

Southeast Regional ADHD Conference

Interpreting Test Results for Tx Planning

Joe Ackerson, Ph.D.
jackerson@ackersonandassociates.com

Today's Agenda

- The Evaluation Process
- Assessing ADHD
- Psychometrics 101
- Interpretation
- Collaborative Treatment Planning
- Verbal feedback
- The written report
- Examples



Evaluating individual clients

- Determine reason/need for evaluation
- Determine premorbid and predisposing variables
- Generate hypotheses and determine methodology
- Assess current neuropsychological functioning
- Identify risk within environmental context
- Predict functional outcomes
- Provide recommendations for management
- Follow-up

Collecting & Reviewing Records

- Process for communicating what records you need and who is responsible.
- Before you get the records know how you will handle them.
- Sources and types of records
 - Family
 - Medical
 - Developmental
 - Psychiatric/mental health
 - Academic
 - Vocational
 - Legal
 - Socioeconomic/environmental
 - Know what they tell you AND what they don't

History

- Difference between testing and evaluation is the history, clinical interview, and interpretation
- You cannot know the present nor predict the future w/o knowing the past
- Look for history of concerns
 - When first evident?
 - How have the problems manifested over time?
 - What efforts have been made to understand and/or treat the problem?
- You MUST know normal development and how the individual's medical/psychiatric/developmental disorder TYPICALLY presents across the lifespan
- Always consider context and function of behavior

Confidentiality Issues

- HIPAA
 - Within a system
 - Outside information
 - Does not always apply
- FERPA
- Tarasoff
- Sticky issues
 - Working as part of a team is different.
 - Confidentiality issues vary by setting and agreements.

Clinical interview(s)

- Before you ask ANYTHING, review limits of confidentiality
- HPI plus all the domains of functioning
- Structured vs semistructured
- Know their story
- Not only WHY but WHY NOW?
- Identify critical information required to formulate not only differential dx but likely moderators of functional outcomes
- Not only WHAT you ask but HOW you ask it
- Multiple sources of information ALWAYS desired

Clinical Interview (II)

- Generate then test the hypotheses
- Corroborate and clarify
- Maintain natural curiosity and respect for the informant
- Healthy skepticism
- Questions should flow and reflect logical progression

Clinical Interview (III)

- Routines, schedules
- Relationships
- Play
- Strengths/Weaknesses
- Goals/Aspirations
- Perceived obstacles
- Resources

Questionnaires/Checklists

- Uses and limitations
- Broad band
- Domain specific
- Disorder specific
- Supplements but does not replace interview

ADHD: a developmental model of executive dysfunction

A neurodevelopmental framework is essential to understanding specific maturational processes that underlie typical and atypical brain development.

Establishing a better understanding of these processes can help inform the timing and focus of interventions (and eventually secondary preventive efforts)—to shift the trajectories away from negative

But how do we know that development has gone awry?

Role of executive functions

Successful navigation of life's "troubled waters":

- increased cognitive (self-) control over emotions and behavior
- *in accordance with abstract principles*
- consideration of long-term consequences
- complex social rules
- use of strategies, planning, and goals
- requires cognitive-emotional integration

BRAIN DEVELOPMENT

Underdevelopment of the frontal lobe/prefrontal cortex and the limbic system make youth with ADHD more prone to "behave emotionally or with 'gut' reactions"

Youth with ADHD tend to use an alternative part of the brain— the amygdala (emotions) rather than the prefrontal cortex (reasoning) to process information

Neural networks support cognition & behavior

Functional integration of widely-distributed circuits lays the groundwork for enhanced *voluntary* control of behavior during child and adolescent cognitive development

This may occur through strengthening of circuit-level brain organization (i.e. faster connections across a set of neural systems)

ED & ADHD

- Barkley - ADHD is grounded in early ED in three aspects of inhibitory control
 - stopping of an ongoing response
 - interference control
 - prepotent response inhibition
- Predicted these core deficits later evolve into more complex ED complications such as working memory (WM) and planning

Neurodevelopment and ADHD

- In the preschool period deficits in inhibitory control in relation to symptoms of ADHD seem to constitute a robust finding
- In contrast, relations between WM deficits and ADHD symptoms in preschoolers have been inconsistent
- For older children of elementary school-age, WM deficits have been shown to generally discriminate well between children with ADHD and typically developing controls

FRONTAL LOBE

Seat of personality, judgment, reasoning, problem solving, and rational decision making

Provides for logic and understanding of consequences

Governs impulsivity, aggression, ability to organize thoughts, and plan for the future

