A continuing education seminar jointly sponsored by the MDH Office of Pharmacy Services, MedChi, APA, and Kepro, an Acentra Health company.

Maryland
DEPARTMENT OF HEALTH

ADHD AND STIMULANT USE DISORDER

April 27, 2024

Maryland
DEPARTMENT OF HEALTH

Continuing Medical Education (CME) &
Pharmacy Continuing Education (ACPE) Seminar

ADHD and Stimulant Use Disorder

Virtual Live Program
on
Saturday, April 27, 2024

8:55 am – Introductions	Maryland Department of Health Office of Pharmacy Services
9:00 am – How Do I Recognize and Treat? ADHD in Adults?	David Goodman, M.D. Johns Hopkins University School of Medicine
10:30 am – ADHD in the Pediatric Population And Stimulant Treatment	Barbara Howard, M.D. Johns Hopkins University School of Medicine
12:00 pm – Pharmacotherapy for Stimulant Use Disorder	Lindsay Bowman, PharmD, BCPS Johns Hopkins Hospital
1:00 pm – Closing Remarks	Maryland Department of Health Office of Pharmacy Services
1:15 pm - Adjourn	

The views and opinions expressed by the speakers are not necessarily the views and opinions of the State of Maryland Department of Health.

****This event will be recorded for future use.***
By attending, you agree to participate in audio and/or visual recording*

CE Program Sponsorship:
This program is jointly sponsored by the Office of Pharmacy Services, MedChi, APA, and Kepro, an Acentra Health company.

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The Alabama Pharmacy Association (APA) will upload your continuing education credit information will be uploaded to CPE Monitor where you will be able to view and print your credits. The statement of credit should be retained as proof of attendance in the event of an audit by the State Board of Pharmacy. To receive ACPE credits, you must provide the month and day of your date of birth and NABP e-Profile ID# at registration, log in to seminar with your full name, and turn in an evaluation form for each presentation attended following the program.

CME Accreditation Statement:
This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint providership of MedChi, The Maryland State Medical Society, Maryland Department of Health Office of Pharmacy Services, and Kepro, an Acentra Health company. MedChi is accredited by the ACCME to provide continuing medical education for physicians.

CME Designation:
MedChi designates this live course for a maximum of four (4) AMA PRA Category 1 Credits. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Presenter Disclosure:
Dr. Goodman states that he does not have relevant financial relationship with commercial interests and will not be discussing “Off-Label” uses of products or devices. This information is on file with Kepro.

Dr. Howard states that she has a financial relationship with CHADIS, Inc. and will be discussing “Off-Label” uses of products or devices. This information is on file with Kepro.

Dr. Bowman states that she does not have relevant financial relationship with commercial interests and will not be discussing “Off-Label” uses of products or devices. This information is on file with Kepro.

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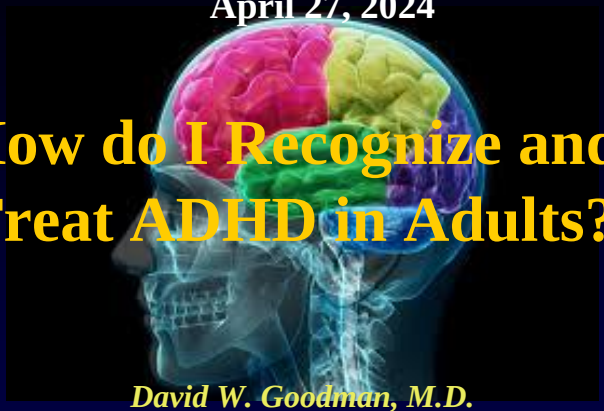
Program Disclosure: Support provided by Kepro, an Acentra Health company.

Activity Type: Knowledge-Based

MDH Spring Continuing Education Program

April 27, 2024



How do I Recognize and Treat ADHD in Adults?

David W. Goodman, M.D.

Assistant Professor, Department of Psychiatry and Behavioral Sciences, Johns Hopkins School of Medicine

Clinical Associate Professor, Department of Psychiatry and Behavioral Sciences, State University of New York

410 583-2726

ADDadult.com

MyADHDFoundation.org

1

Disclosures

Source	Consultant	Advisory Board	Speaker	Research Support	Shareholder
Adlon	X				
Iris Pharm	X				

As of July 23, 2023, I have ended my professional relationships with companies that have a commercial product in the ADHD field.

2

Objectives

- Understand:
  - Prevalence rate in adults and older adults
  - The difference in the adult ADHD presentation and evaluation vs child/adol.
  - Co-existing psychiatric disorders
  - The multiple psychopharmacologic options for treatment
  - The role of psychotherapy for adults with ADHD

3

ADHD Is Prevalent in All Age Groups

- **Historically, ADHD has been thought of as a childhood disorder, but it has been demonstrated to persist into adulthood**

8% of children have ADHD[b]

6% of adolescents have ADHD[c]

4.4% of adults have ADHD[d]

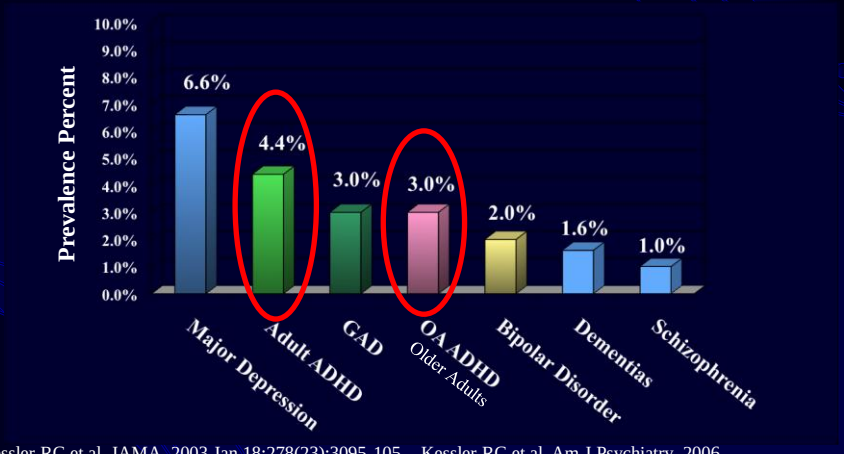
2.8% of seniors have ADHD[e]

Up to 65% of children with ADHD continue to experience the disorder into adulthood[a]

a. Faraone SV, et al. Psychol Med. 2006;36:159-165; b. American Academy of Pediatrics. Pediatrics. 2000;105:1158-1170; c. Pastor PN, et al. Vital Health Stat 10. 2008;(237):1-14;
d. Kessler RC, et al. Am J Psychiatry. 2006;163:716-723; e. Michielsen M, et al. Br J Psychiatry. 2012;201:298-305.

4

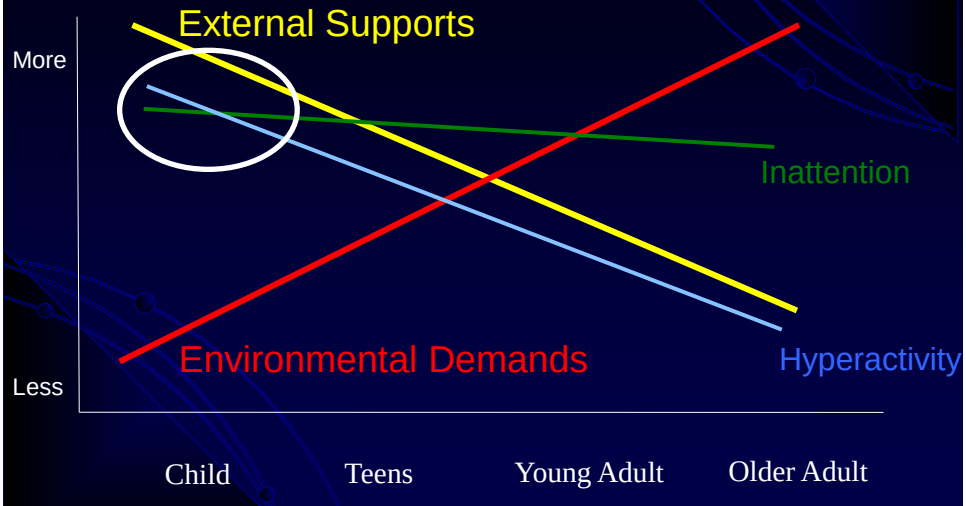
Prevalence Rates of Psychiatric Disorders in U.S. Adults



Kessler RC et al. JAMA. 2003 Jan 18;278(23):3095-105. Kessler RC et al. Am J Psychiatry. 2006 Apr;63(4):415-24. Merikangas KR et al. Arch Gen Psychiatry. 2007 May;64(5):543-52. Michielsen M et al. Br J Psychiatry 2012;201:298-305. Blanco C et al. J Psychiatr Research. 2017;84:310-317. NIMH. Schizophrenia. www.nimh.nih.gov/health/statistics/schizophrenia.shtml Accessed Aug 2020

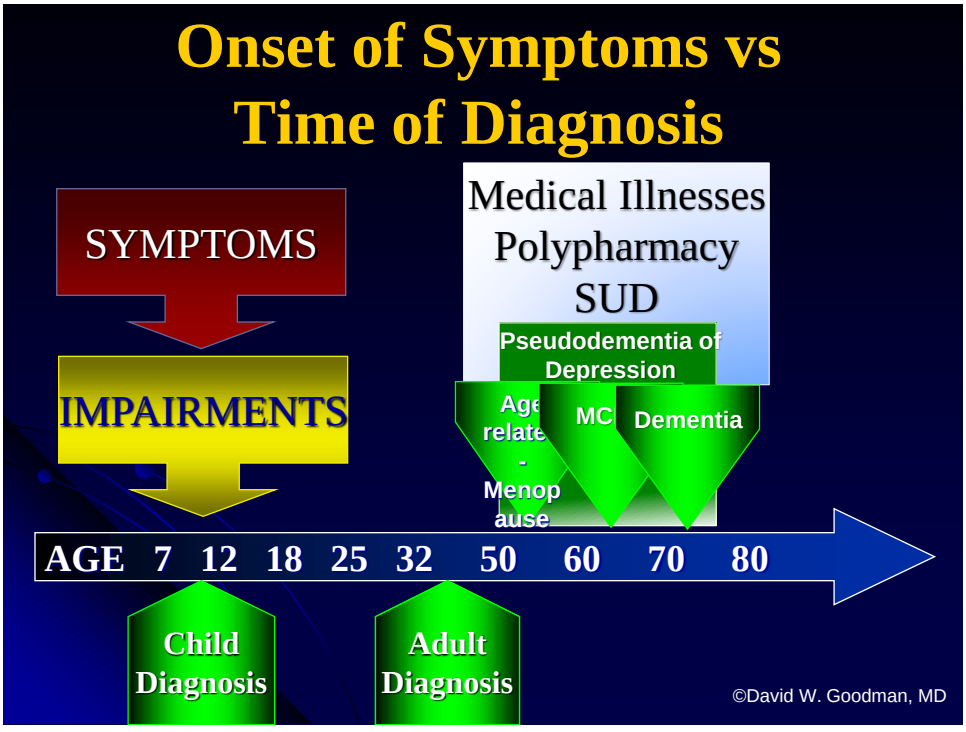
5

Developmental Phases as Trajectories



Turgay et al. Life course of ADHD. J Clin Psych Feb 2012

6


Onset of Symptoms vs Time of Diagnosis
SYMPTOMS
IMPAIRMENTS
Medical Illnesses
Polypharmacy
SUD
Pseudodementia of Depression
Age related - Menopause
MCI
Dementia
AGE 7 12 18 25 32 50 60 70 80
Child Diagnosis
Adult Diagnosis
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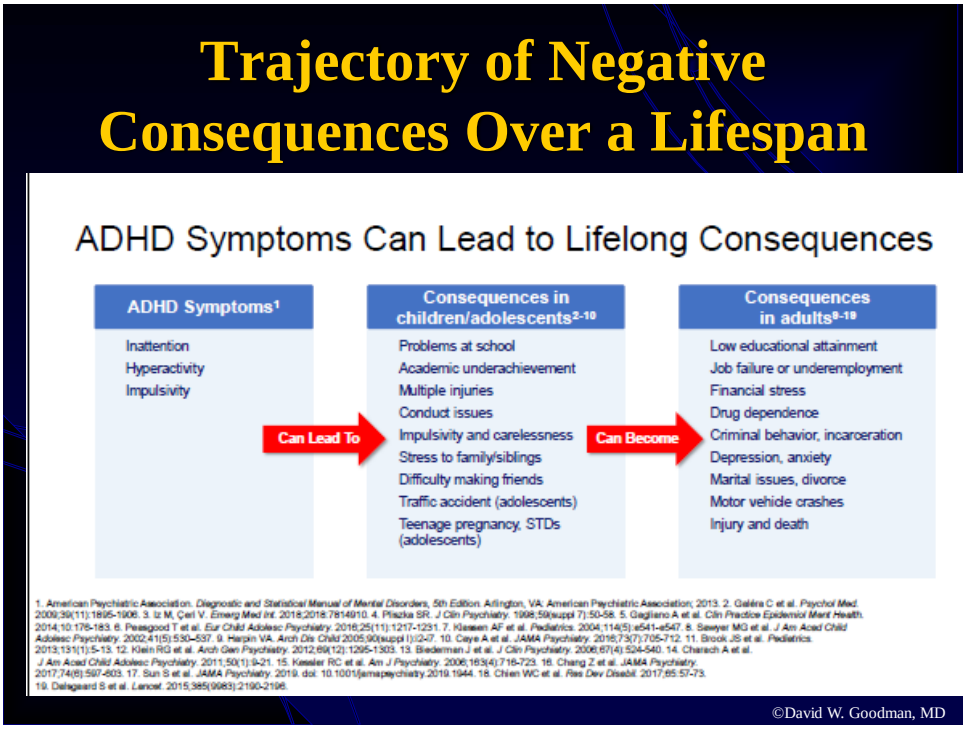
Trajectory of Negative Consequences Over a Lifespan
ADHD Symptoms Can Lead to Lifelong Consequences
ADHD Symptoms[1]
Inattention
Hyperactivity
Impulsivity
Can Lead To
Consequences in children/adolescents[2-10]
Problems at school
Academic underachievement
Multiple injuries
Conduct issues
Impulsivity and carelessness
Stress to family/siblings
Difficulty making friends
Traffic accident (adolescents)
Teenage pregnancy, STDs (adolescents)
Can Become
Consequences in adults[8-19]
Low educational attainment
Job failure or underemployment
Financial stress
Drug dependence
Criminal behavior, incarceration
Depression, anxiety
Marital issues, divorce
Motor vehicle crashes
Injury and death
1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. Arlington, VA: American Psychiatric Association; 2013. 2. Galéra C et al. Psychol Med. 2009;39(11):1895-1906. 3. Iz M, Ceri V. Emerg Med Int. 2013;2013:781410. 4. Pliszka SR. J Clin Psychiatry. 1998;59(suppl 7):50-58. 5. Gagliano A et al. Clin Practice Epidemiol Ment Health. 2014;10:175-183. 6. Pesegood T et al. Eur Child Adolesc Psychiatry. 2016;25(11):1217-1231. 7. Kliewen AF et al. Pediatrics. 2004;114(5):e541-e547. 8. Sawyer MG et al. J Am Acad Child Adolesc Psychiatry. 2002;41(5):530–537. 9. Harpin VA. Arch Dis Child 2005;90(suppl I):i2-i7. 10. Caye A et al. JAMA Psychiatry. 2016;73(7):705-712. 11. Brook JS et al. Pediatrics. 2013;131(1):5-13. 12. Klein RG et al. Arch Gen Psychiatry. 2012;69(12):1295-1303. 13. Biederman J et al. J Clin Psychiatry. 2006;67(4):524-540. 14. Charach A et al. J Am Acad Child Adolesc Psychiatry. 2011;50(1):9-21. 15. Kessler RC et al. Am J Psychiatry. 2006;163(4):716-723. 16. Chang Z et al. JAMA Psychiatry. 2017;74(8):597-603. 17. Sun S et al. JAMA Psychiatry. 2019. doi: 10.1001/jamapsychiatry.2019.1944. 18. Chien WC et al. Res Dev Disabil. 2017;65:57-73. 19. Dalsgaard S et al. Lancet. 2015;385(9983):2190-2196.
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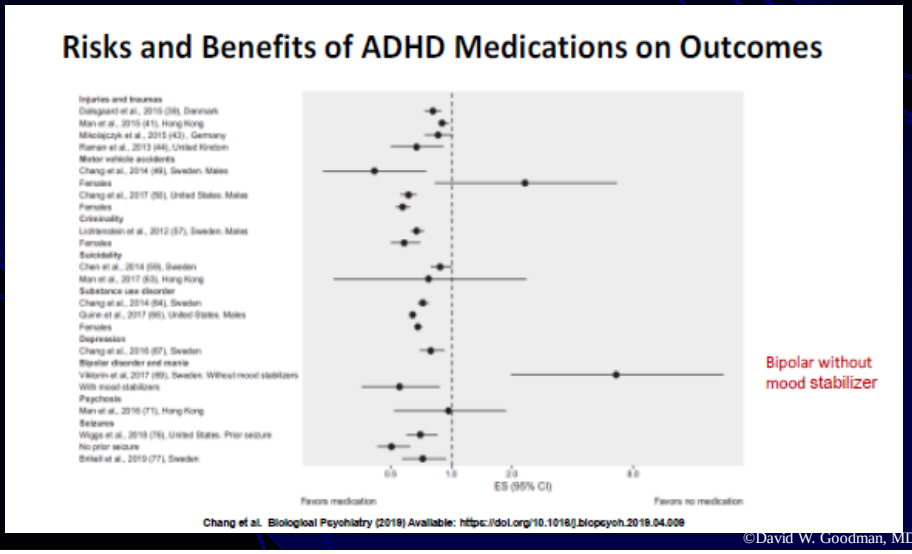
Benefits of ADHD Treatment to Reduce Negative Consequences



