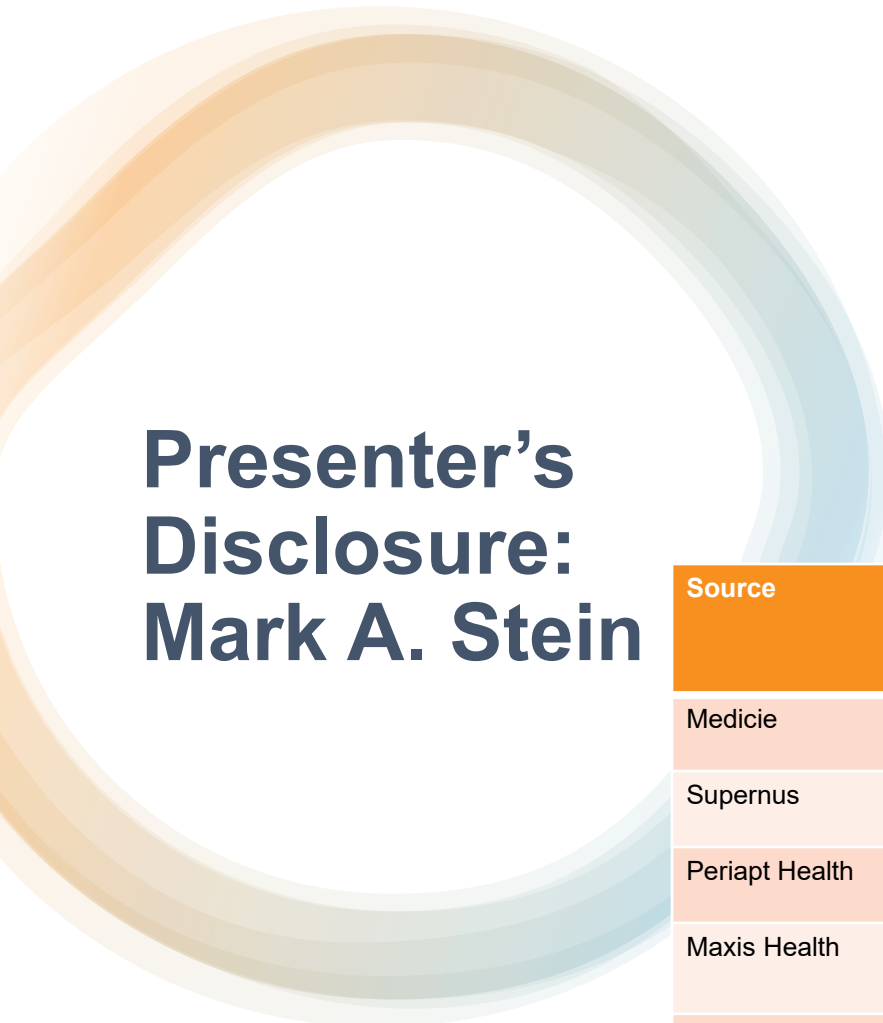


ADHD Update: Clinical and Diagnostic Issues

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UW MEDICINE

August 2024



Presenter's Disclosure: Mark A. Stein

Source	Consultant/ Advisory	Stock	Speaker	Research
Medicie	x			
Supernus	x			
Periapt Health	X			
Maxis Health	X			



Learning Objectives

- Review history, presentation and course of ADHD in adults
- Describe etiology and pathophysiology
- Understand course of the disorder throughout the lifespan
- Increase familiarity with diagnostic tools and process: SIMMS (Symptoms, impairment, mimics, comorbidity, and strengths)
- Discuss ADHD and SUD, treatment implications

Thanks to Tim Wilens, Craig Surman, Jeffrey Newcorn, and Maggie Sibley



John

- 17-year-old senior in high school
- has 1.7 GPA
- can't pay attention in class or get hw done, poor motivation,
- 3 inattentive symptoms on parent Vanderbilt Scale, 1 on teacher
- would like to go to college, feels he is "not smart"
 - school not concerned, will not do evaluation
 - no insurance coverage for evaluation
- single parent family with limited finances
- pediatrician calls and wonders about trying a stimulant

**Jesse, 19
year old
college
student**

On academic probation

misses classes, doesn't complete work, procrastinates, crams

Tried friends Adderall, able to focus, think clearly, and sustain attention during studying

Frequent cannabis use

Always tested well, B student in high school

Older sibling an A student and varsity athlete

Marie-31 year old single parent

- Works part time as a dog walker, not able to find consistent work
- Fired from waitressing, missed work, poor time management
- Insomnia, overweight, dysphoric, anxious, low self esteem
- Feels overwhelmed with parenting
- 7-year old son recently diagnosed with ADHD
- average student, some college but never finished
- SSRI in her 20's, some benefit but did not like how it made her feel
- Cannabis helps her relax before bed

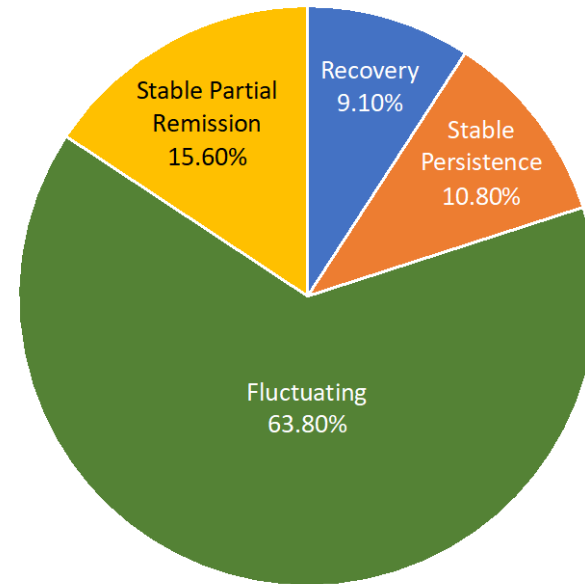
Prevalence of ADHD Across the Lifespan

- Children
 - 8-11%, depending on age and gender¹
- Adolescents
 - 75% of children with ADHD have the disorder as adolescents²
- Adults
 - National Comorbidity Survey Replication: 4.4% prevalence of ADHD among US adults³
 - Only 11% of adults with ADHD are treated³
 - Self-report measures among adults applying for a driver's license: 4.7% prevalence⁴
 - Adult college students: 4% met DSM-IV criteria for ADHD⁵

1. Visser et al., *J Am Acad Child Adolesc Psychiatry*. 2014 ; 53:34-46. 2. Wilens TE. *Psychiatr Clin North Am*. 2004;27:283-301. 3. Kessler R et al. *Am J Psychiatry*. 2006;163:716-723. 4. Barkley AR et al. *Pediatrics*. 1996;98:1089-1095. 5. Heiligenstein J et al. *Am J Coll Health*.1998; 46:185-188.

MTA Follow up

- 9.1% of sample (n=51) demonstrated **recovery** (sustained full remission until study endpoint)
- 10.8% of sample (n=60) demonstrated **stable persistence** (persistence at all time points)
- 63.8% of sample (n=356) demonstrated **fluctuations** between remission (full or partial) and recurrence of ADHD
- 15.6% of sample (n=87) demonstrated **stable partial remission** (partial remission that maintained through study endpoint)



Courtesy of Dr. M. Sibley



Hyperactivity Symptoms and their Manifestation Across the Lifespan

Aimless restlessness often migrates to purposeful restlessness in adolescents and adults; and is generally less impairing with age.