Controls capacity for abstraction, attention, cognitive flexibility, and goal persistence

Undergoes significant changes during adolescence — not fully developed until mid 20's

FRONTAL LOBE

As the "prefrontal cortex" area of the frontal lobe matures, through experience and practice, teens gradually learn to reason better, develop more impulse control, and make better judgments

During this critical time youth with ADHD have an increased need for structure, mentoring, guidance

Prefrontal cortex is one of the last areas of the brain to fully develop, perhaps reaches maturity around 24

TEMPORAL LOBES

Responsible for hearing, understanding speech, and forming an integrated sense of self

Responsible for sorting new information and for short term memory

Contains the limbic-reward system (amygdala, hippocampus, nucleus accumbens, and ventral tegmental area)

Matures around ages 18-19

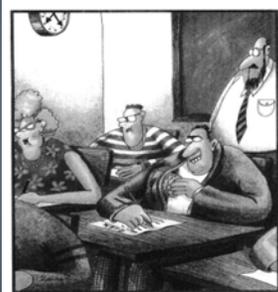
TEMPORAL LOBE/LIMBIC SYSTEM

Limbic system regulates emotions and motivations—particularly those related to survival—such as fear, anger, and pleasure (sex and eating)

Feelings of pleasure/reward are very powerful and self-sustaining. Pleasurable behaviors activate a circuit of specialized nerve cells in the limbic area that is devoted to producing and regulating pleasure called the reward system

Honey I shrunk the kid's brains!

- ADHD patients showed 3-4 percent smaller brain volumes, in all regions.
- The more severe the ADHD symptoms—as rated by parents and clinicians—the smaller their frontal lobes, temporal gray matter, caudate nucleus and cerebellum.



Midway through the exam, Allen pulls out a bigger brain.

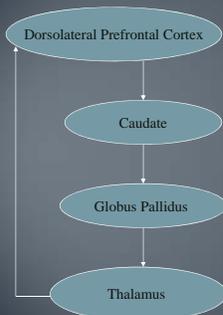
Frontal-Subcortical (FSC) Circuits

Series of parallel segregated FSC circuits linking specific regions of the frontal cortex to the striatum, the globus pallidus (GP) and substantia nigra (SN), and the thalamus

An effector mechanism that allows the organism to interact adaptively with its environment

Relevant to many neuropsychiatric disorders in addition to ADHD

DLPF Circuit



The DLPF Syndrome

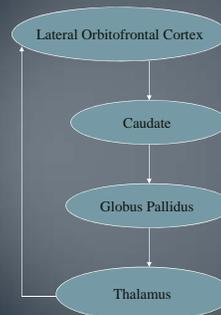
"Executive function" deficits in:

- Anticipation
- Goal selection
- Planning
- Monitoring
- Use of feedback
- Focusing/sustaining attention
- Generating hypotheses
- Maintaining/shifting response set

Also problems with:

- Verbal and design fluency
- Memory search strategies
- Organizing when learning
- Motor programming

OF Circuit



The OF Syndrome

Personality and emotional changes. OF cortex is neocortical representation of limbic system; involved in determining the appropriate time, place, and strategy for elicited behavioral responses.

- Behavioral disinhibition
- Prominent emotional lability
- Lack judgment and social tact
- Inappropriate jocularity/sexual remarks
- Irritable aggression/anger
- Inattention/distractibility
- Hypomania/mania

Assessing individual clients

- Determine premorbid variables
- Assess neuropsychological functioning
- Identify risk within environmental context
- Predict functional outcomes
- Provide recommendations for management

Measures of EF

- What are we measuring?
- Essentially the component skills of goal directed behavior
- Think CEO plus an effective administrative assistant

Defining terms and their measurement

- Simple Inhibition: Go/no-go task
- Selective Attention/Discrimination: Responding to specific words or stimuli but not others (e.g. CPT, TEA-Ch Sky Search or Auditory Attention subtest from the NEPSY battery)
- Complex Inhibition: Interference control with a Stroop-like task
- Complex attention: Trail-making test
- Working memory: brief store of incoming information, characterized by rapid fading and prone to interference (telephone numbers)
- *be sure to look at *efficiency* across tasks

Specific Lab Measures

- Delis-Kaplan Executive Function System (DKEFS)
 - Trails, Stroop, Verbal fluency
- Test of Everyday Attention for Children (TEA-Ch)
- Continuous Performance Tests (CPT-II, TOVA)
- Wisconsin Card Sorting Test (WCST)
- Rey-Osterrieth Complex Figure (ROCF)
- NEPSY-II Developmental EF
- CVLT and other memory measures
- Consider visuomotor, fine motor measures

Informant Based Measures

- Behavior Rating Inventory of Executive Functioning (BRIEF)
- Comprehensive Executive Function Inventory (CEFI)
- BASC-II (CBCL, Conner's & other general behavioral rating forms)
- Be sure to get multiple informants from multiple sites (parents, teacher's, etc.)