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What is Different About Adults with ADHD?

- Longer history to obtain in the evaluation
  - Takes more time to evaluate
  - More information can become diagnostically confusing
  - Longer life span for development of negative consequences
- Neuropsychological testing is not diagnostic
- Onset of major psychiatric disorders
  - Mood disorders, Schizophrenia, SUD, eating disorders
- Concurrent medical illnesses
  - Associated medical illness with ADHD (sleep apnea, TBI)
- Multiple medications (medical illnesses)

10

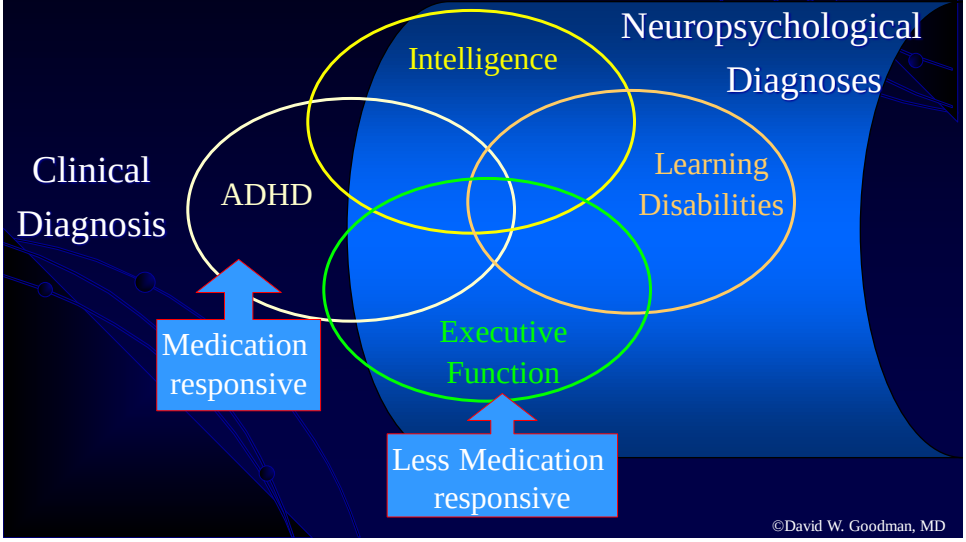
Sex Differences in Adult ADHD

- Results from the National Epidemiological Survey on Alcohol and Related Conditions (the National Epidemiologic Survey on Alcohol and Related Conditions ; N=34,653)
  - Prevalence of lifetime ADHD is significantly higher in men than women, but the rate of persistent ADHD does not differ significantly by sex.
  - Compared to men with persistent ADHD, women with persistent ADHD have lower rates of hyperactive symptoms and significantly more anxiety and perceived mental health impairment.

Cortese S et al. J Clin Psychiatry 2016;77(4):4421-8.

11

Diagnostic Overlap



12

Understanding the Cognitive Effects of Stimulants

In well-controlled studies using [psychological test] batteries,

-stimulant related cognitive enhancements were more prominent on tasks without an executive function component (complex reaction time, spatial recognition memory reaction time, and delayed matching-to-sample)

-than on tasks with an executive function component (inhibition, working memory, strategy formation, planning, and set-shifting).

Swanson J et al. Understanding the Effects of Stimulant Medications on Cognition Individuals with Attention-Defict Hyperactivity Disorder: A Decade of Progress. Neuropsychopharmacology 2011. 36:207-226.

13

Neuropsychological Studies: Inconsistent Deficits

- Neuropsychological tests alone will not make an accurate diagnosis of ADHD
- Neuropsychological tests are not a criteria for the diagnosis of ADHD
- Symptom scales and executive rating scales correlated better with function and quality of life than neuropsychological tests

Gordon M et al.Symptoms versus Impairments: A Case for Respecting the DSM IV Criteria D. J Atten Disorder. February 2006. 9;3:465-475.
Seidman LJ. Neuropsychological functioning in people with ADHD across the lifespan. Clinical Psychology Review. 2006;26:466-485.

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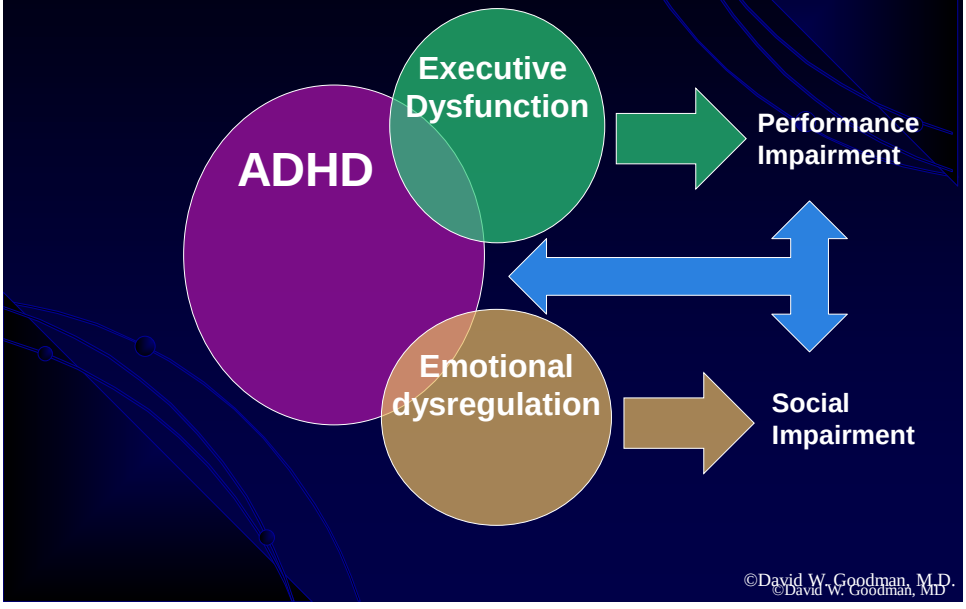
Concurrent Impairment Sources



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World Health Organization/New York University Adult Self-Report Scale for DSM-5

	Never	Rarely	Sometimes	Often	Very Often
1. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?					
2. How often do you have difficulty getting things in order when you have to do a task that requires organization?					
3. How often do you have problems remembering appointments or obligations?					
4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?					
5. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?					
6. How often do you feel overly active and compelled to do things, like you were driven by a motor?					

If 4 or more marks appear in the shaded boxes, the patient has symptoms highly consistent with adult ADHD, and further investigation is warranted.

(sensitivity, 91.4%; specificity, 96.0%; AUC, 0.94; PPV, 67.3%)

Ustin B et al. JAMA Psychiatry. 2017 May 1;74(5):520-527.

16

Adult Self-Report Scale (ASRS-v1.1) : Inattention

≥5 inattentive and/or hyperactive/impulsive symptoms for diagnosis of adult ADHD	Never	Rarely	Some-times	Often	Very Often
1. How often do you make careless mistakes when you have to work on a boring or difficult project?	0	1	2	3	4
2. How often do you have difficulty keeping your attention when you are doing boring or repetitive work?	0	1	2	3	4
3. How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly?	0	1	2	3	4
4. How often do you have trouble wrapping up the fine details of a project, once the challenging parts have been done?	0	1	2	3	4
5. How often do you have difficulty getting things in order when you have to do a task that requires organization?	0	1	2	3	4
6. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?	0	1	2	3	4
7. How often do you misplace or have difficulty finding things at home or at work?	0	1	2	3	4
8. How often are you distracted by activity or noise around you?	0	1	2	3	4
9. How often do you have problems remembering appointments or obligations?	0	1	2	3	4

Kessler R et al. The World Health Organization Adult ADHD Self-Report Scale (**ASRS**): a short screening scale for use in the general. Psychol Med. 2005 Feb;35(2):245-56.

17

Adult Self-Report Scale (ASRS-v1.1) : Hyperactivity/Impulsivity

≥5 inattentive and/or hyperactive/impulsive symptoms for diagnosis of adult ADHD	Never	Rarely	Some-times	Often	Very Often
1. How often do you fidget or squirm with your hands or your feet when you have to sit down for a long time?	0	1	2	3	4
2. How often do you leave your seat in meetings or other situations in which you are expected to remain seated?	0	1	2	3	4
3. How often do you feel restless or fidgety?	0	1	2	3	4
4. How often do you have difficulty unwinding and relaxing when you have time to yourself?	0	1	2	3	4
5. How often do you feel overly active and compelled to do things, like you were driven by a motor?	0	1	2	3	4
6. How often do you find yourself talking too much when you are in a social situation?	0	1	2	3	4
7. When you're in a conversation, how often do you find yourself finishing the sentences of the people that you are talking to, before they can finish them themselves?	0	1	2	3	4
8. How often do you have difficulty waiting your turn in situations when turn-taking is required?	0	1	2	3	4
9. How often do you interrupt others when they are busy?	0	1	2	3	4

Kessler R et al. The World Health Organization Adult ADHD Self-Report Scale (**ASRS**): a short screening scale for use in the general. Psychol Med. 2005 Feb;35(2):245-56.

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Adult ADHD and Comorbidities

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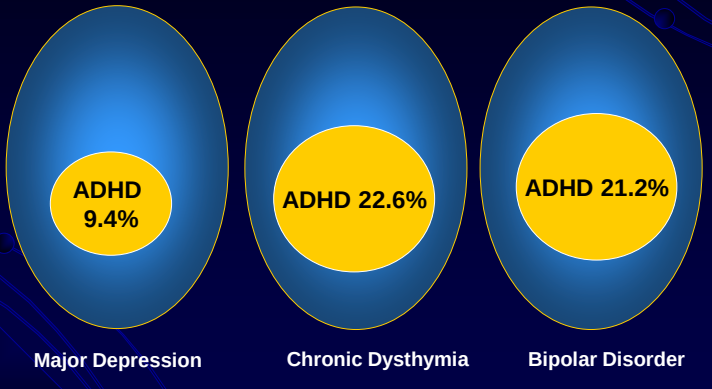
National Comorbidity Survey Replication: Adult ADHD in Other Psychiatric Disorders



Kessler RC et al. *Am J Psychiatry*. 2006;163:716-723.

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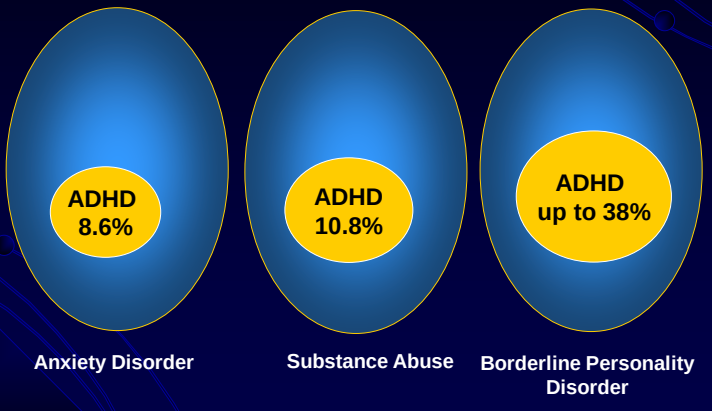
National Comorbidity Survey Replication: Adult ADHD in Other Psychiatric Disorders



Kessler RC et al. *Am J Psychiatry*. 2006;163:716-723. Weibel S. J of Affective Disorders. 2018;226:85-91

21

ADHD and Eating Disorders (ED)

Twelve studies, case-controlled studies (5/12 were peds ages 10-17)

In ADHD	Pooled Odds Ratio	95% Confidence Interval
Any eating disorder	2.23	1.23-4.03
Any ED (self report ADHD)	3.82	2.34-6.24
Any ED (clinical interview ADHD)	5.89	4.32-8.04
Bulimia	5.71	3.56-9.16
Anorexia Nervosa	4.28	2.24-8.16
Binge Eating Disorder	4.13	3-5.67

Nazar, Bruno, et al.; The Risk of Eating Disorders Comorbid with Attention Deficit/Hyperactivity Disorder: A Systematic Review and Meta-Analysis International Journal of Eating Disorders 2016; 49:12: 1045-1057
*Cortese S, Moreira-Maia CR, St Fleur D, Morcillo-Peñalver C, Rohde LA, Faraone SV. Association between ADHD and obesity: A systematic review and meta-analysis. *Am J Psychiatry* 2016; **173**: 34–43.

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ADHD and Personality Disorders (PDs)

- Cross-sectional study, consecutive patients referred to an adult ADHD clinic in Ireland. 147 diagnosed with ADHD by DSM 5 criteria. Mean age: 32.97.
- Personality Disorders were evaluated with Millon Clinical Multiaxial Inventory–III (MCMI-III).
- No severe personality disorders in 72.8% (schizotypal, borderline, paranoid) (n=107)
- Most common Severe Personality Pathology of MCMI-III in those diagnosed with ADHD
  - borderline PD (n=30, 20.4%)
  - schizotypal (n=17, 11.6%)
  - paranoid (n=13, 8.8%)
- F>M: Dependent, depressive, masochistic and borderline (marginal significance) PDs
- In contrast, significantly more males were found with antisocial PD compared to females.

Adamis, Dimitrios, et al.; Prevalence of Personality disorders in Adults with Attention Deficit Hyperactivity Disorder (ADHD). Journal of Attention Disorders. 2023. 1-11.

