Clinical Controversies in ADHD Treatment: “Your questions answered”

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Moderator: Susie H. Park, PharmD, BCPP, CSHP
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Los Angeles, California
Target Audience: Pharmacists
ACPE#: 0202-0000-18-055-L01-P
Activity Type: Knowledge-based
Self Assessment Question # 1
When an ADHD diagnosis is confirmed in a 4-year-old patient, the American Academy of Pediatrics recommends:

A. Methylphenidate extended-release preparations
B. Parent training and behavioral modification
C. Occupational therapy and avoidance of sugar
D. Clonidine or guanfacine extended release

Self Assessment Question #2
True/False – Aggressive symptoms are responsive to stimulant treatment in youth with ADHD

Self Assessment Question #3
True/False – Omega-3 fatty acids may be effective for ADHD
Self Assessment Question #4
True/False A long-acting amphetamine oral disintegrating tablet is available

Self-Assessment Question #5
A 13 year old has been taking 15mg per day of mixed amphetamine salts extended release for 4 weeks with better attention with improved classroom. Ongoing symptoms include daily impulsivity and trouble completing homework assignments. Side effects include insomnia and poor appetite.

Select the most appropriate drug therapy intervention.

a. Increase mixed amphetamine salts to 20mg in the morning.
b. Add guanfacine extended release 1mg and titrate to response.
c. Switch to atomoxetine 10 mg twice daily and titrate to response.
d. Switch to methylphenidate OROS 36mg daily
Disclosures

Dr. Dopheide and Dr. Park have no financial relationships with content presented in this program.

Investigational stimulant formulations not yet approved by the FDA will be discussed.

The American Pharmacists Association is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.
Learning Objectives

1. Differentiate ADHD symptoms responsive to pharmacotherapy from symptoms not responsive to pharmacotherapy
2. Assess the strength of evidence for nonpharmacologic and complementary treatments for ADHD
3. Compare potential advantages and disadvantages of stimulant formulations used for ADHD
4. Given a case of an individual taking ADHD medication, determine if the medication and dose are appropriate
5. Provide counseling to patients and families on ADHD medications to improve treatment success
Outline

- Introduction to ADHD and Treatment
- Moderator Questions
  1. Are ADHD medications overprescribed?
  2. Are there advantages of newer formulations?
  3. Do behavioral treatment or devices help?
  4. Can ADHD start in Adulthood?

- Audience Questions
ADHD is the Most Well-Studied Neuropsychiatric Disorder with Onset in Youth

Prevalence in juvenile population
5%

Prevalence in adult population
2.5%

75% persists into adolescence

50% persists into adulthood

Children with ADHD

Adolescents with ADHD

Adults with ADHD

Diagnostic and Statistical Manual of Mental Disorders - DSM-5 2013
# Evidence-Based Pharmacotherapy for ADHD

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Place in Therapy</th>
<th>Daily Dosing Range</th>
<th>Adverse Reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stimulant:</strong> Methylphenidate, Dexamphetamine, or Amphetamine salts</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; line due to high efficacy</td>
<td>MPH: 10-72 mg daily&lt;br&gt;MXA: 5-40 mg daily&lt;br&gt;Once daily formulations preferred</td>
<td>Nausea, anorexia, insomnia, tics, tachycardia, growth effects</td>
</tr>
<tr>
<td><strong>Atomoxetine</strong></td>
<td>1&lt;sup&gt;st&lt;/sup&gt; line if Substance Use Disorder</td>
<td>20-100 mg daily&lt;br&gt;Youth tolerate bid dosing best</td>
<td>Nausea, sedation, tachycardia, rarely hepatotoxicity</td>
</tr>
<tr>
<td><strong>Alpha&lt;sub&gt;2&lt;/sub&gt;-adrenergic agonists:</strong> Clonidine and Guanfacine</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; line monotherapy or adjunct to stimulant</td>
<td>Clonidine: 0.1-0.4 mg&lt;br&gt;Guanfacine: 1-4 mg</td>
<td>Sedation, dry mouth, bradycardia, dizziness, constipation</td>
</tr>
<tr>
<td><strong>Bupropion</strong></td>
<td>Off-label use&lt;br&gt;3&lt;sup&gt;rd&lt;/sup&gt; line-adults or adolescents</td>
<td>100-300 mg daily&lt;br&gt;Response in 1-2 weeks</td>
<td>Nausea, insomnia, uncommon: seizures</td>
</tr>
<tr>
<td><strong>Phosphatidylserine and Eicosapentaenoic Acid</strong></td>
<td>Unknown&lt;br&gt;“Medical Food” released in 2016</td>
<td>75 mg caps (4 caps daily)</td>
<td>Nausea, diarrhea</td>
</tr>
</tbody>
</table>

