



# Neuropsychological Exams

Larry Fisher, Ph.D., ABPN  
UHS Neurobehavioral Systems



## For More Info:

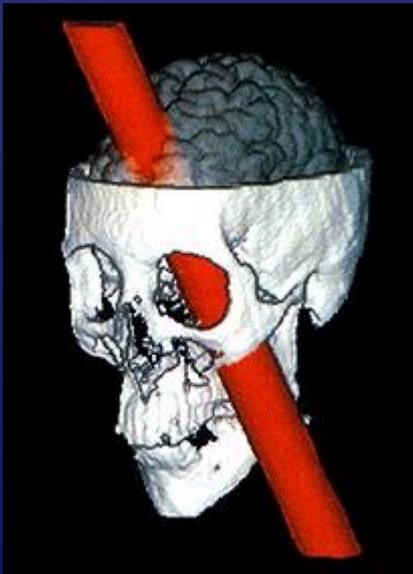
- ❖ Larry Fisher, Ph.D., ABPN
- ❖ Director of Neuropsychological Services
- ❖ Comprehensive Neurobehavioral Systems
- ❖ 12710 Research Blvd., Ste. 255
- ❖ Austin, TX 78759 Tel: 512-257-3468
- ❖ 800-272-4641 ; fax 512-257-3478
- ❖ [cnsgroup@sbcglobal.net](mailto:cnsgroup@sbcglobal.net)



# What is Neuropsychology?

- ❖ ...the study of brain-behavior relationships
- ❖ ...a branch of Clinical or Child Psychology
- ❖ ...a clinical specialty (Neurobehavioral disorders)
- ❖ Two major board certifications:
  - ❖ ABPP-CN and ABPN
- ❖ Usually requires Ph.D., two year post-doc training, and be a licensed Psychologist

# The Case of Phineas Gage





# Neuropsychology Testing

- ❖ Answers the following questions:
- ❖ 1) Is pathological impulsive aggression due to a brain disorder (e.g.: frontal lobe damage)?
- ❖ 2) What are the strengths and weaknesses of this brain impaired youth (e.g.: attention, memory, language, executive cognition, motor skills)?
- ❖ 3) What can we do to deal with this problem?



# Examples of Interventions

- ❖ Problem: Poor attention
  - ❖ Intervention: get eye contact when giving directives
- ❖ Problem: Poor language skills
  - ❖ Intervention: Consider non-verbal psychotherapy
- ❖ Problem: Memory disorder
  - ❖ Intervention: use note pad, check lists, alarm watch
- ❖ Problem: Poor executive cognition
  - ❖ Help him with planning, organization, impulse-control



# NP Testing is used for:

- ❖ Neuropsychiatric Disorders
- ❖ Traumatic Brain Injury (TBI)
- ❖ Neurobehavioral Disorders (impulsive, explosive)
- ❖ ADHD, LD, Tourette's, Autism & PDD
- ❖ Genetic Disorders
- ❖ Neurological Disorders
- ❖ Baseline assessment of brain function



# Source of Neurobehavioral Disorders

- ❖ Prenatal and perinatal disorders
  - ❖ Even with normal delivery, 14% of neonates have blood in cerebrospinal fluid indicating brain damage.
  - ❖ Hypoxia in premature birth, due to poor respiration, affects limbic structures important for emotions.
  - ❖ Alcohol/drug use during pregnancy exposes the fetus to toxic substances, producing neurobehavioral disorders.
  - ❖ Malnutrition, prenatal infections, genetic defects, all contribute to neurobehavioral disorders.



# Pediatric Neuropsychiatry

- ❖ Infant starts life with mild brain disorder and then develops psychiatric disorder:
  - ❖ Impairments in cognition, memory, attention, language, impulse control, emotional control, irritability, etc. make traditional psychiatric treatment (meds or psychosocial) less effective.
- ❖ Common pediatric psychiatric disorders (e.g.: ADHD, PTSD, Bipolar Disorder, Oppositional Defiant Disorder)
- ❖ Brain disorder complicates the treatment of the psychiatric disorder; requires Neuropsychiatry for best outcome.

