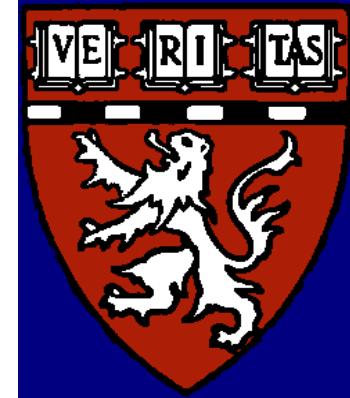




# ***ADHD, Substance Use Disorders & Stimulant Misuse***



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# Faculty Disclosure

- **Timothy Wilens, M.D. has served as a consultant, or has received grant support from the following**
- **US Food and Drug Administration, NSPHS: NIH (NIDA)**
- **Licensing agreements with 3D Therapeutics**
- **Clinical care: MGH, Bay Cove, Gavin Foundation, Major/Minor League Baseball**
- **(Co)Edited Straight Talk About Psychiatric Medications for Kids (Guilford); ADHD Across the Lifespan (Cambridge), Update in Pharmacotherapy of ADHD (Elsevier)**
- **Some of the medications discussed may not be FDA approved in the manner in which they are discussed including diagnosis(es), combinations, age groups, dosing, or in context to other disorders (eg, substance use disorders)**

# Overview of ADHD

- **ADHD prevalence**
  - 8- to 15-year-olds: 6-9%
  - 18- to 44-year-olds: 4-5%
- **Associated with chronic course**
  - Circa 75% persistence into adolescence
  - Circa 50% persistence into adulthood
- **High rates of psychiatric comorbidity**
- **Impairment in multiple domains**
- **Diagnosis by DSM V criteria**
  - Combined, Inattentive, Hyperactive subtype
- **Responds well to treatment**

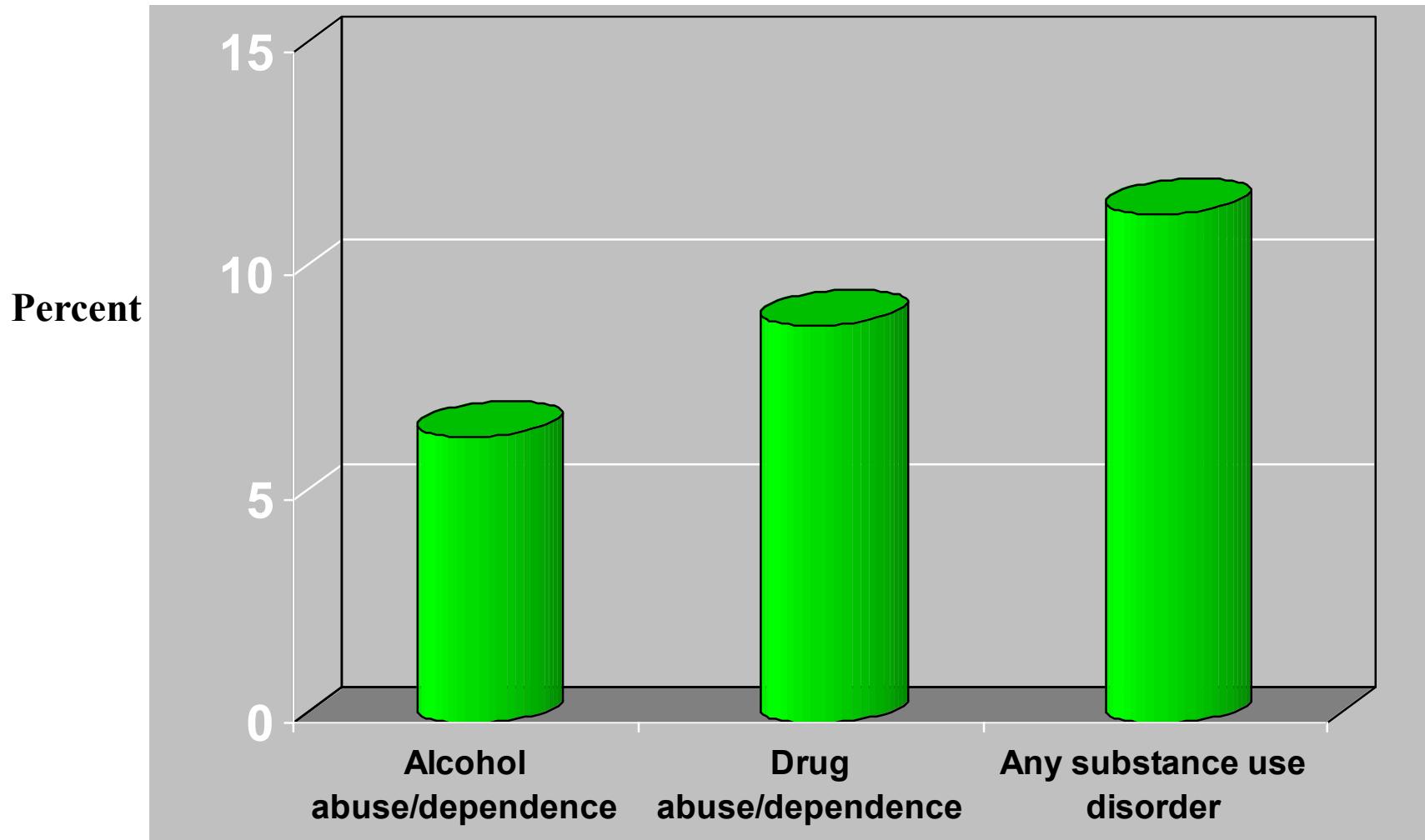


- **Developmentally inappropriate symptoms**
  - **6/9 Symptoms of Inattention, Hyperactivity or Combination**
  - **5/9 if  $\geq$  17 years of age (adult)**
  - **95% of cases are either combined or inattentive subtype**
- **Age of onset  $\leq$  12 years**
- **Not accounted for by other disorder**
  - Can make diagnosis of Autism Spectrum and ADHD
- **Diagnosis Clinically Derived**
- **Rating Scales Helpful (Parent, School)**
  - **WHO – ADHD (ASRS) (<https://add.org/adhd-test/>)**
  - **DSM V, Conners, Brown, Other Scales**

