ADHD across the lifespan

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Disclosure

- No significant relationships to disclose

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Outline

- Diagnosing ADHD/ADD.
- Types of stimulants.
- Stimulant use and misuse.
- Non-stimulant options for Attention symptoms.
- Reasonable prescribing of stimulants for Attention Deficit Disorders.
- Classes of prescription stimulants.
- Ask questions as we proceed.

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Diagnosing ADHD/ADD

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DSM-5 Criteria for ADD

- Inattention: Six or more symptoms of inattention for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:
- Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
- Often has trouble holding attention on tasks or play activities.
- Often does not seem to listen when spoken to directly.
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
- Often has trouble organizing tasks and activities.
- Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).
- Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- Is often easily distracted
- Is often forgetful in daily activities.

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th edition. Arlington, VA., American Psychiatric Association, 2013.

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DSM 5 Criteria for ADHD

- Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level:
- Often fidgets with or taps hands or feet, or squirms in seat.
- Often leaves seat in situations when remaining seated is expected.
- Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).
- Often unable to play or take part in leisure activities quietly.
- Is often "on the go" acting as if "driven by a motor".
- Often talks excessively.
- Often blurts out an answer before a question has been completed.
- Often has trouble waiting his/her turn.
- Often interrupts or intrudes on others (e.g., butts into conversations or games)

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th edition. Arlington, VA., American Psychiatric Association, 2013.

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DSM 5 Further Criteria

- In addition, the following conditions must be met:
- Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.
- Several symptoms are present in two or more setting, (such as at home, school or work; with friends or relatives; in other activities).
- There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning.
- The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.
- Based on the types of symptoms, three kinds (presentations) of ADHD can occur:
- Combined Presentation: if enough symptoms of both criteria inattention and hyperactivity-impulsivity were present for the past 6 months
- Predominantly Inattentive Presentation: if enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months
- Predominantly Hyperactive-Impulsive Presentation: if enough symptoms of hyperactivity-impulsivity, but not inattention, were present for the past six months.
- Because symptoms can change over time, the presentation may change over time as well.

- Diagnosing ADHD in Adults
- ADHD often lasts into adulthood. To diagnose ADHD in adults and adolescents age 17 or older, only 5 symptoms are needed instead of the 6 needed for younger children. Symptoms might look different at older ages. For example, in adults, hyperactivity may appear as extreme restlessness or wearing others out with their activity.

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th edition. Arlington, VA., American Psychiatric Association, 2013.

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Adult ADHD Criteria

- Problems with attention including at least 5 of the following:
- Being often easily distracted by extraneous stimuli.
- Often makes decisions impulsively.
- Often has difficulty stopping activities or behavior needed.
- Often starts a project or task without reading or listening to directions carefully.
- Often shows poor follow through on promises or commitments made to others.
- Often has trouble doing things in their proper order or sequence.
- Often is more likely to drive a motor vehicle much faster than others.
- Often has difficulty engaging in leisure activities or doing fun things quietly.
- Often has difficulty sustaining attention in tasks or leisure activities.
- Often has difficulty organizing tasks and activities.
- Some symptoms that caused impairment were present before age 16 years.
- Impairment from the symptoms is present in two or more settings (e.g., work, educational activities, home life, social functioning, community activities, etc.).

Russell Barkley, PhD. Private communication, shared with permission

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Adult-onset “ADD” usually isn’t

- Some older studies seemed to suggest that “childhood” ADD/ADHD and adult-onset attention problems (Adult “ADD”) were two separate disease states with some similar characteristics.
- Several more recent, well-designed studies do not bear this out.
- In the most recent examination of adults presenting seeking treatment for ADD/ADHD symptoms who were also positive on a Conners type symptom checklist, the researchers showed that 95%of individuals who initially screened as positive were excluded on further testing.
- The most common reason for diagnostic exclusion was symptoms or impairment occurring exclusively in the context of heavy substance use.
- Other excluding diagnoses included mood and anxiety disorders.
- Most late-onset cases that were found to meet criteria did in fact have historical support for onset in adolescence and at that time symptoms were missed.
- Patients who present for new evaluation of attention symptoms after age 16 should be closely evaluated for substance use disorders, mood and anxiety disorders, and other comorbid medical conditions that would impair cognition.
- Rarely, ADD that presents in adulthood may be valid; however these patients should have some history of impairment earlier, even if unrecognized.
- When in doubt, consider referral for standardized psychological testing and defer medication, especially with stimulants until diagnostic procedures are complete.