# Neuropsychiatry & Treatment Plans

- ❖ First, we must assess that brain disorder: We use neuropsychological (NP) tests to evaluate brain function..
- ❖ NP tests help in planning psychosocial treatments by identifying the patient's strengths and weaknesses.





# What do NP Tests Measure?

- ❖ The NP exam is a survey of brain function, looking at intellect, memory, executive cognition, & perceptual-motor functions.
- ❖ Fixed Batteries (e.g.: Halstead-Reitan) are very comprehensive, but take over 6 hours to complete.
- ❖ Brief NP Exam is a short-form that covers only the most important measures.

# Neuropsychological (NP) Tests



- ❖ This picture shows a test of finger dexterity.
- ❖ We test for sensation, perception, motor skill, memory, intellect, and executive cognition.
- ❖ NP tests are sensitive to even mild brain damage



# The Brief NP Exam

- ❖ Wechsler IQ Scale-Children
- ❖ Wide Range Assessment of Memory & Learning
- ❖ Wechsler Individual Achievement Test
- ❖ Executive Cognition
  - ❖ Verbal Fluency – (generate lists for animals, names)
  - ❖ Design Fluency – (generate novel designs, connecting dots)
- ❖ Motor functions (finger tap)





# Testing may....

- ❖ Determine presence of specific deficits
  - ❖ perceptual- motor, cognitive, memory
  - ❖ strengths as well as weaknesses are listed
- ❖ Determine type of brain disorder
  - ❖ Reasoning, attention, memory, language
  - ❖ List diagnoses: ADHD, Learning Disorder
  - ❖ Locate damaged and intact brain regions

# NP tests for Brain “Function”



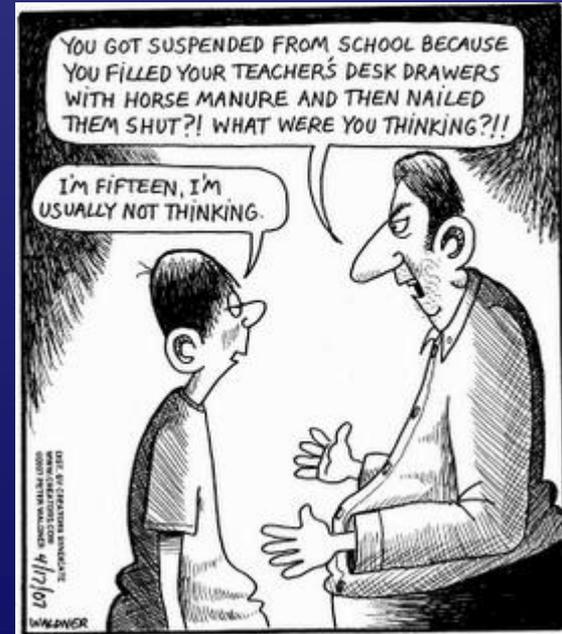


# Testing should also...

- ❖ Assess emotional, behavior, family issues
  - ❖ emotional control, impulse control, conduct issues, family discipline issues
- ❖ Establish treatment needs and plan
  - ❖ Therapies, home discipline, school strategies
  - ❖ Individual, family, behavioral therapies
- ❖ Give specific recommendations

# NP Recommendations

- ❖ NP testing may speak to....
  - ❖ academic issues, behavioral issues, family issues
  - ❖ strategies to bypass & remediate brain deficits
  - ❖ teach to the child's strength
  - ❖ proper discipline methods
  - ❖ setting realistic expectations (we can't cure adolescence)



