ADHD and Substance Use Disorders: the Toxic Relationship.

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Overview

Introduction

Prevalence and clinical implications of ADHD+SUD

Stimulants and SUD: risk or prevention?

ADHD+SUD: treatment

Clinical case

Q&A

ADHD+SUD

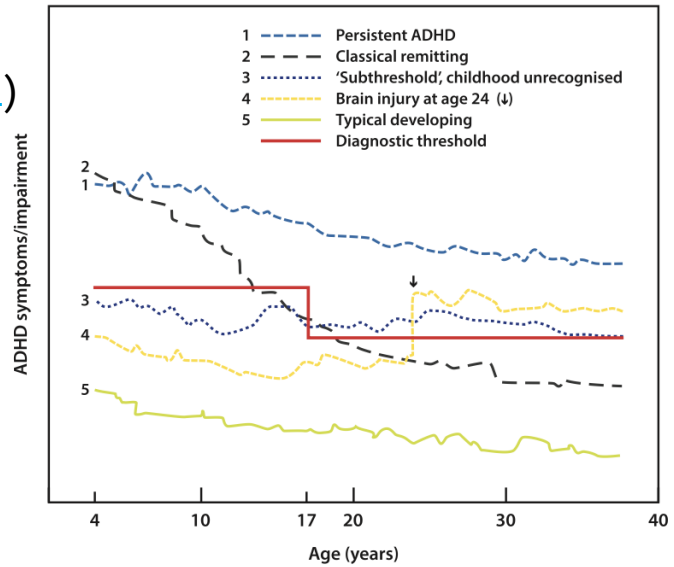
INTRODUCTION

ADHD beyond the DSM-5 criteria

ADHD trajecotries

Children with ADHD:
15% still meet full diagnsotic criteria (2)
50% meet criteria for ADHD in partial remission (1)

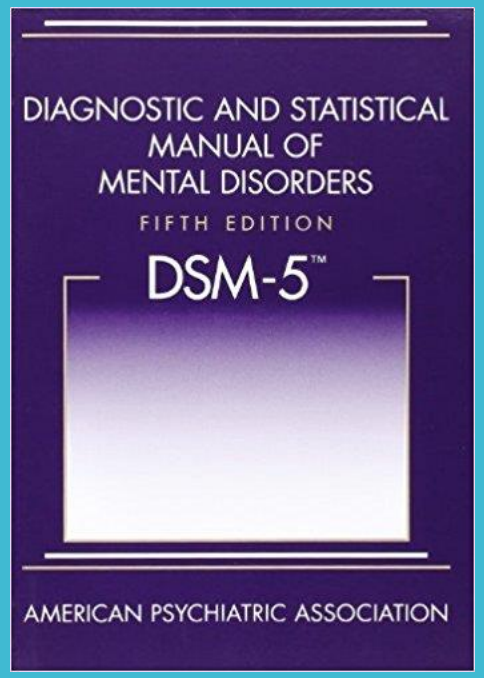
Adults with ADHD:
Adult-onset after traumatic brain injury (4)
Apparent adult-onset
(subtreshold ADHD in childhood) (3)



	Children/Adolescents	Adults
Prevalence	6,5%	1,4-3,6%
Symptom profile	Externalyzing symptoms (hyperactivity)/Attentive symptoms and emotional lability	Affective instability, inattention, comorbidities
Gender differences	M/F: hypercativity/impulsivity / inattention	Similar symptoms
Comorbidities	LD/CD/ASD/TICs/APD/Addiction	Mood and Anxiety / Addictions

Franke et al. Live fast, die young? A review on the developmental trajectories of ADHD across the lifespan. Eur Neuropsychopharmacol. 2018 Oct;28(10):1059-1088.

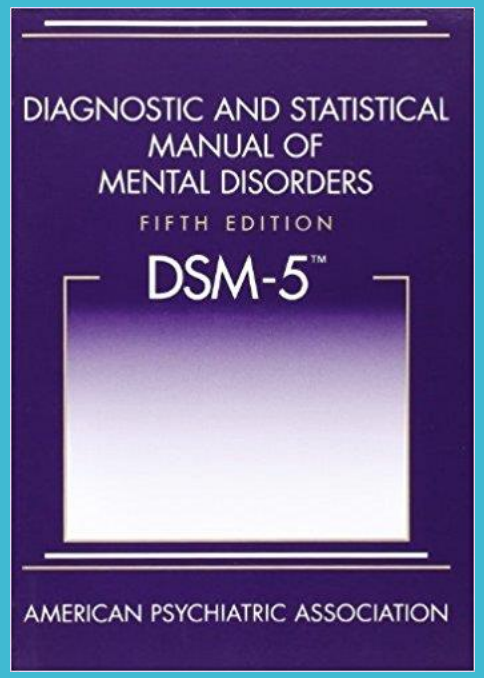
ADHD: DSM-5 cirteria



1-Displays poor listening skills
2- Loses and/or misplaces items needed to complete activities or tasks
3- Sidetracked by external or unimportant stimuli
4- Forgets daily activities
5- Diminished attention span
6- Lacks ability to complete schoolwork and other assignments or to follow instructions
7- Avoids or is disinclined to begin homework or activities requiring concentration
8- Fails to focus on details and/or makes thoughtless mistakes in schoolwork or assignments

