Neuropsychological Assessment: The Search for Answers

Howard M. Goldfischer, Psy.D.
Medical Manager of Medical Rehabilitation Program &
Senior Neuropsychologist at
Easter Seals Capital Region and Eastern Connecticut

and

Director of Pediatric Neuropsychology Services
of Greater Hartford, LLC
What is Neuropsychology?

“The study of the relationship between behavior, emotion, and cognition on the one hand, and brain function on the other”.

1. A **clinical neuropsychologist** is a professional within the field of psychology with special expertise in the applied science of brain-behavior relationships. Clinical neuropsychologists use this knowledge in the **assessment**, **diagnosis**, **treatment**, and/or **rehabilitation** of patients across the lifespan with neurological, medical, neurodevelopmental and psychiatric conditions, as well as other cognitive and learning disorders.
2. The clinical neuropsychologist uses psychological, neurological, cognitive, behavioral, and physiological principles, techniques and tests to evaluate patients’ neurocognitive, behavioral, and emotional strengths and weaknesses and their relationship to normal and abnormal central nervous system functioning.
NAN Definition (2001)

3. The clinical neuropsychologist uses this information and information provided by other medical/healthcare providers to identify and diagnose neurobehavioral disorders, and plan and implement intervention strategies.
NAN Definition (2001)

- A doctoral degree in psychology from an accredited university training program.
- An internship, or its equivalent, in a clinically relevant area of professional psychology.
- The equivalent of two (fulltime) years of experience and specialized training, at least one of which is at the post-doctoral level, in the study and practice of clinical neuropsychology and related neurosciences. These two years include supervision by a clinical neuropsychologist.
- A license in his or her state or province to practice psychology and/or clinical neuropsychology independently, or is employed as a neuropsychologist by an exempt agency.
### Clinical Practice Activities Per Week

Table 8. Clinical Practice Activities in Hours Per Week for Full-Time Doctoral Licensed Clinicians.

<table>
<thead>
<tr>
<th>Activity</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic interview</td>
<td>1126</td>
<td>3.50</td>
<td>4.88</td>
<td>0.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Neurobehavioral examination</td>
<td>1125</td>
<td>2.17</td>
<td>4.04</td>
<td>0.00</td>
<td>38.00</td>
</tr>
<tr>
<td>Neuropsychological assessment</td>
<td>1119</td>
<td>14.06</td>
<td>11.12</td>
<td>0.00</td>
<td>60.00</td>
</tr>
<tr>
<td>Psychological assessment</td>
<td>1123</td>
<td>4.01</td>
<td>5.97</td>
<td>0.00</td>
<td>40.00</td>
</tr>
<tr>
<td>Follow-up assessment</td>
<td>1127</td>
<td>2.16</td>
<td>2.45</td>
<td>0.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Psychotherapy with patients with acquired brain dysfunction</td>
<td>1127</td>
<td>2.70</td>
<td>4.34</td>
<td>0.00</td>
<td>35.00</td>
</tr>
<tr>
<td>Psychotherapy with patients without acquired brain dysfunction</td>
<td>1128</td>
<td>5.10</td>
<td>7.75</td>
<td>0.00</td>
<td>55.00</td>
</tr>
<tr>
<td>Cognitive rehabilitation</td>
<td>1128</td>
<td>0.82</td>
<td>2.69</td>
<td>0.00</td>
<td>40.00</td>
</tr>
<tr>
<td>Treatment planning and coordination</td>
<td>1128</td>
<td>2.38</td>
<td>2.92</td>
<td>0.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Supervision of any of the above items</td>
<td>1125</td>
<td>2.20</td>
<td>3.74</td>
<td>0.00</td>
<td>35.00</td>
</tr>
</tbody>
</table>
Testing vs. Assessment - Purpose of the Evaluation

- Objective Assessment of the Patient’s Neuropsychological Strengths and Weaknesses
- Diagnostic Clarification
- Treatment Recommendations
Target Populations

- Infants & Toddlers (Infancy - age 3)
- Children (ages 4 - 12)
- Adolescents (ages 13 - 17)
- Adults (ages 18 - 64)
- Older Adults (ages 65 and above)
Common Referral Sources

- Physicians
- Counselors
- Teachers
- Lawyers
- Judges
- Companies
When to Refer

- The purpose of referral is to have a person with training or experience different from your own provide additional information about the child and/or adult.