Dopheide JA, Pliszka SR. ADHD. In: Pharmacotherapy: The Clinical Use of Drugs. 10<sup>th</sup> ed.; 2017
"Are ADHD medications overprescribed?"

- **YES! Overprescribed**

  75% of 2-5 year olds diagnosed with ADHD received medication

  2002 to 2010: 59,000 pharmacies: ped prescribing down 7% overall but ADHD meds up 46%

  2008-2012: Express scripts analysis: ADHD med use ↑ by 35.5% all ages; up by 53.4% in adults

CDC Finds 2-5 year olds with private insurance more likely to receive ADHD medication than youth with Medicaid

For more information, visit www.cdc.gov/ADHD or www.cdc.gov/vitalsigns.
Percentage of Women 15-44 Filling Prescriptions for ADHD Medication (Private Insurance) Increasing Rapidly

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Amphetamine</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>Mixed amphetamine salts</td>
<td>44.6</td>
<td>45.4</td>
<td>49.7</td>
<td>54.6</td>
<td>57.0</td>
<td>56.1</td>
<td>55.8</td>
<td>56.5</td>
<td>57.3</td>
<td>58.0</td>
<td>59.4</td>
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<td>Dexamphetamine</td>
<td>1.0</td>
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<td>4.1</td>
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<td>4.4</td>
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<td>3.8</td>
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<td>3.5</td>
<td>3.2</td>
<td>3.1</td>
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<tr>
<td>Dextroamphetamine</td>
<td>6.0</td>
<td>4.3</td>
<td>3.5</td>
<td>3.1</td>
<td>3.2</td>
<td>2.9</td>
<td>2.7</td>
<td>2.4</td>
<td>2.4</td>
<td>1.9</td>
<td>1.7</td>
<td>1.6</td>
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<td>Lisdexamfetamine**</td>
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<td>0.0</td>
<td>0.0</td>
<td>4.0</td>
<td>12.9</td>
<td>17.6</td>
<td>20.9</td>
<td>23.3</td>
<td>24.2</td>
<td>24.4</td>
<td>24.6</td>
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<tr>
<td>Methamphetamine</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
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<tr>
<td>Methylphenidate</td>
<td>42.8</td>
<td>38.1</td>
<td>37.3</td>
<td>35.7</td>
<td>33.6</td>
<td>30.3</td>
<td>28.1</td>
<td>25.5</td>
<td>24.6</td>
<td>22.8</td>
<td>21.2</td>
<td>20.4</td>
<td>18.1</td>
</tr>
<tr>
<td>Pemoline**</td>
<td>1.1</td>
<td>0.7</td>
<td>0.4</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
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<tr>
<td>Atomoxetine</td>
<td>20.6</td>
<td>24.5</td>
<td>19.7</td>
<td>13.7</td>
<td>10.9</td>
<td>9.2</td>
<td>7.5</td>
<td>6.5</td>
<td>5.5</td>
<td>4.9</td>
<td>4.4</td>
<td>4.1</td>
<td>3.8</td>
</tr>
<tr>
<td>No. of eligible women with ≥1 ADHD prescription filled per year</td>
<td>21,333</td>
<td>28,003</td>
<td>33,189</td>
<td>37,595</td>
<td>69,518</td>
<td>92,424</td>
<td>123,404</td>
<td>149,340</td>
<td>194,466</td>
<td>216,496</td>
<td>199,574</td>
<td>219,860</td>
<td>183,053</td>
</tr>
</tbody>
</table>

Are ADHD medications overprescribed? 

