop a treatment plan and/or educational interventions.
- Diagnostic clarification and eligibility for services
- Baseline or pre-surgical testing
- Post-surgical/treatment testing
- Medication effectiveness (e.g. stimulant medication effects on attention/impulsivity)

When/Why Consider an NP Assessment Referral?

School Referrals

- When child is experiencing learning or behavior problems in the school setting, and prior medical or psychological consultations and/or testing does not sufficiently explain behavior.
- School might refer for a second opinion if family does not agree with school's assessment.
- Identify cognitive difficulties and provide a diagnosis so that child can be eligible for school services/supports.

When/Why Consider an NP Assessment Referral?

Referral from Family

- Family identifies behavioral/cognitive difficulties that school (i.e. teacher) does not recognize.
- In young children (i.e. pre-school aged), families are usually the first to notice developmental delays or behaviors suggestive of an autism spectrum disorder.

When/Why Consider an NP Assessment Referral?

Referral from Medical Professional

- When cognitive/behavioral problems present within the context of:
  - Known/suspected brain insult
  - Genetic disorders
  - Neurodevelopmental disorders
  - Medical treatment with possible central nervous system effects
  - Exposure to neurotoxins
  - Failure to respond to interventions
  - Represent gradual or sudden change in child's typical functioning.
- Children seen for NP assessment often have medical diagnoses including epilepsy, cerebral palsy, history of stroke, traumatic brain injury, central nervous system infection or hypoxic event, genetic disorders (e.g. Turners syndrome, Prader Willi, Sturge-Weber), adrenoleukodystrophy), spina bifida, muscular dystrophy, multiple sclerosis, autism, brain tumors, ADHD, bipolar disorder, schizophrenia or tourette's etc.

Questions Answered by NP Evaluation

- What is child's current level of neurocognitive functioning?
- Does child meet criteria for ADHD, Reading Disorder, Math Disorder, Autism, Asperger's etc.?
- Has child's cognitive functioning declined/improved since receiving a particular medical treatment?
- Is brain dysfunction lateralized/localized?
- Has child's cognitive functioning declined/improved since sustaining an injury?
- What are reasonable expectations for the child in terms of academics, adaptive functioning, prospect to live independently, prospect to have a job etc.
- What types of supports/services does the child require and what can they qualify for given their diagnosis?

Where to obtain Neuropsychological Assessment

- Schools and/or physicians often have a list of providers to whom they refer.
- NP assessments frequently occur in hospitals or outpatient academic medical settings, in multidisciplinary outpatient settings or in private practices.
- Wait lists can be up to several months duration.
- Local neuropsychologists can be found through the American Board of Professional Psychology Directory at
- :http://www.abpp.org/i4a/member_directory/feSearchForm.cfm?directory_id=3&pageid=3292&showTitle=1
- In New Mexico, the University of New Mexico Center for Neuropsychological Services offers NP assessments to adults, adolescents and children
- : http://hsc.unm.edu/som/psychiatry/neuro/
- Referral form at UNM Center for Neuropsychological Services
- :http://hsc.unm.edu/som/psychiatry/neuro/referral.shtml

Additional Resources

Physician's Guide to NP Assessment

:http://hsc.unm.edu/som/psychiatry/neuro/forms/Physicians%20Guide.pdf

Parents' Guide to NP Assessment

:http://hsc.unm.edu/som/psychiatry/neuro/forms/Parents%20Guide.pdf

Brain Injury Association of America

: http://www.biausa.org/

Autism Speaks

: www.autismspeaks.org/

Case Example “Jane”

- 10 year old female referred by her pediatrician.
- Concerns of learning difficulties
- History of seizures and concussion
- Currently homeschooled
- Previous school testing showed low intellectual functioning
- Parents wanted to understand why Jane experienced learning difficulties and what would be realistic expectations for Jane in terms of learning

Case Example "Jane"

Intellectual Functioning

Extremely Low. FSIQ <1st %ile

Academics

Significantly impaired in reading, writing and math. Kindergarten-1st grade level

Attention/EF

Attention, Working Memory and Processing Speed all impaired

Learning and Memory

Significantly impaired encoding and retention

Language

Significantly impaired receptive and expressive language

Visual-Spatial Function

Impaired visual motor integration and visual perception

Motor Function

Impaired fine motor speed, dexterity and coordination

Behavior/Emotional/Adaptive Functioning

Ratings significantly elevated on inattention and withdrawal scales and very low on adaptive functioning (overall adaptive functioning level at 5 year, 4 months of age)

Case Example "Jane"

- Diagnosed with Mild Mental Retardation
- Recommendations:
  - Attend public school rather than be homeschooled in a special education program (focus on life skills and functional academics)
  - Continue to receive SL Therapy
  - Apply for Developmental Disability Waiver
  - Consult with physician regarding trial on stimulant medication