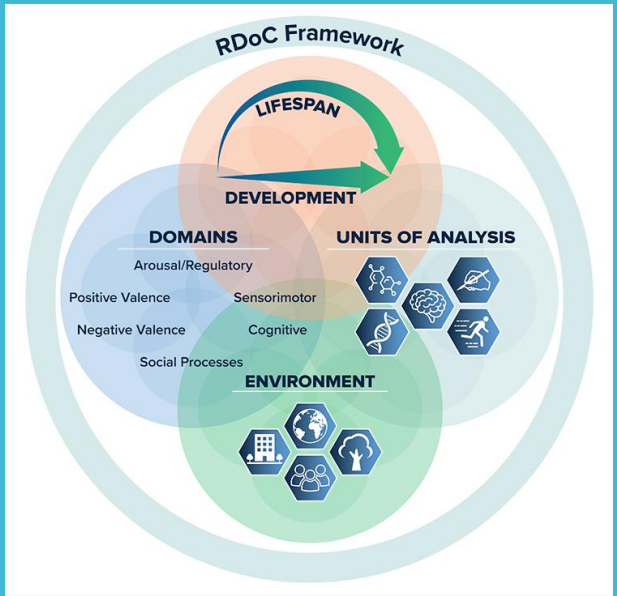
1- Squirms when seated or fidgets with feet/hands
2- Marked restlessness that is difficult to control
3- Appears to be driven by "a motor" or is often "on the go"
4- Lacks ability to play and engage in leisure activities in a quiet manner Incapable of staying seated in class
5- Overly talkative Impulsive Symptoms:
6- Difficulty waiting turn
7- Interrupts or intrudes into conversations and activities of others Impulsively blurts out answers before questions completed