NO- Some Youth Reluctant / Parents Against Medication 

50% nonadherent in 1st year 

32.8% at 2 years; 17.2% at 5 years 

Based on Insurance claims data 

Untreated ADHD increases risk of conduct disorder and development of substance use disorder 

Risk vs. Benefit of Medication Should be assessed on a case my case basis 

Cutler AL, Mattingly GW. Beyond the pill: new medication delivery options for ADHD 
Comparing Benefits & Risks of Stimulant Use for ADHD

**Benefits**
- Improved Academic Performance
- Improved Classroom Behavior
- Better Social Interactions with Siblings and Peers
- Development of Self-Esteem
- Prevents self-medication with drugs and alcohol

**Risks**
- Adverse effects
  - Upset stomach, ↓Appetite
  - Insomnia, irritability/lability
  - Cardiac & potential growth effect
- Earlier onset psychosis
- Drug Diversion

Stimulant Treatment Decreases Risk of Injury in Youth With ADHD, ↑ CV Events

N = 4,557 youth with ADHD
Danish National Registry
Children Born in Denmark 1990-99;
Treatment with ADHD drugs
↓ Risk of injuries
By 43% and ↓ ER visit by 45%

N = 8,300 youth ADHD:
Cardiovascular ADEs rare; 2x > if stimulant
HR: 2.20 [2.15-2.14]

Danish Study shows 2 times > risk of an adverse CV event in ADHD youth treated with stimulant

9.5 yr prospective cohort study, children born 1990-99
N= 8300 children with ADHD
   (n=2818 not treated with stimulant)
   (n=5482 treated with stimulant)

111 adverse cardiac/cardiovascular events
170/100,000 person years

Higher doses associated with greater risk
Regular monitoring essential
Behavioral therapy can allow for lower stimulant doses

Aggression Improves Along With Irritability and Depression in Responders: ADHD/DMDD

N=156
Age 6-13 years ADHD and ODD or CD
75% met criteria for DMDD
51% aggression remitted with optimized stimulant and behavior therapy

Complementary & Alternative Therapies for ADHD (CAM)

- Iron supplement in youth with deficiencies can improve symptoms and allow for lower dose of stimulant
- Omega-3 supplement may beneficial; phosphatidylserine combined with Omega-3 fatty acids- “medical food” approved for ADHD
- Avoiding sugar, aspartame, not demonstrated effective but preferred by parents/families
- Avoiding artificial food coloring and preservatives helpful for some children
- Biofeedback not demonstrated effective

Nigg JT et al. Restriction diet for ADHD. J Am Acad Child Adolesc Psych 2012
Manor I et al. The Effect of Phosphatidyl Serine and Omega-3 on ADHD Eur Psychiatry 2012
ADHD Increases Risk of Substance Abuse

ADHD treatment may protect against cigarette smoking and substance abuse

In utero alcohol and nicotine exposure increases risk of ADHD

Adult ADHD linked to more severe and chronic substance abuse.

Treatment does not increase substance abuse

“Are there any advantages of all these new stimulant formulations? (liquids, oral disintegrating tabs, caps, patch, different extended release forms, a form to give at bedtime)"
# Methylphenidate Formulations