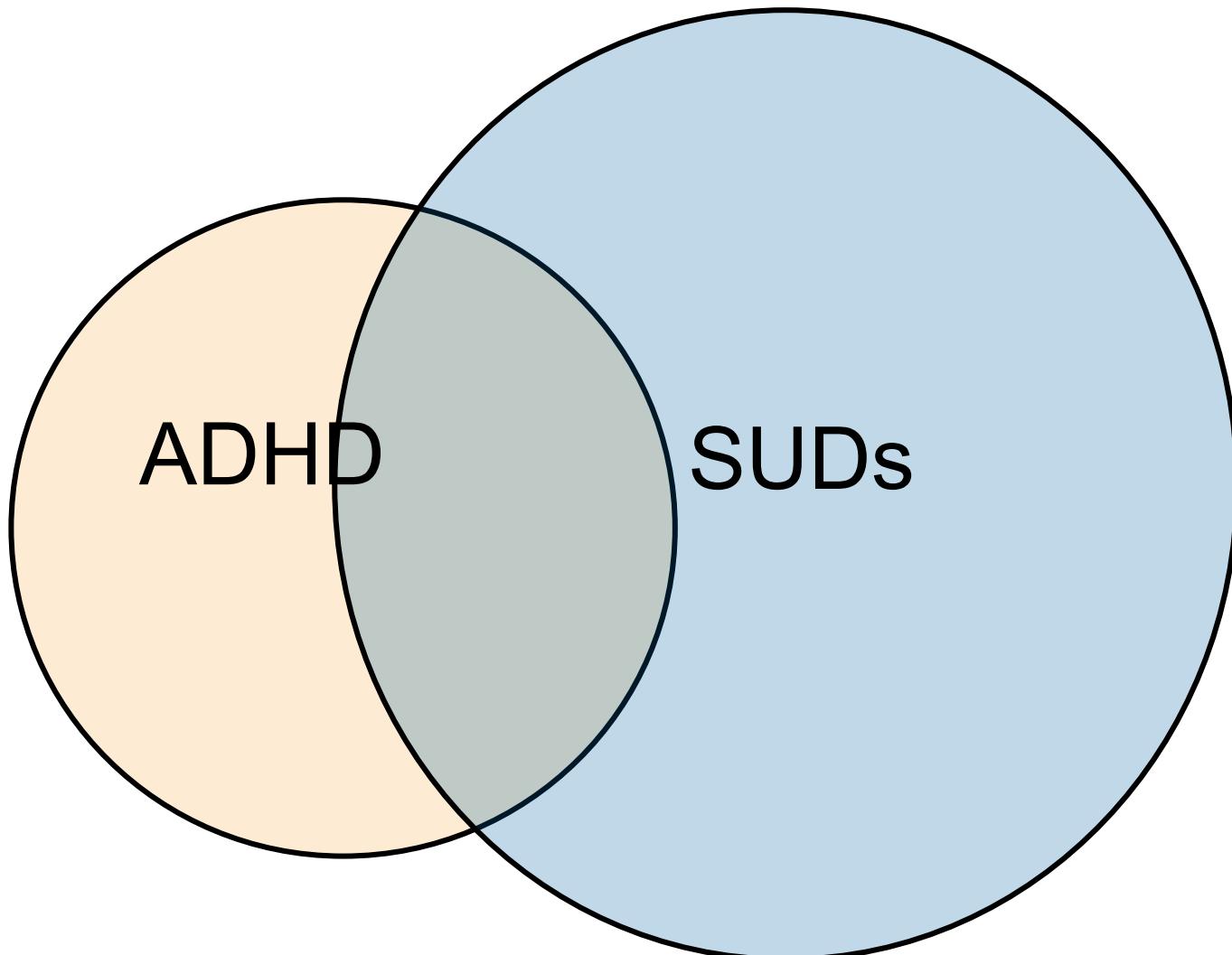
## Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

Patient Name	Today's Date					
		Never	Rarely	Sometimes	Often	Very Often
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.						
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?						
<b>Part A</b>						
7. How often do you make careless mistakes when you have to work on a boring or difficult project?						
8. How often do you have difficulty keeping your attention when you are doing boring or repetitive work?						
9. How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly?						
10. How often do you misplace or have difficulty finding things at home or at work?						
11. How often are you distracted by activity or noise around you?						
12. How often do you leave your seat in meetings or other situations in which you are expected to remain seated?						
13. How often do you feel restless or fidgety?						
14. How often do you have difficulty unwinding and relaxing when you have time to yourself?						
15. How often do you find yourself talking too much when you are in social situations?						
16. When you're in a conversation, how often do you find yourself finishing the sentences of the people you are talking to, before they can finish them themselves?						
17. How often do you have difficulty waiting your turn in situations when turn taking is required?						
18. How often do you interrupt others when they are busy?						
<b>Part B</b>						