- Referral is typically done to answer specific questions about a patient’s developmental, cognitive, or emotional status.
Common Referral Reasons

- To help clarify possibility of dementia in the aging
- To assess for attention and learning problems in a child
- To clarify one’s functioning following a traumatic brain injury (TBI)
- To assess for a possible autistic spectrum disorder
- To assess for long-term neuro-cognitive sequela following treatment for Acute Lymphoblastic Leukemia (ALL)
Additional Common Referral Questions

- Sports-Related Injuries
- Failure to Achieve Developmental Milestones
- Exposure to Drugs, Alcohol, & Maternal Illness in Utero
- Exposure to chemicals, toxins, or lead
- Neurodegenerative Diseases & Medical Conditions
- Genetic Disorders
- Seizure Disorders
- Longstanding History of Substance Abuse
Approaches to Testing (1)

1) Fixed Battery Approach
2) Flexible Battery Approach
3) Process Approach
Approaches to Testing (2)

- **Psychometric vs. Process approach**
  - Psychometric approach focuses upon “normal” vs. “impaired”.
    - Useful in identifying brain injury.
  - Process approach looks more at a person’s individual strengths and weaknesses and problem-solving style.
    - Typically more useful for children and LD questions.
## Major Neuropsych Areas Typically Assessed

<table>
<thead>
<tr>
<th>1. Intellectual Ability</th>
<th>7. Processing Speed/Mental Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Language Processing</td>
<td>8. Attentional Skills</td>
</tr>
<tr>
<td>4. Visual-Motor Integration</td>
<td>10. Academic Skills</td>
</tr>
</tbody>
</table>
Some Testing Examples - Intellectual Ability

The **WISC-IV** has four specific cognitive domains (Indexes) which together contribute to the Full Scale IQ.
Decoding the WISC-IV/WAIS-IV

- Full Scale IQ **Standard Score** (Mean=100, SD=15); Four Index **Standard Scores** (Mean=100, SD=15) and **Subtest Scaled Scores** (Mean=10, SD=3)

- The test manual provides qualitative descriptions for the WISC-IV and WAIS-IV Full Scale Scores which include:
  - 130+ Very Superior
  - 120-129 Superior
  - 110-119 High Average
  - 90-109 Average
  - 80-89 Low Average
  - 70-79 Borderline
  - Below 69 Extremely Low

- The subtest scaled scores for an individual's same age peers have a metric mean of 10 and a SD (i.e. standard deviation) of 3. Thus scaled scores of 7 (16 %ile) and 13 (84 %ile) are 1 SD below and above the mean respectively, while scaled scores 4 (2 %ile) and 16 (98 %ile) are 2 SD's below and above the mean respectively.
Some Testing Examples - Language Functioning
Some Testing Examples - Visual Processing
Some Testing Examples-
Visual Closure
Some Testing Examples - Motor Functioning
Some Testing Examples - Visual Memory & Approach
Some Testing Examples - Rey Example 1
Some Testing Examples-
Rey Example 2
Some Testing Examples - Executive Functioning (A)
<table>
<thead>
<tr>
<th>red</th>
<th>blue</th>
<th>green</th>
<th>red</th>
<th>blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>green</td>
<td>blue</td>
<td>green</td>
<td>red</td>
<td>green</td>
</tr>
<tr>
<td>green</td>
<td>red</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
</tr>
<tr>
<td>red</td>
<td>green</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
</tr>
<tr>
<td>red</td>
<td>green</td>
<td>blue</td>
<td>green</td>
<td>red</td>
</tr>
<tr>
<td>blue</td>
<td>green</td>
<td>red</td>
<td>blue</td>
<td>green</td>
</tr>
<tr>
<td>green</td>
<td>red</td>
<td>blue</td>
<td>red</td>
<td>blue</td>
</tr>
</tbody>
</table>
Some Testing Examples - Executive Functioning (C)
Some Testing Examples - Executive Functioning (D)

Rules:
1. blue - Name the ink color.
2. red - Read the word.
Some Testing Examples - Emotional Functioning
Some Testing Examples - Affect Recognition
Some Testing Examples-
Social Skills Assessment
Importance of Validity

- **Validity** refers to how well the test measures what it purports to measure. Specific types of validity that may be questioned include the following:
  - **Construct validity** - Does the test measure what it is supposed to measure?
  - **Concurrent validity** - Do new tests correlate highly with existing tests or independent measures of the construct in question?
  - **Face validity** - Does the test appear to measure what it is supposed to measure?
  - **Localization validity** - Does the test localize focal lesions accurately?
  - **Ecologic validity** - Does the test predict real-life ability?
Important Factors to Consider in Testing

- Results of a Neuropsychological Assessment must be considered in the context of the patient’s:
  - Age
  - Education
  - Sex
  - Cultural background

- Use of norm-referenced tests to evaluate an individual’s specific strengths and weaknesses
Unique Issues with Testing Children

1-While the adult brain is relatively static, the child brain is dynamic and depending on age is subject to major changes.