DSM-5 Symptom Domain

- Squirms and fidgets
- Cannot stay seated
- Runs/climbs excessively
- Cannot play/work quietly
- "On the go"/"driven by motor"
- Talks excessively



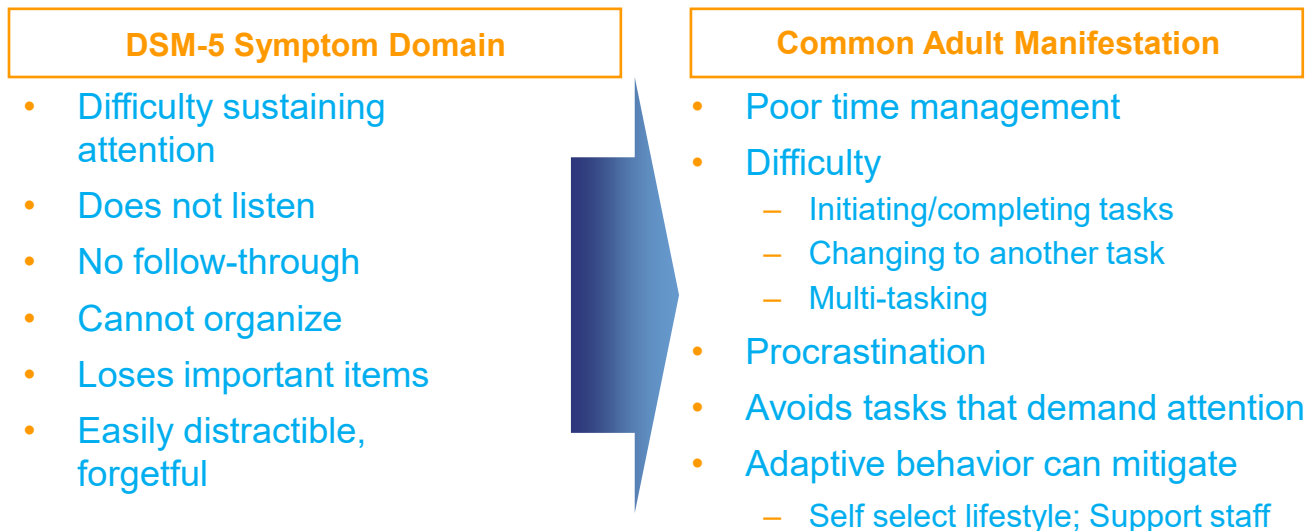
Common Adult Manifestation

- Adaptive behavior
 - Work long hours
 - Do many activities, multiple jobs or a very active job
- Constant activity/inability to settle down
- Avoids situations requiring low activity; easily "bored"
- Often felt rather than manifested

American Psychiatric Association, 2013; *ADHD in Adulthood* 1999, Weiss, Hechtman, and Weiss.

Inattention Symptoms and their Manifestation Across the Lifespan

Inattention-related problems and executive dysfunction represent leading reasons for seeking treatment in all age groups, and especially adolescents and adults.



American Psychiatric Association, 2013; *ADHD in Adulthood 1999*, Weiss, Hechtman, and Weiss.

Impulsivity Symptoms and their Manifestation Across the Lifespan

Impulsivity often decreases with age, but when present, often carries serious consequences.

DSM-5 Symptom Domain

- Blurts out answers
- Cannot wait turn
- Intrudes/interrupts others

Common Adult Manifestation

- Low frustration tolerance
 - Quitting a job
 - Ending a relationship
 - Losing temper
 - Driving too fast
- Makes hasty decisions
- Impulsive aggression
 - Verbal predominates

American Psychiatric Association, 2013; *ADHD in Adulthood 1999*, Weiss, Hechtman, and Weiss.

Paul Wender (center), with Fred Reimherr and Jeff Newcorn

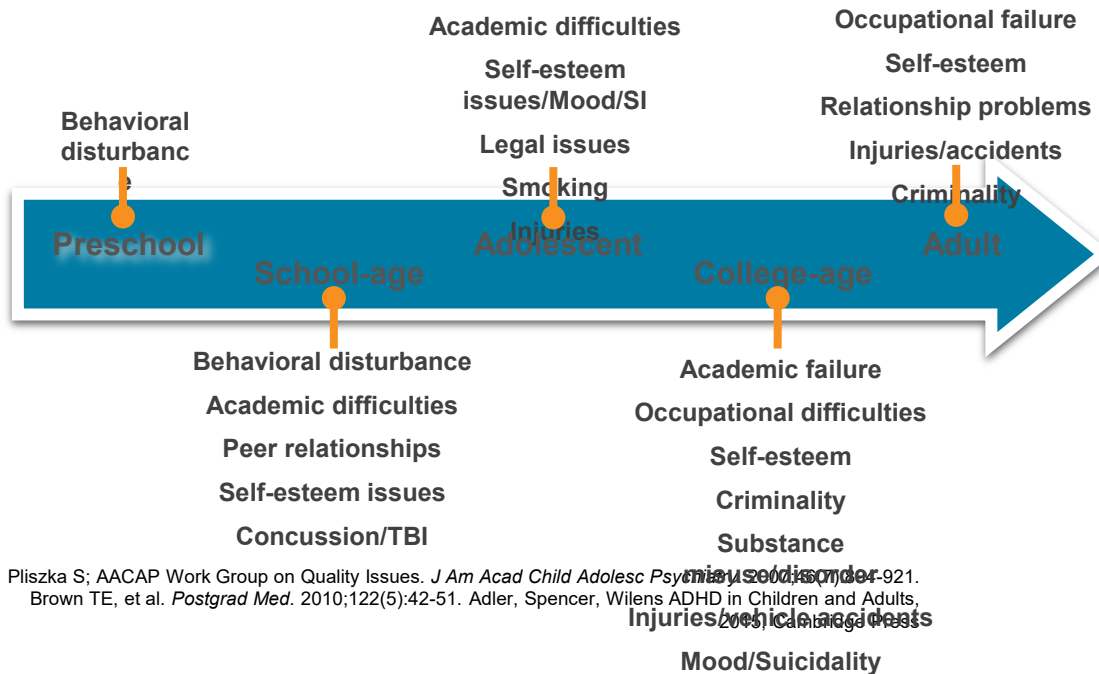
- Utah Criteria for adults
 - Affective lability
 - Hot temper
 - Inability to complete tasks and disorganization
 - Stress intolerance
- WURS (childhood-Wender Utah Rating Scale), WRAADS (current)
- Efficacy of stimulant medications in adults (1977)



Prevalence of Emotional Dysregulation (ED) In Youth and Adults with ADHD

- Children: 30-40% have significant impairments
 - Rage outbursts
 - Irritability
 - Over-reactivity
 - Low frustration tolerance
 - Susceptibility to anger
- (Stringaris, Cohen, Pine, & Leibenluft, 2009; Barkley & Fischer, 2010; Sobanski et al., 2010; Anastopoulos et al., 2011; Spencer et al., 2011; Biederman et al., 2012; Skirrow & Asherson, 2013; Karalunas et al., 2014; Shaw, Stringaris, Nigg, & Leibenluft, 2014; Barkley, 2015; Liu et al., 2016)
- Adults: over 50% report impairments
- (Reimherr, Marchant, Strong, et al, 2005; Reimherr, Williams, Strong, et al, 2007; Barkley, Murphy, & Fischer, 2008; Surman, Biederman, Spencer, et al., 2011; Surman, Biederman, Spencer, Miller, McDermott, & Faraone, 2013; Barkley, 2015)

Developmental Impact of Untreated ADHD



Pliszka S; AACAP Work Group on Quality Issues. *J Am Acad Child Adolesc Psychiatry*. 2005;44(10):914-921.
 Brown TE, et al. *Postgrad Med*. 2010;122(5):42-51. Adler, Spencer, Wilens ADHD in Children and Adults, 2005, Cambridge Press

Persistent Symptoms of ADHD Are Associated With Potentially Serious Consequences

Consequences of persistent inattention:

- 15–25% of children have poor academic outcome¹
- Almost 30% of ADHD subjects fail grades¹
- 46% of ADHD pupils suspended¹
- **Lower occupational attainment; lower earning across SES levels**

Consequences of persistent impulsivity:

- Four times as likely to have a sexually transmitted disease²
- Three times more likely to be currently unemployed²
- Twice as likely to have been divorced³
- Twice as likely to have been arrested³
- **78% more likely to be addicted to tobacco³**
- Five times more likely to have their license suspended²

1. Barkley RA. *Attention-Deficit Hyperactivity Disorder. A Handbook for Diagnosis and Treatment*, 2nd ed. New York: Guilford Press;1998. Barkley RA. *J Am Acad Child Adolesc Psychiatry*. 2006;45:192-202. 3. Biederman J et al. *J Clin Psychiatry*. 2006;67:524-540.