MH Sibley, et al. Late-Onset ADHD Reconsidered With Comprehensive Repeated Assessments Between Ages 10 and 25. American Journal of Psychiatry 2018 175:2, 140-149.

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Types of stimulants

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What is a stimulant?

- A stimulant is a natural or synthetic substance that leads to excitation of the central nervous system typically through inhibition of reuptake of 2 neurotransmitters: Dopamine and Norepinephrine.
- This results in a feeling of increased energy, focus, confidence, and enhanced mood or at times euphoria.
- Amphetamine was first synthesized in Germany in the late 1800s; however, its stimulant properties were not really discovered until about 1930, when it began to be used to treat nasal congestion.
- Stimulants have been used to treat a variety of conditions, from alcohol hangovers to weight loss. Prescription stimulants are also used most commonly to treat attention and hyperactivity problems and narcolepsy.
- Stimulants are sometimes used for binge eating (Lisdexamphetamine), and off label for weight loss or as adjuctive treatment for depression (they don't separate from placebo in some controlled trials).

Richards C, Iosifescu DV, Mago R, et al. A 12-month open-label extension study of the safety and tolerability of lisdexamfetamine dimesylate for major depressive disorder in adults. J Clin Psychopharmacol. 2018; 38(4):336-343.

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Types of Stimulants

- Caffeine/Theophylline.
- Ephedra.
- Pseudoephedrine.
- Modafanil/Armodafanil.
- Phentermine.
- Methylphenidate.
- Amphetamine (levo/dextro).
- Cocaine.
- Methamphetamine.
- Methylenedioxymethamphetamine.
- α-Pyrrolidinopentiophenone.

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Stimulants on the street

- Cocaine: blow, bump, C, candy, Charlie, coke, crack, flake, rock, snow, toot. May be snorted, smoked, injected.
- Amphetamine: bennies, black beauties, crosses, hearts, LA turnaround, speed, truck drivers, uppers. May be swallowed, snorted, smoked, injected.
- Methamphetamine: meth, ice, crank, chalk, crystal, fire, glass, go fast, speed. May be swallowed, snorted, smoked, injected.

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More street stimulants

- Methylenedioxymethamphetamine: MDMA, Ecstasy, Adam, clarity, Eve, lovers' speed, Molly, peace, uppers. May be swallowed, snorted, injected.
- α-Pyrrolidinopentiophenone: Flakka. May be smoked, injected, snorted, or vaped.

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Acute effects of stimulants

- All stimulants: Increased heart rate, elevated blood pressure, excessive body temperature, faster metabolism, feelings of exhilaration, increased energy, mental alertness, tremors, reduced appetite, irritability, anxiety, panic, paranoia, violent behavior, psychosis.
- MDMA: hallucinogenic effects, increased tactile sensitivity, empathic feelings, lowered inhibition, chills, sweating, teeth clenching, muscle cramping.
- Flakka: suicide, pulmonary edema, extreme hyperthermia (leading to disrobing), delirium, acute aggression.

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Long term risks of stimulants

- All stimulants: weight loss, insomnia, cardiovascular complications, stroke, seizures, addiction.
- Cocaine: nasal damage or deterioration from snorting.
- Methamphetamine: severe dental problems or tooth enamel loss (meth-mouth).
- MDMA: sleep disturbances, depression, impaired memory.