<table>
<thead>
<tr>
<th>Stimulant</th>
<th>Duration of Effect</th>
<th>Initial Dose and Available Strengths</th>
<th>Usual Dosing Range; Maximum Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylphenidate C-II&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3-5 hours</td>
<td>5 mg two or three times daily; increase by 5-10 or 20 mg/day at weekly intervals</td>
<td>5-20 mg two or three times a day; maximum dose: 60 mg/day</td>
</tr>
<tr>
<td>Short-acting IR</td>
<td></td>
<td>SR, ER doses; corresponds to the IR dose</td>
<td>20-40 mg every AM or 40 mg every AM and 20 mg in the early afternoon; maximum dose: 60 mg/day</td>
</tr>
<tr>
<td>Ritalin, methylin, generics&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3-8 hours</td>
<td></td>
<td>20-40 mg every AM and 20 mg in the early afternoon; maximum dose: 60 mg/day</td>
</tr>
<tr>
<td>Intermediate-acting</td>
<td></td>
<td></td>
<td>20-60 mg/day, given every AM; maximum dose: 60 mg/day</td>
</tr>
<tr>
<td>Ritalin SR&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
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<tr>
<td>Metadate ER&lt;sup&gt;b&lt;/sup&gt;</td>
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<td></td>
<td></td>
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<tr>
<td>Methylphenidate SR&lt;sup&gt;b&lt;/sup&gt;</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Methylin ER&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Long-acting</td>
<td></td>
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</tr>
<tr>
<td>Ritalin LA 50% IR, 50% ER beads&lt;sup&gt;b&lt;/sup&gt;</td>
<td>8-10 hours</td>
<td>20 mg every AM; available as 10, 20, and 30 mg</td>
<td>27-72 mg/day, given every AM; maximum dose: 72 mg/day</td>
</tr>
<tr>
<td>Metadate CD 30% IR, 70% ER beads&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10-12 hours</td>
<td>20 mg every AM; available as 20, 30, and 40 mg</td>
<td></td>
</tr>
<tr>
<td>Concerta (OROS controlled-release delivery)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10-12 hours</td>
<td>18 mg every AM; available as 18, 27, 36, and 54 mg; 90% bioavailability of IR</td>
<td></td>
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<tr>
<td>ER inner compartments coated with IR methylphenidate</td>
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<td></td>
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<tr>
<td>Daytrana methylphenidate transdermal system&lt;sup&gt;b&lt;/sup&gt;</td>
<td>12 hours when worn for 9 hours</td>
<td>10 mg (12.5 cm&lt;sup&gt;2&lt;/sup&gt;) applied to clean, dry area on hip each morning and removed after 9 hours</td>
<td>10-30 mg (12.5-37.5 cm&lt;sup&gt;2&lt;/sup&gt;). Drug active for 3 hours after patch removal</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Max: 60 mg daily</td>
</tr>
<tr>
<td>Aptensio XR 40% IR, 60% ER</td>
<td>10-12 hours</td>
<td>10 mg; available as 10, 20, 30, 40, 50, and 60 mg capsules</td>
<td>Max: 60 mg daily</td>
</tr>
<tr>
<td>Extended release methylphenidate&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td>10-20 mg in AM suspension</td>
<td></td>
</tr>
<tr>
<td>Quillavent extended release suspension 20% IR/80% ER&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10-12 hours</td>
<td>Only studied in 6- to 12-year-olds</td>
<td>Stable for 4 months after reconstituted</td>
</tr>
<tr>
<td>Must be reconstituted by pharmacist to 25 mg/5 mL concentration</td>
<td></td>
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</tr>
<tr>
<td>Dextroamphetamine salts C-II&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3-5 hours</td>
<td>2.5 mg every AM or twice daily; available as 2.5, 5, and 10 mg tablets</td>
<td>5-10 mg/day given twice a day; maximum initial dose: 7.5 mg/day; maximum dose: 20 mg/day</td>
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<td></td>
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<td></td>
<td>5-40 mg/day, given every AM maximum dose: 30 mg/day for children and adolescents; maximum 40 mg/day for adults</td>
</tr>
<tr>
<td>Focalin XR 50% IR, 50% ER beads&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10-12 hours</td>
<td>5 mg every AM; available as 5, 10, 15, 25, 30, 35, and 40 mg capsules</td>
<td></td>
</tr>
</tbody>
</table>
# Amphetamine Formulations