ADHD: DSM-5 Criteria

- ADHD is classified as a neurodevelopmental disorder:
- A. Threshold level of symptoms of Inattention and/or Hyperactivity – impulsivity must be present for 6 months or more (5 in individuals \geq 17 years)
- B. Several symptoms must be present before 12 years of age
- C. Impairment from symptoms must be present in 2 or more settings (e.g. school, work, home, other)
- D. Significant impairment: social, academic, or occupational
- E. Symptoms must not be better accounted for by other mental (or physical) disorders

- American Psychiatric Association, 2013

Diagnosis Process (in Adults)

- Current **Symptoms** (DSM V) (harder to evaluate) + Childhood symptoms
 - Screening does not = diagnosis
- **Impairment** (e.g., academic/vocational, social adaptive and executive functioning) usually more obvious
- **Mimics**
 - Psychiatric (Wider range of psychopathology to consider)
 - Biological (Medical) (medications, thyroid, sleep)
 - Social
- **Co-Morbidities** and Associated Problems (Psychiatric (Mood, Substance Abuse), Medical)(Wider range)
 - Wender characteristics
- **Strengths** (Social, Cognitive, Familial)

- (Nayakkara., Hans, & Stein MA. Assessment of ADHD . In L Adler, T. Spencer, T. Wilens: *ADHD in Children, Adolescents and Adults*. Cambridge University Press (2018)

Adult ADHD: Symptom Assessment Scales

Scale	Description/ Features/ Comments	Scale available from:
Brown ADD Scale	Rates inattention/executive dysfunction; items extend beyond DSM definition of ADHD; good for high functioning adults with inattentive subtype	<i>The Psychological Corporation</i>
Conners Adult ADHD Rating Scale (CAARS)	Large item set of developmentally relevant items; DSM subscale maps onto diagnosis; self- and other-report forms	<i>Multi Health Systems, Inc.</i>
Wender-Reimherr Adult Attention Deficit Disorder Scale	Retrospective symptom scales provide age of onset data; less clearly tied to DSM-IV ADHD.	<i>Fred W. Reimherr, MD, Department of Psychiatry, University of Utah Health Science Center, Salt Lake City, Utah</i>
Barkley's Current Symptoms Scale	Dimensional scale; uses actual DSM items but not re-worked for adults; rates behavior in the past 6 months; self and other informant reports.	<i>Barkley RA, Murphy KR. Attention-Deficit Hyperactivity Disorder: A Clinical Workbook. Second Edition.</i>
Adult Self-Report Scale v1.1 (18-item symptom assessment and 6-item screener)	ADHD DSM items made developmentally relevant for adult manifestations of symptoms; rates frequency, not severity, on a 0 - 4 scale	<i>www.med.nyu.edu/Psych/training/adhd.html and the WHO website</i>
Adult Investigator Symptom Report Scale (AISRS)	Interviewer administered scale; 18 DSM-IV-TR ADHD criteria re-worked for adults; employs adult ADHD prompts to ensure adequate probing of breadth of adult symptoms.	<i>Lenard Adler, MD, Adult ADHD Program NYU School of Medicine adultADHD@med.nyu.edu</i>

Screening Adults for ADHD

- The first 6 questions from the Adult ADHD Self-Report Scale (ASRS) correlate highly with diagnosis of ADHD.
- Individuals who note 4 or more of these symptoms at the shaded frequency levels should undergo a comprehensive assessment for ADHD

Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

Patient Name	Today's Date					
Please answer the questions below, rating yourself on each of the criteria shown using the scale on the right side of the page. As you answer each question, place an X in the box that best describes how you have felt and conducted yourself over the past 6 months. Please give this completed checklist to your healthcare professional to discuss during today's appointment.		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?						

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The complete ASRS can be used to identify other ADHD symptoms during diagnosis and treatment. It can be found at www.med.nyu.edu/psych/psychiatrist/adhd.html.

No ADHD without Impairment

Evaluate the burden of symptoms

Does it show up differently in roles or contexts?

Is it an effort to compensate for?

Consider impairment relative to potential

How would individual function if symptoms resolved?

Is there mismatch with role/environment?

Would change in role or environment remedy?

Is concern exaggerated?

workaholic / perfectionistic / inaccurate self-evaluation

Accommodate, don't Enhance

Medical Mimics

(Pearl, Weiss, and Stein, 2002 & 2014)



SENSORY
IMPAIRMENTS
(HEARING,
VISION, MOTOR)



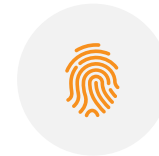
SLEEP
DEPRIVATION,
POOR
NUTRITION
(BREAKFAST)



MEDICATION
EFFECTS (E.G.,
STEROIDS,
ANTICONVULSA
NTS)



CHRONIC AND
ACUTE ILLNESS
(HYPOTHYROIDI
SM, SEIZURES)



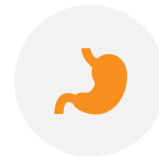
GENETIC
SYNDROMES
(FRAGILE X,
WILLIAMS)



ENVIRONMENTA
L TOXINS (PB,
FAE)



POST-
TRAUMATIC
ENCEPHALOPAT
HY



CONSTIPATION/E
NCOPRESIS

Mimics-*social-most complex*

Poor fit between temperament, expectations

Mercer Island ADHD

Marital dissatisfaction

Chaotic environments

FAD/EXCUSE

Psychiatric Mimics/Comorbidity

Bipolar disorder

Autism Spectrum Disorders

Intellectual Disability

Depression

Anxiety and OCD

Adjustment disorders

“ADHD personality”

ADHD Summary

Common,
neurodevelopmental
disorder in all ages

Not a new Disorder

Heterogenous in
etiology, severity,
comorbidity pattern

Highly familial

Often a fluctuating
course, more like
asthma than diabetes

Tools to assess
symptoms and
impairment

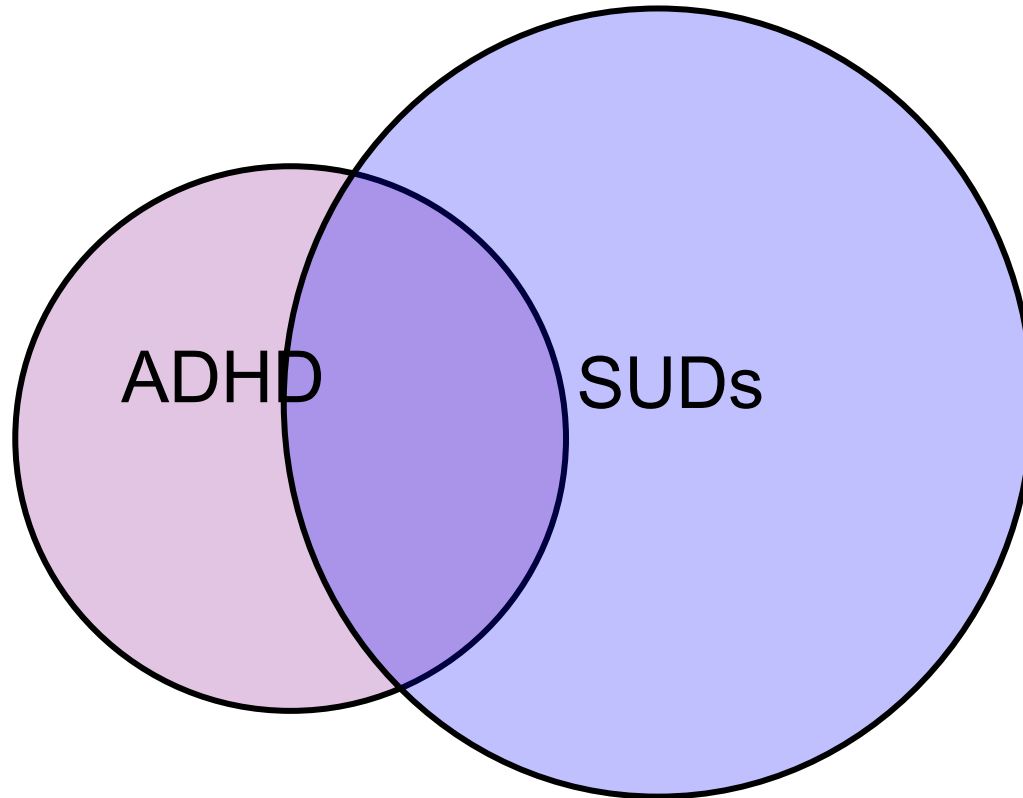
Clinical Diagnosis

- Rule out mimics
- Assess symptoms
- Impairment
- Comorbidities
- Strengths

Adult ADHD

- © Suggested evaluation procedures:
 - © Interview with patient
 - © Review of previous medical/educational records
 - © Corroborating data from parent, spouse, employer
 - © Physical Examination and labs
 - © Rating Scales (CAARS, WURS)