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Diagnostic Prioritization for Pharmacotherapy

Alcohol and substance abuse

Mood disorders

Bipolar and MDD

Anxiety disorders

Obsessive-compulsive disorder, generalized anxiety disorder, panic

ADHD

Personality Disorders

Order of treatment also considers the severity of the concurrent disorders.

Goodman D. Treatment and assessment of ADHD in adults. In: Biederman J, ed. *ADHD Across the Life Span: From Research to Clinical Practice—An Evidence-Based Understanding.* Hasbrouck Heights, NJ: Veritas Institute for Medical Education, Inc.2005.

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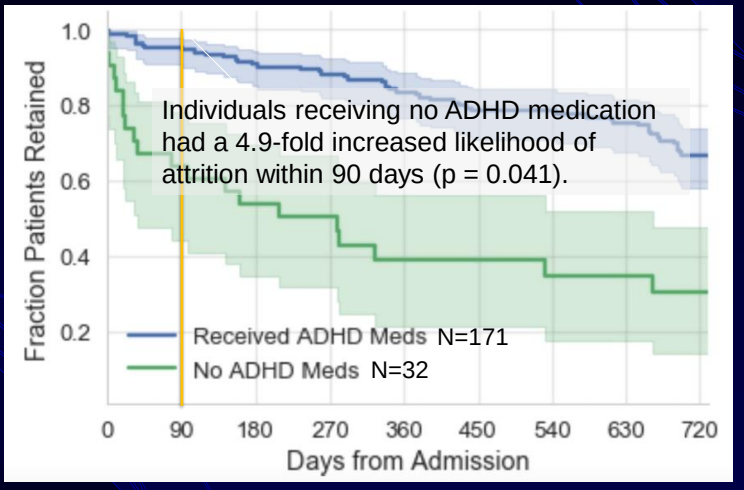
Relapse Reduction of SUD with Treated ADHD



Kast J Clin Psychiatry. 2021. 82(2): . doi:10.4088/JCP.20m13598.

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ADHD treatment and risk of antidepressant-resistant depression among patients with major depression.

	Antidepressant-resistant depression			
	n	%	OR	95% CI
Non-ADHD	47	2.5	1	–
ADHD				
Non-treatment	87	6.1	**2.23**	1.54 – 3.24
Irregular treatment	21	6.6	**3.11**	1.80 – 5.37
Regular treatment	6	3.9	**1.76**	0.72–4.27

Mu-Hong Chen et al., Attention-deficit hyperactivity disorder comorbidity and antidepressant resistance among patients with major depression: A nationwide longitudinal study. European Neuropsychopharmacology, 2016-11-01, Volume 26, Issue 11, pages 1760-1767

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Concurrent or Sequential Treatment?

- Concurrent
  - Perhaps: SUD in treatment and ADHD
  - Perhaps: GAD and ADHD
  - Perhaps: PTSD and ADHD
  - Perhaps: Binge eating disorder and ADHD
  - Not: Anorexia eating disorder and ADHD
  - Not: Acute panic disorder and ADHD
  - Not: Acute bipolar episode and ADHD
- Sequential
  - Perhaps: Acute bipolar episode then ADHD
  - Not: SUD untreated then ADHD

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Number of Stimulant Preparations ?

>30+

For comparison, there are 29 antidepressants.

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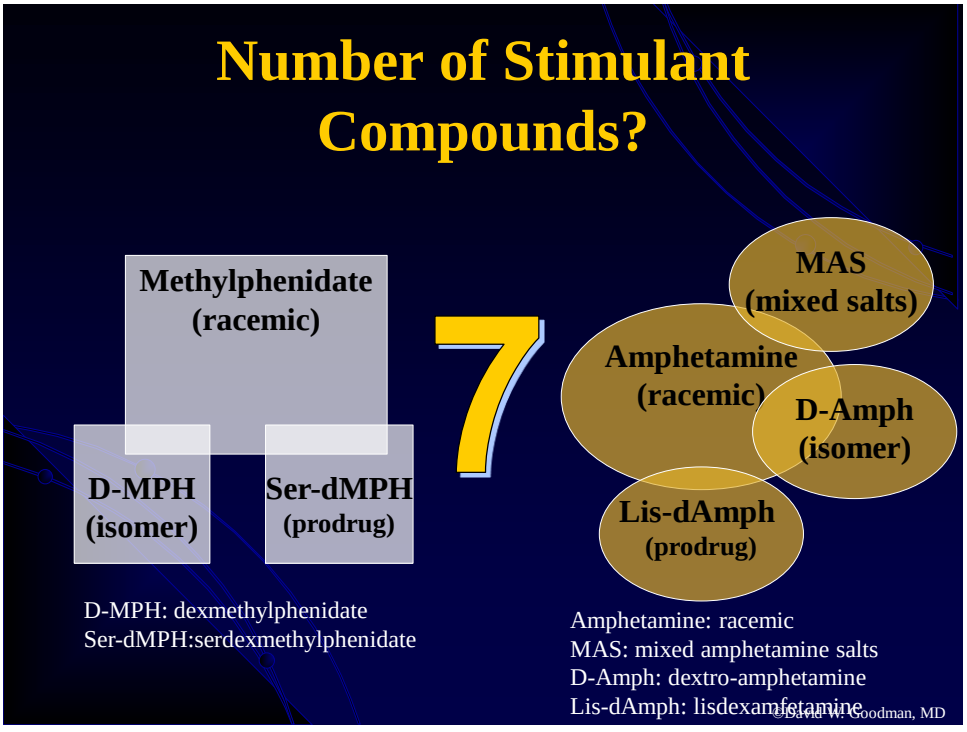
Number of Stimulant Compounds?
Methylphenidate (racemic)
D-MPH (isomer)
Ser-dMPH (prodrug)
7
MAS (mixed salts)
Amphetamine (racemic)
D-Amph (isomer)
Lis-dAmph (prodrug)
D-MPH: dexmethylphenidate
Ser-dMPH:serdexmethylphenidate
Amphetamine: racemic
MAS: mixed amphetamine salts
D-Amph: dextro-amphetamine
Lis-dAmph: lisdexamfetamine
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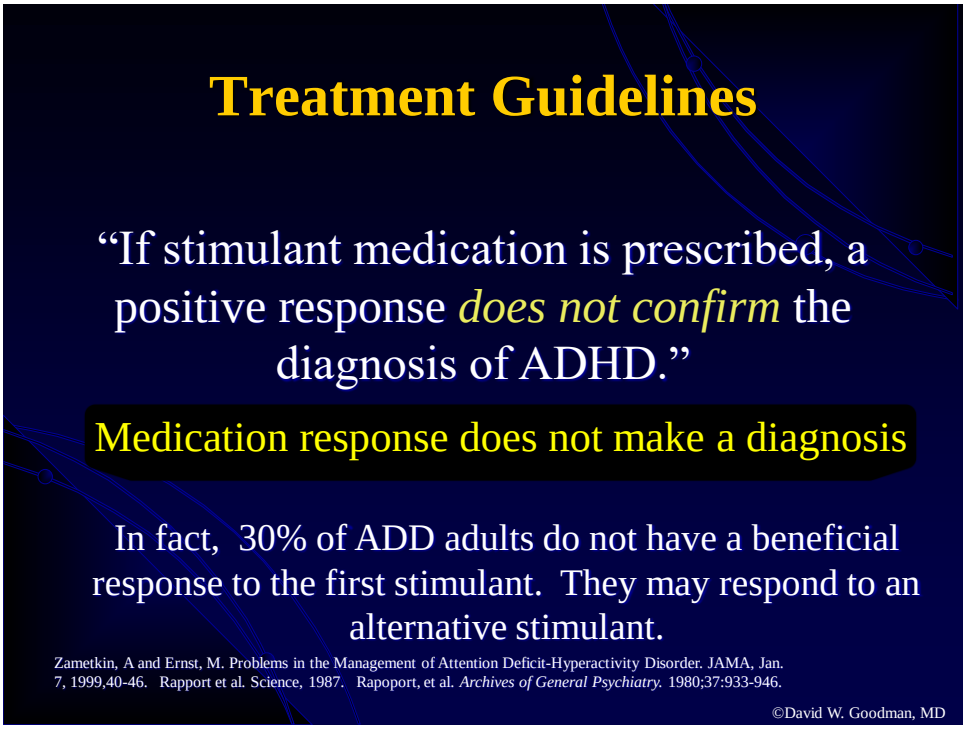
Treatment Guidelines
"If stimulant medication is prescribed, a positive response does not confirm the diagnosis of ADHD."
Medication response does not make a diagnosis
In fact, 30% of ADD adults do not have a beneficial response to the first stimulant. They may respond to an alternative stimulant.
Zametkin, A and Ernst, M. Problems in the Management of Attention Deficit-Hyperactivity Disorder. JAMA, Jan. 7, 1999,40-46. Rapport et al. Science, 1987. Rapoport, et al. Archives of General Psychiatry. 1980;37:933-946.
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Pharmacogenetic Testing in ADHD

- "In conclusion, we report moderate effects of the genes SLC6A3, DRD4, SNAP25, and ADGRL3 in the response to MPH, thereby supporting several previous studies of these genes. We also found interactions between response to treatment over 12 months and genotypes of SLC6A3 and DRD2.
- When all the covariates are taken into account, the models explain around 20% of the response to MPH. Therefore, other genetic or non-genetic factors must be involved in the variability of response to MPH. More research is required to find pharmacogenetic variants that could help to establish the best treatment regimen."

Gomez-Sanchez CI et al.Pharmacogenetics of methylphenidate in childhood attention-deficit/hyperactivity disorder: long-term effects. www.nature.com/scientificreports

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Pharmacogenetic Testing Utility?

- Childhood ADHD pharmacogenomic efficacy studies published during the last decade (2009–2019)
- Despite the progress, no one genetic variant or currently available pharmacogenomics test has demonstrated clinical utility in pinpointing the optimal ADHD medication for a given individual patient.
- Currently, no phenotypic or patient factors have been shown to consistently predict ADHD medication response.

Elsayed NA et al.CNS Drugs. 2020 April ; 34(4): 389–414.; Wolraich ML, et al. Pediatrics. 2019 10;144(4).; Lowe N, et al. 2006;4:231–43.; Stein MA, McGough JJ. Child and adolescent psychiatric clinics of North America. 2008 4;17(2):475–90.

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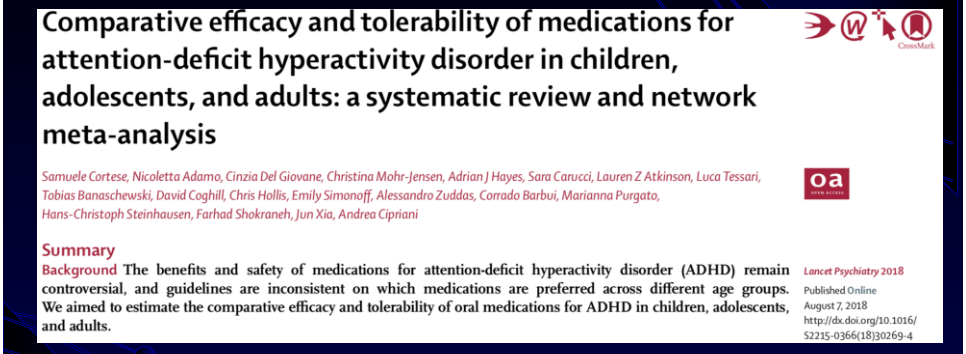
Stimulant Preference by Age



Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults: a systematic review and network meta-analysis

Samuele Cortese, Nicoletta Adamo, Cinzia Del Giovane, Christina Mohr-Jensen, Adrian J Hayes, Sara Carucci, Lauren Z Atkinson, Luca Tessari, Tobias Banaschewski, David Coghill, Chris Hollis, Emily Simonoff, Alessandro Zuddas, Corrado Barbui, Marianna Purgato, Hans-Christoph Steinhausen, Farhad Shokraneh, Jun Xia, Andrea Cipriani

Summary

Background The benefits and safety of medications for attention-deficit hyperactivity disorder (ADHD) remain controversial, and guidelines are inconsistent on which medications are preferred across different age groups. We aimed to estimate the comparative efficacy and tolerability of oral medications for ADHD in children, adolescents, and adults.

Lancet Psychiatry 2018
Published Online
August 7, 2018
http://dx.doi.org/10.1016/S2215-0366(18)30269-4

Taking into account both efficacy and safety, for the first time evidence supports methylphenidate in children and adolescents, and amphetamines in adults as first choice **at the group level.**

Cortese S, et al. Lancet Psychiatry. 2018.

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Stimulant Switch Rate in Adult ADHD Treatment

- 86 newly referred adults ages 18-45, untreated stimulant naïve ADHD, treated by single expert psychiatrist (JB)
- The choice of initial treatment was based on the clinician's preference
- Switching was based clinical judgment of tolerability by the prescribing clinician
- Switching occurred within ~60 days
- American Academy of Child and Adolescent Psychiatry (AACAP) does not provide any guidelines as to which one should be used first.

J Biederman, M DiSalvo, A Green, K Woodworth, T Gilfix, C Law, J Gabrieli, S Faraone; Rates of switching stimulants in consecutively referred medication naïve adults with ADHD: Acta Psychiatr Scand. 2021;144:626-634

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Stimulant Switch Rate in Adult ADHD Treatment

- The rate of switching was significantly higher in those initially prescribed MPH versus AMPH (p=0.01; OR = 4.23 95% CI= 1.38, 12.93).
- Among males and patients initially prescribed AMPH, those who switched stimulant families had significantly higher baseline emotional dysregulation scale scores compared to those who did not switch (p≤0.01).
- The need to switch could not be adequately predicted by sociodemographic or clinical characteristics.