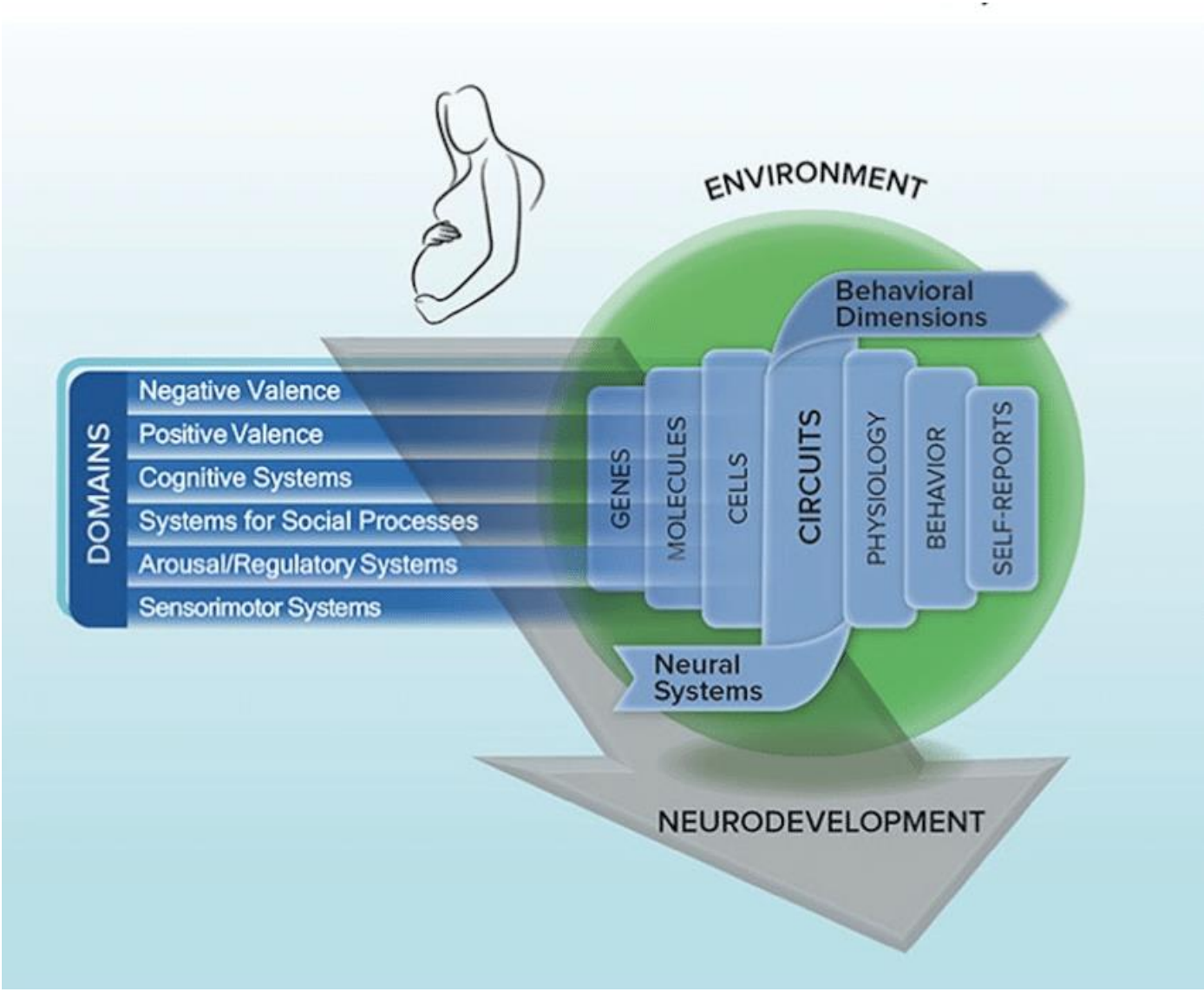
SUD: DSM-5 cirteria



1- Using more of a substance than intended or using it for longer than you're meant to.
2- Trying to cut down or stop using the substance but being unable to.
3- Experiencing intense cravings or urges to use the substance.
4- Needing more of the substance to get the desired effect — also called tolerance.
5- Developing withdrawal symptoms when not using the substance.
6- Spending more time getting and using drugs and recovering from substance use.
7- Neglecting responsibilities at home, work or school because of substance use.
8- Continuing to use even when it causes relationship problems.
9- Giving up important or desirable social and recreational activities due to substance use.
10- Using substances in risky settings that put you in danger.
11- Continuing to use despite the substance causing problems to your physical and mental health.