Overlap between ADHD and SUDs



Childhood ADHD is Related to Future Cigarette and SUD Likelihood (OR) to Develop SUD

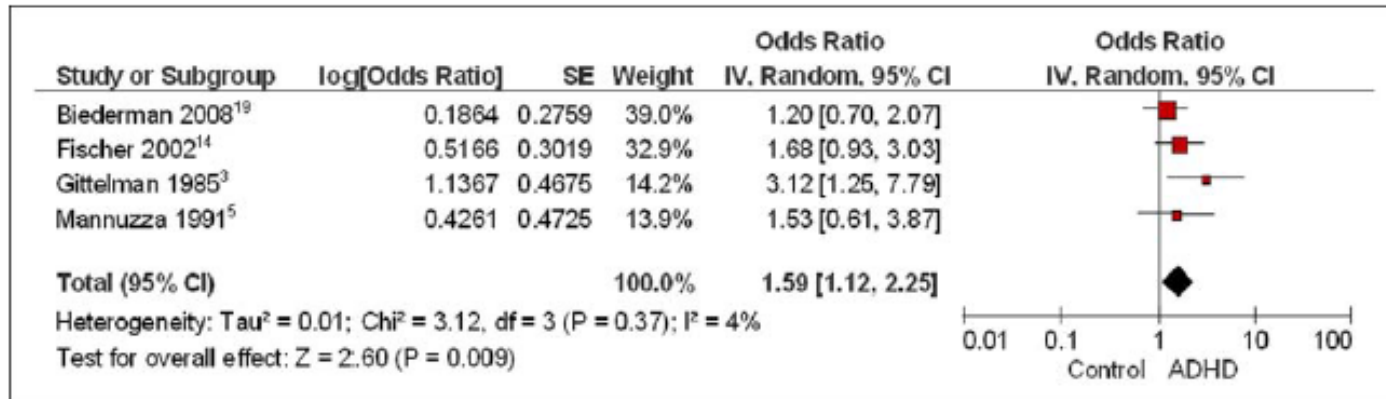


FIGURE 4 Meta-analysis of attention-deficit/hyperactivity disorder (ADHD) and psychoactive substance use disorder. Note: Results from a meta-analysis comparing ADHD versus control subjects for psychoactive substance use disorder. CI = confidence interval.

Likelihood (OR) to Develop Cigarette Smoking

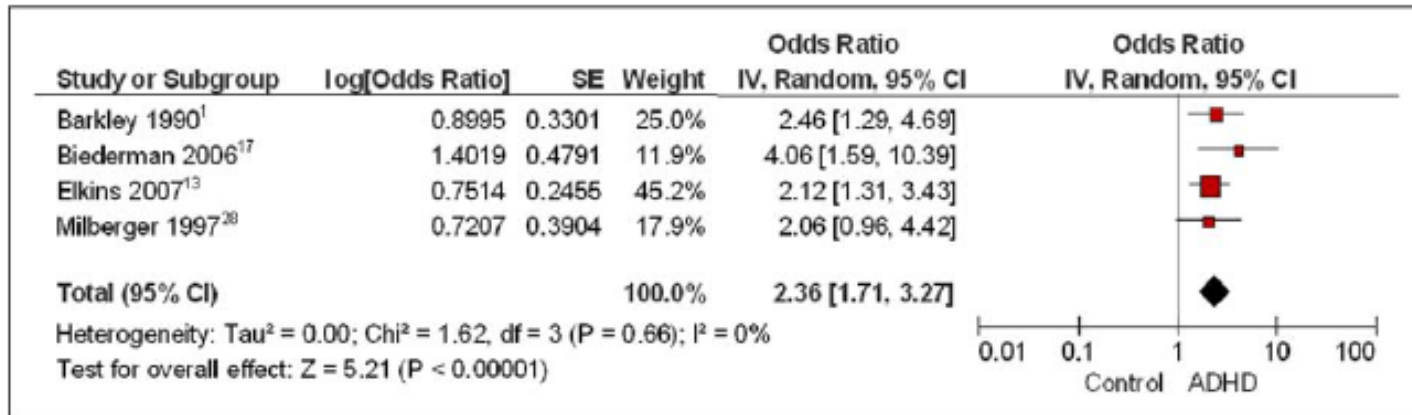


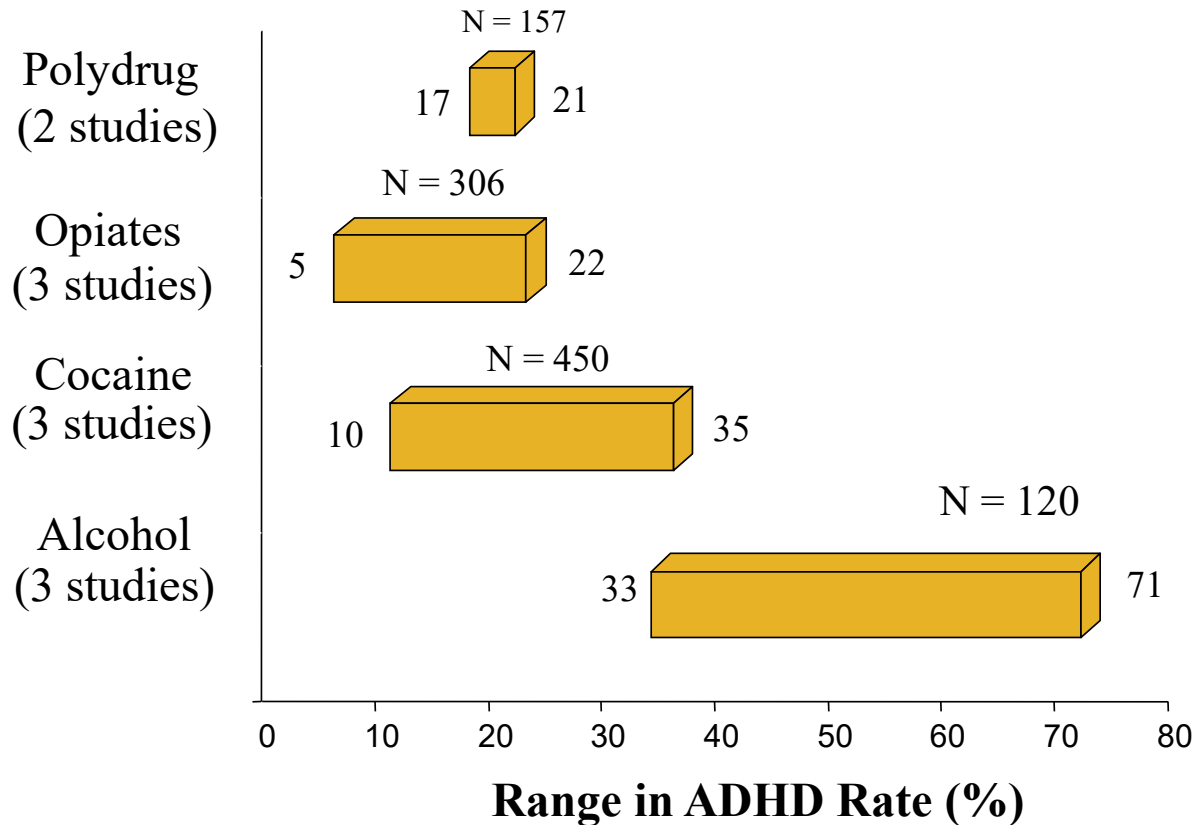
FIGURE 6 Meta-analysis of attention-deficit/hyperactivity disorder (ADHD) and nicotine use. Note: Results from a meta-analysis comparing ADHD versus control subjects for nicotine use. CI = confidence interval.