2-Although the path of development for children is fairly similar, individual children develop at different rates.

3-Until recently most of the available tests were adapted versions of tests designed to assess adults.

4-Contextual issues (e.g., school, home environment).
Basic Components of the Neuropsychological Report

I. *Reason for Referral*

II. *Background Information*
   - Family Info
   - Birth/Development
   - Educational History
   - Cognitive Concerns
   - Emotional History
   - Medical History
   - Behavioral Concerns
   - Social Skills
   - Previous Testing
   - Additional Information from Teachers or Caregivers
Basic Components of Neuropsych Report (con’t)

III. Behavioral Observations

IV. Validity Testing - Importance of Effort (Malingering?)

V. Tests Administered

VI. Description of Performance by Domain Assessed (The Body of the Report)

VII. Summary and Conclusions (Diagnostic Formulation)

VIII. Recommendations for Intervention/Remediation
Accurate diagnosis requires multiple sources of data

- Parent report
- Teacher report
- Caregiver report
- Behavioral and school history
- Medical history
- Behavioral observation
- Objective test data
- Neurological examination in some cases
- Integration of findings
Common Diagnoses in Children

- **Pervasive Developmental Disorders-Autistic Spectrum Disorder (ASD)**
  - Autism
  - Asperger’s Syndrome
  - PDD-NOS

- **Attention Deficit/Hyperactivity Disorder (ADHD)**
  - Predominantly inattentive
  - Predominantly hyperactive
  - Combined type
Common Diagnoses in Children (con’t)

- Specific Learning Disability
  - Reading Disorder (Dyslexia)
  - Disorder of Written Expression
  - Mathematics Disorder

- Language Disorders
  - Mixed Receptive-Expressive Language Disorder
  - Expressive or Receptive Language Disorder

- Phonological Disorder (formerly Developmental Articulation Disorder)
Common Diagnoses in Children (con’t)

- Reactive Attachment Disorder
- Conduct Disorder
- Oppositional Defiant Disorder
- Developmental Coordination Disorder
- Tic Disorders
  - Tourette’s Disorder
  - Chronic Motor or Vocal Tic
- Mental Retardation - Intellectual Impairment
Common Diagnoses in Adults

- Memory Loss
- Dementia vs. Pseudodementia
- ADHD
- Psychiatric Populations (Depression, Bipolar Disorder, Anxiety Disorders, PTSD, Personality Issues)
- Traumatic Brain Injury
- Strokes
- Cognitive Disorder-Not Otherwise Specified
- Substance Abuse and/or Conduct Disorders
Interventions

 Medical
   Medication (Vyvanse, Ritalin, Prozac)
   Surgical Procedures (palate reconstruction, shunt placement, tumor resection)
   Follow-up Neuroimaging

 Behavioral
   Developmental (language, motor functioning)
   Psychological (behavior modification plans)

 Vocational
   Recommendations regarding one’s capacity to work
   Determination of eligibility for supportive employment
Interventions (con’t)

Educational
- Learning Disability intervention
- Classroom accommodations/modifications
- Contribution to and development of IEP goals
- Supportive Education & Attainment of GED

Psychological
- Therapy
- Educational Recs (class placement, academic goals)
- Psycho-education (re: one’s mental health)
- Advocacy
Interventions (con’t)

- **Referrals to Outside Agencies including:**
  - DSS for ABI Waiver Eligibility
  - DDS for services due to MR eligibility
  - BRS for employment related opportunities
  - DMHAS for mental health-related services
  - Local School District for PPT and IEP/504 Plan development
  - Medical Rehabilitation facilities for remediation of medical complications and disorders/syndrome
  - Rehab Centers for substance-related issues
  - Nursing Home/Residential Facility for elderly issues
Interventions (con’t)