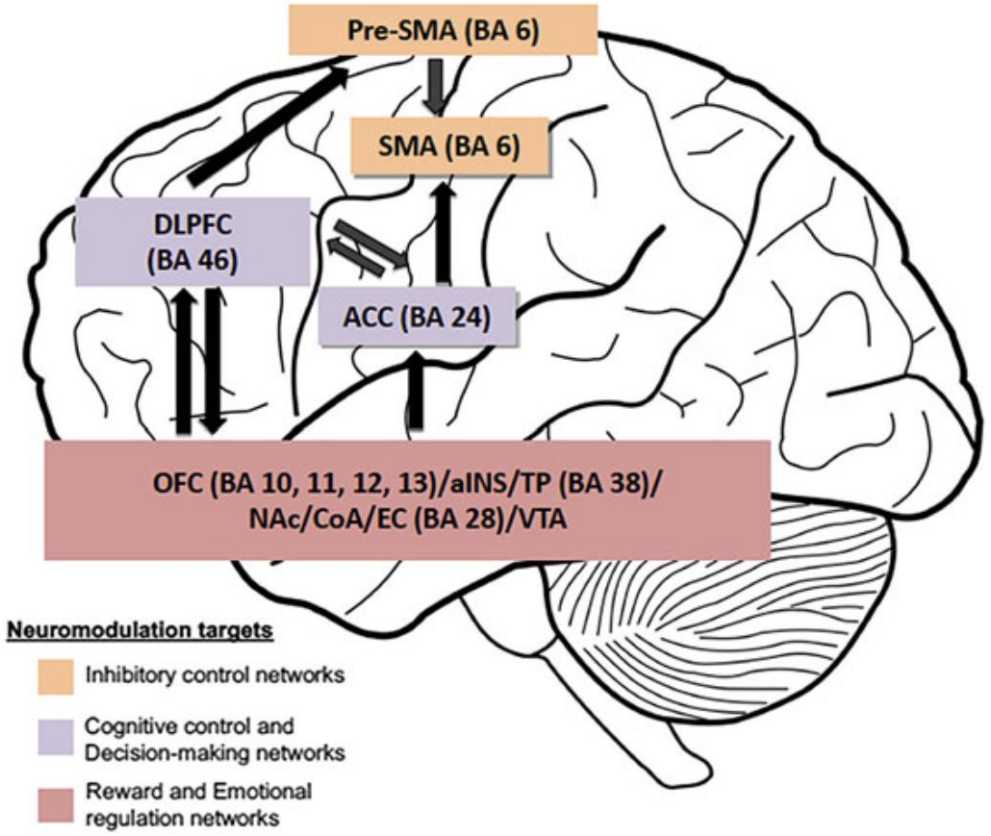
The RDoC Framework

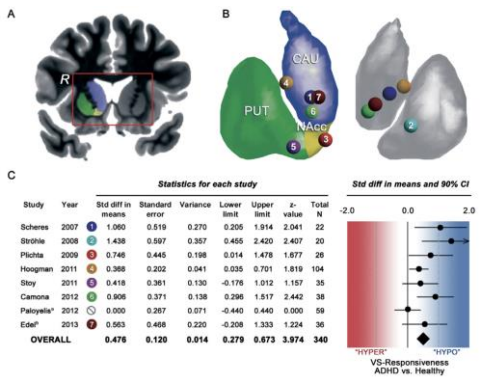




ADHD
SUD
GD:
RDoC Research Domain Criteria Initiative
perspective

Positive valence system:
reward processing
Cognitive system:
cogntive control
inhinition-suppression





SUD – GD –ADHD : ventral striatal hypoactivation during reward anticipation

SUD – GD –ADHD : motor inhibition deficit (incresed stop signal reaction time)

Grassi G, Makris N, Pallanti S. Addicted to compulsion: assessing three core dimensions of addiction across obsessive-compulsive disorder and gambling disorder. *CNS Spectr*. 2020;25(3):392-401.
Luijten et al. Disruption of Reward Processing in Addiction : An Image-Based Meta-analysis of Functional Magnetic Resonance Imaging Studies. JAMA Psychiatry. 2017

ADHD+SUD

PREVALENCE and CLINICAL IMPLICATIONS

ADHD-SUD comorbity: prevalence in meta-analyses

The prevalence of **ADHD among** adolescents and adults with **SUD is 21%**

Childhood ADHD is associated with **alcohol use disorder by young adulthood** (**OR = 1.35**)

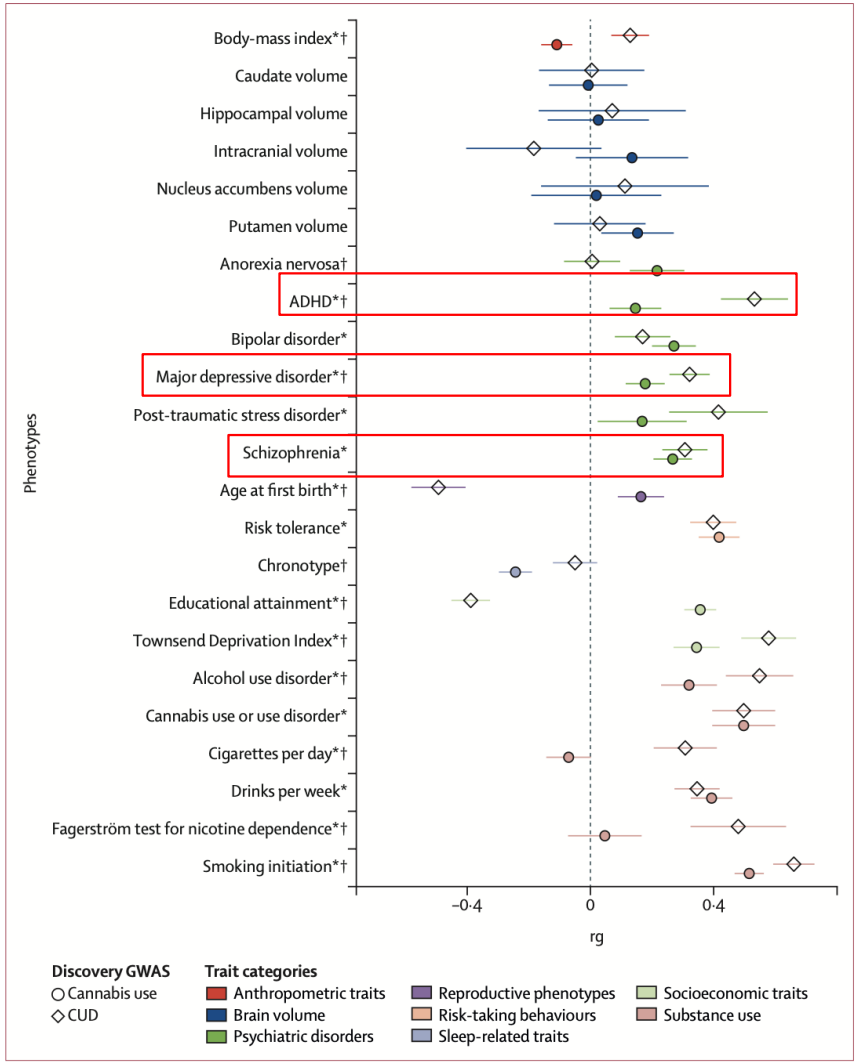
Childhood ADHD is associated with with **nicotine use by middle adolescence** (**OR = 2.36**).