Conduct disorder and severe mood dysregulation increases SUD risk in ADHD.

OR = odds ratio.

Charach A, et al. *J Am Acad Child Adolesc Psychiatry*. 2011;50(1):9-21.

SUD is a Risk Factor for ADHD: Illustrative Overlap of ADHD in Adults with SUD



Overall, 23% of adults with SUD have ADHD (N = 29 studies)*.

A More Complicated Course of SUD is Associated with ADHD

- More severe SUD
- Higher rates of other psychiatric comorbidities (eg, conduct/antisocial disorders)
- Longer course of SUD
- Less remission from SUD
- Lower retention in SUD treatment

Evaluating ADHD

- Rating Scale (ASRS, CAARS, ADHD RS, WRADS)
- Impairment (WFIRS)
- Often a careful clinical history of symptoms during past periods of abstinence or prior to the onset of substance use problems
- Collateral information from family or review of objective data (eg, school performance, reports)

Treatment Considerations

Keys to successful treatment

- Begins with an evaluation (Symptoms, Impairment, Mimics, Comorbidities, Strengths)
- Pharmacologic treatment is highly effective in reducing symptoms
- impairment guides treatment duration
- 24 hour disorder
- Lifespan Disorder
 - Monotherapy seldom adequate
 - Combine and sequence as needed through lifespan
- Focus on global impairment and adherence, not just symptoms
 - Shared Decision Making to Increase Engagement

ADHD Medications Worldwide*

(approved and investigational)



Stimulants

Methylphenidate

Short Acting

Ritalin #
Focalin*

Intermediate

Ritalin SR #
Metadate ER #

Long Acting

Concerta #
Metadate CD #
Ritalin LA #; Focalin XR*
Daytrana (patch) #
Aptensio XR #;
Quillivant (liquid) #
Quillichew #; Cotempla-XR-ODT #

New Formulations

Jornay PM #
Adhansia XR #

Amphetamine

Short Acting

Dextrostat†
Dexedrine tabs†

Intermediate

Dexedrine Spansule†
Adderall‡
Evekio ‡

Long Acting

Adderall XR‡
Vyvanse †
(tablets/chewable)
Adzenys (ODT) ‡
Dyanavel (liquid) ‡
Mydayis ‡

Novel stimulant formulations

Non-Stimulant

Approved

Strattera¶
Intuniv ‡‡
Kapvay¶

Not Approved

TCAs §
Provigil**
Wellbutrin, Zyban††
Tenex‡‡
Catapres¶¶
Effexor/Pristiq § §
Duloxetine/Reboxetine

Investigational Drugs

Dasotraline
Centanafadine
Mazindol
Viloxazine
Fasoracetam
Molindone
Misc. early phase

***Not all drugs and/or formulations available in all countries**

#d,l-methylphenidate
*dexmethylphenidate
†dextroamphetamine sulfate
‡mixed amphetamine salts
¶atomoxetine

§ tricyclic antidepressants

(many brands)

**modafinil

††bupropion

‡‡guanfacine

¶¶clonidine

§ § venlafaxine

Benefits of Acute Stimulant Treatment

- **Core Symptoms**

- Inattention
- Impulsivity
- Hyperactivity

ES for core symptoms is
~0.8-1.1 across studies

Time-action properties
complicate response

- **Associated Features**

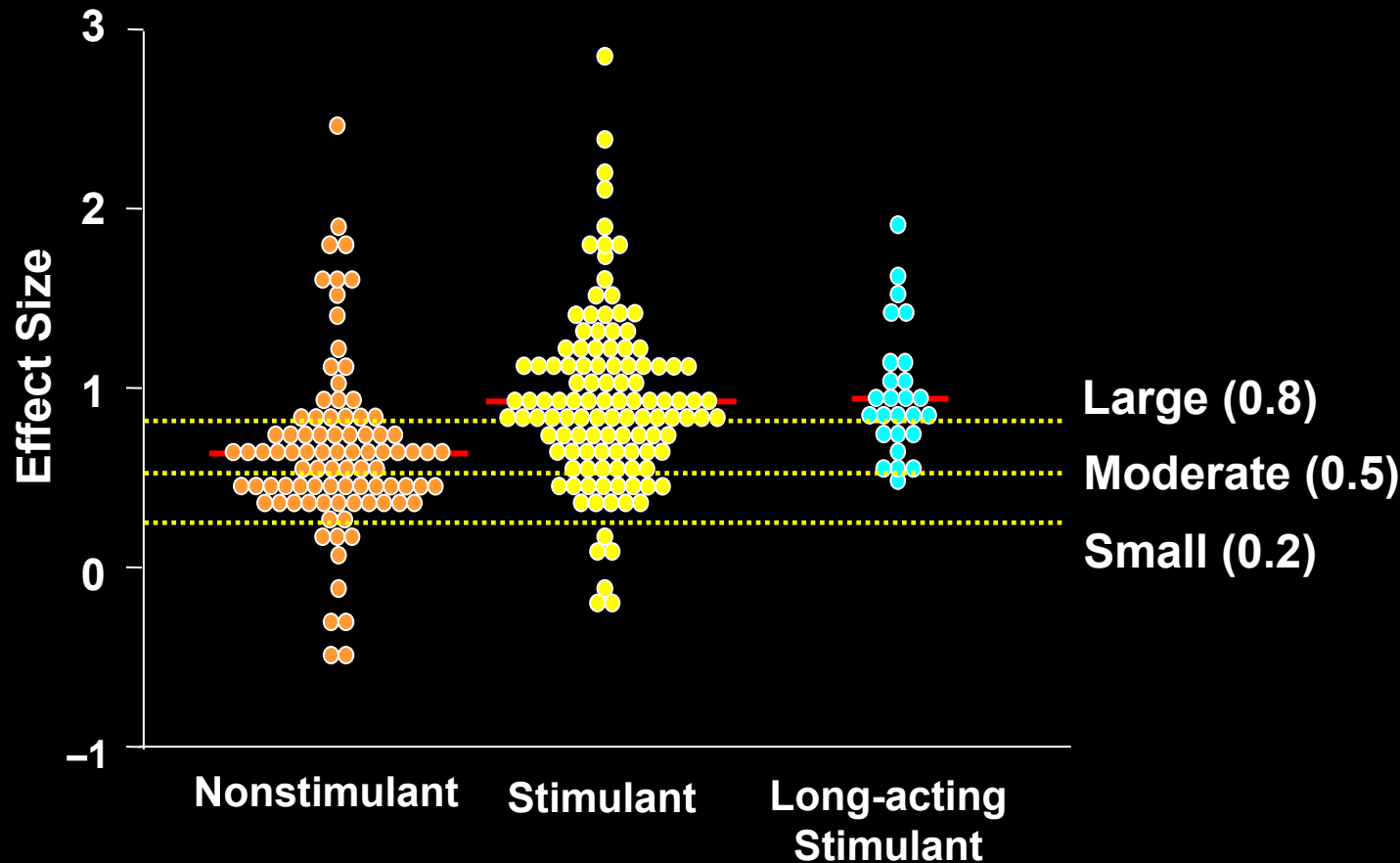
- Noncompliance
- Impulsive aggression
- Social interactions
- Academic efficiency
- Academic accuracy
- Family dynamics
- Self-esteem

ADHD Practice Parameters. *J Am Acad Child Adolesc Psychiatry*. 1997;36:85S.
Greenhill LL, et al. *J Am Acad Child Adolesc Psychiatry*. 1999;38:503-512.