Preparing for testing

- Review all available info
- Generate hypotheses
 - Develop the protocol
 - Fixed versus flexible
 - Anticipate logistical and clinical obstacles and have a plan
- Prepare the stage
 - Have all materials ready beforehand
 - Know the tests you will be giving/ordering
 - Have a flexible timeline and sequence laid out

Comparison Standards for Deficit Measurement

- Normative
- Individual
- Direct
- Indirect
- Estimating premorbid ability
- Best performance method
- Neuropsychology organizes around established brain-behavior relationships

Domains of Assessment

- Assessment requires a review of all pertinent neurocognitive systems
- Examples of relevant domains include:
 - Intelligence
 - Executive functions (Attention, Self-regulation, Flexibility, Problem-solving, Reasoning, Planning, Organization)
 - Learning (acquisition)/Memory (retention, retrieval)
 - Language (Expressive, receptive, confrontation naming, fluency, repetition, semantic, phonological, pragmatic, prosodic)
 - Visuospatial/Visuomotor Construction
 - Sensory/Motor
 - Adaptive (Behavioral/social)
 - Personality, Mental state
 - Condition specific instruments

The Process

- Motivation
 - State and trait
 - Largely influenced by the examiner
 - Treat each pt as an n of 1
- Standard administration versus testing of limits
- Addressing special needs and populations
- Observation
 - Checklists
 - Notation
 - Improves with experience
- Documentation

Testing

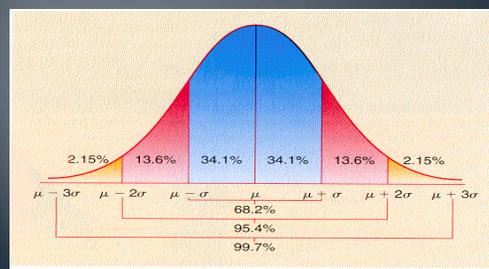
- Sampling behavior under specific performance demands.
- Document behavioral observations and impressions AS YOU GO. Create a usable, reviewable document.
- Tests provide formal documentation of *performance levels* (overall ability as well as specific strengths and weaknesses) and *problem-solving processes* in specific skill areas.
- The instruments are only as good as their psychometric/scientific foundations and the clinician that is employing them as tools.
- Test materials as tools of the trade- protect their integrity

Psychometrics

- The systematic measurement of psychological/neuropsychological functions
- Allows for NORMATIVE comparisons
- Extremely powerful tool to assist clinical decision-making
- Prone to abuse (a little knowledge is a dangerous thing)
- Validity (Face and Ecological)
- Sensitivity
- Specificity
- Positive vs negative predictive value (true positive/true negative). Partially dependent on base rate and probability

Normal Curve and deviation

- Standard Deviation (SD) – measure of deviation from the mean within a distribution of values



Interpretation

- Tests are multifactorial and frequently not specific to single mental operations or even a single neurocognitive domain.
- The examiner must analyze each task with respect to the skills/processes it requires and attempt to identify the ones that account for THIS individual's performance.
- Performance on seemingly different tasks may require one or more similar component mental processes.
- Your interpretation must account for ALL of the findings and bring coherence to the data

Brain and Behavior

- Analysis of brain-behavior relationships provides insights into adaptation
- Brain-behavior relationships provide a framework for organizing findings
- Any complex behavior reflects multiple brain systems
- Evidence for brain impairment involves both convergent and divergent validity

Context

- Environments constrain behavior
- Adaptation is a function of brain and context (i.e., they are not independent)
- Brain-behavior relationships are moderated by context
- The expression of brain impairment is context (and development) specific

Understanding Context

- Knowledge regarding environmental influences on development is crucial
- Assessment must consider multiple contexts
- Rule out alternative explanations and determine risk
- Test data is collected within a context (i.e., the examiner-child dyad)

Interpretation

- Interpret findings within context of ALL available information
- Findings reflect both brain functioning and context of the evaluation
- Failures in adaptation result from a clash between individual capacities and environmental demands/expectations

Interpretation

- Level of Performance
 - Objective normative standard
 - Do NOT pathologize normal levels of functioning
- Pattern Analysis
 - Strengths and weaknesses
 - Individual comparison standard
 - Test score comparison (especially consider DOMAINS and Brain-Behavior)
- Pathognomic sign
 - Are there any specific signs that are indicative of brain dysfunction? Are they specific to certain conditions?