J Biederman, M DiSalvo, A Green, K Woodworth, T Gilfix, C Law, J Gabrieli, S Faraone; Rates of switching stimulants in consecutively referred medication naïve adults with ADHD: Acta Psychiatr Scand. 2021;144:626-634

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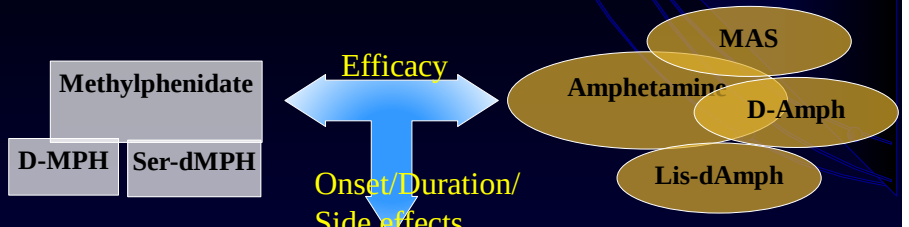
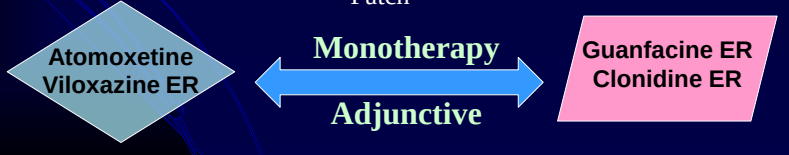
ADHD Medication Sequencing



Delivery System Technology

Beaded
(IR/ER ratio, double/triple beaded)
OROS (osmotic release)
Microparticles (liquid, dissolvable tabs, chewables)
Patch



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My Proposed Medication Decision Tree

- Medication compound
- Form of administration
- Onset/Duration of action
- Delivery system/technology
- Dosing
- Patient Preference
- Cost

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Non-Stimulants

- Atomoxetine
- Viloxazine ER

Approved for children/adolescents:

- Guanfacine ER
- Clonidine ER

Off-label:

- Bupropion (positive controlled adult trials)
- Desipramine (positive adult trial)
- Modafinil (child study positive, adult study negative)

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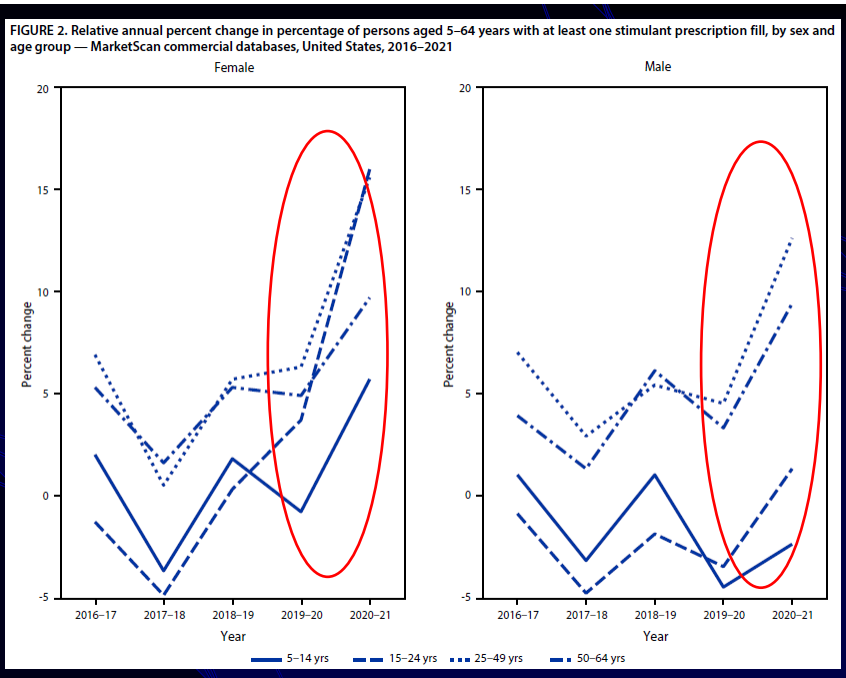

Danielson M, et al. Trends in Stimulant Prescriptions Fills Among Commercially Insured Children and Adults-United States, 2016-2021. MMR. 72 (13); March 31, 2023. ©David W. Goodman, MD

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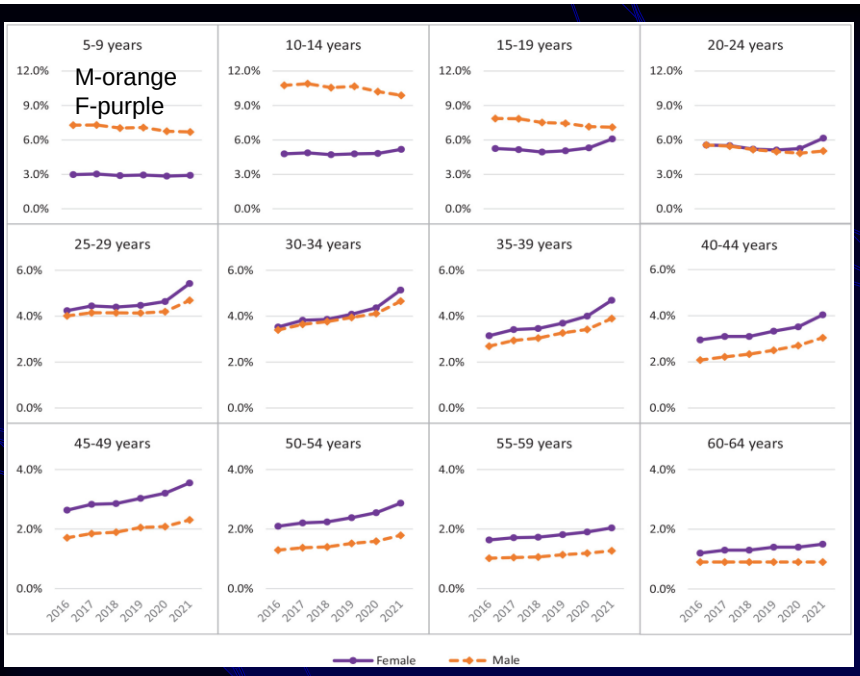
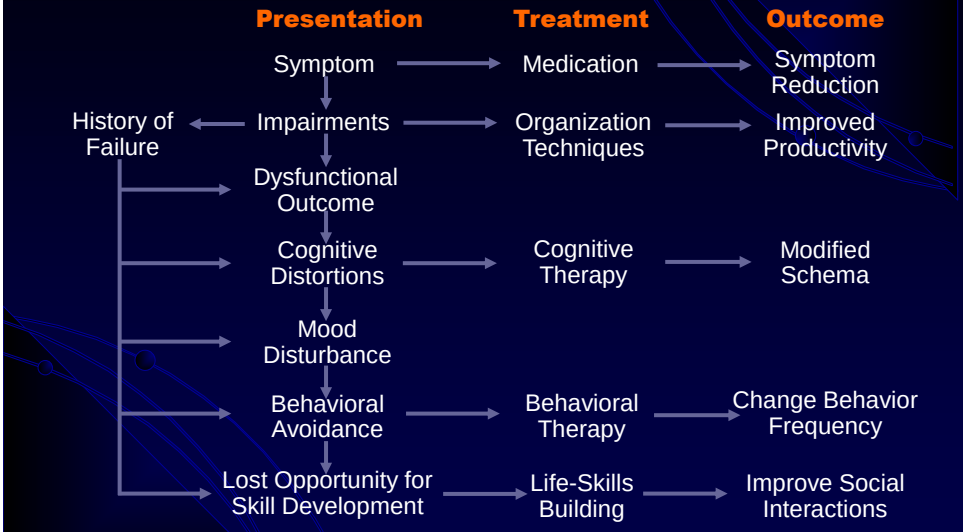


Danielson M, et al. Trends in Stimulant Prescription Fills Among Commercially Insured Children and Adults - United States, 2016-2021. MMWR Morb Mortal Wkly Rep. Mar31;72(13):327-332. ©David W. Goodman, MD

40

Comprehensive Role of the Therapist



Goodman D. Treatment and assessment of ADHD in adults. In: Biederman J, ed. *ADHD Across the Life Span: From Research to Clinical Practice—An Evidence-Based Understanding.* Hasbrouck Heights, NJ: Veritas Institute for Medical Education, Inc. 2006

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Resources for ADHD Clinicians/Researchers

- American Professional Society for ADHD and Related Disorders (APSARD.org)
- ADHDinAdults.com
- World Federation for ADHD (www.adhd-federation.org)
- European Network Adult ADHD (www.eunetworkadultadhd.com)
- Canadian ADHD Resource Alliance (caddra.ca)
- National Institute of Health and Care Excellence (NICE) (www.nice.org.uk)

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Summary

- ✓ ADHD is highly prevalent in both children and adults- *screen regardless of age*
- ✓ Diagnostic accuracy is enhanced by considering:
  - Presenting symptoms
  - Age of onset
  - Longitudinal course: chronic, pervasive, impairing
  - Family psychiatric history
- ✓ Use symptom checklists for baseline target symptoms and change with treatment
- ✓ Look for psychiatric/medical comorbidities and prioritize accordingly
- ✓ Education, behavioral changes and cognitive therapies are effective

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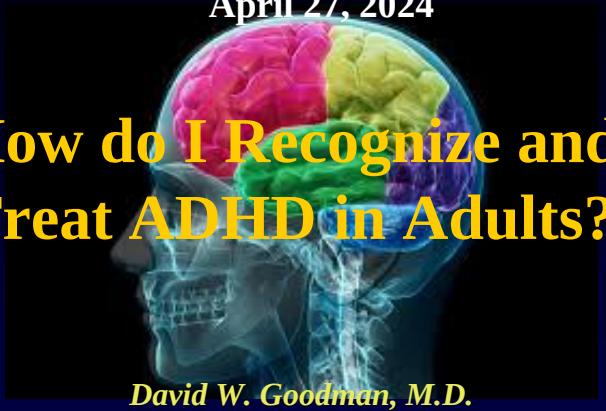
MDH Spring Continuing Education Program

April 27, 2024



How do I Recognize and Treat ADHD in Adults?

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ADDadult.com

MyADHDFoundation.org

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ADHD and stimulant use in the pediatric population

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1

I & my spouse have the following financial relationship with the manufacturer of any commercial product and/or provider of commercial services discussed in this CME activity: CHADIS

The Center for Promotion of Child Development through Primary Care and its for-profit partner company, CHADIS, Inc. developed CHADIS, a web-based screening and decision support system. Dr. Howard is President and she and her spouse Dr. Sturner are members of the Board of Directors of the for-profit partner company, CHADIS, Inc. Dr. Sturner is Director of the Center and both are members of its Board of Directors. They are paid consultants to both entities.

I do not intend to discuss an unapproved/investigational use of a commercial product/device in my presentation. Some medications discussed are off label.

2

Learning Objectives:

1. Participants will be able to state criteria for diagnosing simple and complex ADHD.
2. Participants will be able to describe current medication use for management of ADHD.
3. Participants will be able to select from medication strategies for children with uncomplicated and complex ADHD.
4. Participants will be able to discuss potential benefits and risks of stimulant medication in children

3

"ADHD" is a very common problem

- Common: ADHD affects 4-12% of children
- Complicated:
  - Differential diagnosis for ADHD includes many mental health, medical, learning and family problems
  - High rates of coexisting conditions- ~70%
  - Children with ADHD also have: 30% mood, 50% LD, 25% ODD disorders
  - Increased rates in disadvantaged, traumatized
- Has service problems:
  - "ADHD" constitutes 1/2 of children referred to child psychiatrists
  - Finding referral resources to diagnose and manage is often difficult
  - Insurance coverage

4

Long term problems for people with ADHD

Mental health issues
Educational failure
Vocational underachievement
Substance Use Disorder
Poor relationships with family and other adults
Legal problems
Increased risk for early death (accidents, suicide)

5

Adverse Long term Outcomes of Untreated ADHD

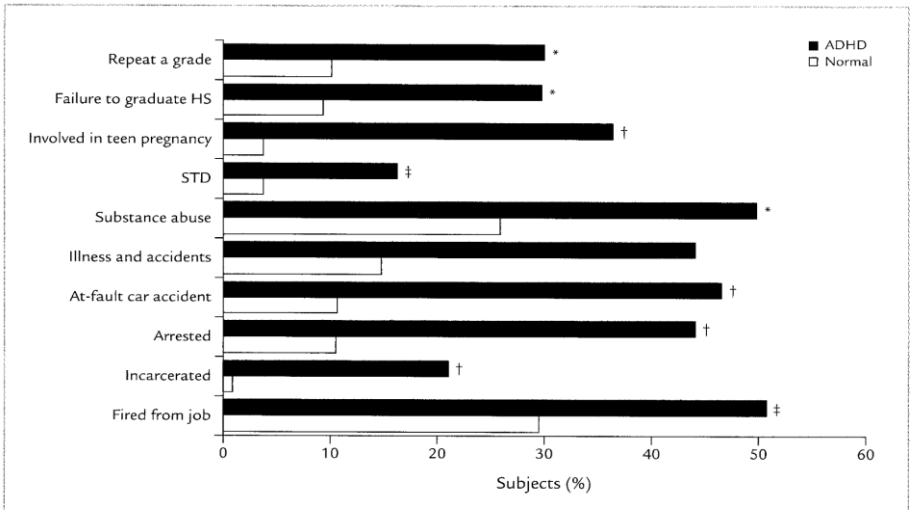

Figure 1. Functional impairments in patients with attention-deficit/hyperactivity disorder (ADHD) compared with those without ADHD.[16-18,20,21,23-25] HS = high school; STD = sexually transmitted disease. *$P \leq 0.01$; †$P \leq 0.001$; ‡$P \leq 0.006$.

6

Early and Appropriate Diagnosis and Treatment of ADHD

Result in:

- Earlier optimization of dose and academic progress
- Lower rates of school retention
- Lower rates of special class placement
- Lower rates of oppositional defiant disorder (and presumed conduct disorder)
- Lower rates of later substance abuse
- Lower rates of injuries
- Lower costs to school and health system

7

Problems of Care for ADHD

- Inadequate child psychiatry & counseling resources/insurance
- Stigma of mental health care
- Need early diagnosis which is not part of referred care
- Managed mostly by primary care physicians
  - May have inadequate training in this area
  - Tend to be under-reimbursed for these services
  - Inadequate time

8

AAP Guidelines for ADHD *Diagnosis* (2011)

1) In child 4-18 yrs with inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems, PCP "should initiate evaluation"

2) Diagnosis requires DSM 4 TR *criteria*

DSM V may have onset <12 years

3) Assessment requires evidence >1 from:

a) parents/caregivers re: core symptoms in various settings, age of onset, duration, functional impairment

b) child: interview, checklist, strengths, PE/neuro, consider substance abuse

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AAP Guidelines for ADHD *Diagnosis* – cont'd

4) Data from school re: core sx, duration, functional impairment, associated conditions

5) Assessment for coexisting conditions eg hearing, vision

e.g. History for OSA, restless legs, Fe def., thyroid, anxiety, depression, sz, LD, language, Developmental Coord. Disorder, sleep.

6) Tests not routinely indicated for dx of uncomplicated but for complex and coexisting (eg, LD and MR) e.g. Einstein, psychol. testing

10

Example Rating scales for ADHD

- Vanderbilt- initial, f/u, parent, teacher. 4+, free
- Conners-4- Parent, Self, Teacher, short, long
- ADHD-V- (DuPaul, et al) age and gender forms, cost
- ADHD Rating Scale IV-Preschool Version
- Adult ADHD Self Report Scale v1.1- for adol and adult
- SWAN- range of normal included

11

Tools to detect coexisting conditions- sample categorieszz

- General Mental Health- eg Child Behavior CheckList, Weiss ADHD Comorbid Health Screen
- Anxiety- eg SCARED
- Autism- eg Social Responsiveness Scale
- Depression- eg PHQ-9
- Disruptive Behavior- eg MOAS
- Goals for Change
- Learning Issues- eg Einstein, WRAT
- Medication Side Effects
- Sleep- eg Childhood Sleep Questionnaire
- Strengths- eg Goals and Strengths
- SDoH- eg PRAPARE
- Suicide- eg ASSQ
- Tics- eg Yale Global Tic Severity Scale (YGTSS)

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AAP Guidelines for *Treatment* (4-18 year olds) (2011)

Appropriate diagnosis first

1) Use explicit criteria for the diagnosis using the *DSM-V* criteria

2) Info >1 setting (esp. schools)

i.e. checklists, work, social hx, report cards, testing, discipline

3) Search for coexisting conditions that may make the diagnosis more difficult or complicate treatment planning, incl. tics, OSA

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"PCP & specialists cannot work alone" AAP

- Ongoing communication with parents and schools
- Integration of services with psychologists, child psychiatrists, educational specialists, and other mental health professionals if coexisting conditions or treatment failure.
- Knowledge of community activities and services (for both help and strengths).

