Understanding ADHD Diagnosis and Treatment:
Jon E. Nadherny/Calciano Memorial Youth Symposium

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Outline

• Symptoms
• Impact
• Development
• Assessment
• Treatment
• New frontiers
What is ADHD?

- Attention Deficit Hyperactivity Disorder
- Presents itself as inattentive or hyperactive/impulsive
- No longer called ADD (for inattention) or ADHD for (hyperactivity)
- Neurodevelopment disorder
  - Neuro= the brains of people with ADHD function differently
  - Developmental= effects individuals differently at different ages
ADHD: Core Symptom Areas

- Inattention
- Impulsivity/Hyperactivity
Impact of ADHD

- Lower academic achievement
- Higher rates of unemployment & underemployment
  - ADHD earners $8,900 to $15,400 less than non ADHD workers
- Economic impact of ADHD $143 to $266 billion for national annual incremental costs
- Higher rate of peer and relationship issues
- Higher divorce rates
- Higher rate of other psychiatric and learning disorders
  - Young adult females with ADHD higher rates of suicide ideation & attempts
- 25-45% increased antisocial behavior and arrests
- Higher rate of accidents and emergency department visits
- Heavier use of alcohol, cigarettes, illicit substances
- Riskier sexual behavior
ADHD is Associated with Significant Rates of Irritability

Schweitzer, unpublished
ADHD is Associated with Significant Rates of Emotional Lability

Sobanski et al 2010 find EL is associated with hyperactivity/impulsivity

Schweitzer, unpublished
Psychiatric Disorders and High School Dropout

Did Not Complete High School on Time

Weighted %

Depression/Dysthymia
Mania
Panic
Specific phobia
Social phobia
PTSD
GAD
Conduct disorder
ADHD—Inattentive Type
ADHD—Hyperimp Type
ADHD—Combined Type
Tobacco Dependence

Sample Size N=29,662
Breslau, J., et al., 2011 J Psychiatric Research
ADHD and Number of ADHD Symptoms Impact Success with Obtaining Bachelor’s Degree

LNCG = local normative comparison group; ADHD = attention-deficit/hyperactivity disorder
ADHD and Greater Number of ADHD Symptoms in Adulthood
Lead to Greater Emotional Distress in Adulthood

Note: LNCG = local normative comparison group; ADHD = attention-deficit/hyperactivity disorder.

Hechtman et al., 2016
Sex Differences

- Girls and boys at risk for same co-morbid disorders and impairments in ADHD
- Girls at greater risk for internalizing disorders than boys
- Girls more prone to binge eating and bulimia in adolescence
- Differences in ratio of prevalence of ADHD between boys to girls declines in adulthood
- Women much more likely to seek psychological help than men
- No known differences in neuropsychological performance or response to treatment
ADHD: SOME SYMPTOMS DECLINE OR CHANGE WITH DEVELOPMENT

INATTENTION

IMPULSIVITY

HYPERACTIVITY

AGE
Mom, can Trent come over today?

Trent? Trent's a little reckless.

"Reckless"?? What's that supposed to mean?

Reckless means doing things without thinking or caring about the consequences.

Does that sound like anyone you know?

I'm a seven-year-old kid. It sounds like everybody I know.
Characteristics and Impact of ADHD Change with Development

Asherson, 2012
SO, DAD, YOU KNOW HOW SOMETIMES SOMETHING THAT SEEMS LIKE A REALLY GOOD IDEA TURNS OUT TO BE NOT SUCH A GOOD IDEA...
When Should One Seek an Evaluation?

- Behavioral issues
- Teacher or friends suggest ADHD symptoms
- Family history of ADHD
- "Look alike" concerns such as anxiety, depression, or learning disabilities
- Symptoms associated with ADHD are causing problems in two environments (home, school/work, community)
Why Would A Parent Want an Evaluation?

- To better understand your child
  - Why are these behaviors present?
  - What can I do as a parent to help?
- To get the right treatment, services, and support
  - Documentation is often required to be eligible for services

VS

- Failure to seek help and intervene can result in:
  - Frustration and feelings of helplessness
- Your child may experience:
  - Behavioral disturbances and poor academic achievement
Who is qualified to diagnose ADHD?