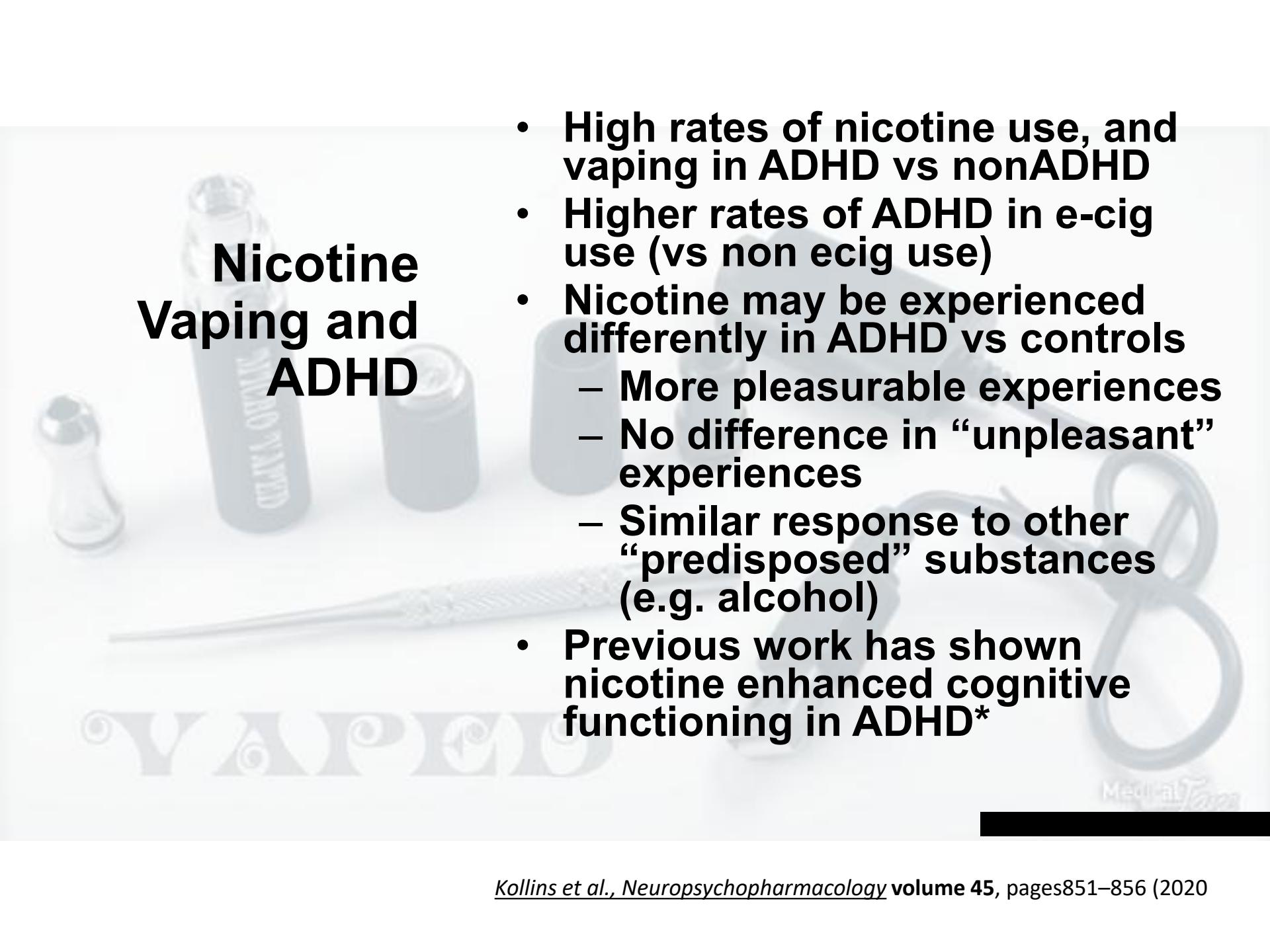
# Lifetime Prevalence Substance Use Disorders (SUD) in Adolescents



# Overlap between ADHD and SUDs



Wilens TE. *Psychiatr Clin North Am.* 2004;27(2):283-301. van Emmerik-van Oortmerssen K, et al. *Drug Alcohol Depend.* 2012;122(1-2):11-19.



# Nicotine Vaping and ADHD

- High rates of nicotine use, and vaping in ADHD vs nonADHD
- Higher rates of ADHD in e-cig use (vs non ecig use)
- Nicotine may be experienced differently in ADHD vs controls
  - More pleasurable experiences
  - No difference in “unpleasant” experiences
  - Similar response to other “predisposed” substances (e.g. alcohol)
- Previous work has shown nicotine enhanced cognitive functioning in ADHD\*

# A More Complicated Course of SUD is Associated with ADHD

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

Carroll KM, et al. *Compr Psychiatry*. 1993;34(2):75-82. Schubiner H, et al. *J Clin Psychiatry*. 2000;61(4):244-251. Levin FR, et al. *Drug Alcohol Depend*. 1998;52(1):15-25. Levin FR, et al. *Addict Behav*. 2004;29(9):1875-1882. Wilens TE, et al. *Am J Addict*. 1998;7(2):156-163. Wilens TE, et al. *Am J Addict*. 2005;14(4):319-327.

# Internet Gaming Addiction and ADHD



- **Higher risk for internet gaming addiction in ADHD**
- **Study of young adults with internet gaming (N=87) and controls (N=87)**
  - **Higher risk for ADHD (vs controls)**
  - **Prominent impulsivity and hostility (mood dysregulation) mediate internet gaming disorder in ADHD\***