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#1- Manage ADHD as chronic condition

- ***Educate***: information about the condition – effects on learning, behavior, self esteem, social skills, family
- ***Periodically***: Update and monitor family knowledge and understanding
- ***Counseling***: about family response to the condition
- ***Adjust education of child*** about ADHD as the child grows – etiology, treatment, long-term outcomes, and effects on daily life
- ***Stay available***: to answer family questions
- ***Ensure coordination***: of health and other services
- Help families ***set specific goals***: related to the child's functioning for daily activities
- ***Link*** families: with other families as needed and available- e.g. support groups

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#2 Collaborate (pa, child, school) to *specify target functional outcomes*

Pick 3-6 targets related to child's key impairments: SMART (specific, measurable, achievable, relevant, time-bound) and monitor outcomes

- improvements in relationships with parents, siblings, teachers, and peers
- decreased disruptive behaviors
- improved academic performance: volume of work, efficiency, completion, and accuracy
- increased independence in self-care or homework
- improved self-esteem
- enhanced safety in the community, such as in crossing streets or riding bicycles.

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#3 AAP Guidelines Recommend stimulant medicine and/or behavior therapy for >4 yr., uncomplicated

Stimulants are first line. Behavior therapy may be helpful or an adjunct.

- Stimulants improve core symptoms equally. Child may respond to one but not to another.
- Stimulants require no serologic, hematologic, or EKG monitoring.

3A: If one stimulant does not work at the highest feasible dose, try another.

3B: Find highest dose with no side effects or dose at which side effects are tolerable.

3C: If stimulants do not work/not tolerated, try non-stimulants with evidence-basis

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"Complex ADHD" Criteria

- Age at presentation: < 4 years or > 12 years
- Presence of co-existing conditions
  - Neurodevelopmental
  - Mental health
  - Medical
  - Psychosocial factors adversely affecting health and development
- Moderate to severe functional impairment- academic, social interactions

(family, peers), self esteem, community participation, activities of daily living

- Diagnostic uncertainty
- Inadequate response to treatment

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Complex ADHD Guidelines (SDBP 2020)

1. Intended for mgt by clinicians with specialized training
2. Focus on **functional impairment** to improve long-term outcomes
3. Evidence-based **psychosocial treatment is foundational** before meds
4. Data-based, sequential approach using shared decision-making
5. Interprofessional care (medical, psychological, educational)
6. Multimodal treatment (psychosocial + pharma)
7. Life course perspective

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Complex ADHD

- Functional assessment
- Psychoeducation of child and family
- Psychological and educational testing
- Initiate behavior therapies- meds alone address current fx but not long term as therapies may
- If functioning does not normalize, then multimodal i.e add pharmacotherapy
- Start with area of functioning most affected

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Assessing Function

- Information from parent/child interview, reports from school, and, where possible:

  ratings of functional impairment e.g. Clinical Global Impression-Improvement (CGGI-i)

  or Impairment Rating Scale

- Significant improvement represented by the following:
  - 25% decrease in parent or teacher Vanderbilt total or relevant subscale score
  - Patient no longer meets 6/9 positive items criteria on relevant Vanderbilt subscale,

    reported by the parent or teacher
  - >=1 category increase in parent OR teacher CGI-I score
  - Patient has met or maintained a satisfactory level of symptoms and functioning

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Psychological Testing

1) Initial testing for all children with Complex ADHD. IQ, achievement, +/- specific for language, writing, handwriting, math
2) Repeat testing if-

   Deterioration in mental health or functional status

   Poor academic progress not explained by previous test results

   Suboptimal response to treatment for core ADHD symptoms

   Young age (<6 years) at time of previous testing

   Patients preparing for a transition to college

3) Neuropysch testing if: CNS trauma, brain tumors, stroke

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ADHD for Disadvantaged Children

- Minority racial and ethnic and low income group children are 1.85–2.21 more likely to have ADHD but:
  - Less diagnosis
  - Less med use
  - Less acceptability for meds
  - Less ADHD awareness
  - Less care access
  - Expect less from ADHD trt.
- Beh therapy + Meds may be more effective for disadvantaged for aggressive/oppositional behavior
- May need more
  - Motivational interviewing strategies
  - Assistance in reducing barriers to care
  - Opportunities for social support and problem solving among peers
  - Increased coaching during behavior therapy

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Trauma as cause for ADHD sx

- Early trauma- becomes hardwired
- Later trauma- same sx but can be resolved
- Ongoing trauma

All produce: Hypervigilance, and anxious, distractible, highly aroused and impulsively aggressive behavior that resembles ADHD.

Abused children with ADHD have more severe impulsivity and inattention but less hyperactivity compared to non-abused.

Danger of medication keeping them in abusive situation (when should be protected).

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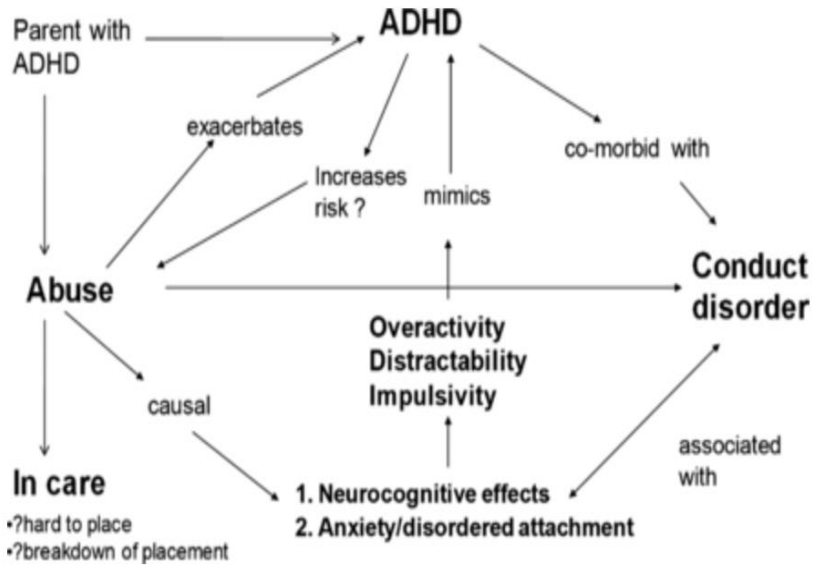
Trauma mimics ADHD



25

Sleep problems in ADHD

- 85% of children with ADHD had sleep problems *before* using meds
- Sleep debt makes ADHD and coexisting conditions worse
- Mostly trouble falling asleep but also restless
- Consider OSA if snore, bipolar if up for hours in the middle of the night
- Start with routine bedtime, back rub, milk, white noise
- Meds prn: evening stimulant dose, melatonin 1-8 mg, Clonidine 0.05-0.3 mg, guanfacine up to 1 mg
- Beh. mgt q 2 weeks by PCP reduced sleep issues and signif. improved ADHD ratings by parents and teachers (Hiscock)

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Psychosocial Therapies

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Behavioral Parent Training (<12 yrs)

- 8 to 12 weekly group sessions with a trained therapist.
- Focus on the behavior and difficulties in family relationships.
- Aims to improve the parents' understanding of child's behavior and skills.
- Specific techniques for:
  - giving commands
  - reinforcing adaptive and positive behavior
  - decreasing inappropriate behaviors
- Plan for maintenance and relapse prevention.
- Does not necessarily bring behavior into the normal range on parent rating scales
- Medium effect size
- *Mindfulness training for adult caregivers!*

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Effective Parenting Techniques

- Positive reinforcement: Rewards or privileges contingent on performance.
- Time-out: Removing access to positive reinforcement contingent on performance
- Response cost: Withdrawing rewards or privileges contingent on performance of unwanted or problem behavior.
- Token economy: Combining positive reinforcement and response cost.

Effective only while implemented & maintained.

29

Behavioral Classroom Management (<12 yrs)

- Use for all students in a class or a selected child
- Increase the structure of activities- e.g., posted classroom rules, positive reinforcement for appropriate behavior and work completion/accuracy, appropriate consequences for rule violations
- Systematic rewards and consequences: point systems or token economy to increase appropriate behavior and eliminate inappropriate behavior.
- A periodic (often daily) report card.
- May not bring behavior into the normal range on teacher rating scales.
- Large effect size.
- E.g. Good Behavior Game (paxis.org)

30

Classroom Accommodations

- Preferential seating
- Cueing by teacher before instruction
- Shorter work periods with frequent breaks
- Visual and tactile stimuli with verbal instructions
- Remediation when necessary
- FM receivers

Can be requested via 504 Plan from clinician

Accommodations alone are not enough.

31

Behavioral Peer Interventions (BPI) (<12 yrs)

Skills deficits: weekly group training sessions in school or clinic (e.g., how to initiate interactions with other children).

Behavioral excesses (e.g., name-calling, teasing, aggression) are typically dealt with in the settings in which they occur by behavior management plans.

BPI in school or summer camp have medium to large effect sizes.

Limited evidence for the effectiveness of office- or clinic-based social-skills training alone.

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Organization Skills Training (OST)

- For older elementary and teens (9-18 yrs).
- Skills training: organize learning materials, track assignments, and plan work completion.
- Typically includes consultation with parents and/or teachers to promote generalization
- Strength of the evidence less than for the other forms of behavioral intervention; medium.

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Other interventions

- Cognitive training (e.g., working memory training) and neurofeedback. Some improvement in laboratory-based, task-specific outcomes, but insufficient to recommend.

- Not effective- Play therapy, sensory integration, hippotherapy, diet, supplements and eye tracking have little to no evidence.

34

How to decide on meds

- Expectations, attitudes and preferences
- Risk for potentially severe adverse effects
- Predominant ADHD core symptoms
- Need for rapid onset, duration
- Age and ability to swallow
- Coexisting conditions
- Concerns re diversion or misuse
- Risk of drug-to-drug interactions
- Cost
- Individual variability in response
- Family history with similar meds

(CADDRA, 2011)

35

Medication Selection

- History of response to previous treatment with medication
- Duration of desired effect (length of school day, homework, and afterschool activities; intermediate-release preparations [6–8 hours] vs extended-release preparations [10–12 hours]
- Ability to swallow pills
- Potential for abuse/misuse/diversion (tablet and beaded formulations have higher potential than osmotic-controlled release oral delivery system (Concerta), prodrug (Vyvanse), or dermal formulations (Daytrana).

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Parent Preferences

Parents preferred attributes of Long Acting medications including:

- a once-daily oral therapy (odds ratio [OR]=1.76 [95% CI 1.43, 2.18])
- rapid speed of onset (OR=1.22 [95% CI 1.07, 1.39])
- control lasting until 9 p.m. (OR=3.79 [95% CI 2.98, 4.82]).

Adherence and persistence better for:
Long Act > Short Act; Amphetamines (AMP)>Methylphenidate (MPH);
stimulants > non-stimulants;
Lisdex (Vyvanse) best over Mixed AMP Salts, dMPH, MPH, Atomoxetine

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If starting meds

- Psychoeducation about benefits, risk and side effects of treatment
- Baseline ADHD symptom rating scale
- Baseline functional status- behavioral, educational, social
- Side effect inventory- headache, appetite, sleep, GI, tics
- Establish treatment goals and targets for *functional improvement*- SMART goals
- Treat with MPH or AMP at lowest "formulated" dose
- Reassess q 1-2 weeks by phone and scale
- Increase as tolerated
- In person exam with VS, cardiac exam at 4-6 weeks

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Titration or Placebo Trial

- Week 1: Start at the lowest dose on Saturday; follow up by phone or email at the end of week or if significant side effects are noted
- Week 2: Increase to next dose if equivocal effectiveness and minimal/tolerable side effects
- Week 3: Discontinue medication; keep the teacher blinded
- Week 4: Resume most recent dose and complete in-person follow-up visit

Or

A,B,C,A,B,C weekly with A= placebo, B = low dose, C= higher dose

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Preschool ADHD 4-5 year olds

- Issues: range of typical behavior is broad; limited evidence-based treatment
- DX:
  1. symptoms that have persisted for at least 9 months,
  2. dysfunction that is manifested in both the home and other settings such as preschool or child care, and
  3. dysfunction that has not responded adequately to behavior therapy.
- Trt:
  - Evidence-based parent- and/or teacher-administered **behavior therapy as the first line of treatment**
  - May prescribe MPH if behavior trt does not provide significant improvement and there is mod-to-severe dysfunction.

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Preschool meds

- Only after trial of behavioral management
- Meds- in person visit q 3-4 months
  - MPH 2.5 mg qd first line
  - Alpha agonist less evidence- clonidine 0.1 mg or guanfacine 0.25-0.5 mg
- If meet trt goals with min. side effects on MPH -> consider bid to tid or intermediate acting MPH
- More and different side effects than older children: listlessness, social withdrawal, and repetitive movements.
- If xs side effects -> change category of med, or increase therapy on lower dose
- After goals met, continue therapy and meds and revisit q year

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Medication added to behavioral treatment

- When core ADHD symptoms cause functional impairment
- Assumes psychosocial treatments are in place
- Establish collaborative target goals
- Titrate to maximal effect with minimal side effects using measure data
- Weigh benefits vs. side effects at each dose
- If a co-existing conditions emerges, refer to relevant complex ADHD treatment algorithm

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Medication Choice: Stimulants

- Methylphenidate (MPH) and DextroAmphetamine (DA) are approximately equivalent in efficacy (75%) & side effects
- No difference in effectiveness or side effects by presentation type i.e. hyperactive, inattentive, or combined
- Side effects: headache, abdominal pain, dizziness, loss of appetite. Small inc. BP 1–4 mmHg and HR, 1–6 bpm, esp. at start.
- 43% respond better to one than the other class
- Boys>girls on DA (78.8% vs 51%; OR, 3.4; 95% CI, 1.5–7.54; p = .002) (Barberesi)
- DA is CYP2D metabolized. Serotonin syndrome possible with MAO and SSRI.
- MPH dose = 0.3 -.5 mg/kg/dose; DA = 0.15-0.25 mg/kg/dose

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MPH Formulations (short>long)

- Methylin liquid 5 or 10/5cc- short acting, 3-4 hrs
- Methylin chewable- 3-4 hrs
- Metadate CD- MPH, 6 hours, can sprinkle. 30% immediate/70% long
- Focalin- d MPH- 3-4 hrs; ½ dose; same effectiveness and side effects
- Ritalin LA- MPH, 5 hours, 50/50 short/long. More reliable than Ritalin SR
- Ritalin SR is less effective and slower onset than short acting.
- Quillichew 6-8 hrs
- Quillivant 25/5- 8-10 hrs, shake 10 sec.
- Focalin XR (5,10,20)- 10-12 hours, same side effects. Can sprinkle =2 doses MPH duration, ½ dose of MPH
- OROS (Concerta) 10-12 hrs, no effect of breakfast, less abuse potential,=3 doses MPH
- Daytrana or MTS or MethyPatch- takes 2 hrs to act; lasts 3 hrs after removed at 9 hrs., irritates skin, can sensitize. Insomnia 13% vs 8% OROS; anorexia 26% vs 19% OROS

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DA Formulations (short > long)

- Procentra = Liquid Dexedrine 5 mg/5 cc, 4-6 hrs
- Evekeo- 5,10 mg. ½ levo, ½ dextro. 4-6 hrs 2.5-5 mg qd –bid, 3-16 yrs
- Zenzedi 2.5, 5, 7.5,10, 15, 20, 30 mg., 4-6 hrs, 2.5-5 qd-bid, CYP2D6, 3-16 yrs.
- Dyanavel = Liquid Dexedrine 2.5 mg/cc. 10-13 hrs, delayed by food, 2.5-5 mg qam. 6 yrs+. Max 20 mg
- Mixed Amphetamine Salts = Adderall tablet- 5, 7.5, 10, 12.5, 15, 20, 30 mg, 5-8 hours, max 40 mg
- Mixed Amphetamine Salts = Adderall XR- 5,10, 25, 20, 25, 30 mg. 9-12 smoother. Fatty breakfast interferes with release over 8 hrs. Can sprinkle. 6+yrs.
- Dexedrine SR-5,10,15 mg. 10-12 hours, greater anorexia, irritability. 6+yrs.
- Lisdexamfetamine (Vyvanse, Elvanse)- 10, 20, 30, 40, 50, 60, 70 mg. Peaks 1-4 hrs delayed by food, T1/2 10-13 hrs, titrate by 20 mg, more insomnia, irritability. Can mix in water. Not CYP metabolized as it is a pro-drug. Less misuse.

