ADHD: BEYOND THE CLASSROOM

NEFEC ANNUAL SCHOOL COUNSELORS FORUM
FEB 1, 2017
NIKHIL RAO, MD, MSC
ANAND PATEL, MD, MBA
GOALS OF STIMULANT THERAPY

• “I’m not a bad guy. And I’m smart. I used to be in gifted. I don’t like mouthing off or doing stupid things. I just can’t help it. When I’m on [insert stimulant here] I just feel like I have a second. I have a second to make a better choice, and a second before the urge takes over me to stop it.”
OBJECTIVES

• Review the basics of ADHD diagnosis and treatment
• Review common conditions that may present as ADHD
• Discuss how ADHD affects functioning outside of academic performance and classroom disruption
A BRIEF INTRODUCTION

- ADHD is marked by deficits in two areas:
  - Inattention
  - Hyperactivity/Impulsivity

- ADHD is one of three psychiatric illness that REQUIRES medication treatment:
  - The others are Bipolar Disorder and Schizophrenia

- Therapeutic approaches, life skills, and coaching are important, but cannot replace medications

- ADHD can be thought of as a disorder of ‘executive functioning’
  - A broader concept that includes such facets of behavior as planning, impulse control, organization, and sensory filtering
ADHD: DIAGNOSIS

• The first thing to understand is that ADHD is almost definitely a heterogeneous set of disorders encompassing everything from neurodevelopmental disorders to the inherent pathology of the modern environment.

• The next thing to understand is that this may not matter that much, as all such subgroups seem to benefit from pharmacotherapy and the consequences of inadequate treatment are pretty awful.

• The final thing to understand is that a dysregulated child has all sorts of reasons to be dysregulated.
  • Stimulants help everyone, at least a little.
  • So it’s easy to forget the core deficits in internal and external world that may lead to ADHD-like symptoms.
ADHD: DIAGNOSIS PEARLS

• Must show symptoms in **Inattention** or **Hyperactivity/Impulsivity** prior to age 12
• Must be present in **two or more environments**
ADHD: DIAGNOSTIC RATING SCALES

- A good attention scale also identifies comorbidities including Anxiety, Depression, ODD, Conduct
- Connors – Gold Standard
  - Like gold, very expensive
- Vanderbilt – Also a Gold Standard
  - Open Source
  - Different Parent and Teacher Forms
- SNAP-IV
  - Provides an easy diagnostic cutoff
  - Provides longitudinal tracking
MTA Study
(The Multimodal Treatment Study of Children With ADHD Cooperative Group: 1999)

579 children with ADHD followed in 3 treatment groups for 14 months

- Medication Management Only
- Medication and Behavioral Treatment
- Intensive Behavioral Treatment (Parent training, Child-focused treatment, and School based intervention)
- Control Group - Standard Community Care
MTA Results
Swanson et al 2001

- Success highest for Combined Tx: 68%
- Medication Management: 56%
- Behavioral Tx: 34%
- Community Care (Tx by community providers): 25%

- See MTA Follow-up Articles:
  - At 24 months
  - At 3 years
  - At 8 years
ADHD TREATMENT

• ADHD is one of the three diseases in psychiatry that REQUIRE medication treatment:
  • Schizophrenia
  • Bipolar
  • ADHD

• While therapy and skills development can play an adjunctive role, it cannot replace the normalization of brain chemistry that can only be achieved through stimulants

• There is some evidence that being on stimulants more consistently and for longer as a child may reduce the likelihood of needing them as an adult.
ADHD TREATMENT

• There is a large body of evidence showing that due to the aforementioned executive dysfunction, people with ADHD are at risk for a number of bad outcomes
  • Impulsive crime
  • Violence (victim and perpetrator)
  • Substance use
  • Unemployment
  • Dropping out of school

• There's a growing body of evidence that stimulants can prevent or ameliorate these outcomes
  • Yes, daily dosing of appropriate levels of stimulants when young can prevent stimulant abuse when older
ADHD TREATMENT

- Stimulants are the first line treatment and are the only ones that work on BOTH inattention and hyperactivity.
- Strattera does improve primarily inattentive symptoms with less effect on hyperactivity. Its effect on inattentive symptoms is notably less than stimulants.
- Alpha agonists are most helpful for hyperactivity symptoms but do not modify the underlying executive dysfunction.
GETTING OFF OF STIMULANTS

- Many children will need these to achieve their greatest academic and functional potential
  - Be wary of discontinuing because ‘behavior’ is improved as inattention may still be severe.
  - ‘Good enough’ academic performance is not the same as ‘The best they can do’
- However, due to improved myelination, many can transition off in adolescence or college
  - Many may not though
- Children may take ‘holidays’ on weekends and holidays
GOALS OF STIMULANT THERAPY