# Major Brain Circuits Involved in Addiction

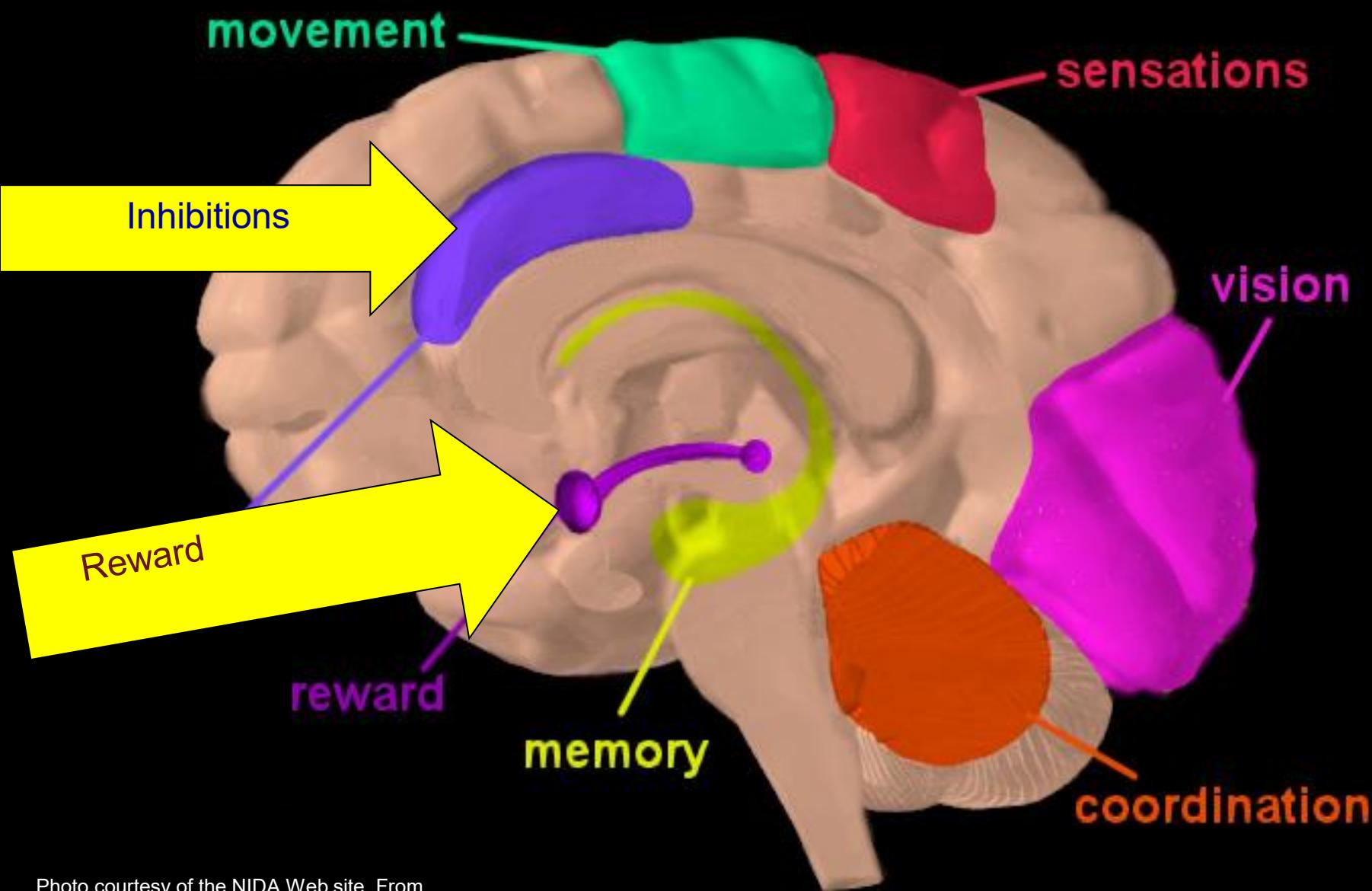


Photo courtesy of the NIDA Web site. From  
A Slide Teaching Packet: The Brain and the  
Actions of Cocaine, Opiates, and Marijuana.

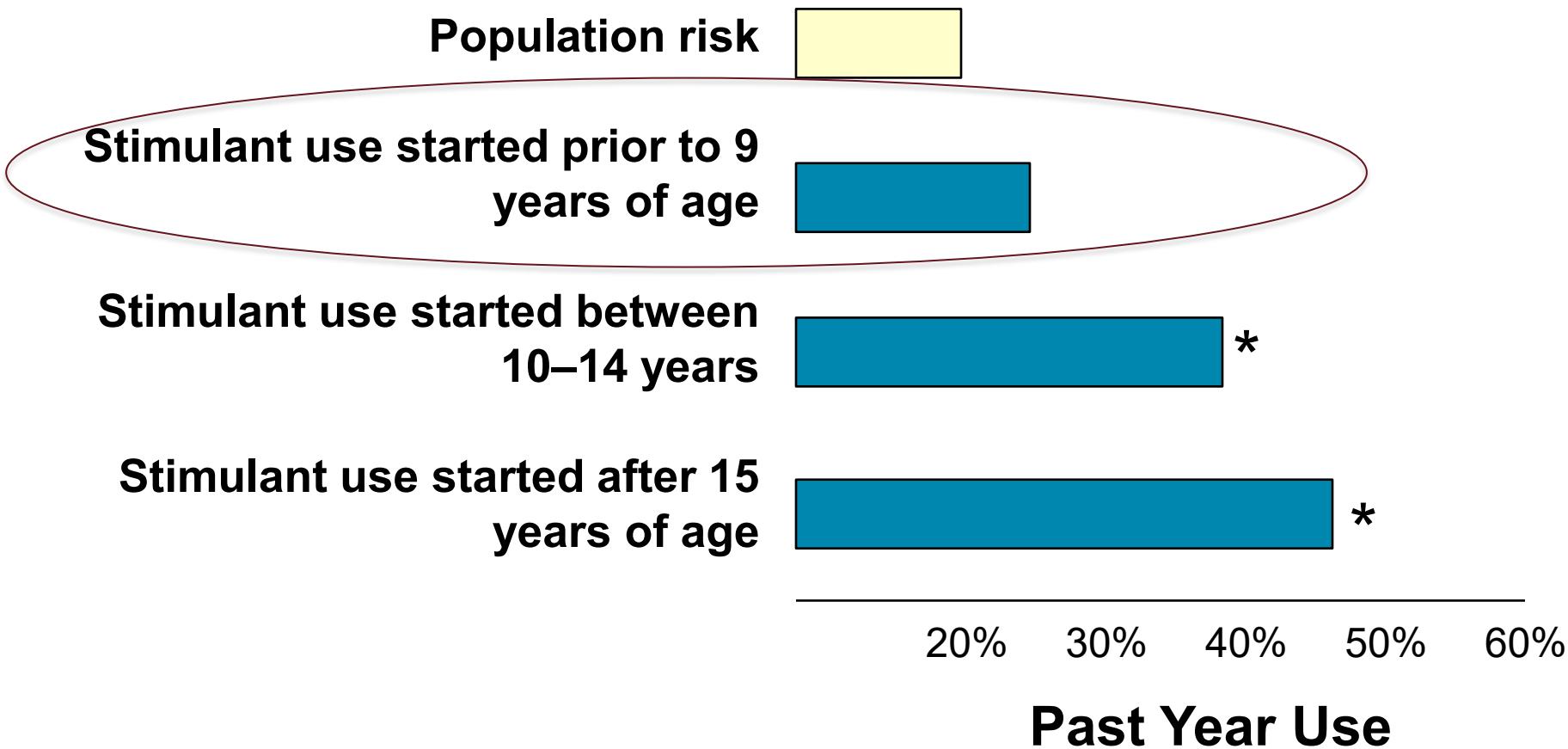
# *Does Treatment of ADHD in Childhood Impact later SUD?*

# 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 

(from Boland et al, J Psychiatric Research, 2020)

