ADHD and The Brain

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CHILDREN ADOLESCENT AND YOUNG ADULT CONNECTIONS (CAYAC)
Objectives

1. Learn the specific brain structures and neurochemicals involved in ADHD.
2. Learn how to recognize the specific symptoms of ADHD.
3. Learn the concept of executive functioning and how it is impacted with ADHD.
4. Recognize myths about taking medication for ADHD.
5. Learn medication options for ADHD.
Understanding the ADHD Brain
Structural Differences

- Frontal Lobes are less developed as compared to “typical” peers

- Frontal lobes are not done developing until age 25
Neurochemical Differences

- Dopamine and Norepinephrine
- Motivation, reward, focus, planning, attention, and movement
Self-Regulation and the Brain

- Automatic Regulation – Bottom Up
- Intentional or Deliberate Regulation – Top Down
Automatic Regulation: Bottom Up

- Alertness to detect sensory information
  - ADHD brains – less cortical arousal
- Filtering of information
Deliberate Regulation: Top Down

- **Working Memory**
  - Short term
  - Manipulate Information

- **Inhibiting Responses**
  - Delay Satisfaction

- **Set Shifting**
  - Seeing things from more than one point of view
Executive Functioning
How it feels to have ADHD...

- You are in a new city and you only have a new, fast motorcycle to get you to a restaurant to meet your friends. All your other friends are driving cars with passengers to read directions from a map or use your GPS.
Executive Functioning: Your Brain’s GPS

- Connecting the dots between actions and consequences
- Organizing information
- Impulse control
- Shifting attention
- Emotion regulation
# Executive Functioning Age

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ADHD Symptoms
ADHD: The Symptoms

- **ADHD is a disorder of the brain**, highly genetically influenced
  - Self-management skills are underactive
  - Skills such as planning, remembering, and paying attention are **driven by genetics**

- What does this mean?

  Your child **is not doing these behaviors intentionally**.
ADHD: The Symptoms

- Inattention
  - Forgetfulness
  - Limited attention
  - Easily distracted
  - Difficulty following through on tasks
  - Does not seem to listen when spoken to directly
  - Makes careless mistakes
ADHD: The Symptoms

- **Hyperactivity**
  - Often fidgets
  - Talks excessively
  - Trouble waiting his/her turn
  - Interrupts others
  - Often leaves seat when expected to stay seated
  - “On the go”
ADHD occurs in 5% of children, 2.5% of adults

ADHD is more frequent in males than females

- 2:1 in children; 1.6:1 in adults

Females are more likely to present primarily with inattentive symptoms

- Which may cause ADHD to go undetected until later in development
My child was diagnosed with ADHD, what does this mean?

- Untreated ADHD can have several unfavorable outcomes:
  - Delayed motor coordination (60% of individuals)
  - Greater risk of accidents (4-5x more speeding tickets)
  - Difficulties with sleep (20-25%)
  - Lower sense of self-esteem
  - Impaired relationships with peers
  - Earlier sexual activity (38% higher teen pregnancy, 16% higher risk of STDs as teens)
My child was diagnosed with ADHD, what does this mean?

However...There is good news!

- ADHD is one of the most researched psychiatric disorders
- ADHD *medication* is one of the most researched medications in psychiatry
- **Treatment WORKS!**
  - 70-80% of those treated with stimulant medication experience significant relief from symptoms
- Family and parent strategies and school support are two big components to treatment as well but are far more effective when medication is part of treatment. (Stay tuned for parts 2 and 3!)
Medication
You’re telling me that the most effective treatment is medication, but giving my child a medication to manage their behaviors worries me...
Myths about Medication

- Medications for ADHD are addictive
  - Only if inhaled or injected
  - Proper medication treatment reduces likelihood of later substance use disorders
- Medication will change my child’s personality
  - NO, but it improves their internal experience, helps with development
- Increase aggression
  - Actually the opposite
Myths about Medication

- Causes Tourette’s
  - If someone is already predisposed and has tics, 1/3 increase, 1/3 no change, 1/3 decrease
- Dosage is often too much
  - On average, doctors under-dose children
- Overprescribed
  - Only ½ of all children with ADHD are taking medication
Types of Medication Treatment

Stimulants

- Stimulant medication is one of the most researched pediatric medications
- Helps control hyperactive and aggressive behaviors
- Medication decisions are made based on:
  - Individual’s responsiveness
  - Presenting symptoms
  - Family history
Types of Medication Treatment

Stimulants

- Research shows that stimulants help improve:
  - Social relationships
  - Academic achievement
  - Normalize inattention, hyperactivity, and impulsivity
Non-stimulants are an alternate option to stimulants

- However, non-stimulants have much less research support

Typically decided upon if:

- Stimulants found to be ineffective
- Comorbidity
- Family history
If you are still hesitant about medication use…

- Consult with a local psychiatrist
  - There are several in our community who specialize in childhood/adolescent ADHD!
- Recall the brain chemistry we just reviewed!
  - Medication helps adjust for brain differences present in those with ADHD (motivation and attention)
- Refer to the research to get more education about your choices and empirical findings
- Remember: medication **AND** behavioral treatment
  - And medication makes behavioral treatment more effective!
Questions?