- A wiser, older child psychiatrist liked to tell the kids (and me, back when I was deathly afraid of stimulants) that stimulants are like “a good pair of eyeglasses. They help you focus. But you still have to choose what to focus on”
GOALS OF STIMULANT THERAPY

• Coincidentally, I did an intake a while back where a kid told me:
  • “I’m not a bad guy. And I’m smart. I used to be in gifted. I don’t like mouthing off or doing stupid things. I just can’t help it. When I’m on [insert stimulant here] I just feel like I have a second. I have a second to make a better choice, and a second before the urge takes over me to stop it.”
WHEN YOU DON’T USE A STIMULANT FIRST

- Comorbid OCD or Tic Disorder – Most likely will exacerbate
- Comorbid Anxiety – May exacerbate
  - Consider an alpha agonist first
  - Strattera has some evidence for anxiety (was nearly approved for this)
  - **HOWEVER**, if the anxiety is performance-related, the anxiety may improve if they feel their attention improve as well.
- Comorbid PTSD – May exacerbate
  - Alpha agonists have strong evidence of benefit in PTSD for both daytime hyperarousal and night-time re-experiencing (nightmares)
- Disruptive and Explosive Behavior Disorders
  - Stimulants won’t always make these worse, but alpha agonists will often make them better
    - Two birds, one stone
DIFFERENTIAL DIAGNOSIS

• We make diagnoses based on collections of symptoms
• Sometimes other diseases overlap with ADHD
• These overlapping conditions MUST BE RULED OUT
  • ADHD treatment could mask these conditions or even worsen them
  • Many of the other conditions have potentially severe impacts on long term outcomes
• Much of the diagnostic confusion comes from the fact that ADHD is often first noted at the same time as other childhood diseases emerge into clinical significance
DIAGNOSTIC CONFUSION
AGE

• ADHD can be a clinically relevant problem as early as preschool
• However, at that age there can be a lot of culprits
  • Boys develop impulse control later than girls. A boy who looks ADHD at age 5 has a substantially lower likelihood of appearing ADHD just a year later.
  • Poor nutrition
  • Epilepsy – Especially absence seizures
  • Asthma
  • Vision and hearing issues
  • Sleep disorders (Obstructive Sleep Apnea and chronic tonsillitis)
  • Neglect or deficient parenting skills – Children learn self-regulation from the adults in their lives. Both through mimicry and through imposed structure
  • Psychological trauma and anxiety can both mimic ADHD as well
BRAINS NEED OXYGEN

- Especially during sleep
- Impaired oxygenation during sleep prevents deep (N3) sleep
- Without deep sleep, children (and adults!) struggle with daytime sleepiness, concentration, and memory.
- Sinusitis and Tonsilitis
- Obstructive sleep apnea
  - Usually in children due to enlarged tonsils or ‘floppy airway’
  - More recently, obesity-related OSA is on the rise
- Asthma – Can be ‘silent’. Especially in sedentary children.
- Allergies – Third generation antihistamines
EPILEPSY

- Absence seizures – Blank staring spells without obvious prodrome or post-ictal confusion
  - Can look like ‘zoning out’
- Complex Partial Seizures – Usually associated with a stereotypical prodrome (lip-smacking, picking at shirt) and a sensation of ‘gorge rising’, followed by loss of consciousness.
  - May not be obvious to either the child or observer. May look like fidgeting and zoning out.
HEARING AND VISION

- A child who is having difficulty hearing or seeing will often drift off or engage in their own chosen behaviors.
LEARNING DISORDERS

- A child who is struggling with a certain subject:
  - Math – Dyscalculia and dysgraphia
  - Reading – Dyslexia
- May stop trying to actively learn – inattention
- May fidget, get out of seat, or disrupt classroom – Hyperactivity/impulsivity
- May be a subconscious response, or a conscious response
  - ‘If I make a scene, they won’t realize I can’t read’
• Attention, impulse control, and organizational behavior sit at the top of the heap of cognitive and executive functioning. Disturbances at ‘lower levels’ of brain function can lead to difficulties with attention.

• Autism and Sensory Processing Disorder – Struggles with integrating external stimulation with internal world

• Anxiety – Worry and agitation interfere with ability to concentrate

• PTSD – Constant activation of the ‘fight or flight’ system leads to children being focused on new stimuli, or filled with unease.