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Medication - Dosing

- Short acting lasts 3 1/2 to 4 hours
- Children benefiting from school dosing usually can benefit from a 3rd dose
- Long acting now recommended
- Consider using a placebo trial
  - With weekly parent and teacher ratings to establish objectivity
  - Helps parents carefully sort out their fears from fact
  - Helps establish an optimal dosage early
- Adjust q 3-7 days, visits q mo until stable then q 3 months for 1st year then q 6 months

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Stimulant Shortages

- Recent shortages of stimulants due to substrate shortages, manufacturing in disaster areas, manufacturing “choices”
- Most states requiring electronic prescribing
- US rules only allow one transfer of such eprescriptions
- Many pharmacies refuse to tell families about availability, prescriber must make multiple calls to locate a source.
- Pharmacists could help by looking up patient names of abusers on the registry
- Pharmacists could help by identifying sites with adequate supplies.

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CHADIS Graphic display of Vanderbilt

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Non-stimulants for ADHD

- Atomoxetine
- Intuniv = guanfacine extended release
- Clonicel = long acting clonidine (KapVay)

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Atomoxetine (Strattera)

- Norepinephrine reuptake inhibitor- not category II
- 10, 18, 25, 40, 60, 80, 100 mg.
- CYP2D6 metabolized, T1/2 5.2 h. Interacts with MAO and SSRIs
- 0.5 mg/kg->2.0 q 3 d max 100mg div qd-bid. Less with paroxetine or fluoxetine
- Takes 4-6 or even 9 weeks to max effectiveness
- Side effects: anorexia 14%, N/V/D 12-15%, dizziness, fatigue 9%, mood swings 5% SUICIDAL. Also sleepiness, headache, dry mouth, reduced appetite, sweating, allergic rash. Esp. early on, usually transient.
- BP −3 and −5 mm Hg; HR −3 to −6 bpm; some significant hypotension, risk of orthostatic hypotension, marked bradycardia.
- Effect size 1.37 (95% CI [1.24, 1.51], $p < .001$ vs placebo but not as good as DA or MPH
- Acute liver abnormalities (many) and failure (1). Need LFTS at onset and watch for signs of hepatitis

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Guanfacine

- Selective agonist for alpha-2A-receptors in the prefrontal cortex
- Nonstimulant
- Monotherapy or adjunct
- Benefits for sleep, aggression as well as attention
- **Intuniv**- Once daily long acting; am or pm. 1, 2, 3, 4 mg
  - Ages 6 to 17 years
  - 1-4 mg qd, 7 in teens. Do not crush.
  - Better than placebo in 2 double blind trials but not as good as DA or MPH
  - Main side effect is somnolence, headache, upper abdominal pain, fatigue, and sedation, hypotension. CYP 3A4 metabolized.
  - Takes 2-4 weeks for effect; taper to stop
- **Tenex**- 1, 2 mg. T1/2 12 hrs. Inexpensive, tiny pill, can crush. Max 3 mg, taper to stop

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Clonidine

- Monotherapy or adjunct
- Esp for aggression, over arousal
- Sedation HS, constipation, hypotension, irritability, nightmares
- CVS concerns
- **Clonidine**: 0.1 mg, 3 hrs., 4-5 microgram/kg/day
- **Kapvay** tablet 0.1, 0.2. Dose 0.1-0.4 mg div. bid, T1/2 12 hrs. Do not crush; taper to stop
- **Catapres** patch- 0.1, 0.2, 0.3 mg q week, can cut

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Stimulants and CV Risk

FDA reports showed:

- 25 patients (19 who were 18 years and younger) taking stimulants had suddenly died.
- 54 more patients on these pills had unusual heartbeats, heart attacks, or strokes. Some had pre-existing heart problems, some were taking other pills, including cocaine.
- No serious QTc abnormalities with guanfacine or clonidine, alone or with stimulants
- AAP advises continuing current practice
- FDA- no black box warning
- No issues in combination with alpha 2 blockers
- BP and pulse slightly increased (about 2-4 mmHg and about 3-6 bpm) but not clinically significantly.
- Neither current nor former users of stimulants for ADHD had greater rates of cardiac events
- Prudent to avoid use in unexplained syncope, exertional chest pain, structural heart disease, arrythmia, ? if FH sudden death in children or young adults
- Risk of injury and death with no medication!

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Effect Size Med Comparison

	ADHD-RS-IV	Family	Learning and School	Life Skills	Child's Self-Concept	Social Activities	Risky Activities	Total score
LDX	1.80***	0.73***	1.25***	0.24^{NS}	0.26^{NS}	0.64***	0.64***	0.92***
OROS-MPH	1.26***	0.65***	0.91***	0.35*	0.36*	0.60***	0.41*	0.77***
GXR	0.76***	0.38**	0.42**	0.23^{NS}	0.09^{NS}	0.45**	0.21^{NS}	0.44**
ATX	0.32*	0.16^{NS}	0.32*	0.16^{NS}	0.15^{NS}	0.21^{NS}	0.14^{NS}	0.28*
GXR	0.52***	0.11^{NS}	0.22^{NS}	0.10^{NS}	-0.15^{NS}	0.06^{NS}	-0.01^{NS}	0.14^{NS}
GXR	0.77***	0.53***	0.46***	0.17^{NS}	0.05^{NS}	0.42***	0.34*	0.45***
LDX continuation	*1.49****	*0.86****	*0.72****	*0.23^{NS}*	*0.20^{NS}*	*0.20^{NS}*	*0.51***	*0.91****

LDX Lisdexamfetamine OROS-MPH =Concerta
ATX Atomoxetine GXR- Guanfacine, Intuniv

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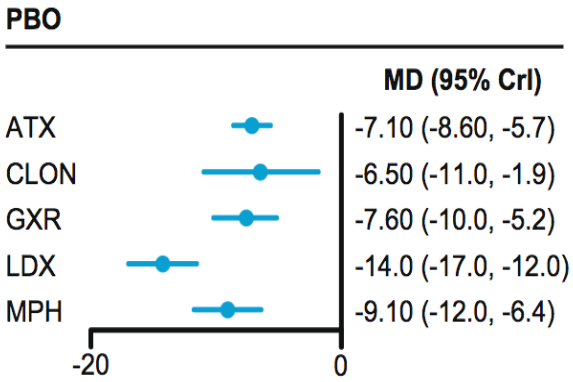
Symptom control comparison

Fig. 2 Network meta-analysis on change of ADHD-RS after different drug therapy compared with PBO or LDX



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Stimulant Side Effects

Common- mostly mild, mostly in first few months

Decreased appetite is most common

Occur in ½ of 5 years of use

DA forms are associated with more side effects than MPH (10% v 6%).

Tics –

Rates low irrespective of DA or MPH,
usually transient,
sometimes as part of Tourette's, (not a contraindication)

Emotions-

anxiety, irritability, sadness, and overfocusing
may need a change in class of stimulant or to a non-stimulant.
may represent comorbid conditions; look for comorbidities whether medication is used or not.

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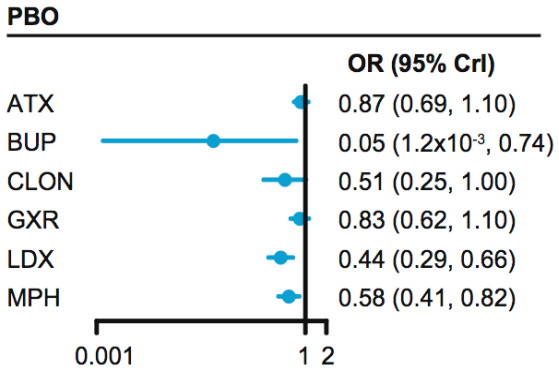
Choosing to stop medications

Fig. 4 Network meta-analysis on all-cause withdrawals compared with PBO or LDX



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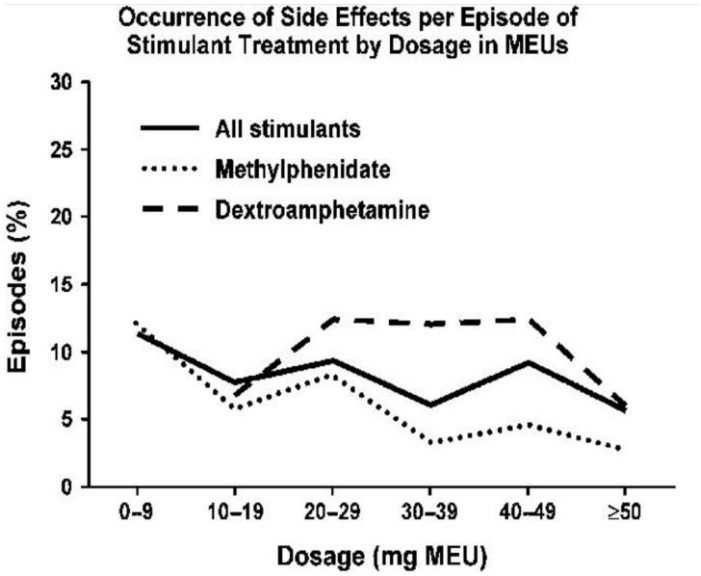

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Significant Side Effects

- Any suicidal ideation
- Any hallucinations or psychotic thoughts
- Moderate to severe aggression or irritability not associated with the medication wearing off
- Moderate to severe irritability, mood lability or mania
- Weight loss >2 graphed percentile categories since start of med
- Atomoxetine: jaundice
- Alpha agonist: significant daytime sedation (unable to wake up, constantly falling asleep); >10 point decrease in BP or evidence of postural hypotension

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Alcohol and Stimulants (Vyvanse, Adderall)

- Adderall may increase heart rate and BP to an unsafe level,
- Alcohol + Vyvanse can reduce the stimulant effects while still causing intoxication increasing risk for overdose.
- Other- chest pains, seizures, hallucinations

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Growth effects of stimulants

- Growth rate declines more common in preschool
  - height by 20.3%, and weight by 55.2%, more in heavier children (PATS study)
- Even with continual use for years and initial deficits of 2 cm and 2.7 kg, no significant differences in adulthood.
- Moderate with
  - favored food for school
  - encourage eating when hungry
  - evening fourth meal

NOTE: This data was when short acting was typical vs today's long-acting 7 days per week

- Transdermal MPH with 12 hour release over 3 years showed a small but significant delay in growth
  - mean deficit rates 1.3 kg/year mainly in the first year
  - mean deficit 0.68 cm/year in height in the second year.
- If growth is not recovering after the first year, use shorter acting, and medication "holidays" on weekends or vacations (reduce but do not end the deficits) or use non-stimulant

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Side effects AMP v MPH

TABLE 2. GROUP-LEVEL ANALYSES OF SEVERITY ASSOCIATED WITH EACH OF 17 SERS ITEMS IN THE PLACEBO CONDITION (PLA), AND DEXTROAMPHETAMINE (DEX-H) AND METHYLPHENIDATE (MPH-H) HIGH-DOSAGE CONDITIONS

				Friedman test		
SERS items	*PLA Mean (SD)*	*DEX-H Mean (SD)*	*MPH-H Mean (SD)*	$\chi^2(2, n=34)$	p	*Wilcoxon signed rank test Pairwise comparison**
Insomnia	1.3 (2.1)	3.2 (3.3)	2.0 (2.8)	13.67	<0.01	DEX>PLA; MPH>PLA; DEX>MPH
Deceased appetite	1.4 (1.6)	2.4 (2.5)	2.7 (2.9)	7.54	0.02	MPH>PLA
Stomachache	0.4 (0.7)	0.4 (1.0)	0.8 (1.7)	1.75	0.42	—
Headache	0.7 (1.2)	0.5 (1.2)	0.9 (2.1)	1.87	0.39	—
Dizziness	0.4 (1.0)	0.4 (0.8)	0.4 (1.3)	0.31	0.86	—
Nausea	0.4 (0.8)	0.7 (1.4)	1.0 (2.0)	0.22	0.90	—
Irritability	2.8 (2.3)	1.9 (2.2)	2.2 (2.6)	3.05	0.22	—
Sadness	1.3 (1.7)	1.0 (1.8)	1.4 (2.3)	2.28	0.32	—
Tendency to cry	1.4 (2.0)	1.2 (2.1)	2.3 (3.0)	4.65	0.10	—
Anxiety	0.6 (1.1)	0.5 (1.3)	1.0 (2.4)	1.92	0.38	—
Nightmares	0.3 (0.7)	0.2 (0.5)	0.2 (0.8)	4.39	0.11	—
Staring/daydreaming	0.9 (1.3)	0.8 (1.5)	0.3 (0.7)	10.46	<0.01	MPH<PLA
Talks little to others	0.5 (1.0)	0.4 (0.7)	0.9 (1.7)	3.64	0.16	—
Uninterested in others	0.5 (1.0)	0.5 (1.2)	0.7 (1.6)	0.91	0.64	—
Tics	0.4 (1.0)	0.3 (1.1)	0.4 (1.3)	3.50	0.17	—
Drowsiness	1.4 (1.5)	1.2 (2.0)	1.0 (2.0)	3.00	0.22	—
Unusually happy	0.6 (0.9)	1.2 (2.1)	0.5 (1.4)	8.40	0.02	—

SERS, Barkley's Side-Effect Rating Scale rated by parents.
*Pairwise comparisons that remained significant after adjustment for multiple comparisons are listed.

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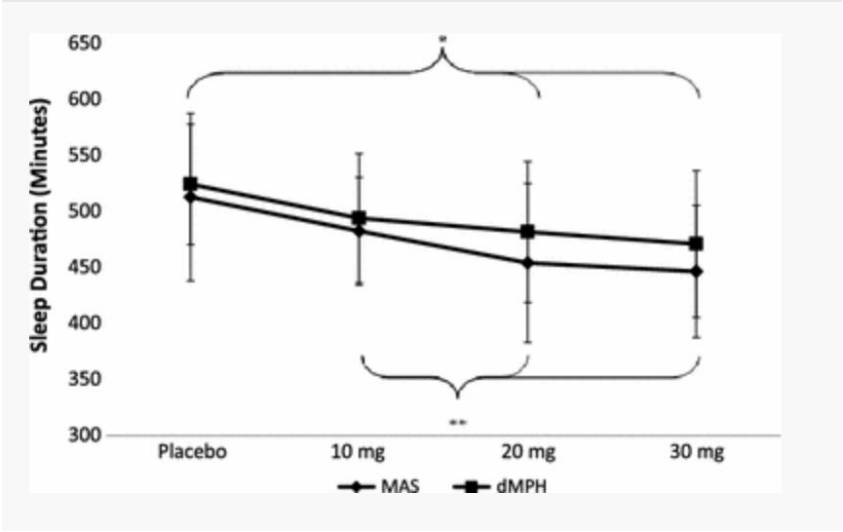
Sleep and AMP v MPH



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Possible long term effects of stimulants

- Reports in rodent models and a few children of chromosomal changes with stimulant exposure
- Reviewers do not interpret these as an individual cancer risk.
- Record review of patients who received stimulants showed lower numbers of cancer than expected.
- No evidence of reproductive effects of stimulants, although use during pregnancy is not cleared.