- Referrals to other professionals (as deemed necessary):
  - Psychiatrist
  - Neurologist
  - Psychologist
  - Behaviorist
  - Speech and Language Therapist
  - Occupational Therapist
  - Academic Therapist and/or Tutor
Testing can provide **data to guide decisions** about the patient’s condition with regards to:
- Competency to manage legal and financial affairs.
- Capacity to participate in medical and legal decision making.
- Ability to live independently or with supervision.
- Ability to return to work and school affairs.
- Candidacy for transplantation.
Data from a neuropsychological evaluation can be used to guide the following assessments and procedures:

- Evaluation of the cognitive effects of various medical disorders and associated interventions
- Assessment of CNS lesions and/or seizure disorders before and after surgical interventions, including corpus callosotomy, focal resection (e.g., topectomy, lobectomy), and multiple subpial transection
- Monitoring of the effects of pharmacologic interventions
- Documentation of the cognitive effects of exposure to neurotoxins
- Documentation of adverse effects of whole brain irradiation in children
- Comparison with guidelines for electroconvulsive therapy (ECT) influenced by standardized evaluation of memory
- Standard protocols for assessment of specific disorders, such as dementia of the Alzheimer type (DAT), multiple sclerosis (MS), and stroke
What The Physician Gets...

- The neuropsychological assessment and report will provide you with:
  - A description of the patient’s pattern of performance relative to his/her peers, identifying cognitive strengths and weaknesses.
  - Suggested interventions for remediation of weaknesses or to compensate for weakness.
  - A means of assessing the functional effects of your medical treatment.
What The Physician Gets…
(con’t)

- A way to help parents understand their child’s developmental pattern so that parents can set appropriate expectations for their child.
- A way to help parents understand what they need to do to help maximize their child’s development.
- A more efficient way to provide your service to the child and family. By helping the parent to understand the etiology, prognosis, and treatment for their child’s problems, parents will be less likely to repeatedly contact your office looking for a medical treatment or change in medication treatment to “fix” a developmental problem.
Practical Considerations I

- For children: Typically, 1 two-hour interview session with the parents and 2 half-day testing sessions with the child
- For adults: Typically, one 45-minute interview session with the patient and a single day of testing (3 - 7 hours)
- Turnaround time of reports: Typically, 4 - 6 weeks
- Reports sent to physicians, parents/patient, and whomever is identified to receive a copy
Practical Considerations II

- School Evaluation vs. Comprehensive Neuropsychological Assessment
- Cost of Evaluation: Insurance vs. Out-of-Pocket
- The “Year Long” Waiting List dilemma
- Consultation and Treatment Prescription vs. Ongoing Treatment Provision
- Importance of Serial Evaluations and Routine Follow-Ups
How to Refer

Provide a referral question - What do you want to learn from this assessment?

Provide relevant medical records - Selected chart notes or summarize the history in a brief referral letter.

Special instructions:

A. Inform parents that they will need to provide the neuropsychologist with copies on any previous assessments conducted with the child.

B. If the child is receiving special education services, the neuropsychologist will need a copy of the child’s current Individual Education Plan (IEP), and of any testing done by the school as a basis for this plan.

C. An adult with diminished capacity will need to be accompanied to the initial interview.
Resources for You and Your Patients

- Brochures are available from the National Academy of Neuropsychology on such topics as, “Parent’s Guide to Neuropsychological Assessment” and “Neuropsych Evaluation Information Sheet”.

- Brochures specifically written for physicians as to the benefits of Neuropsychological Assessment are also available.

- Spanish translations of these brochures are available.

- [https://www.nanonline.org/](https://www.nanonline.org/) (Under PAIC, you will find “Handouts and Brochures”).
For More Information:

Howard M. Goldfischer, Psy.D.
Clinical Manager of Medical Rehabilitation Program
and Senior Neuropsychologist

Easter Seals Capital Region &
Eastern Connecticut, Inc.
100 Deerfield Road
Windsor, CT 06095
Phone: 860-270-0600 Ext 135
Fax: 860-270-0601
hgoldfischer@escrec.org
www.hartford.easterseals.com

Pediatric Neuropsychology Services
of Greater Hartford, LLC

Howard M. Goldfischer, Psy.D.
Pediatric Neuropsychologist
Licensed Psychologist

682 Prospect Ave.  860-236-5900 - Phone
Hartford, CT 06105  860-236-5902 - Fax
drgoldfischer@pedineuropsych.com
www.pedineuropsych.com