• Neglect and Home Environment – Children learn about self-regulation from the adults around them.
HOME ENVIRONMENT

• Children develop their ability to organize their thoughts and their actions through their environment

• Poor regulation-via poor parenting skills-can look like ADHD
  • Parent Management Training – An evidence based approach to helping parents provide appropriate discipline and behavioral modifications to children
  • Parent Child Interaction Therapy – An intensive approach with guided direction for parents to improve oppositional and disruptive behaviors
  • These approaches typically lead to quick improvement in hyperactivity symptoms but less improvement in concentration

• Standard practice is to do these therapies before medications in children with Oppositional or Explosive Behaviors
NEGLECT AND TRAUMA

• Neglect – A child relies on a *dyadic relationship* delivered by a primary caregiver as well as interactive play directed by said caregiver to develop their abilities to interact with others and the outside world
  • They also need a stimulating environment to build their ability to *attend* to said world

• Trauma – Traumatic experience results in issues in trust, fear of or disregard for authority figures, and a constantly on ‘fight or flight system’
  • A child who experiences this is less likely to orient to an authority figure, more likely to be preoccupied with escape, and have more difficulty maintaining constant concentration due to ‘fear circuitry’ being constantly turned on
ANXIETY

• Worry is a preoccupying force, both physically and mentally

• Anxiety results in unease felt within the body

• Anxiety results in a ‘turning off’ of the frontal brain and a ‘turning on’ of the limbic (fear and emotional) system
  • There is literally reduced blood flow to the areas we need for concentration, focus, and decision making
  • The focus of our worry becomes preoccupying and it is difficult to keep it out of the forefront of our thoughts
  • Our emotional experience prevents focus on the logical experience.
• Abnormalities in the processing of sensory information. Either over or undersensitive.

• Hypersensitive children will shy away from too much stimulation. The noise of fellow students, the loudness of classroom bells, and even textures and touch sensations. They will shut down and look inattentive.

• Hyposensitive children will crave more stimulation. They might fidget, make impulsive nonsense noises, get up out of chairs, shuffle the items on their desks. They will look hyperactive.
AUTISM SPECTRUM DISORDER

- In addition to sensory processing issues
- Children with ASD will have trouble focusing on others’ interests and struggle to engage in the activities that others would like them to. They have difficulty identifying other individuals as focuses of interest within the world, and being directed by those individuals.
- Children with ASD are behaviorally rigid, and will want to work on their own internal schedule. They will struggle to task-switch based on an externally imposed schedule. They will also become very upset when their routine is disrupted.
INTELLIGENCE, SKILLFULNESS, AND DISCIPLINE

• ADHD may be diagnosed relatively late, especially inattentive type.
  • These children are less disruptive than those with hyperactivity

• Intelligence and Skills can overcome the functional barriers to learning when younger
  • However, with onset of adolescence and adulthood, the increased demands of organization, time of focus, and planning, may result in unmasking of symptoms
  • Additionally, the consequences of impulsive choices (fighting, ‘mouthing off’, risk-taking) multiply as one gets older.
ADHD PATHOPHYSIOLOGY BASICS

- We diagnose ADHD based on three realms of ‘core symptoms’
  - Attention Deficit
  - Hyperactivity
  - Impulsivity
- Even though some children have only inattentive symptoms, and some children have both, the pathophysiology is believed to be the same based on imaging and electrophysiology studies, as well as longitudinal outcome studies
- HOWEVER, as we’ve alluded to, an overfocus on obvious manifestations may not do this disorder justice
ADHD PATHOPHYSIOLOGY

• Comparative neuroanatomy of ADHD vs control brains show
  • A reduced size left Prefrontal Cortex – The part of the brain responsible for self-control and decision making
  • Reduced Posterior Parietal Cortex – Sometimes called Multisensory Association Areas. Responsible for integrating multiple inputs and directing attention
EXECUTIVE DYSFUNCTION

• Executive Functioning is truly what distinguishes us from other animals
  • Attentional Control
  • Inhibitory Control
  • Working Memory
  • Cognitive Flexibility
  • Problem Solving
  • Planning
  • Organization

• These processes are all affected in ADHD
  • As one can imagine, this could be quite debilitating, especially as one’s responsibilities grow larger.
EXECUTIVE DYSFUNCTION

• The ability to plan and organize is crucial to succeed in adult life
  • Without these skills, we can’t work toward long-term goals, pay bills, or take care of the myriad tasks of modern life

• The ability to control our impulses is also important
  • Not saying the first thing that comes to our mouth. Not taking the tempting option. Problem-solving rather than conflict
Brain myelination and pruning is a process that occurs throughout our teens and into our 20s (30s in men). As this process unfolds, many children with ADHD will 'normalize'. However, many won’t, although their deficits may become less obvious.

The hyperactive symptoms are the quickest to disappear
  - By high school, few children with ADHD exhibit hyperactive symptoms off of their medications.
  - This likely reflects natural brain maturation processes

The inattentive symptoms may appear less disabling
  - They may reduce in intensity, but more often, the need for focused attention grows less as we age. Learning routines and being familiar with necessary tasks.

The subtle executive function deficits may persist lifelong however
SO MUCH BRAIN
WHY WE NEED DOPAMINE

Dopamine acts as a signal to engage in more of a behavior.