The lifetime prevalence of **cannabis use disorder** (CUD) among **ADHD** patients is **26.9%** and the risk of CUD in the ADHD population is **2.85 higher** than in the general population

The prevalence of **cocaine use is 26.0%** and that of **cocaine use disorder is 10%**

Oliva et al. Prevalence of cocaine use and cocaine use disorder among adult patients with ADHD: A systematic review and meta-analysis. *J Psychiatr Res*. 2021;143:587-598.
Froude et al. The prevalence of cannabis use disorder in attention-deficit hyperactivity disorder: A clinical epidemiological meta-analysis. *J Psychiatr Res*. 2024;172:391-401.
Rohner et al. Prevalence of ADHD among Substance Use Disorder (SUD) Populations: Meta-Analysis. *Int J Environ Res Public Health*. 2023;20(2):1275.
Charach et al. Childhood attention-deficit/hyperactivity disorder and future substance use disorders: comparative meta-analyses. *J Am Acad Child Adolesc Psychiatry*. 2011;50(1):9-21.

CUD and ADHD liability are genetically correlated



Cannabis use disorder and cannabis use were genetically correlated, but they showed significantly different genetic correlations with 12 of the 22 traits we tested, suggesting at least partially different genetic underpinnings of cannabis use and cannabis use disorder.

Cannabis use disorder was **positively genetically correlated** with other psychopathology, including **ADHD, major depression, and schizophrenia.**

Johnson EC, Demontis D, Thorgeirsson TE, et al. A large-scale genome-wide association study meta-analysis of cannabis use disorder [published correction appears in Lancet Psychiatry. 2022 Apr;9(4):e12.