# Early ADHD Treatment Reduces Marijuana Use



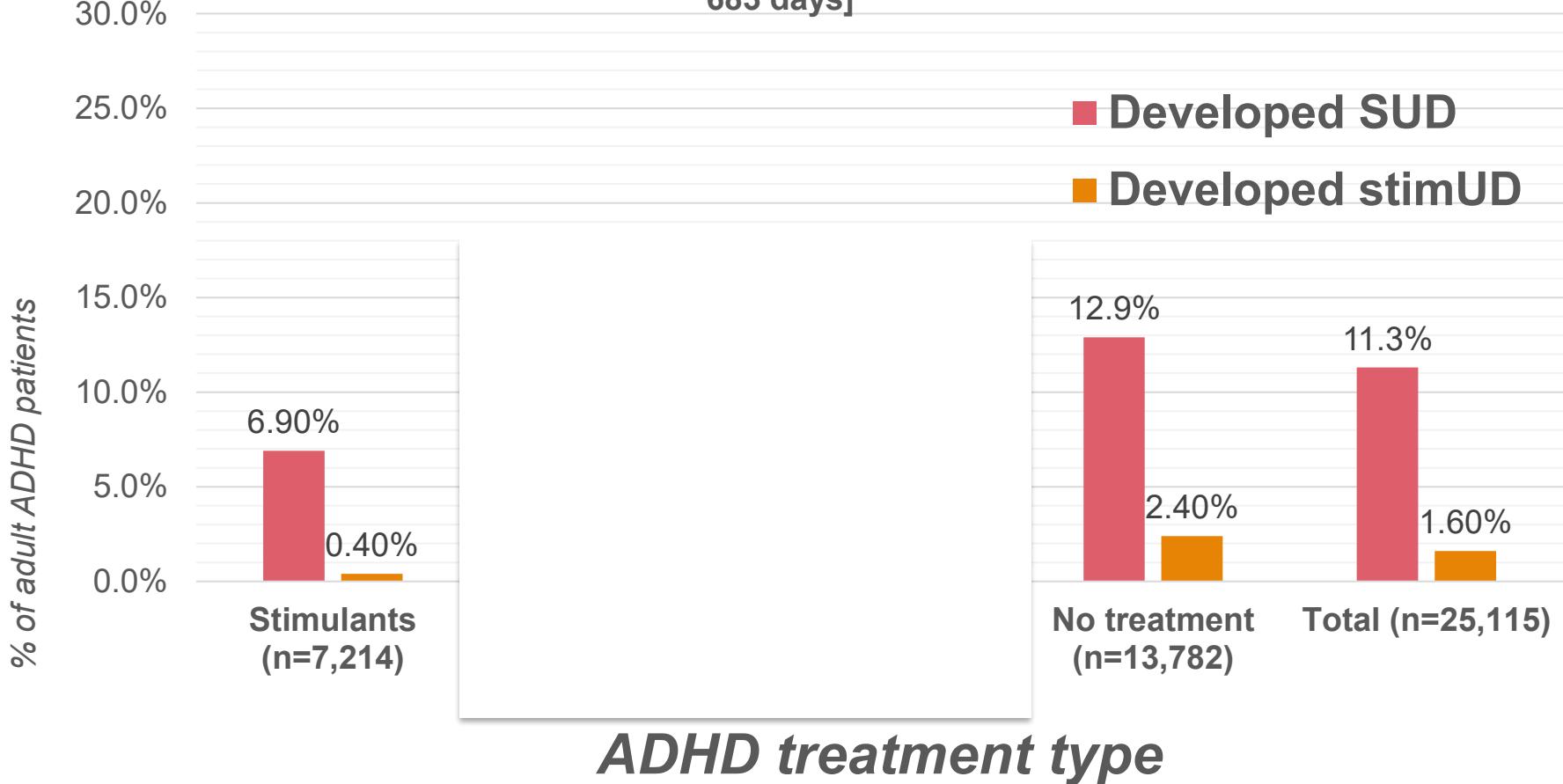
10 Cohorts of high school seniors 2005 to 2014 (N = 40,358; ~10% with ADHD; from 3-6+years of stim).

\* $P < .001$  vs controls.

McCabe SE, et al. *J Am Acad Child Adolesc Psychiatry*. 2016;55(6):479-486.

# Treatment of ADHD in Adults with Stimulants Does Not Increase Stimulant (stimUD) or Substance Use Disorders (SUD)

[N=25,115 Adults with ADHD, MGB Electronic Health Records, Mean age 31.4 years, f/u mean 683 days]