Medical professionals:
- Pediatricians
- Psychiatrists
- Neurologists
- Psychiatric Nurses

Clinical professionals:
- Clinical Psychologists
- Neuropsychologists
- Marriage/Family Therapists
- Social Workers
- Licensed Educational Psychologists

NOT allowed to diagnose:
- Occupational Therapists
- Speech Pathologists
- Behavior Analysts
- Teachers
- Tutors
- Life Coaches
Identify What Your Goal is to Help Determine What Type of Help You and Your Child Need

When choosing a provider to see ask yourself the following:

- Do you want to confirm what you already know?
- Do you want to consider other reasons for the behavior?
- Do you want to access medication?
- Do you want to access behavioral support?
- Do you need formal documentation of the diagnosis?
- Do you need documentation of diagnosis and needs to provide it to your child's school?
Screening Vs. Evaluation

- Brief interview
- Rating Scales
  - Parent and teacher

- Lengthier interview and behavioral observation
  - Parent, child, potentially teacher

- Parent and teacher rating scales
  - Broad based behavior and emotion
    - BASC
    - CBCL
  - ADHD specific
    - Conners
    - ADHD:RS 5

- Assessment of comorbid or alternative disorders
- Testing, when indicated
  - IQ, achievement, neuropsychological
Screening

Pros

- Can be done in a short amount of time (30 minutes)
- Can tell you if abnormal behaviors are atypical
- "Quick" way to formal diagnosis and medication

VS

Cons

- Does not tell you why behaviors are present
- Documentation may not be enough to receive school based services
Formal Evaluation

**Pros**

- Alternative explanations for the behavior
- May identify other challenges that may be happening in addition to ADHD
- Can help with educational interventions and behavioral interventions
- Opens doors to other services

**Cons**

- Greater time investment (several appointments)
- Cost (may be out of pocket, partially reimbursed)
- Child is often nervous or unsure about the first appointment and may complain about the process
Clinical Care for Pediatric ADHD
Diagnostic Considerations for ADHD

• Impairment before 12 years of age
• Substantial impairment across settings?
• Other explanations to account for symptoms?
• Comorbid conditions?
• Do parents have ADHD or other condition that may affect their parenting or perception of ADHD?
• Changes with DSM 5 include ADHD can co-occur in ASD; presentations rather than subtype
Further Diagnostic Considerations and Measures

- Social skills rating scales
- Sleep and sleep hygiene
- School performance and academic assessment
  - Report cards
  - Academic performance rating scale
  - Homework habits
  - Organizational tools
  - School to parent and child forms of communication
  - Formal testing (WIAT; WJ)
Additional Evaluation Considerations

• Self-report measures of emotional functioning for child
  – Anxiety, depression, general interview

• Parental stress

• Discipline styles

• If the Patient’s Medical History Is
  – Unremarkable, Laboratory or Neurological Testing Is Not Indicated (including SPECT, fMRI) for clinical purposes
Next Step after Diagnosis

• Is the child sufficiently impaired to need?
  – Medication (primary care question)
  – Therapy (psychiatric health)
  – Special services (education)

• Evaluate treatment outcomes

• Do parents need evaluation or treatment for their own problems? Depression, ADHD, stress
Behavioral Interventions for Children and Youth

Parent Education/Behavioral Parent Training
Organizational Skill Training
Classroom Intervention
Educational support services
Parent Child Interaction Training (PCIT)

The Incredible Years

Defiant Children: A Clinician’s Manual for Assessment and Parent Training

Russell A. Barkley
Treatment Considerations

- ADHD is a chronic disorder
- Behavior therapy has some role
  - Comorbidity
  - Initial treatment or concern regarding diagnosis
  - Lower dose of medication
  - Less Than Optimal Response to Medication
- Assess need for treatment of parent’s mental health
General Behavioral Interventions

- Focus on specific behaviors rather than ADHD in general
- Focus on goal setting
- Help children to engage in behaviors that are incompatible with problems behaviors
- Assess what are the antecedents to problem behaviors
- Utilize universal interventions such as classroom-wide incentive programs
- Establish token economies contingency contracts as a regular part of your program
Implications for Treatment

• Teaching skills is inadequate
• All treatments are at the point-of-performance
• While ADHD creates a diminished capacity, does this excuse accountability? (No!, the problem is time and delays -- not consequences)
• Behavioral treatment is essential but does not generalize or endure after removal
• The compassion and willingness of others to make accommodations are vital to success

Barkley, 2008
Environmental Support

- Externalize important information
  - lists, posters, signs, other cues of critical reminders and post at the point of performance

- Externalize time periods related to tasks
  - use timers, clocks, counters, that signal time’s passing

- Break up future tasks into many small steps
  - do 1 step each day

- Externalize sources of motivation
  - Quick praise, token/point systems, tangible rewards

Barkley, 2008
Environmental and Instructional Considerations

- Task Duration
- Scheduling of academic work
- Novelty is your friend
- Structure and contingency management
- Allow productive physical movement
- Utilize active involvement
- Anticipate problems and have a ready plan
  - Be proactive rather than reactive
- Make expectations clear and provide rule reminders with visual and auditory cues
Organizational Skill Training in Children