Relative Efficacy of ADHD Therapies: Effect Size

Effect size:
a statistical measurement of the magnitude of effect of a treatment.





Large = 0.8
(Swanson et al, 2001)



Stimulant Adverse Effects

- Common Side effects:
 - Decreased appetite, Headache, Nausea/abdominal pain, Insomnia (but also a common problem in ADHD), Palpitations, Irritability/Aggression, “Rebound” when drug wears off, Rash/anaphylaxis, Decreased growth rate, Dizziness
- Rare side effects
 - Tics - stimulant thought to unmask rather than cause disorder
 - Risk of sudden cardiac death – uncertain relationship; large-scale data base studies find not increase risk over general population rates
 - Psychiatric risk (psychosis, mania, suicidal ideation)
 - Lower seizure threshold
- Concern about Misuse/Abuse/Diversion:
 - Up to 35% of college students!
 - State registries monitor use
- *Monitor HR, BP, height, weight, signs of diversion*

Long-Term Studies of ADHD: Stimulant Treated vs Untreated and Subsequent Substance Use Disorders

Study	Country	Total: N	ADHD: N	Age	Main Findings Tx vs UnTx
Quinn et al. 2017	USA	146,000,000	2,993,887	15–42 yrs	Within group 
Sundquist et al. 2015	Sweden	551,164	9,424	Mean 15 yrs	Between group 
Chang et al. 2014	Sweden		38,753	8–46 yrs	Between group 
Steinhausen et al. 2014	Denmark		20,742	11–20 yrs	Between & Within groups 

ADHD Medication and Substance Use Disorder:

- Largest database examining ADHD medication treatment and later SUD
 - Almost 3 million in US with ADHD
- Comparison of periods of medicated vs unmedicated ADHD individuals (*primary outcome*)
 - Males 35% lower risk: Treated periods < untreated periods for SUD risk (OR=0.65, CI 0.64–0.67)
 - Females 31% lower risk: Treated periods < untreated periods for SUD risk (OR=0.69, CI 0.67–0.71)
 - For first-only SUD incidents, medication was associated with 55% and 43% lower SUD events in male and females, respectively

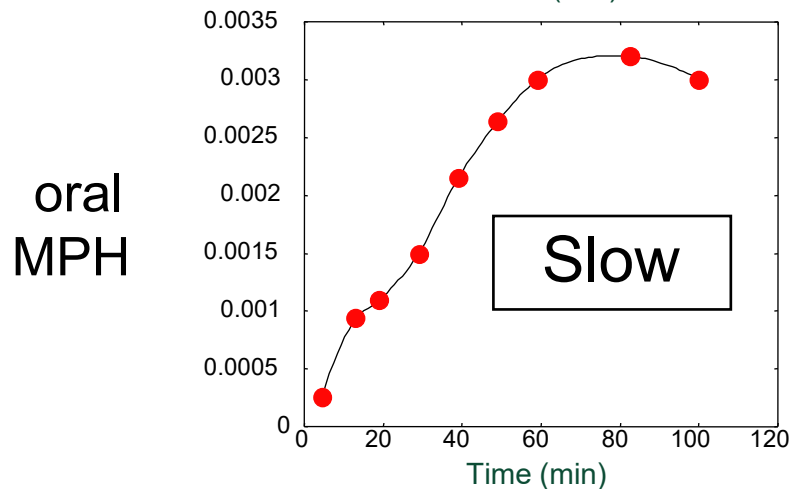
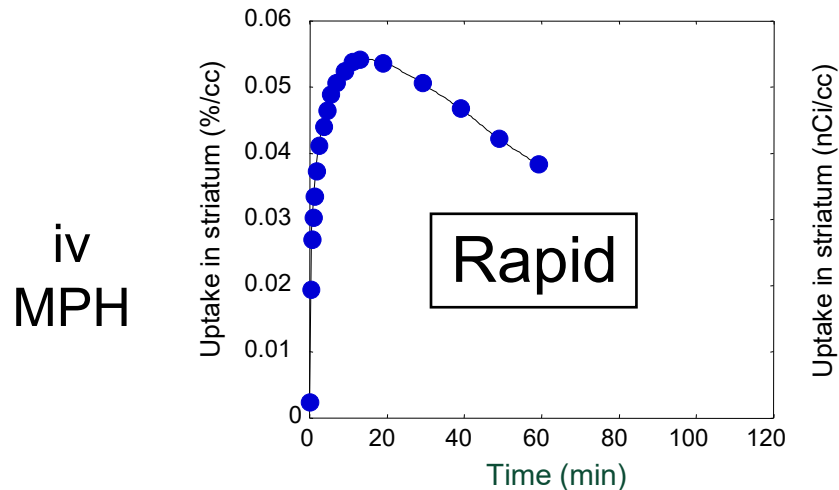
Recent Population Data Show Positive Effects of Stimulants Treatment on Functional Status

- Substance abuse¹
 - Analysis of commercial health care claims: 2,993,887 adolescent and adult ADHD patients
 - Medication was associated with lower concurrent risk of substance-related events
- Automobile accidents²
 - In a US ADHD cohort (n = 2,319,450), rates of MVCs were lower during periods when they received ADHD medication.
- Unintentional injury³
 - Among 1,968,146 individuals with ADHD, medication use was associated with a reduction of unintentional injuries in children and adolescents of both sexes.

¹Quinn et al., *Am J Psychiatry*, 2017, 174(9){877-885; ²Chang et al., *JAMA Psychiatry*, 2017, 74(6):597-603;

³Ghirardi et al., *JAACAP*, 2019, S0890-8567(19)30452-6.

Rapidity of Uptake (?Dopamine) Drives Euphoric Effects of Stimulants (Methylphenidate)



Intravenous (IV) methylphenidate leads to stronger rewarding effects (euphoria) than oral methylphenidate

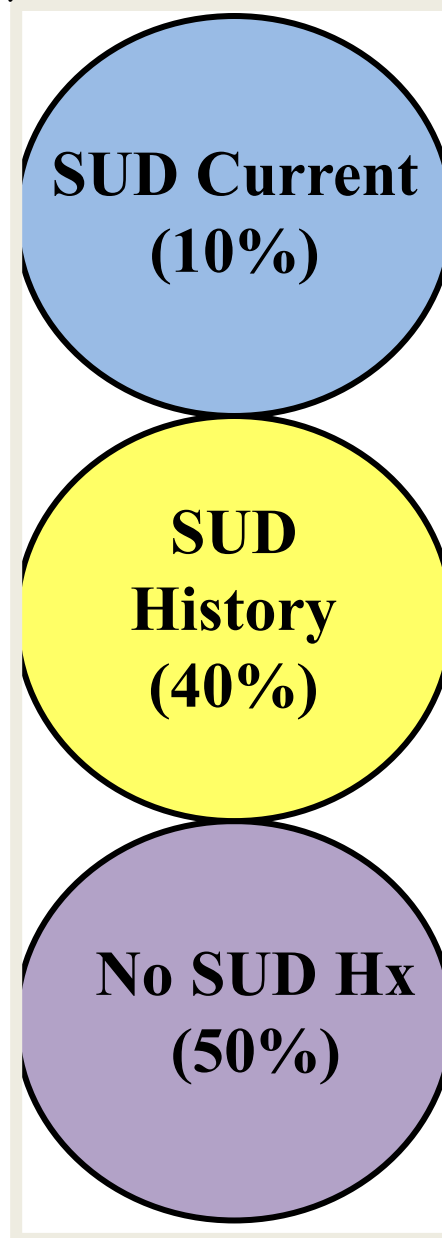
Reasons for Misusing Stimulants (N=100)

To help concentrate or focus better	79%
To stay awake	62%
To reduce distraction	56%
To get more energy	48%
To experiment – to see what it's like	42%
To have a good time with my friends	22%
To feel good or get high	21%
To get through the day	12%

Things Practitioners Can Do to Curtail Prescription Drug Misuse

- Educate adolescents, young adults, and yourself about prescription drug misuse-start early!
- Communicate with your patient about the medical, psychological, addictive, legal issues of stimulant misuse
- Prescribe extended-release stimulants and nonstimulants
- Don't overprescribe quantity (e.g., stockpile)
- Safe storage (not in medicine cabinets)
- Confidentiality: "don't advertise you are on stimulants"
- Safeguard—recommend to dispense of old medications, monitor active prescriptions (pain killers, stimulants, benzodiazepines)

SUD in ADHD Adults Presenting for Treatment



ADHD ADULTS

The American Journal on Addictions, 16: 45–56, 2007 Treatment Strategies for Co-Occurring ADHD and Substance Use Disorders
John J. Mariani, MD, Frances R. Levin, MD

the decision regarding the use of **stimulant medications** for a patient with ADHD and a co-occurring substance use disorder should be made on the basis of a broad clinical assessment and an individual risk-benefit analysis.