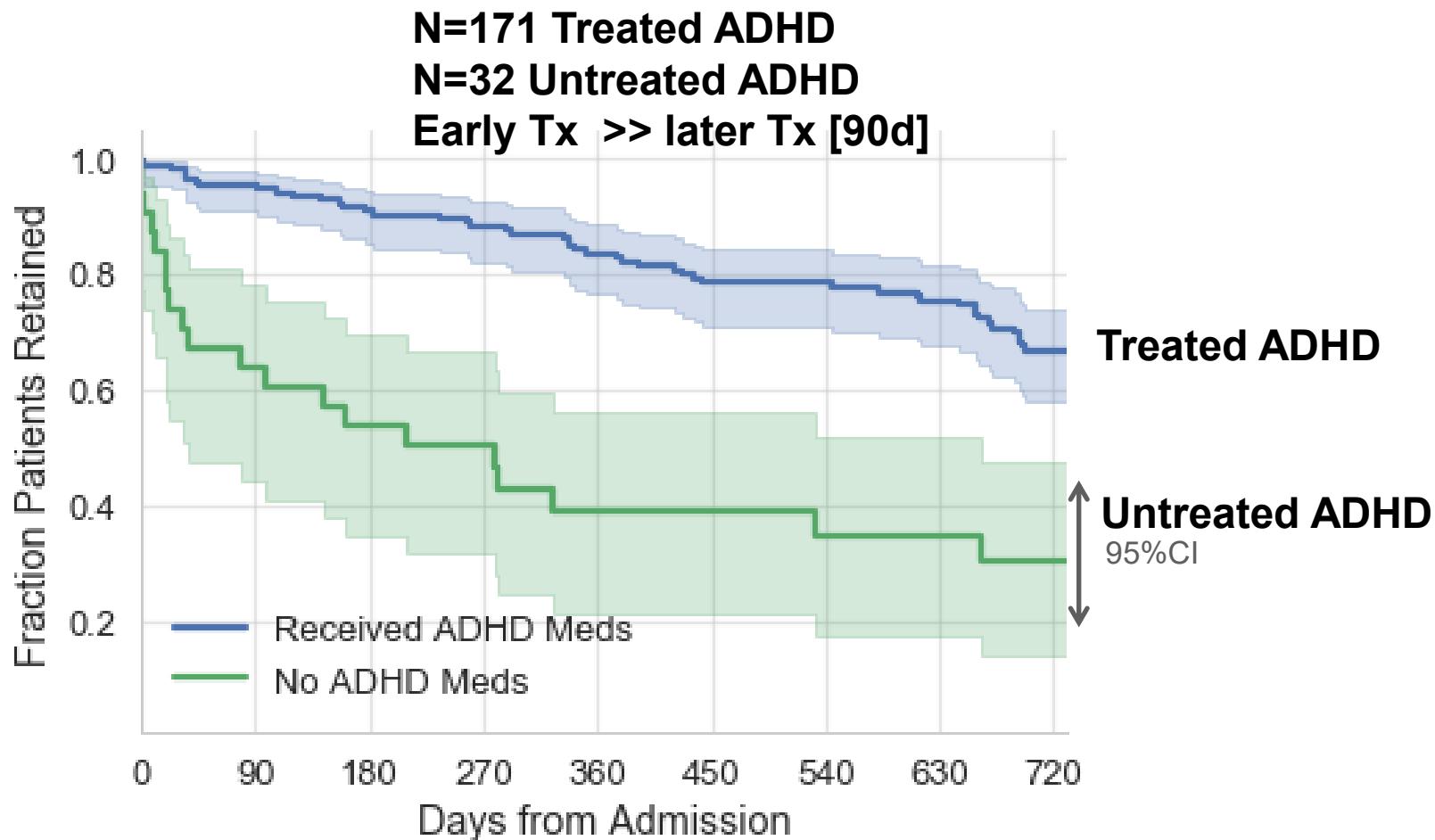


# Cannabis and ADHD

- **Most common “drug” used/misused in ADHD**
- **ADHD is second most common comorbidity in cannabis use disorder**
- **Cannabis associated with neuropsychological impairment**
  - Acute effects
  - **Chronic - persistent executive dysfunction if marijuana initiated in adolescence (early)**

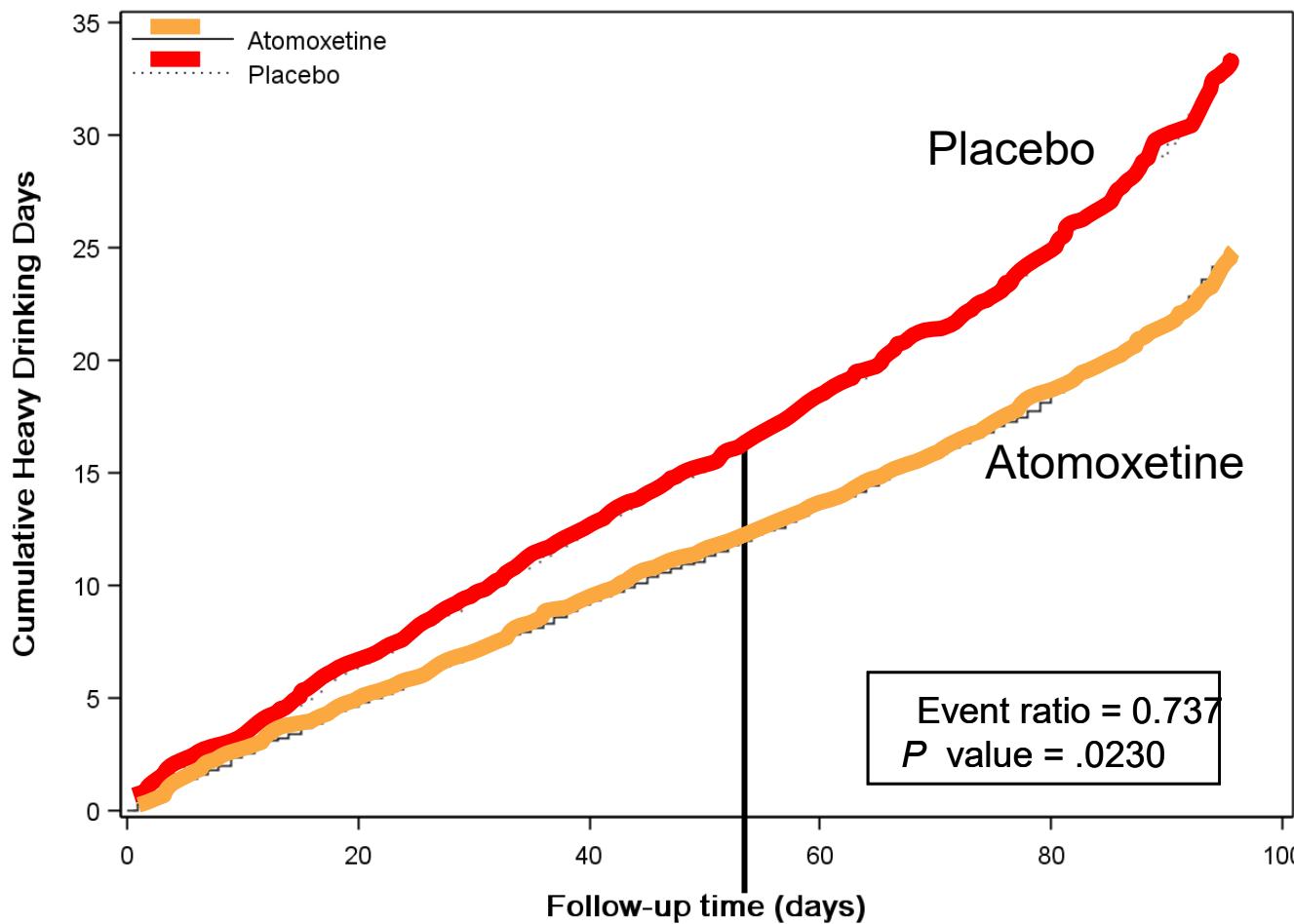
Wilens et al., J Am Acad Chld Adolesc Psych: 2011; Am J Addict 2010: 16:14-23  
Cooper et al. Eur Neuropsychopharmacol 2017: 27:795-808