- Organization, time management, and planning (OMTP) are key skills for academic success.
- Recent studies suggest that explicit teaching and practice of organizational skills significantly improves OMTP deficits (Abikoff et al, 2013) in 8-11 year olds.
- May be most effective with inattentive type ADHD.
Parent–Teen Therapy for Executive Function Deficits and ADHD
Building Skills and Motivation

• Motivational interviewing
• Personalized approach
• Collaborative problem-solving
• Several examples
• Practical
• Evidence-based
• Manualized
Not All Persons with ADHD Are Alike: ADHD Presentations/Subtypes Differ in Brain and Behavioral Functioning

Mazaheri, et al., 2014

ADHD Subtype Differences in Brain Functioning

ADHD n= 193; TDC n=

TDC = 23
IA = 17
CB = 17

Fair et al., 2013
Sluggish Cognitive Tempo (SCT) or Concentration Deficit Disorder

- Daydreaming, drowsiness, sluggishness/slowness to respond and hypoactivity
- 30-63% ADHD inattentive subtype children have high levels of SCT (Carlson and Mann, 2002; Garner et al., 2010; McBurnett et al., 2001)
- Highly correlated with IA symptoms (see Willcutt et al., 2012); may be significantly negatively correlated with hyperactivity/impulsivity (Lee et al., 2014; Penny et al., 2009)
- SCT distinct disorder from ADHD based on factor analytic studies (Lee et al., 2014; McBurnett et al., 2014; Willcutt et al., 2014)
Hypothesis: IA versus SCT symptom types will be associated with different patterns of neural activation

Methods: To probe the contribution of SCT symptoms to neural differences examined the correlation between activation and parent ratings of (1) SCT symptoms and (2) ADHD inattentive symptoms.
Inattentive and SCT Have Different Associations with Cognitive-Control Related-Brain Activity

SCT correlated with sup parietal hypoactivity;
IA correlated with thalamic hypoactivity

Dark blue cluster - negative correlation with SCT in L SPL
Red cluster - positive correlation with IA symptoms in SMA

Green clusters - negative correlations with SCT in bilateral SPL and SMA when not controlling for inattentive symptoms.
Dark blue - negative correlation with SCT in L SPL.
Light blue negative correlation with SCT controlling for IA symptoms in L SPL.
Violet clusters - negative correlations with inattentive symptoms in bilateral thalamus.

Fassbender et al., 2015
ADHD Symptoms “Remit” during Electronic Game Playing – Dopamine Theory?
Can Video Game-Like Apps Help Children with ADHD?

Julie Schweitzer, PhD
Faye Dixon, PhD

Game-Based Digital Therapy for Pediatric ADHD

What is the study about?
Researchers at the UC Davis MIND Institute in Sacramento, along with 7 other research institutions nationwide, are doing a study to see if a video game-like iPad application (app) can help children with ADHD. We are doing this study to gain more information about the digital therapies to understand if there is an effect on attention and other ADHD symptoms.

Who can participate?
- Ages 8-12
- Children with ADHD

What can families expect?
- 2 visits to the UC Davis MIND Institute in Sacramento for cognitive, behavioral and ADHD evaluations
- Four weeks of playing the video game-like app at home (25 minutes/day, 5 days every week)
- $125 compensation
- No invasive procedures, imaging or blood draws
- Weekend and evening appointments are available

Contact us at:
Attention, Impulsivity, Regulation (AIR) and ADHD Program
916.703.0294
addhd@ucdmc.ucdavis.edu

MIND Institute
2825 50th Street
Sacramento, CA 95817
Can We Improve Attention in Children by Reducing Response to Distractors?
Example of Our Future VR Classroom
Can We Use Game Playing to Decrease Impulsivity?

Preschoolers with Impulsivity Learn to Wait

Schweitzer & Sulzer-Azaroff, 1988

Currently under development: DeLTA App to Increase Self-Control
Correlations between flanker on trial by trial accuracy and intensity & frequency of movement
The ADHD Group Only Demonstrate More Accurate Performance with More Intense Movement

ADHD have More Frequent & Intense Movements than TD

<table>
<thead>
<tr>
<th></th>
<th>TD (n = 18)</th>
<th>ADHD (n = 26)</th>
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</thead>
<tbody>
<tr>
<td><strong>Average PIM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct trials</td>
<td>6.4 (8.9)'</td>
<td>17.3 (17.1)'</td>
</tr>
<tr>
<td>Incorrect trials</td>
<td>6.8 (8.1)</td>
<td>12.4 (15.5)</td>
</tr>
<tr>
<td><strong>Average ZCM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct trials</td>
<td>0.9 (1.0)'</td>
<td>2.0 (1.5)'</td>
</tr>
<tr>
<td>Incorrect trials</td>
<td>1.2 (1.2)'</td>
<td>1.9 (1.5)'</td>
</tr>
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PIM = Intensity
ZCM = Frequency
Implications and Future Directions