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Stimulant use and misuse

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Recent data on misuse

- Stimulant misuse is common.
- 0.5 million youths and 4.8 million adults reported misuse in 2015 alone.
- Prescriptions for stimulants for adults (20 and older) is now over 55% of all prescriptions written.
- Adults are at a higher risk for clinically significant complications (anxiety, paranoia, hallucinations, insomnia, tachycardia, death) relative to children.
- Stimulant use (with or without misuse) is highly correlated with major depressive episodes, suicidal ideation, having asthma, and higher than average use of emergency departments for all causes.

WM Compton, et al. Prevalence and Correlates of Prescription Stimulant Use, Misuse, Use Disorders, and Motivations for Misuse Among Adults in the United States. American Journal of Psychiatry 2018; 175: 741-755

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Recent data on misuse

- In 2016, 6.6 % of the adult US population (16 million) used prescription stimulants.
- 4.7% used with misuse or a true use disorder.
- 56.3% used with the stated motivation to help with alertness or concentration.
- 56.9% obtained the stimulant free from a friend or relative.
- More frequent misuse was associated with obtaining the medication from a prescriber, drug dealer, or stranger for payment.

WM Compton, et al. Prevalence and Correlates of Prescription Stimulant Use, Misuse, Use Disorders, and Motivations for Misuse Among Adults in the United States. American Journal of Psychiatry 2018; 175: 741-755

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Motivations for misuse

- 56.3% misused to help be alert, concentrate, or study.
- 21.9% used to get a "high", due to dependence, or to offset the effects of other drugs of abuse.
- A relatively low percentage (4.1%) misused for the stated purpose of weight loss.

WM Compton, et al. Prevalence and Correlates of Prescription Stimulant Use, Misuse, Use Disorders, and Motivations for Misuse Among Adults in the United States. American Journal of Psychiatry 2018; 175: 741-755

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Stimulant Abuse

- Stimulants may be taken orally, smoked, or injected.
- Injection is the method to cause the drug to enter the bloodstream and the brain most rapidly, creating the most intense high.
- As noted above, the most common initial abuse of stimulants is to enhance cognition, attention, or as a study aid.
- People will often equate alertness (a common side effect of stimulants) with cognitive performance enhancement, but studies have shown that students who misuse amphetamines do not perform any better than peer and may in fact often perform worse.
- The common understanding that stimulants are a performance enhancing drug may relate more to their euphoric and alertness generating properties than to any effect on focus,
- Often, misuse of stimulants for academic reasons may lead to more severe, illicit use of the drug to get high.
- A 2015 survey found 4.8 million people in the US abused prescription amphetamines (1.8% of the population 12 and older).
- The same study found the rate of methamphetamine use was 1.2 million people (0.4% of the population).

SE Lakhan and A Kirchgessner. Prescription stimulants in individuals with and without attention deficit hyperactivity disorder: misuse, cognitive impact, and adverse effects. Brain Behav. 2012 Sep; 2(5): 661–677.

B Han, et al. Prescription Opioid Use, Misuse, and Use Disorders in U.S. Adults: 2015 National Survey on Drug Use and Health. Ann Intern Med. 2017;167(3):293-301.

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Signs of Stimulant Abuse

- Increased heart rate and blood pressure.
- Decreased appetite and weight loss.
- Insomnia.
- Digestive problems (reflux, diarrhea, constipation).
- Mood swings.
- Aggression.
- Paranoia.
- Anxiety.
- Visual, auditory, or tactile hallucinations.
- Inability to keep up with work, school, or home responsibilities.
- Dental problems (methamphetamine)
- Skin sores (methamphetamine).

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Diversion

- Most controlled substance medications have significant street value.
- Consider diversion if:
- Patients ask for name brand rather than generics.
- Patients ask for immediate release rather than XR versions of controlled substances.
- Patients ask you not to communicate with their other providers.
- Negative drug screens even with regular filling of prescriptions.
- Sign up for the SC DHEC prescription monitoring website at https://scpmpph.hidinc.com/

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Non-stimulant options for attention symptoms

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Alpha Agonists

- Guanfacine: available as IR (Tenex) and XR (Intuniv). Begin with 1 mg BID (IR) or 1 mg QD (XR). Monitor for hypotension, headache, rash. This option is less sedating than Clonidine. Hypertensive reaction with abrupt withdrawal.
- Clonidine: available as IR (Catapres) and XR (Kapvay). Begin with 0.1 mg or lower QHS (IR) or 01. mg QD (XR). Monitor as above with Guanfacine. Clonidine also may cause significant sedation.