PREVALENCE OF SUBSTANCE USE DISORDERS IN THE ADHD POPULATION

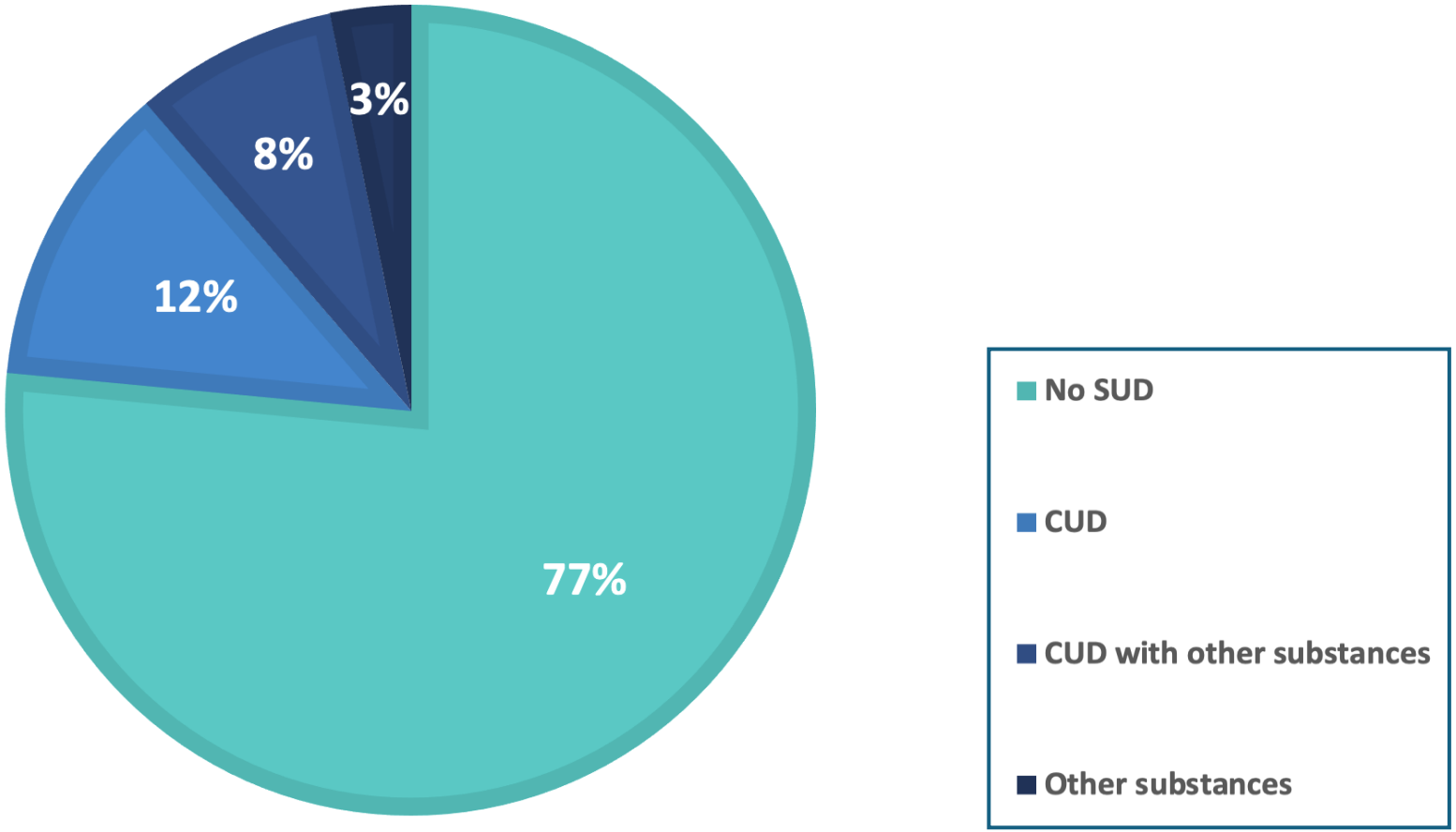
ENTIRE ADHD SAMPLE

Sample size = **469**
Mean age = **30.06**
Gender = *Female*: **56.3%**

ADHD with SUD

Size = **110**
Mean age = **29.25**
Gender = *Female*: **48.2%**

- **CUD (57)**
  Mean age = **27.35**
  Gender = *Female*: **49.1%**
- **CUD with other substances (38)**
  Mean age = **30.63**
  Gender = *Female*: **42.1%**
- **Other substances (15)**
  Mean age = **33**
  Gender = *Female*: **60%**



Δ9-THC:CBD for treating ADHD

Description of cannabis use by ADHD adults patietns often report: feeling calmer, less restelss, improved sleep and remain focused

30 adults ADHD pts
Randomized to
Sativex oromucosal spray (1:1 ratio of Δ9-THC:CBD 2,7 mg and 2,5 mg)
or **placebo**
Duration: **6 weeks** (with 2 weeks of flexible titration)
Patients discontiuned stimulants before starting the study

No signficant difference in cognitive performance (but a trend to better performances with sativex)
Signifcant improvement in hypercativity/impulsivity and to a **trend for inattention and emotinal libaility**.
Results did not meet significance following adjustment for multiple coparisons

Johnson EC, Demontis D, Thorgeirsson TE, et al. A large-scale genome-wide association study meta-analysis of cannabis use disorder [published correction appears in Lancet Psychiatry. 2022 Apr;9(4):e12.

Impact of ADHD+SUD comorbidity

ADHD is strongly associated with early age at onset and faster transition from less to more severe SUD

ADHD+SUD associated with more poly-substance use than SUD without ADHD

ADHD+SUD have more psychiatric comorbidities: antisocial and borderline personality disorders, bipolar disorders, PTSD, anxiety disorders

ADHD+SUD poorer treatment response for SUD

ADHD+SUD lower effectiveness of standard doses for the treatment of ADHD (effect size of 0.30 vs 0.57-0.72)

Levin FR, Mariani JJ, Pavlicova M, et al. Extended-Release Mixed Amphetamine Salts for Comorbid Adult Attention-Deficit/Hyperactivity Disorder and Cannabis Use Disorder: A Pilot, Randomized Double-Blind, Placebo-Controlled Trial. J Atten Disord. 2024;28(11):1467-1481.

The risk of under- and over-diagnosing of ADHD+SUD

ADHD-like symptoms associated to intoxication/withdrawal or the (interpersonal) consequences of SUD

Many consequences of ADHD (job loss, poor school performance) are also seen in SUD and can be attributed to the substance use

Adults with ADHD are dealing with symptoms since many years and have developed compensation startegies that can mask symptoms

SUD patients may exaggerate ADHD symptoms to obtain prescription of stimulants

Assessment should include: current ADHD symptoms, ADHD symptoms during childhood, family history of ADHD and SUD, school and occupational history, marriage, physical signs and comorbidity (collateral history taking)

ADHD symtpoms should be described in childhood and be present in period not affected by substance use

Crunelle CL, van den Brink W, Moggi F, et al. International Consensus Statement on Screening, Diagnosis and Treatment of Substance Use Disorder Patients with Comorbid Attention Deficit/Hyperactivity Disorder. *Eur Addict Res*. 2018;24(1):43-51.

ADHD assessment tools

The Short Version of the Adult ADHD Self-Report Scale (ASRS-SV)

Conners' Adult ADHD Rating Scale

Wender Utah Rating Scale (WURS)

Barkley Adult ADHD Rating Scale (BAARS-IV)

DIVA 5.0 (structure Interview for adult ADHD)

Crunelle CL, van den Brink W, Moggi F, et al. International Consensus Statement on Screening, Diagnosis and Treatment of Substance Use Disorder Patients with Comorbid Attention Deficit/Hyperactivity Disorder. *Eur Addict Res*. 2018;24(1):43-51.

ADHD+SUD

STIMULANTS and SUD RISK/PREVENTION

Stimulants and SUD

Do stimulants in ADHD increase the risk of subsequent SUD?