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Managing Side Effects

- Appetite - "4th meal" at bedtime
- Abdominal pain – disappears in 3 wks; try slow acting medication; ?bowel urgency; give with food. Constipation- fiber, miralax
- Headache – disappears in 3 wks; try slow acting, use 7 days/wk
- Growth – 1 kg, 1-2 cm vs peers; mostly nutrition related; may be reversible with drug holidays if needed but not always
- Tics - mostly due to comorbidity, may have *less* tics with stimulants; 0.5% chance of a persistent problem; try lower dose
- Irritability- change family of meds, use another dose in pm

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Misuse

- Stimulant misuse rates 5–9% among HS students
- 14% of 12th graders divert DA
- 26% diverted MPH in the past month
- 5–35% by college students
- 16% parents diverted to household member, mainly themselves.
- Stimulants have Black Box warning as high potential for abuse and psychological or physical dependence
- Neither past nor present use for ADHD has been associated with greater substance use long term.

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Overdose

- OD can occur, especially parenterally
- OD presents with: dilated pupils, tremor, agitation, hyperreflexia, combative behavior, confusion, hallucinations, delirium, anxiety, paranoia, movement disorders, and/or seizures.
- OD with prescribed stimulants (not street) rarely fatal if medically managed
- Recent “fake” Adderall (not from pharmacies) may have lethal amounts of fentanyl or methamphetamine.

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Misuse Avoidance

- Avoid short-acting in high-risk due to rapid high
- Use long-acting stimulants, with caution
- Lisdexamfetamine misuse not increased despite increased number of prescriptions
- Atomoxetine or α2-adrenergic agonists are first-line in high risk cases
- Atomoxetine is used by adults for nonmedical purposes less than MPH
- Point out that:
  - peer provided a stimulant may have underlying medical or psychiatric issues that increase adverse events.
  - selling can have serious legal implications (fines to incarceration)
  - record of arrest increases the likelihood of high school dropout, lack of 4 year college, and later employment barriers.
  - if they deviate from dosing, no one will prescribe for them

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Monitoring

- Every 1-2 weeks if titrating meds
- Every 3-4 months for symptoms and functioning
- Annual screen for coexisting conditions
- Screen substance use at every visit >12 years

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Families as Advocates

- Individual plan for LD
  - Request complete intelligence and achievement testing
  - Other specific assessments as needed e.g. VMI, educational assessment, projective testing
- Especially key at change to KG, middle, high, graduation
- Always appeal possible for higher level of service

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When Management Fails

- Collect information from multiple sources
- Review data initially obtained to make the diagnosis
- Gather info from child, school, and family re core symptoms and their impact on functioning.
- Reconsider other conditions mimicking ADHD: missed or developed over time.
- Psycho-ed testing may clarify learning and language disorders, but other disorders require different testing
- Assess implementation, key barriers.
- Assess adherence to meds and behavior therapy

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Treatment Failure

1) Lack of response to 2 or 3 stimulant medications at max. dose without side effects or at any dose with intolerable side effects; and
2) Inability of beh therapy or combination therapy to control behaviors; or
3) Interference of a coexisting condition.

Plan: Referral to mental health knowledgeable about behavioral interventions.

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Follow Up for ADHD

- Identify patient & family concerns and goals
- Jointly design plan addressing these concerns & promoting these goals
- Document:
  - Target behaviors
  - Educational output
  - Medication side effects
  - Dates of refills, the medication type, dosage, frequency, quantity, adherence and responses to treatment (both medication and behavior therapy) in flow sheet, ideally, or in a progress note

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AAP Follow Up Guidelines

- Frequency of monitoring depends on the degree of dysfunction, complications, and adherence
- *Once child is stable*, visit q 3 - 6 months for assessment of learning and behavior, side effects eg decreased appetite and alteration of weight, height, and growth velocity.
- Times of refills are opportunity to ask re school, relationships, obtain school feedback.

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ADHD Follow-Up Visits- Goals

- To monitor for side effects incl. growth
- To watch for and begin early intervention for co-morbid conditions
- To adjust medication as needed
  - Teacher and parent checklists and work samples and report card data
  - Repeat placebo trials are helpful
- To monitor self concept of child, perception of parents and progress toward asset building (e.g., involvement in non-school skill building)
- Monitor >=12 years for Substance use, risk taking at each visit

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Consult complex care co-existing conditions algorithms

- Tics
- Anxiety
- Depression
- Substance Use
- Disruptive behavior disorder
- Autism

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Thank you!

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- *Appendix to ADHD Clinical Practice Guideline: Implementing the Key Action Statements — An Algorithm and Explanation for Process of Care for the Evaluation, Diagnosis, Treatment and Monitoring of ADHD in Children and Adolescents* (http://pediatrics.aappublications.org/content/suppl/2011/10/11/peds.2011-2654.DC1/zpe611117822p.pdf)

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Pharmacotherapy for Stimulant Use Disorders

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Disclosures

- I have no relevant financial relationships or commercial interests to disclose for this presentation
- I did not review literature regarding this topic in the pediatric patient population

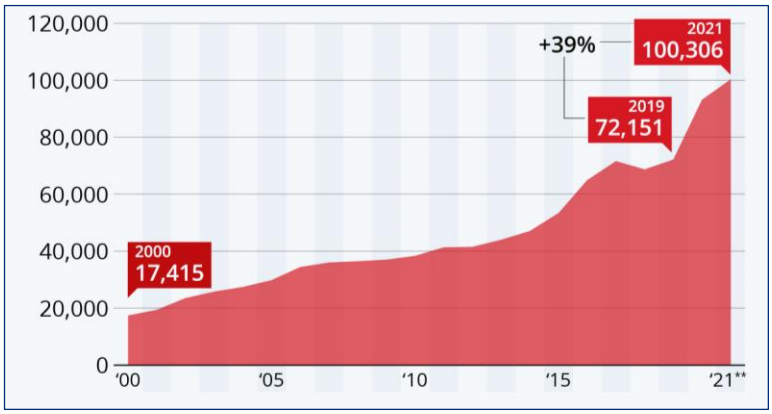
2

Objectives

1. Identify features and related harms of stimulant use disorder
2. Recommend pharmacotherapy for treatment of stimulant use disorder
3. Suggest additional interventions to reduce harms associated with stimulant use disorder

3

Opioid Overdose Deaths Amid the Pandemic



** 4/2020-4/2021

Overdose-related deaths reached a record-high during the COVID-19 pandemic

Opioid Related Deaths *	
Any opioid	75,774
Synthetic opioids (Fentanyl)	64,268
Heroin	12,236
Methadone	3,850

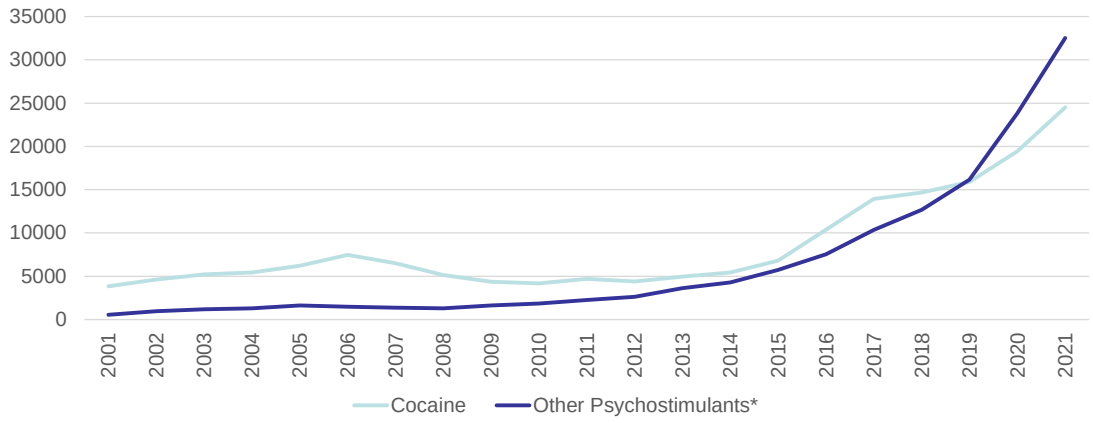
*Since overdose deaths may involve more than one substance, counts do not sum to total number of deaths

statista

https://www.statista.com/chart/18744/the-number-of-drug-overdose-deaths-in-the-us/
National Center for Health Statistics. 2021. https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm#drug_specificity

4

US Stimulant Overdose Deaths



*includes methamphetamine, amphetamine and methylphenidate

https://www.cdc.gov/nchs/data/databriefs/db457-tables.pdf#5

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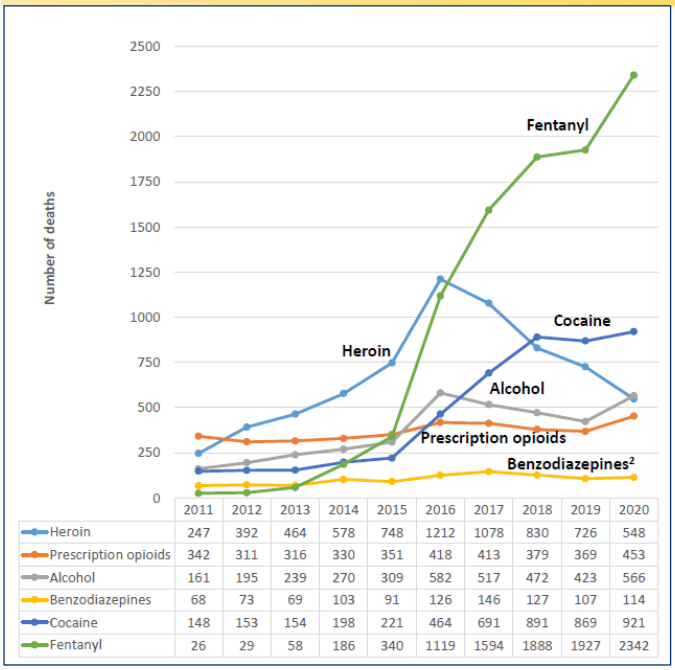

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Heroin	247	392	464	578	748	1212	1078	830	726	548
Prescription opioids	342	311	316	330	351	418	413	379	369	453
Alcohol	161	195	239	270	309	582	517	472	423	566
Benzodiazepines	68	73	69	103	91	126	146	127	107	114
Cocaine	148	153	154	198	221	464	691	891	869	921
Fentanyl	26	29	58	186	340	1119	1594	1888	1927	2342

Unintentional Drug- and Alcohol-Related Overdose Deaths in Maryland[1]

Fentanyl-related deaths drive opioid-related deaths

https://health.maryland.gov/vsa/Documents/Overdose/Annual_2020_Drug_Intox_Report.pdf

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Common Stimulants

- **Cocaine**
- **Amphetamine-Type Stimulants**
  - **Methamphetamine**
  - **Amphetamine**
  - **Methylphenidate**
- Phenethylamine derivatives (MDMA)
- Cathinones (i.e. “bath salts”)
- Caffeine
- Ephedrine/pseudoephedrine

Rastegar DA, Fingerhood MI. The American Society of Addiction Medicine Handbook of Addiction Medicine. Second edition. Oxford University Press; 2020.

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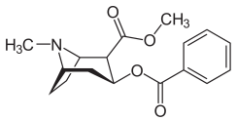
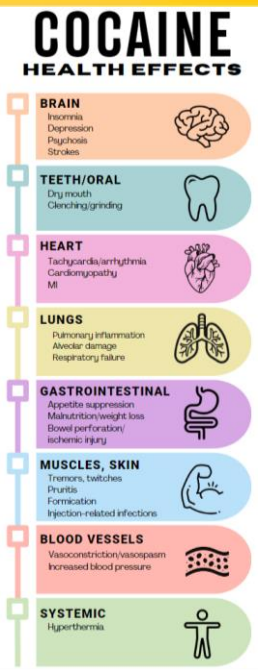
Cocaine



- Cocaine hydrochloride – acid (salt) form, water-soluble powder
  - Insufflated (intranasal) – bioavailability 30-60%, time to peak ~14 mins
  - Dissolved for injection – time to peak ~3 mins
  - Generally not smoked
- Cocaine base – solid “rock” form of cocaine, lower melting point
  - Generally smoked (time to peak ~1 min)
- Common adulterants:
  - Bulking agents (ie dextrose, starch, talc)
  - Substances with similar effects (ie procaine, caffeine, ephedrine)
  - Levamisole – “boosts” efficacy of cocaine
  - Synthetic opioids including fentanyl
  - Amphetamines
- Duration of effect: usually 1 hour or less

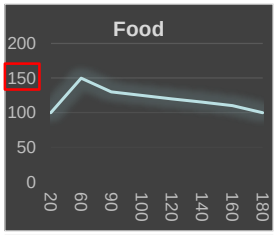
Volkow ND, Wang GJ, Fischman MW, et al. Effects of route of administration on cocaine induced dopamine transporter blockade in the human brain. *Life Sciences*. 2000;67(12):1507–1515. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3056348/

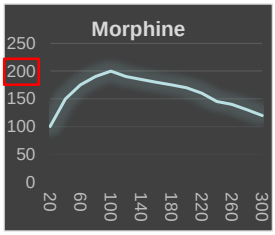


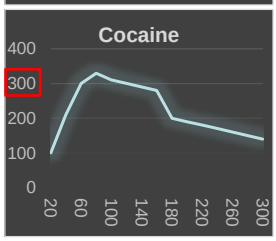
8

Cocaine

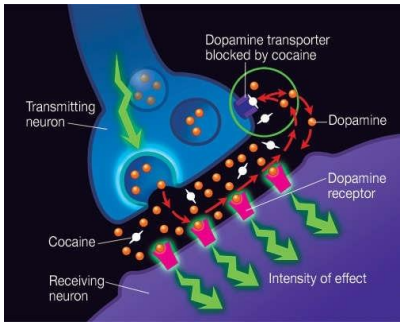
Dopamine reuptake inhibitor – keeps dopamine in the synapse for longer







Adapted from: Di Chiara et al., Neurosci, 1999.; Di Chiara G, Imperato A. Proc Natl Sci. 1988

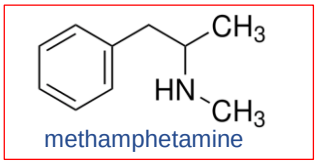


https://nida.nih.gov/publications/research-reports/cocaine/how-does-cocaine-produce-its-effects

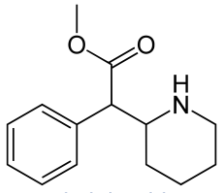
9

Amphetamine-Type Stimulants (ATS)

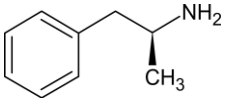
- Methamphetamine – typically a pill or powder
- Crystal methamphetamine – resembles glass fragments or shiny blue-white rocks
  - Usually has a higher purity vs powdered methamphetamine
  - Typically smoked or injected
- Onset – ~immediate (smoked/injected); 3-5 mins (intranasal); 15-20 mins (PO)
- Duration ~12+ hours



methamphetamine



methylphenidate



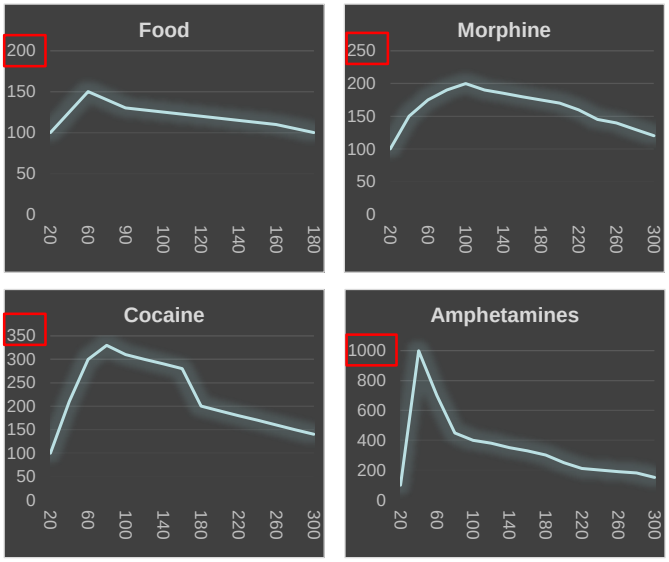
dextroamphetamine

https://nida.nih.gov/publications/research-reports/methamphetamine/what-methamphetamine