# MGH Study: Medication Treatment of ADHD Improves Retention in SUD Treatment



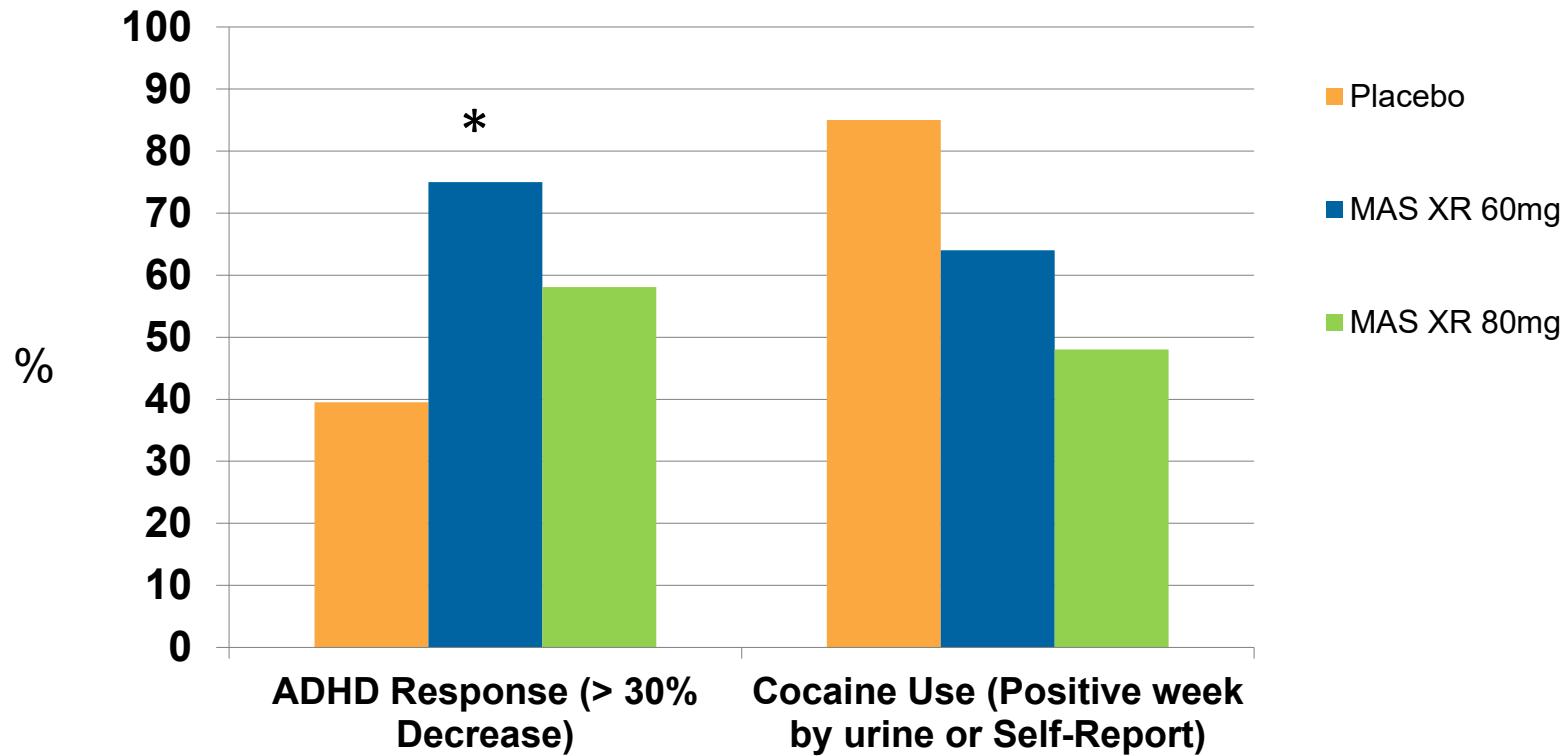
(Kast K, Rao V, Wilens T. J Clin Psych: 2021)

# Atomoxetine Improves Heavy Drinking in Recently Abstinent Adults



An event ratio of .737 indicates that, relative to patients treated with placebo, atomoxetine-treated patients experienced an approximately 26.3% greater reduction in the rate of heavy drinking. Separation between groups first occurred at day 55.

# Higher Dose MAS XR is Helpful in ADHD and Cocaine Use Disorder in Patients with OUD



13-week RCT

Diagnosis: Cocaine Use Disorder and ADHD

Treatment: CBT +/- MAS XR

N = 126. \*P < .05.

Levin FR, et al. *JAMA Psychiatry*. 2015;72(6):593-602.

# Strategies for ADHD and SUD

**In context to SUD, ADHD treatment should be considered**

**If misuse or less severe SUD, treat ADHD concomitantly (e.g. smoking MJ sometimes)**

**More severe SUD --> address SUD (e.g. daily MJ) and treat ADHD**

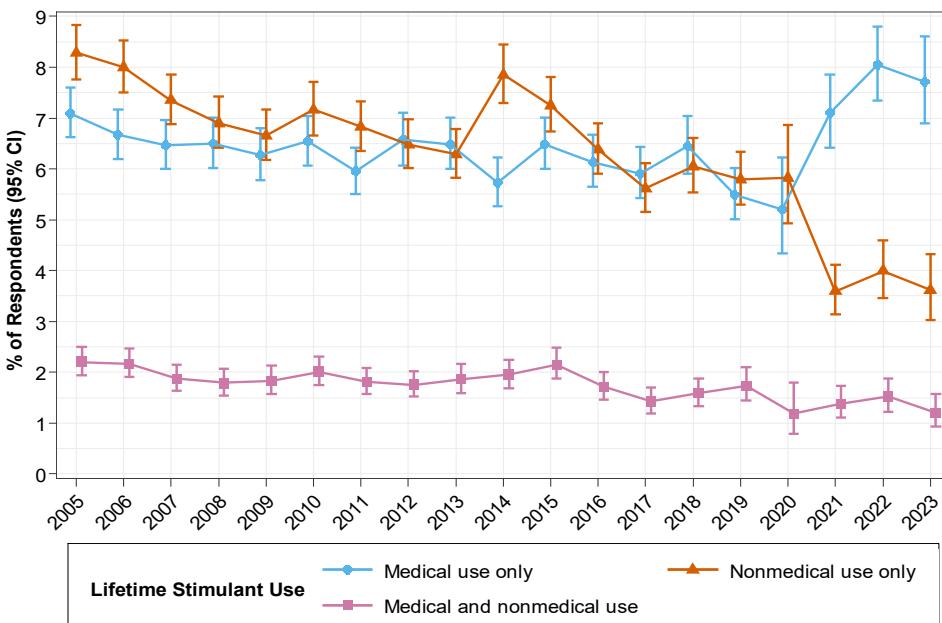
**In context to SUD ->use CBT, nonstimulants, pro-drug/extended-release stimulants (may need higher dose)**