Common Interpretation Errors

- Overgeneralization
- Absence of evidence
- Confirmatory bias
- Misuse of salient data can lead to both over and under interpretation
- Failure to consider "base rates"
- Effort/motivation

Communicating Your Findings

- Style Counts
- Know the audience and accommodate to them
- Consider yourself a teacher and use teaching aids whenever needed
- Be sure to address the referral question
- Make your findings relevant and useful
- Be prepared to field questions
- Polish your crystal ball

Collaborative Treatment Planning

- Review the purpose of the evaluation, solicit goals for the evaluation and feedback session from the team
- What are the team concerns?
- Identify goals for the student/client
- What are the obstacles to success?
- Review data within context of strengths and weaknesses
- Discuss moderators for success and risk factors
- INDIVIDUALIZE your recommendations to fit the clients specific neurocognitive profile. Data, not just diagnosis, driven
- Limit yourself to scientifically proven interventions
- If going beyond science, clearly state so.
- Recognize everyone's expertise

Verbal feedback

- Use language appropriate to the listener
- Give them permission to interrupt and get clarification
- Use visual aids/graphic representations of data whenever possible
- Leave plenty of time for questions and answers
- Do not be afraid to say "I don't know"
- Invite group discussion
- DO NOT be the know-it-all
- Tell them what they need to hear, not what you know
- Meet the need
- Anticipatory guidance

Writing Essentials

- Clarity
- Integration
- Accuracy
- Relevancy



Clarity

- Avoid jargon
- Define terminology in lay terms
- Use standard scores only when helpful to the reader
- When scores are provided, include interpretive guidelines
- Provide specific behavioral descriptions

Integrate all relevant information

- Premorbid
- Medical information
- Psychosocial factors
- Academic information
- Prior testing
- Current findings
- Address inconsistencies

Accuracy

- Define the degree of confidence in current findings
- Address the limitation of the data but do not become apologetic
- Stay within the confines of the findings

Relevancy

- Address all areas of concern
- The report should address the needs of the client AND the referral source
- Recommendations should be specific, realistic, and flow from the data
- Client centered treatment planning, appreciating values and unique needs

Report Format

- Develop your own style
- Setting and consumers needs
- “No one reads long reports”
- Write reports “as long as a lady’s skirt”
- Your most visible “product”

Examples

- The following slides provide some examples of deficit based treatment planning
- Keep in mind there may not be clear cut, right vs wrong answers
- Collaboration helps you achieve the “most likely to work” solution



Arousal problems

- Person focused
 - Medication (Amantadine and Provigil work by enhancing alertness thereby someone is awake to learn)
 - Improve sleep hygiene
 - Brief breaks or naps
 - Energizing diet
- Environment focused
 - Gradual school re-entry
 - More demanding classes in morning
 - Progressive increase in physical activity
 - Rest breaks during the day

Attention/initiation problems

- The individual
 - Stimulant medication
 - Task analysis
 - Stop and think
 - Rewards for task completion
- The environment
 - Preferential seating
 - Hands-on, participatory instruction
 - Monitoring and redirection



Slowing

- The individual
 - Medications
 - Teach word-processing
 - Teach and reinforce efficient learning strategies
- The environment
 - Reduce pace of instruction and amount of work
 - Evaluate quality, not quantity
 - Limit homework
 - Allocate more time for activities
 - Permit peer note-taking

Nonverbal/Visuospatial deficits

- The individual
 - Teach to verbal strengths
 - Visual training
- The environment
 - Use familiar and readable materials and tasks
 - Use step-by-step approach, build on practice and review
 - Use models and demonstrations to concretize abstract concepts

Memory deficits

- The individual
 - Mnemonic strategies
 - Medications
- The environment
 - Frequent repetition and review
 - Environmental aides
 - Homework assignment book
 - Activity schedules
 - Regular routines
 - Cueing

Executive function deficits

- The individual
 - Instruction in study skills
 - Habit based training to establish routine and automaticity
- The environment
 - Structure and organize
 - Routine and predictability
 - Break tasks into manageable steps
 - Need for frequent feedback
 - Focus on process, not just outcome

QUESTIONS?