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Antidepressants

- Tricyclics: Desipramine and Imipramine have data in ADHD. Both work by partial Norepinephrine reuptake inhibition. Start at 10-25 mg and advance as needed. Monitor ECG with dose changes. May have unacceptable side effects. Monitor use, tricyclics are lethal in overdose.
- Atomoxetine (Strattera): Norepinephrine reuptake inhibitor. Start at 10-25 mg and advance based on body weight.
- Bupropion (Wellbutrin): Norepinephrine/Dopamine reuptake inhibitor. Off label use for ADHD. Start at 150 mg QAM and advance as needed.

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Stimulant-like medications

- Modafinil (Provigil): Central dopamine agonist, indicated for Narcolepsy and Sleep Phase Problems. Begin with 100 mg QAM. Side effects similar to stimulants. May cause Stevens-Johnson syndrome.
- Armodafinil (Nuvigil): Central dopamine agonist. Indications and risks as with Modafinil. Start with 50 mg QAM.

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Reasonable stimulant prescribing

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When prescribing stimulants

- Avoid diagnosing "ADD" in adults with no childhood history.
- Don't be afraid to wait for standardized testing when in doubt.
- Caution patients against diversion.
- Caution patients against misuse as well as mixing medication with other psychoactive substances (including alcohol).
- Consider controlled substance agreements and random drug screens.
- Monitor medication use and prescription fill data.
- Periodically assess for comorbid psychiatric diagnoses and health problems.
- Ongoing screening for substance use is needed.

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Prescribing pearls

- Although initial effects may be seen early, medication may take weeks for full effect. Avoid too rapid titration of doses.
- Individual patients may respond differently to immediate release vs extended release stimulants.
- Patients may be sensitive to stimulant blood level decline at the end of the dose. Symptoms may include agitation, excessive hyperactivity, excessive appetite, heightened emotional responses.
- Patients may respond better to one type of stimulant over the others, even those with a very similar structure.
- Patients on extended release preparations may require an afternoon dose of immediate release medication to boost stimulant blood levels for homework. Always use the lowest possible dose in this case to avoid sleep disturbance.
- Many patients do better with medication "holidays" when it is not absolutely required to allow for appetite bounce back.

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Classes of prescription stimulants

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Methylphenidate

- Ritalin (IR) 5, 10, 20 mg
- Ritalin LA (50% IR/50% SR) 10, 20, 30, 40, 60 mg
- Concerta (100% SR) 18, 27, 36, 54 mg
- Metadate CD (30% IR/70% SR) 10, 20, 30, 40, 50, 60 mg
- Quillivant oral suspension (100% SR) 25 mg/5 mL
- Daytrana patch (SR-transdermal) 10, 15, 20, 30 mg/9 hours
- Jornay PM (SR-evening dosing) 20, 40, 60, 80, 100 mg

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Dexmethylphenidate

- Focalin (IR) 2.5, 5, 10 mg
- Focalin XR (100% SR) 5, 10, 15, 20, 25, 30, 35, 40 mg

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Dextroamphetamine

- Dexidrine (100% SR) 5, 10, 15 mg

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Amphetamine/Dextroamphetamine

- Adderall (IR) 5, 7.5, 10, 12.5, 15, 20, 30 mg
- Adderall XR (100% SR) 5, 10, 15, 20, 25, 30 mg
- Mydayis (30% IR/30% SR/30% XR) 12/5, 25, 37.5, 50 mg

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Lisdexamphetamine

- Vyvanse (SR) 10, 20, 30, 40, 50, 60, 70 mg

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Conclusion

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