- Formerly known as 'Dopamine Reward Hypothesis'
- Now thought of as 'Dopamine Salience Theory'
  - Better accommodates for importance in attention, emotion, learning,
DOPAMINE SALIENCE THEORY

• Why would the brain evolve a structure conserved over hundreds of millions of years of evolution for the purpose of getting us addicted to things?
• …It wouldn’t
• So then why do we have a Dopamine ‘Reward’ Center?
• We don’t
• What we have is a Dopamine MOTIVATION Center
• First, dopamine makes us care
• Then, dopamine rewards us for caring
• Trust in the dopamine
DOPAMINE AND ADHD

- Default Mode Network – The areas of the brain active during wakeful rest. Daydreaming, idle social processing (thinking about others), thinking about the past or the future
  - Negatively Correlated with the Attention Network
  - Involved in both storytelling and experiencing and thinking about stories
  - **Deactivates during external goal-oriented tasks:** Visual or cognitive problem solving.
  - Brain Regions – Posterior Cingulate Cortex, medial PreFrontal Cortex, Angular Gyrus

- Task-Positive Network – The areas of the brain active when engaged in a task involving the external environment (and also when imagining such tasks)
  - Generally anti-correlated with the DMN
  - **Activates during external goal-oriented tasks**
  - Brain regions – Insula, Orbitofrontal Cortex, Ventrolateral PreFrontal Cortex
THE ADHD BRAIN

• In ADHD, the DMN may be asynchronous – i.e. the PCC and the mPFC aren’t firing together
  • Impaired sense of self especially with regard to causality and intentionality – 50% of ADHD patients
    • ‘Storytelling of self’ is impaired
    • Disconnect between actions and results
• In ADHD, the DMN competes with the TPN even during executive functioning tasks
  • I.e. the brain remains turned inward even when it’s supposed to focus on a task
  • Or, thought of another way, it is hard for the TPN to activate strongly enough to supercede the DMN’s tendency to ‘mind-wander’
SEARCHING FOR DOPAMINE

• The ADHD Brain can be thought of as a brain searching for salience, searching for motivation, searching for reward…and failing to get it
  • This explains the hyperactivity and fidgetiness, in an attempt to self-stimulate
  • This explains the inattention, always ready to respond to the next stimulus, the one that might just be enough
  • This explains the impulsivity, big risk for big reward
  • This explains the executive dysfunction with the failures to plan and the failures to suppress short-term desire
A DIFFICULT ENVIRONMENT

The modern classroom: A small immature primate is expected to sit still for 45 minutes at a time.

This same small primate is told to engage in repetitive tasks in order to avoid badness.

It is also told to not use 90% of its body for 90% of its school day.
MORE DIFFICULT ENVIRONMENT

An adult primate, evolved to live in a cohesive group, engaging in life-affirming tasks, avoiding danger and finding pleasure in small victories, is instead forced to wear pants and engage in repetitive boring tasks in order to avoid badness. Every year it has more repetitive, pointless tasks devoid of dopaminergic stimulation to complete. It spends its nights in a small enclosure, alone, crying softly while playing videogames.
HOW DOES THIS HELP US?

• We can be more sensitive to the different ways that ADHD can present:

  • Be careful of the Disruptive Behavior Disorder labels as they can become self-fulfilling prophecies
    • What looks like oppositionality may be a genuine inability to maintain salience
    • What looks like conduct may be a failure of impulse control that is ego-dystonic

• Think about effort, ability, and outcome as separate variables:
  • Studying efficiency
  • Number of task interruptions

• Think about Adaptive Functioning in ADHD
COMPASSIONATE ADHD COUNSELING

- Try to distinguish choice from pathology
  - This is, of course, a slippery slope.
  - Using a framework of bad choices vs symptomatic failure can help here
    - The child will be likely to respond with honesty if they see you advocating for them

- Problem solve around inherent areas of weakness
  - Rather than say ‘you need to be more organized’ help them figure out HOW to be more organized when they aren’t good at it.
ADHD: CLASSROOM ACCOMMODATIONS

- Teachers completing planners for the children
- Using checklists
- Frequent on-task check-ins
- Smaller chunks of work
- Time away from desks
- LET THEM FIDGET
ADHD: IMPROVING ADAPTIVE FUNCTIONING

- CHADD.org
- ADDitude Magazine
- Reminders, alarms, planners, creative problem solving
- Help the child find a routine that works
- MINDFULNESS skills – Building awareness
- Proactive problem solving – Discussing specific challenges of impulse control
ADHD: COMMUNITY AND LEGISLATIVE ADVOCACY

- Improved diet
  - Sugars are not an old wives tale
  - Fiber helps
  - Omega 3s are lifechanging for some
- Bring back recess
- Changing time intervals
- High stakes testing