Do stimulants in ADHD reduce the risk of subsequent SUD?

Stimulants and long-term SUD risk: results from register studies

Sweedish register on more than **26.249 men and 12504 women** with **ADHD** at **4 years follow-up** (different ages but most adolescents and young adults)

Stimulant ADHD medication in 2006 and hazard ratio for substance abuse during 2009.

Medication	Hazard ratio for substance abuse during 2009							
	Confounder adjustment				Mediation analysis			
	Model 1: Adjusted for sex, age, and ADHD medication in 2009		Model 2: As in model 1 + other potential confounders before 2006		Model 3: As in model 2 + non-substance mediators 2006–2008		Model 4: As in model 3 + substance related mediators 2006–2008	
	Hazard ratio	95% Confidence interval	Hazard ratio	95% Confidence interval	Hazard ratio	95% Confidence interval	Hazard ratio	95% Confidence interval
All patients with an ADHD diagnosis								
Stimulant ADHD medication in January 1, 2006	0.52	0.42–0.66	0.69	0.57–0.84	0.77	0.65–0.93	0.87	0.74–1.03
Duration of treatment with stimulant ADHD medication 2006–2008 (in years)	0.80	0.73–0.88	0.87	0.80–0.94	0.89	0.82–0.96	0.95	0.88–1.02
All patients with an ADHD diagnosis and 15 years or younger in 1/1/2006								
Stimulant ADHD medication in January 1, 2006	0.33	0.20–0.56	0.38	0.23–0.64	0.42	0.26–0.70	0.45	0.27–0.74
Duration of treatment with stimulant ADHD medication 2006–2008 (in years)	0.72	0.61–0.86	0.76	0.63–0.90	0.77	0.65–0.92	0.80	0.68–0.94
All patients with an ADHD diagnosis and 20 years or older in 1/1/2006								
Stimulant ADHD medication in January 1, 2006	0.65	0.46–0.91	0.75	0.58–0.98	0.85	0.67–1.07	0.97	0.78–1.20
Duration of treatment with stimulant ADHD medication 2006–2008 (in years)	0.92	0.82–1.03	0.90	0.91–0.99	0.92	0.84–1.01	0.97	0.89–1.06

ADHD medication was **not associated with increased rates of substance abuse**.

Decrease in SUD (hospital visits, deaths, convictions) up to four years after medication

The **longer duration of ADHD medication**, the **lower the rate of substance abuse**.

Chang et al. Stimulant ADHD medication and risk for substance abuse. J Child Psychol Psychiatry. 2014

Brain Center FIRENZE

Stimulants and long-term SUD risk: results from register studies

ADHD Medication and Substance-Related Problems

Patrick D. Quinn, Ph.D., Zheng Chang, Ph.D., Kwan Hur, Ph.D., Robert D. Gibbons, Ph.D., Benjamin B. Lahey, Ph.D., Martin E. Rickert, Ph.D., Arvid Sjölander, Ph.D., Paul Lichtenstein, Ph.D., Henrik Larsson, Ph.D., Brian M. D'Onofrio, Ph.D.

Objective: Substance use disorders are major contributors to excess mortality among individuals with attention deficit hyperactivity disorder (ADHD), yet associations between pharmacological ADHD treatment and substance-related problems remain unclear. This study investigated concurrent and long-term associations between ADHD medication treatment and substance-related events.

Method: The authors analyzed 2005–2014 commercial health care claims from 2,993,887 (47.2% female) adolescent and adult ADHD patients. Within-individual analyses compared the risk of substance-related events (i.e., emergency department visits related to substance use disorders) during months in which patients received prescribed stimulant medication or atomoxetine relative to the risk during months in which they did not.

Results: In adjusted within-individual comparisons, relative to periods in which patients did not receive ADHD medication, male patients had 35% lower odds of concurrent substance-related events when receiving medication (odds ratio=0.65, 95% CI=0.64–0.67), and female patients had 31% lower odds of concurrent substance-related events (odds ratio=0.69, 95% CI=0.67–0.71). Moreover, male patients had 19% lower odds of substance-related events 2 years after medication periods (odds ratio=0.81, 95% CI=0.78–0.85), and female patients had 14% lower odds of substance-related events 2 years after medication periods (odds ratio=0.86, 95% CI= 0.82–0.91). Sensitivity analyses supported most findings but were less consistent for long-term associations among women.

Conclusions: These results provide evidence that receiving ADHD medication is unlikely to be associated with greater risk of substance-related problems in adolescence or adulthood. Rather, medication was associated with lower concurrent risk of substance-related events and, at least among men, lower long-term risk of future substance-related events.