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Duration</th>
<th>Description</th>
<th>Dosage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mixed amphetamine salts C-II</strong> (dextroamphetamine and levoamphetamine 3:1 ratio)</td>
<td>4-6 hours</td>
<td>2.5 - 5mg every am to twice daily; Available in 5, 10, 7.5, 12.5, 15, 20, 30mg tablet</td>
<td>5-40mg; Max: 40mg/day</td>
</tr>
<tr>
<td><strong>Short-acting IR (Adderall, mixed amphetamine generics)</strong></td>
<td>6-10 hours</td>
<td>2.5 -5mg every am to twice daily; Available in 5 and 10mg tablets</td>
<td>5-20mg; Max: 40mg/day</td>
</tr>
<tr>
<td><strong>Amphetamine C-II (dextroamphetamine and levoamphetamine ratio 1:1)</strong></td>
<td>10-12 hours</td>
<td>3.1, 6.3, 9.4, 12.5, 15.7, 18.8, extended release oral disintegrating tablets</td>
<td>3.1 – 18.8mg/day; Max: 18.8mg/day</td>
</tr>
<tr>
<td><strong>Evekeo, Long-acting XR (Adzenys XR-ODT)</strong></td>
<td></td>
<td>Dextroamphetamine and levoamphetamine ratio 3:1</td>
<td></td>
</tr>
<tr>
<td><strong>Dyanavel XR 2.5mg/ml</strong></td>
<td>10-12 hours</td>
<td>2.5mg/1ml oral suspension</td>
<td>5 – 20mg/day; Max: 20mg/day</td>
</tr>
<tr>
<td><strong>Dextroamphetamine and levoamphetamine ratio 3:2:1</strong></td>
<td></td>
<td>2.5mg of suspension ~ 4mg of mixed amphetamine salts</td>
<td></td>
</tr>
<tr>
<td><strong>Mixed amphetamine salts C-II Extended release capsule (Adderall XR)</strong></td>
<td>10-12 hours</td>
<td>5 – 10mg every am; available as 5, 10, 20, 30mg extended release capsule</td>
<td>5 - 30mg; Max: 30mg/day</td>
</tr>
<tr>
<td><strong>Dextroamphetamine C-II Short-acting</strong></td>
<td>4-6 hours</td>
<td>2.5 mg every am once- or twice-daily dosing</td>
<td>10-40 mg/day (divided in two doses)</td>
</tr>
<tr>
<td><strong>Dextroamphetamine generics</strong></td>
<td>3-5 hours</td>
<td>2.5 mg every am to two or three times daily dosing</td>
<td>10-40 mg/day given twice daily</td>
</tr>
<tr>
<td><strong>Intermediate-acting</strong></td>
<td>5-8 hours</td>
<td>Available as 5, 10, and 15 mg</td>
<td>5-30 mg every day or 5-15 mg twice daily; maximum: 40 mg/day</td>
</tr>
<tr>
<td><strong>Dexedrine Spansule</strong></td>
<td></td>
<td>5 mg every am; available as 5 and 10 mg</td>
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<tr>
<td><strong>Long-acting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lisdexamfetamine (Vyvanse)</strong></td>
<td>10-12 hours</td>
<td>Available as 20, 30, 40, 50, 60, and 70 mg capsules</td>
<td>Start at low end; titrate weekly to response give in AM</td>
</tr>
</tbody>
</table>

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**FR** extended release; **IR** immediate release; **OROS** osmotically released oral delivery system; **SR** sustained release; **XR** extended release.
Pharmacokinetics of a single dose 54mg Methylphenidate delayed and extended release, taken at bedtime (HLD 200)

Can ADHD start in adulthood or does a person have to have symptoms in childhood for a valid diagnosis?
Studies in Support of Adult-Onset ADHD

Caye A, et al. study from Brazil
- N = 5249 youth in Brazil
- 1993 to 2015
- ADHD assessed age 11 and again between age 18-19
- Age 11 N= 393 child onset ADHD
- Age 18 N= 492 adult onset ADHD, no symptoms in childhood

Agnew-Blaise study in United Kingdom
- N=2040 youth in England, twins studied longitudinally
- 1994 to 2015
- N= 166 met ADHD criteria in adulthood
  n=111 (67.5%) had no symptoms in childhood

DSM-5 Adult ADHD Self-Report Screening Questions

1. How often do you have difficulty concentrating on what people say to you, even when they are speaking to your directly?

2. How often do you leave your seat in meetings or other situations in which you are expected to remain seated?

3. How often do you have difficulty unwinding and relaxing when you have time to yourself?

4. When you’re in a conversation, how often do you find yourself finishing the sentences of the people you are talking to before they can finish themselves?