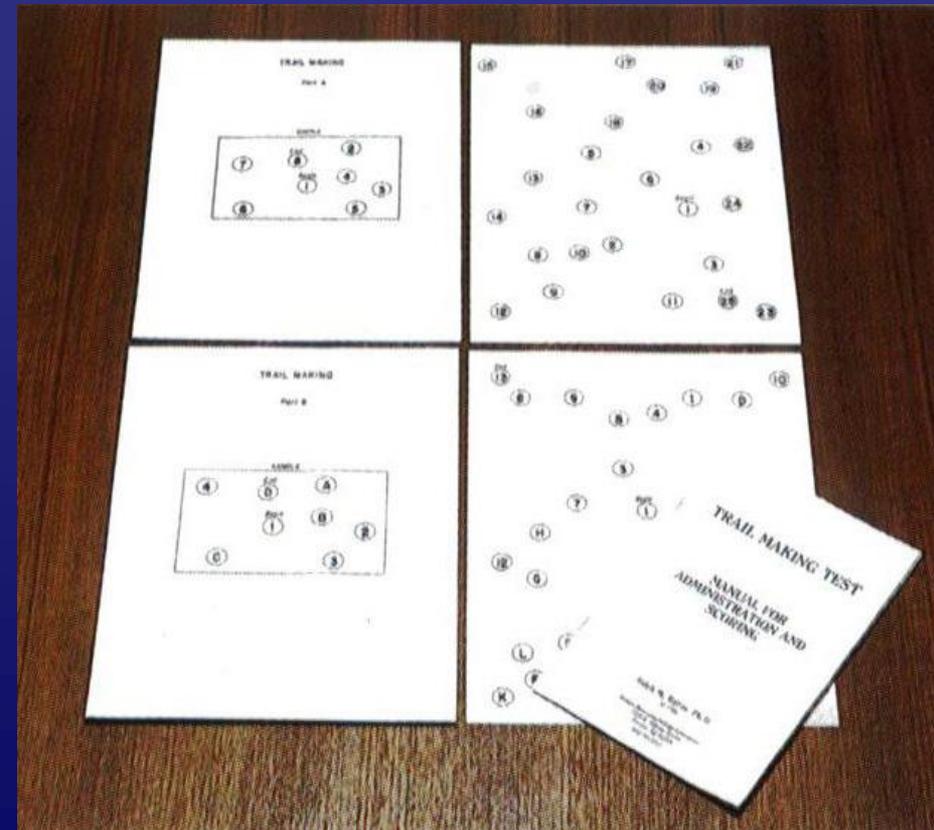


# Overlapping Specialties

- ❖ Neuropsychology Reports may overlap with:
  - ❖ School Psychology reports
  - ❖ Educational Diagnostician reports
  - ❖ Occupational Therapist Reports
  - ❖ Speech & Language Reports
  - ❖ Clinical Psychology Reports
  - ❖ Psychiatrist Reports
  - ❖ Neurologist Reports

# NP Reports Help...

- ❖ Provide scientific data, compared to norms
- ❖ Left side against right
- ❖ Suggest useful treatments
- ❖ Suggest strategies for teaching
- ❖ Suggest compensation techniques





# Example: EM

- ❖ EM is a 10 year-old, right-handed, Hispanic male, unresponsive to treatment for Bipolar Disorder and ADHD. On low dose anticonvulsant, a stimulant, & anti-psychotic. Persistent explosive aggression, two recent hospitalizations, family and school problems. EEG normal, but left AER/VER & P-300 abnormal. NP exam left abnormal.
- ❖ QEEG – left frontal & left temporal-limbic abnormal
- ❖ NP – left frontal symptoms plus memory disorders
  - ❖ Strengths = normal intellect, perceptual-motor functions
  - ❖ Weaknesses = vocabulary, word memory, general memory, attention, poor written expression, irritable in pm.