10

Amphetamines

Increase dopamine release **AND** block dopamine reuptake → maintains a very high concentration of dopamine in the synapse



Adapted from: Di Chiara et al., Neurosci, 1999.; Di Chiara G, Imperato A. Proc Natl Sci. 1988

https://nida.nih.gov/publications/research-reports/methamphetamine/how-methamphetamine-different-other-stimulants-such-cocaine

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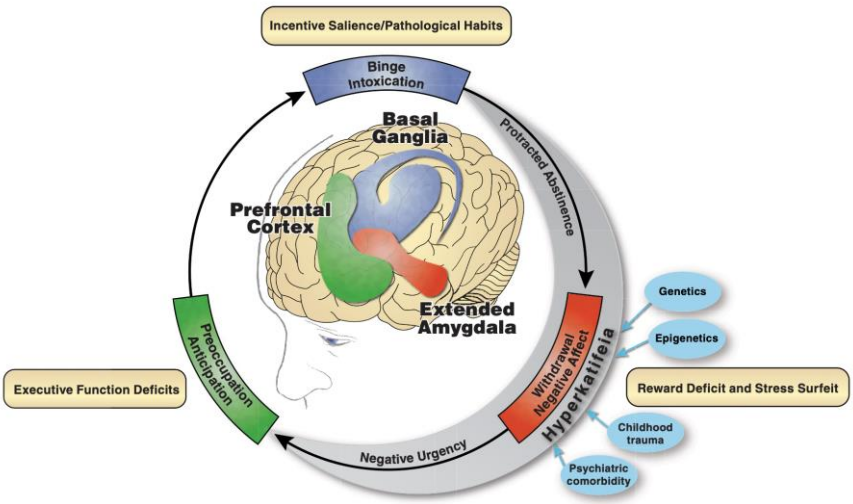
What is Stimulant Use Disorder?

JOHNS HOPKINS MEDICINE



Koob GF, Powell P, White A. Addiction as a Coping Response: Hyperkatifeia, Deaths of Despair, and COVID-19. *Am J Psychiatry*. 2020;177(11):1031-1037.

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Stimulant Use Disorder (StUD)

Treatable, chronic, relapsing disease in which substance use is associated with:

Impaired Control	Social Impairment	Risky Use	Withdrawal/ Tolerance

Morbidity associated with SUDs:

- Trauma
- Suicide
- Homelessness/housing insecurity
- Infection:
  - HIV
  - Hepatitis C
  - Skin/soft tissue infections
  - Osteomyelitis
  - Endocarditis

Shuckit MA. N Engl J Med 2016; 375:357-368.
National Academies of Sciences, Engineering, and Medicine. 2019.
American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders: DSM-5. 2013.

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Co-morbidities and Related Harms

Common co-occurring conditions

- Attention-deficit/hyperactivity disorder (ADHD)
- Depression
- Anxiety
- Eating disorders
- Other substance use disorders
  - Opioid Use Disorder
  - Alcohol Use Disorder
  - Tobacco Use Disorder

Harms Associated with StUD

- Overdose risk
- Cardiac, psychiatric, dental and nutritional complications
- HIV, viral hepatitis, infective endocarditis, and other infectious diseases

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StUD Treatment Options

- Behavioral interventions
  - **Contingency management – gold standard**
  - Cognitive Behavioral Therapy
  - Community Reinforcement Approach
- Pharmacotherapy
  - Non-stimulant medications
  - Psychostimulant medications
- Secondary & Tertiary Prevention

The ASAM/AAAP Clinical Practice Guideline on the Management of Stimulant Use Disorder. November 2023. https://www.aaap.org/wp-content/uploads/2023/11/stud_guideline_document_final.pdf

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PHARMACOTHERAPY FOR STIMULANT USE DISORDER

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Pharmacotherapy Options for Cocaine Use Disorder

- Non-psychostimulant Medications
  - Bupropion
  - Topiramate
- Psychostimulant Medications
  - Modafinil
  - Topiramate + Extended-Release Mixed Amphetamine Salts
  - Long-acting Amphetamine Formulations

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Bupropion

- **FDA-approved indications:**
  - Major depressive disorder
  - Seasonal affective disorder
  - Smoking cessation
- **Mechanism of action:** dopamine and norepinephrine reuptake inhibitor
- **Key Adverse effects:**
  - Hypertension
  - Lower seizure threshold
  - Appetite suppression
- **Consider in patients with…**
  - Co-occurring depression
  - Co-occurring tobacco use disorder
- **Caution in patients with…**
  - Seizure disorders
  - At risk or currently underweight
- **Dosing**
  - Initial dosing: 150 mg once daily
  - Target dosing: 150 mg SR* BID (or 300 mg XL** once daily)

*SR: 12-hr sustained release
**XL: 24-hr extended release

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Topiramate

- **FDA-approved indications:**
  - Epilepsy
  - Migraine
- **Mechanism of action:**
  - Voltage-dependent sodium channel blocker
  - Carbonic anhydrase inhibitor
  - May also increase gamma-aminobutyric acid A (GABA-A) receptor activity and antagonize glutamate receptor subtypes
- **Key Adverse effects**
  - Cognitive slowing
  - Paresthesia
  - Appetite suppression
- **Consider in patients with…**
  - Co-occurring alcohol use disorder
- **Caution in patients with…**
  - At risk or currently underweight
  - Drug-drug interactions
  - Renal dysfunction
- **Dosing**
  - Initial dosing: 25 mg once daily
    - Titrate by 25-50 mg per week
  - Target dosing: 100-150 mg BID (200-300 mg/day)

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Pharmacotherapy for Amphetamine-Type Stimulant Use Disorder

- Non-psychostimulant Medications
  - Bupropion +/- naltrexone
  - Topiramate
  - Mirtazapine
- Psychostimulant Medications
  - Methylphenidate

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Bupropion + Naltrexone

- **FDA-approved indications:**
  - Alcohol Use Disorder
  - Opioid use disorder (long-acting injectable form only)
- **Mechanism of action:**
  - Opioid antagonist (naltrexone)
- **Key adverse effects:**
  - Blockade of opioid analgesics
  - Precipitated opioid withdrawal (in patients actively exposed to full agonist opioids)
  - Transaminitis

- **Consider in patients with…**
  - Co-occurring depression
  - Co-occurring tobacco use disorder
  - Co-occurring alcohol use disorder
  - ? Unintentional fentanyl exposures (due to contamination)
- **Caution in patients with…**
  - Seizure disorders
  - Pain requiring opioid analgesics
  - OUD treated with opioid agonists (i.e. methadone, buprenorphine)
- **Dosing** – 380 mg IM q4 weeks

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Mirtazapine

- **FDA-approved indications:**
  - Major depressive disorder
- **Mechanism of action:**
  - Central presynaptic alpha2-adrenergic antagonist
    - Increased release of serotonin and norepinephrine
  - 5-HT2 and 5-HT3 antagonist
  - H1 receptor antagonist
  - Peripheral alpha1-adrenergic and muscarinic antagonist
- **Key Adverse effects:**
  - Hypertension

- **Other off-label uses:**
  - Sleep
  - Nausea
  - Weight gain
- **Consider in patients with…**
  - Co-occurring depression
- **Caution in patients with…**
  - Renal dysfunction
  - Metabolic disorder
- **Dosing**
  - Initial dose: 7.5-15mg
  - Target dose: 30-60 mg

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Other Risks Assessment

- Assess for risky patterns of stimulant use, including:
  - Frequency and amount of use
  - Use with no one else present
  - Concurrent use of prescribed and nonprescribed substances (opioids, alcohol, other CNS depressants)
  - History of overdose, stimulant-related ED visits and/or hospitalizations

- Assess for other risky behaviors
  - Injection drug use
  - Risky sexual behaviors
  - Nutrition and food security

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The Fentanyl Problem

- 50x more potent than heroin
- Highly lipophilic
  - Widely distributed throughout the body
  - Less predictable withdrawal timeline
- Replacing heroin in illicit opioid supply
- Now involved in more deaths of Americans under 50yo than any cause of death, including:
  - Heart disease
  - Cancer
  - Homicide
  - Suicide
  - Other accidents

https://www.statnews.com/2016/09/29/why-fentanyl-is-deadlier-than-heroin/

https://www.dea.gov/fentanylawareness

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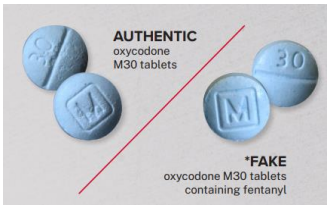
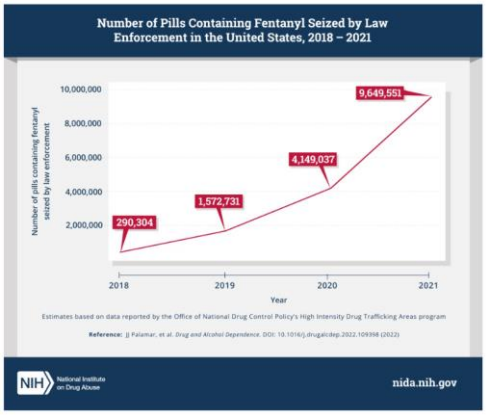
Fentanyl problem

Many who are exposed to fentanyl are unaware they were actually taking fentanyl





https://www.dea.gov/onepill

https://nida.nih.gov/news-events/news-releases/2022/03/law-enforcement-seizures-of-pills-containing-fentanyl-increased-dramatically-between-2018-2021

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Risk factors for Opioid Overdose

- Mixing other drugs with opioids, especially:
  - Benzodiazepines
  - Alcohol
  - Promethazine (Phenergan ®)
  - Muscle relaxants
  - **Cocaine**
- Loss of tolerance
- Using alone
- Older age/poor physical health
- **Administration via intravenous (IV) injection or smoking**
- Previous non-fatal overdose

National Harm Reduction Coalition. Opioid Overdose Basics: Overdose Risks & Prevention. 9/1/2020. Accessed 6/2/23.
https://harmreduction.org/issues/overdose-prevention/overview/overdose-basics/opioid-od-risks-prevention/

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Preventing Opioid Overdose

- **Treat opioid use disorder!**
- Dispense naloxone
  - All patients with OUD
  - Friends/family members of those with OUD
- When all else fails, reduce harm – safe injection counseling:
  - Use one drug at a time
  - Use less after periods of abstinence – even a few days can decrease tolerance
  - Test the strength of a drug before using the whole amount
  - Avoid using alone
  - Consider intranasal use instead of intravenous or inhalational use, which have higher risks of overdose

National Harm Reduction Coalition. Opioid Overdose Basics: Overdose Risks & Prevention. 9/1/2020. Accessed 6/2/23.
https://harmreduction.org/issues/overdose-prevention/overview/overdose-basics/opioid-od-risks-prevention/

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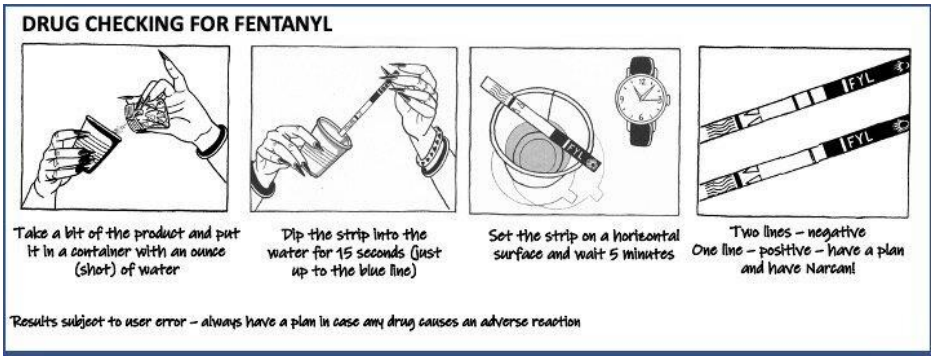
Harm Reduction: Fentanyl Test Strips



https://fentcheck.org/how-we-do-it

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Recognizing Opioid Overdose

Check	Listen	Look	Touch
• sleepy • heavy nodding • deep sleep • hard to wake • vomiting	• slow or shallow breathing (1 breath every 5 seconds) • snoring • raspy, gurgling, or choking sounds	bluish or grayish: • lips • fingernails • skin	• clammy sweaty skin

https://www.pbm.va.gov/PBM/AcademicDetailingService/Documents/508/10-1538_OEND_NasalSpray_508Conformant.pdf

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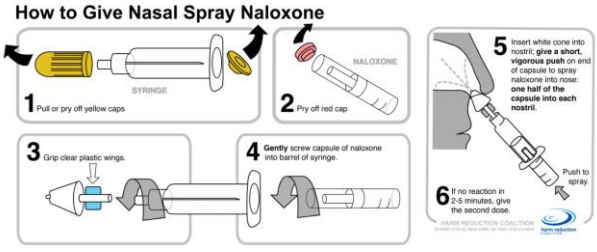
Treating Opioid Overdose

- Naloxone!
  - Opioid antagonist
  - Many dosage forms (IV solution, nasal spray, auto-injector, etc)
  - Rapid onset (IN spay: 8-13 mins, IV injection: ~2 mins, IM injection: ~5 mins)
  - Duration: ~30-120 mins***
    - Repeat doses usually needed



National Harm Reduction Coalition. 9/1/2020. Accessed 6/2/23. https://harmreduction.org/issues/overdose-prevention/overview/overdose-basics/opioid-od-risks-prevention/

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Naloxone: Good Samaritan Laws

- Encourage those observing or experiencing a medical emergency due to ingestion of alcohol or drugs to seek care
  - Possessing or administering controlled substances
  - Possession or use of drug paraphernalia
  - Underage possession of alcohol or obtaining, furnishing, or allowing alcohol for underage consumption
- Protects against violation if specifically related to seeking or giving care
- Does not apply to other drug felonies or crimes, does not preclude investigation

Good Samaritan Law, health.maryland.gov/qahealth/substance-abuse/Pages/Good-Samaritan-Law.aspx

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Other Considerations

- Sexually-transmitted infection (STI) testing every 3-6 months
- Referral to dental care providers
- Nutrition counseling

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Summary & Key Points

- Stimulant use disorder is a chronic, relapsing condition in which stimulant use is associated with features of:
  - Impaired control
  - Social impairments
  - Risky use
  - Tolerance/Dependence
- Selection of pharmacotherapy for StUD should be informed by:
  - Which stimulant is implicated (cocaine vs amphetamine-type)
  - Co-morbid disease states
- Other risk assessments in this population should screen for risky behaviors to inform the need for additional interventions, including:
  - Naloxone dispensation
  - Safe injection equipment/counseling
  - Fentanyl test strips
  - More regular STI testing
  - Nutrition counseling
  - Referral to dental providers

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Thank you! Questions?

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Notes

Notes

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Toll Free: 1-800-492-5231 TTY: 1-800-735-2258
https://health.maryland.gov/mmcp/pap