5. How often do you put things off until the last minute?

6. How often do you depend on others to keep your life in order and attend to details?

2016 NIH Recruits 10,000 Youth for Adolescent Brain Cognitive Development (ABCD) Study

• Age 9-10 years followed into adulthood
• Precision Brain Mapping-fMRI
• Role of Genetics vs. Environment
• Onset and Progression of Mental Disorders, Substance Use

https://reasonography.files.wordpress.com/2013/03/group_of_kids-cdc.jpg
“What about behavioral interventions or devices such as the fidget-spinner, are these helpful for managing ADHD symptoms?”
Behavioral Interventions are Recommended by the American Academy of Pediatrics Practice Guidelines for ADHD

- Parent Training
- Identify target behaviors
- (+) Reinforcement
- Skill development
- Intensive behavioral tx can ↓ substance abuse and delinquency
- Lower med dose
- Less parental stress

Am Academy of Pediatrics Clinical Practice Guideline for ADHD Pediatrics 2011
Behavioral Interventions are First-line for Preschoolers

For more information about behavior therapy, go to: http://www.cdc.gov/ncbddd/adhd/behavior-therapy.html

What parents learn when trained in behavior therapy

- Positive Communication
- Positive Reinforcement
- Structure and Discipline


**In areas where behavioral treatments proven to work are not available, the healthcare provider should weigh the risks of starting medicine at an early age against the harm of delaying diagnosis and treatment, as recommended in the American Academy of Pediatrics practice guidelines.
## Behavioral Interventions for ADHD

<table>
<thead>
<tr>
<th>Age</th>
<th>Intervention</th>
<th>Typical Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool and</td>
<td>Parent and Family - Education on ADHD</td>
<td>Improved parental understanding</td>
</tr>
<tr>
<td>School age</td>
<td>Training on Behavioral Modification</td>
<td>Decreased parental stress</td>
</tr>
<tr>
<td></td>
<td>Classroom training for Teachers</td>
<td>Improved following directions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improved Teacher Satisfaction</td>
</tr>
<tr>
<td>Adolescent</td>
<td>Break up homework into smaller segments</td>
<td>Completion of assignments</td>
</tr>
<tr>
<td></td>
<td>Structured schedule</td>
<td>Improved academic success</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improved self esteem</td>
</tr>
<tr>
<td>Adolescent and</td>
<td>ADHD-specific cognitive behavioral therapy (CBT)</td>
<td>Improved productivity and vocational success;</td>
</tr>
<tr>
<td>Adult</td>
<td>Meta-cognitive therapy</td>
<td>Improved relationships</td>
</tr>
</tbody>
</table>

Dopheide JA, Pliszka SR. ADHD. In: Pharmacotherapy: The Clinical Use of Drugs. 10th ed.; 2017
Can a Fidget Spinner Help Treat ADHD? NO
Movement Helps Youth with ADHD Concentrate, ↑ Working Memory

N=29 youth with ADHD; N=23 typically developing controls; mean age: 9 years

Working memory assessed during movement and stillness

Higher rates of activity: better working memory in youth with ADHD

Higher rates of activity predicted lower working memory in non-ADHD controls

Cognitive Behavioral Therapy Superior to Relaxation & Education in Adults with ADHD

- Controlled trials increasingly show that Cognitive Behavioral Therapy (CBT) is beneficial for ADHD in adolescents and adults and may allow for lower medication doses.
- CBT superior to yoga, meditation and relaxation techniques such as deep breathing.
- Group CBT effective.

Self Assessment Question # 1
When an ADHD diagnosis is confirmed in a 4-year-old patient, the American Academy of Pediatrics recommends:

A. Methylphenidate extended-release preparations
B. Parent training and behavioral modification
C. Occupational therapy and avoidance of sugar
D. Clonidine or guanfacine extended release

Self Assessment Question # 2
True/False – Aggressive symptoms are responsive to stimulant treatment in youth with ADHD

Self Assessment Question # 3
True/False – Omega-3 fatty acids may be effective for ADHD
Self Assessment Question #4
True/False A long-acting amphetamine oral disintegrating tablet is available.

Self-Assessment Question # 5
A 13 year old has been taking 15mg per day of mixed amphetamine salts extended release for 4 weeks with better attention with improved classroom. Ongoing symptoms include daily impulsivity and trouble completing homework assignments. Side effects include insomnia and poor appetite.

Select the most appropriate drug therapy intervention.
   a. Increase mixed amphetamine salts to 20mg in the morning.
   b. Add guanfacine extended release 1mg and titrate to response.
   c. Switch to atomoxetine 10 mg twice daily and titrate to response.
   d. Switch to methylphenidate OROS 36mg daily.
Audience Questions?