For many patients, psychostimulants can be used safely and effectively; however, **careful monitoring** during treatment is essential to ensure prescribed stimulants are being used in a therapeutic manner, and **in the case of worsening substance use or when faced with evidence of the diversion of prescribed medication, treatment should be discontinued.**

Strategies for ADHD and SUD

- In context of ADHD, treat ADHD and Associated Problems (CD, Anxiety, learning problems, family, monitoring) and build up strengths to decrease risk of SUD
- In context to SUD, ADHD treatment should be considered.
 - If less severe SUD, treat ADHD concomitantly
 - More severe SUD --> address SUD
 - If unable to address or recalcitrant SUD -> use CBT, nonstimulants, extended-release stimulants (may need higher dose)
 - Stay tuned for guidelines regarding lower abuse liable stimulants
 - E.g. serdexmethylphenidate/MPH

Wilens and Morrison, ADHD & SUD in ADHD in Children and Adults, Cambridge Press,

2015

Kaminski and Wilens, Overlap of ADHD and SUD, in Textbook of SUD, 2019 in press

Marie-31 year old single parent

- 7 year old son recently diagnosed with ADHD
- Works part time as a dog walker, not able to find consistent work
- Fired from waitressing, missed work, poor time management
- Insomnia, obesity, demoralized, anxious, low self esteem
- Feels overwhelmed with parenting
- Poor relationship choices
- average student, some college but never finished
- SSRI in her 20's, some benefit but did not like how it made her feel
- Cannabis helps her relax before bed

John

17-year-old at public high school

has 1.7 GPA

can't pay attention in class or get hw done, has 3 inattentive symptoms on parent Vanderbilt Scale, 1 on teacher

would like to go to college

- school not concerned, will not do evaluation
- no insurance coverage for evaluation

single parent family with limited finances

pediatrician calls and wonders about trying a stimulant

Jesse, 19 year old college student



Misses classes, doesn't complete work, procrastinates, crams, on probation



Tried friends Adderall, able to focus, think clearly, and sustain attention during studying Father is accountant, mother is a teacher



Frequent cannabis use



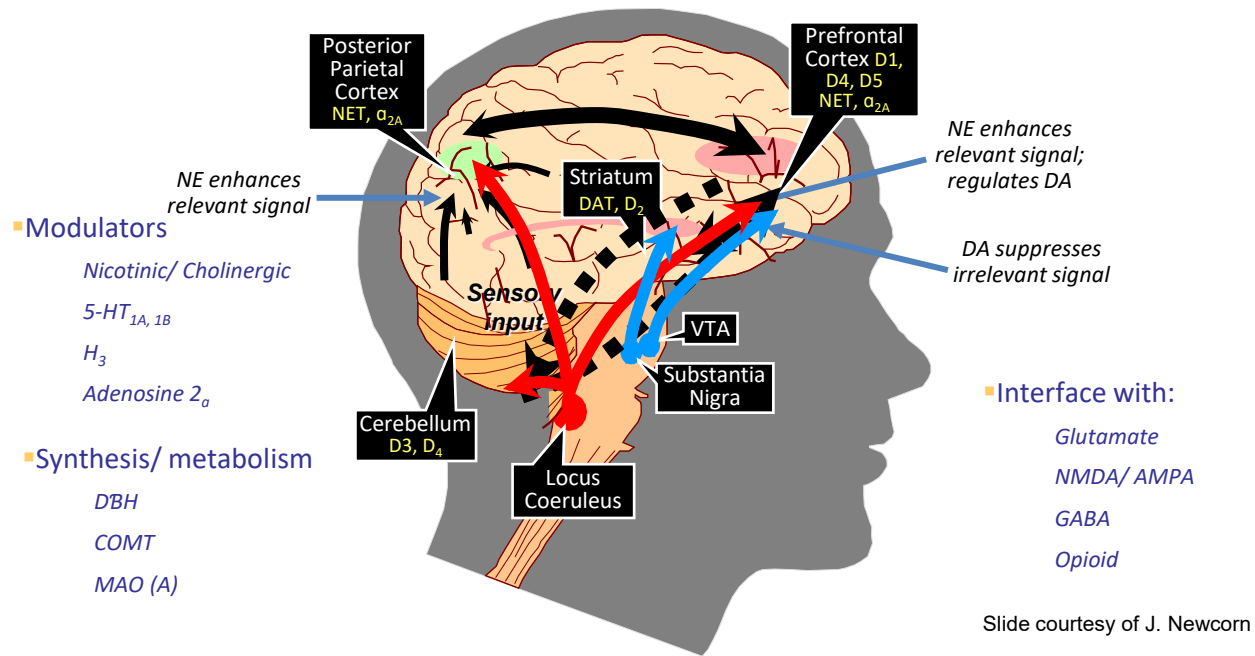
Always tested well, b student in high school



Older sibling an A student and varsity athlete

Optional

Neurobiology of ADHD: Interaction of Multiple Brain Networks, Receptors and Candidate Genes in the Regulation of Attention and Inhibitory Control



Conclusions (Courtesy of Dr. M. Sibley)

- Most desistance from ADHD represents partial, rather than full remission
- Recovery from ADHD by young adulthood is rare – most remitted ADHD recurs
- **ADHD appears to be a fluctuating disorder**—ADHD continues into adulthood for most, though there may be periods of remission (good functioning)
- Research is needed to identify determinants of remission to promote clinical therapeutics that leverage health or environmental variables

Treatment of ADHD in Patients with Treated Opioid Use Disorders

- 12-week, placebo controlled trial
- N = 98 patients with opioid use disorder (and 53% also with cocaine disorder) receiving methadone maintenance
- Three arm trial: **Extended-release methylphenidate vs bupropion vs placebo**
- FDA approved maximum dosing
- All subjects received cognitive behavioral therapy (CBT)
- Outcome:
 - No difference between groups: ADHD or SUD
 - All treatments well tolerated; no misuse or safety concerns
 - **No worsening of SUD (opioid, cocaine) in any group**
 - High placebo response (46%)

New Findings Confirm Very Low or Absent Cardiac Risk of Stimulants

- Reviewed cardiac events in 171,126 privately insured youth ages 6 – 21^a
 - Clinical diagnoses of cardiovascular events and symptoms were rare and not associated with stimulant use^a
- Examined 150,359 stimulant users ages 25 – 64, compared with double the number of matched controls^b
 - Current or new use of ADHD medications, compared with nonuse or remote use, was not associated with an increased risk of serious cardiovascular events^b