# EM: Neuropsychiatric Treatment Plan

- ❖ QEEG: findings and recommendations
  - ❖ Frontal lobe = Clonidine; or Amantadine to improve frontal lobe function
  - ❖ Temporal-limbic = use high dose anticonvulsant to stabilize the limbic system
  - ❖ P-300 = continue stimulant medication (discontinue antipsychotic) for ADHD
- ❖ NP: findings and recommendations
  - ❖ Strength: Normal intellect = mainstream classroom + modifications for attention, memory
  - ❖ Weaknesses:
    - ❖ Vocabulary, word memory = no fill in the blank tests, use multiple choice; help rebuild vocabulary; use more visual aides (he is a visual learner). Use more charts, graphs, diagrams, pictures.
    - ❖ General memory = checklists, notepads, alarm watch, study buddy
    - ❖ Attention = get eye contact for commands, one step commands, preferential seating away from distractions, shorter assignments.
    - ❖ Written expression = learning disability, special education support for writing, don't demand essays, don't give written instructions, consider Speech and Language therapy.
    - ❖ Irritable in pm = Avoid confrontation, use positive discipline, use functional behavior analysis (FBA) to find triggers to avoid, do most of the school work in the am (before he becomes irritable) and avoid gym or hard subjects in pm, give more rest in pm.
    - ❖ Verbal Memory = Don't depend on talk-therapy; use more behavior therapy, more skill-based therapy, consider non-verbal therapies such as experiential therapy or art therapy.



# Data used in the NP report:

- ❖ First is the history:
  - ❖ Presenting Problem (why referred?)
  - ❖ History of that problem (when did it start?)
  - ❖ Past history (pregnancy, development, school)
  - ❖ Medical and Family history
  - ❖ Social history (home, school, drugs, legal)
  - ❖ Prior assessments and testing



# Data continued...

- ❖ Second - the observations

- ❖ mental status (alert, oriented, psychotic?)
- ❖ behavior (mood, emotional control, hyper?)
- ❖ personality (antisocial, shy or outgoing, etc.)

- ❖ Third - test results

- ❖ Cognition, Sensory, Perceptual-Motor
- ❖ IQ, Memory, Language, etc.



# REPORT SECTIONS

- ❖ History - info from all sources
- ❖ Observations - test behavior observed
- ❖ Results - test data obtained
- ❖ Discussion - Summary of the findings
- ❖ Formulation - What it all means
- ❖ Clinical Impression - Diagnostic conclusion
- ❖ Recommendations - Specific suggestions



# Implications:

- ❖ Frontal lobe disorder
  - ❖ impulse control, planning, activity control, executive cognition
- ❖ Subcortical disorder
  - ❖ memory (verbal or visual), emotional control
- ❖ Left hemisphere disorder
  - ❖ language, reading, writing, comprehension, right side of body
- ❖ Right hemisphere disorder
  - ❖ visual-spatial, social skills, organization, math, left side of body



# Psychosocial Interventions

- ❖ Frontal lobe disorder -poor self control
  - ❖ student needs external control, structure, cues
- ❖ Subcortical disorder - memory & emotions
  - ❖ memory aids, anger management, school supports
- ❖ Left Hemisphere – language/learning disorder
  - ❖ visual aids, demonstrations, charts, pictures, graphs
- ❖ Right Hemisphere – visual/spatial/social
  - ❖ auditory aids, help with organization & social skills



# Treatment Planning

- ❖ QEEG: primarily for pharmacological planning
  - ❖ Temporal limbic: high dose anticonvulsants
  - ❖ Frontal lobe: stimulants, Clonidine, Amantadine
- ❖ NP: primarily for psychosocial planning
  - Attention?: get eye contact, preferential seating
  - Memory?: checklists, multiple-choice exams
  - Executive?: Positive discipline (his brakes are broken)
  - Language?: Non-verbal, skill-based, behavior therapy



# Summary:

- ❖ NP exam is a survey of brain's functional abilities
  - ❖ Intellect, memory, executive, perceptual-motor skills
- ❖ Provides a review of strengths and weaknesses
  - ❖ Attention, language, learning and memory
- ❖ Suggests concrete psychosocial recommendations
  - ❖ Treatment needs, discipline needs, school issues
- ❖ Dovetails with QEEG, which helps choose meds