**Careful with immediate release stimulants, use abuse-deterrent/extended release stimulants when available**

Taubin, Wilson and Wilens, ADHD and SUD in Young People, in *Updates in Pharm of ADHD*, Child Adolesc Psych Clin N America, Newcorn and Wilens (eds), Elsevier Press, 2022.  
Kaminski and Wilens, Overlap of ADHD and SUD, in Textbook of SUD, 2019

# Stimulant Misuse and Diversion

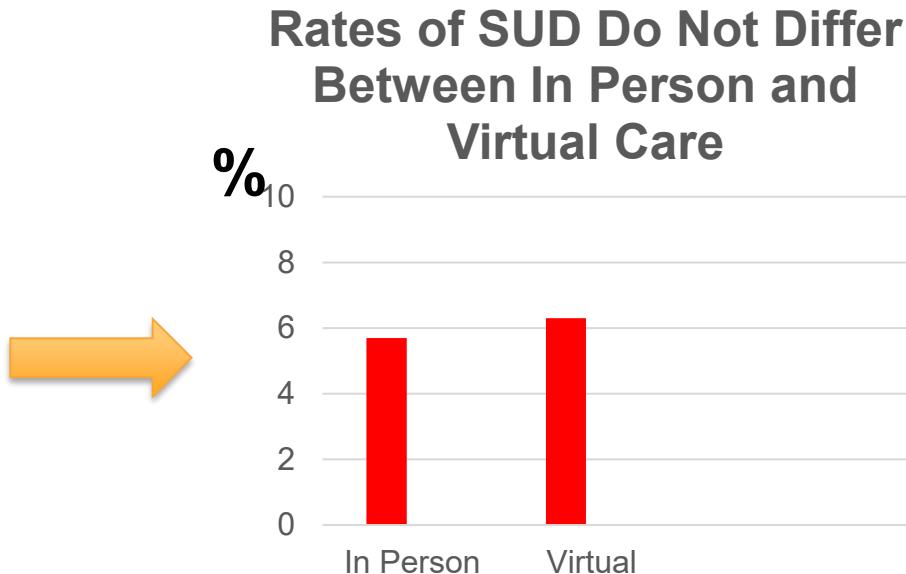
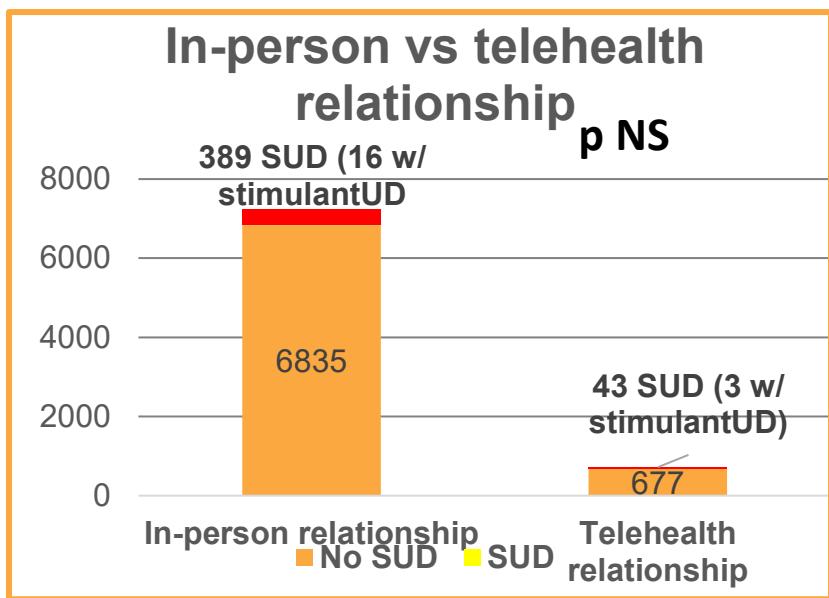
- N > 120 studies; mostly survey studies in college students (80%)
- 10% to 20% with nonmedical use of stimulants
- 65% to 85% of stimulants diverted from “friends”
  - Majority not “scamming” local practitioners
  - Not seen as potentially dangerous



McCabe SE, et al. *Addiction*. 2005;100(1):96-106. Arria AM, et al. *Subst Abus*. 2008;29(4):19-38. Wilens TE, et al. *J Am Acad Child Adolesc Psychiatry*. *J Am Acad Child Adolesc Psychiatry*. 2008;47(1):21-31. Wilens TE, et al. *J Clin Psychiatry*. 2016;77(7):940-947. : Faraone et al. *J Am Acad Child Adolesc Psych*, 2020; McCabe et al *JAMA Network Open* 2023).

# Telehealth Compared to In Person Experience Does Not Increase Subsequent Stimulant or other SUDs

(N=7944 patients)



# Summary

- Since ADHD is a risk factor for cigarette smoking and SUD, teenagers and young adults with ADHD should be queried for both potential problems
- ADHD should be considered in adolescents and adults who smoke cigarettes and/or have SUD
- Treating ADHD helps protect against the onset of cigarette smoking, SUD, and SUD-related criminality
- Strategies exist for management of substance use and use disorder in ADHD
- Since stimulants can be misused, in high risk groups consider mitigation strategies (e.g. ER vs IR stimulants, education and monitoring)

**QUESTIONS?**