Treatment of ADHD + Depression

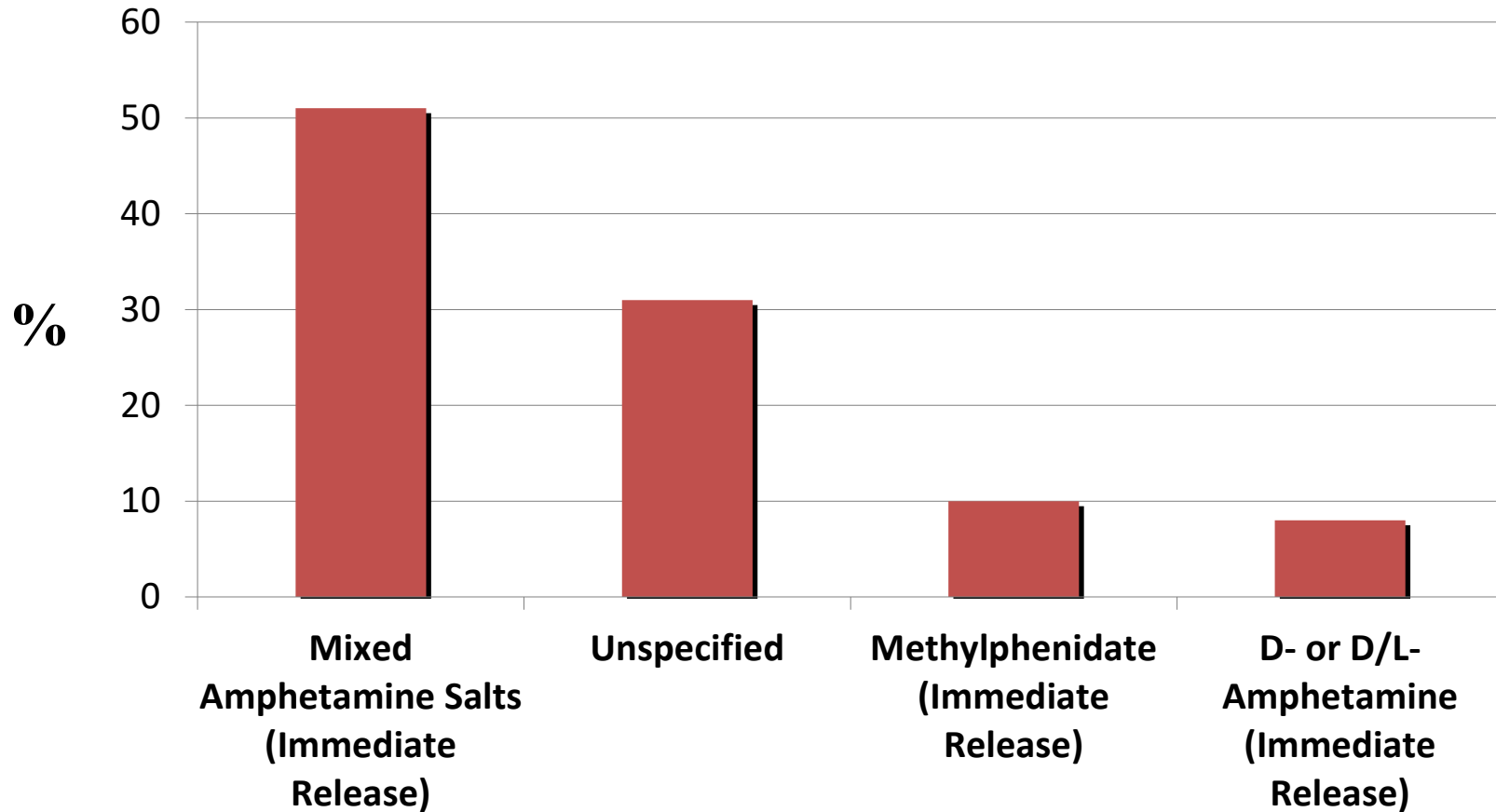
- Distinguish between severe/primary and mild/ secondary depression
 - Severe depression should be prioritized and treated first
 - Depression or demoralization secondary to ADHD is not uncommon; treating the ADHD will often improve this
- Stimulant treatment can augment anti-depressant response but is rarely adequate on its own
- Opportunity for parsimonious treatment: bupropion
 - Moderate ES for ADHD
 - Multi-site studies in both children¹ and adults²
- Combined treatment with anti-depressant and ADHD medication is often required

¹Conners et al., JAACAP, 2009, 35(10):1314-21;

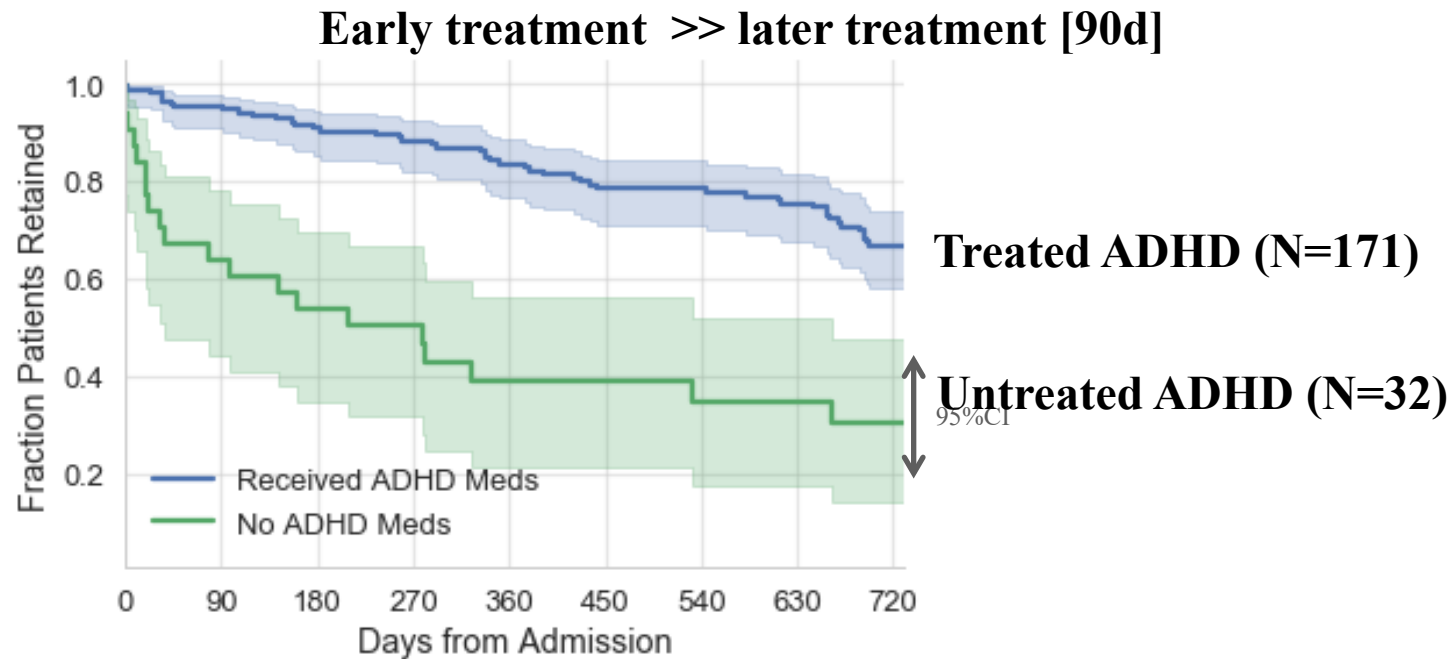
²Wilens et al., *Biol Psychiatry*. 2005, 57(7):793-801.

Immediate-Release Stimulants are Misused by College Students with a Stimulant Use Disorder

(n = 39; ~40% have a stimulant use disorder)



MGH Study: Treatment of ADHD Improves Retention in SUD Treatment



(Kast K, Rao V, Wilens T. J Clin Psych: 2021)

Clinical Implications- Existing Patients

- Patients should still be monitored after remission is detected
- Communicate to parents and patients that ADHD is almost always a chronic disorder; however, periods of good functioning can be expected when the right steps are taken.
- Cognitive-behavioral treatment should focus on identifying factors that promote remission of symptoms and impairment (being your best self):
 - Environmental factors (characteristics of jobs, educational settings, support systems)
 - Coping skills (organization skills, communication skills, self-regulation)
 - Identifying high interest areas to create productive engagement in work/school
 - Looking for settings that minimize interference from ADHD symptoms
 - Lifestyle choices that promote symptom management: healthy diet, exercise, sleep, screen time limits