- Hyperactivity isn’t always negative
- Consider perspective that fidgeting may be helpful
- Test if fidgeting is helpful for all children with ADHD or subgroups
- Is there a relationship between fidgeting and neural activity?
- Test empirically if fidget toys, gum and exercise are linked with better performance in ADHD
- Develop socially-appropriate, nondisruptive ways to integrate movement into tasks
Participant-Driven Engagement for Advancing the Dissemination of Diagnosis and Treatment for ADHD

PURPOSE: To engage patients and caregivers in the evaluation and decision-making of personalized ADHD treatment options.

INPUTS/RESOURCES
- Adult patients
- Adolescents
- Children
- Parents of patients
- Community organizations
- Physicians
- Participants

ACTIVITIES
- Identify barriers and stigmas encountered in seeking treatment
- Identify personal treatment decisions encountered by persons and caregivers

OUTPUTS
- Consensus perspectives of persons seeking treatment
- Consensus on treatment options for persons engaged in treatment

EFFECTS (over time)
- Improved accuracy of diagnosis and appropriate use of treatment options
- Reduction of barriers to treatment due to stigma
- Personalized adoption of treatment options

CONTEXT: Patients with ADHD and caregivers of patients with ADHD face significant social stigma and misinformation in seeking treatment options. Variable environments of treatment (primary care, pediatrics, mental health clinics) have uneven application of CER ADHD methods.

Website to Deliver Resources on Evidence-Based Information on ADHD Informed by Persons with ADHD in the Family
Clinical Care for ADHD in Adults
Clinical Presentation

Adulthood

- Disorganized, fails to plan ahead
- Forgetful, loses things
- Difficulty in initiating and finishing projects
- Misjudging available time
- Inattention/concentration problems
- Job instability or under employment, marital or relationship difficulties, impulsivity
Impact of ADHD in Adults

• Lower academic achievement
• Higher divorce rate
• Lower occupational success
• Other psychiatric problems
• Substance use disorders
• Legal problems and arrest
• Accidents and emergency department visits
• Increased risk of driving accidents
ADHD diagnosis and pharmacotherapy per 1,000 population: U.S. office visits for adults aged ≥ 20 years.
Diagnostic Considerations for Adults

- Evidence of impairment in childhood?
  - Modified from early childhood
    - Fewer DSM criteria (5 rather than 6)
- Evidence of current substantial impairment across settings?
- Could other explanations account for the symptoms?
- Evidence of comorbid conditions in individuals with ADHD?
ADHD in College Students

• 25% of college students receiving disabilities services are diagnosed with ADHD
• Problems with time management & organizational skills
• College students with ADHD have lower GPA, more likely to be on academic probation
• Increased rates of alcohol, nicotine and drug use
• Majority of studies on college students use inadequate diagnostic procedures
• Rates of self-reported diagnosis are lower in historically black colleges and universities 3.8% vs. 5.0%
Assessment Protocol

• Clinical interview with patient and observations
• Interview and ratings with patient and other informants
• Emotional, psychiatric, substance use domains
• Executive functioning
  – Time management; self-restraint; problem solving; motivation; organization across domains
• Relationship health
• Previous records (e.g., school report cards)
Risky Rise of the Good-Grade Pill

“Now I have to worry about this, too? Really? This shouldn’t be what they need to do to get where they want to,” said Dodi Sitar, after listening to her ninth-grade son, Jonathan, describe how some classmates abuse stimulants.

By Alan Schwarz
Published: June 9, 2012 | 019 Comments
College Students and ADHD

• Feign ADHD symptoms to obtain academic accommodations or to obtain a prescription
• 25-48% of students self-referred for ADHD evaluations exaggerate symptoms (Sullivan et al., 2007)
• May fake on rating scales, interviews and cognitive tests
Nonpharmacological Treatment

• Insight
• Counseling – Education, acceptance, hope
• Cognitive behavior therapy has some role and can be effective in adults
  – Comorbidity
  – Lower dose of medication
  – Less than optimal response to medication
• Coaching may be effective
• Meditation; mindfulness (?)
• Academic accommodations (?)
Resources

• Centre for Evidence Based Medicine
  – www.cebm.net/
• National Initiative for Children's Healthcare Quality (NICHQ)
  – www.nichq.org/
• American Academy of Pediatrics
  – www.aap.org
• American Academy of Child and Adolescent Psychiatry
  – www.aacap.org
• National Institute of Mental Health
• ADHD Report – Guilford Press
• CHADD
• PEN
Current and Recent Schweitzer Laboratory Members and Collaborators

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