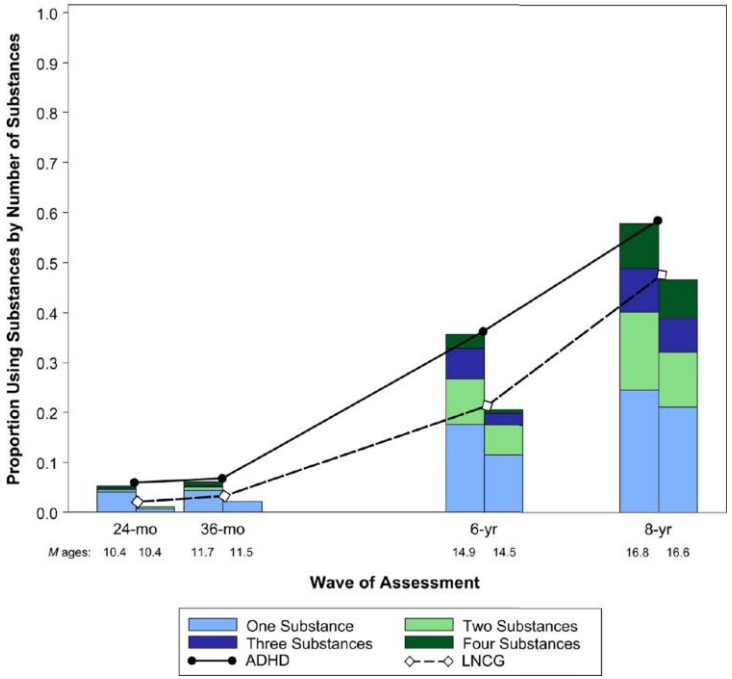
Am J Psychiatry 2017; 174:877–885; doi: 10.1176/appi.ajp.2017.16060686

Stimulants and long-term SUD risk: results from prospective studies

The Multimodal Treatment Study of ADHD (MTA)

579 children with ADHD Combined Type, aged 7 to 9.9 years, assigned to 14 months of medication management (titration followed by monthly visits); intensive behavioral treatment (parent, school, and child components, with therapist involvement gradually reduced over time); the two combined; or standard community care (treatments by community providers).

406 pts at 8 yy follow-up (mean age 17)



Only 32.5% of subjects were medicated over 50% of days in the past year

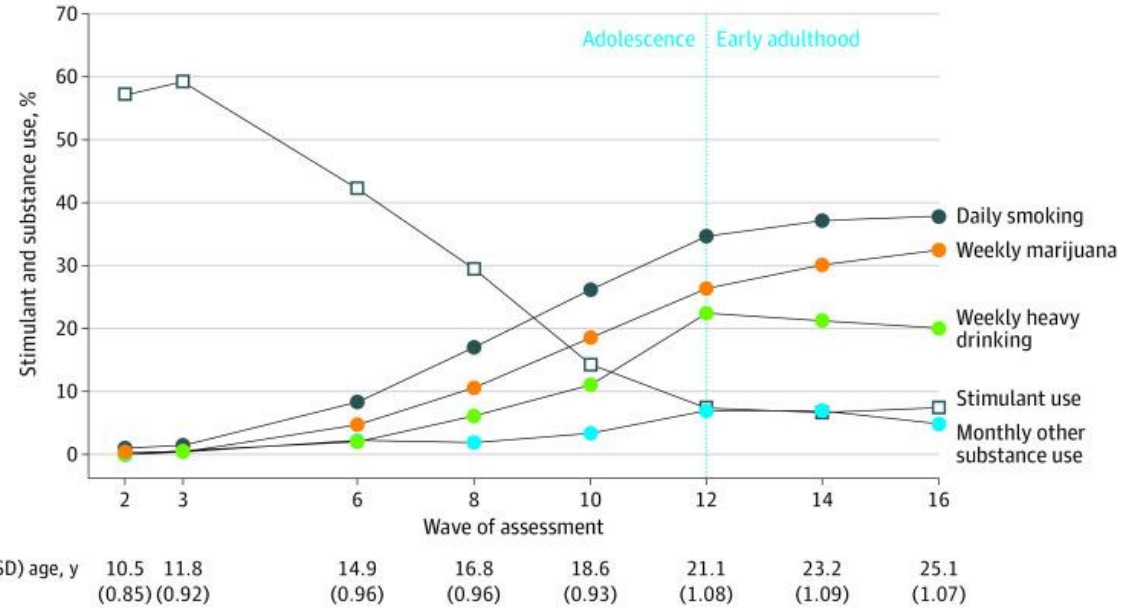
Substance Use was 35% in the ADHD group compared to 19.5% in the control group (the substances signficantly more used were: **alcohol**, **tobacco** and **cannabis**)

No associations between medications at baseline or proportion of medicated days in the last year and substance use at follow-up

Molina BS, Hinshaw SP, Eugene Arnold L, et al. Adolescent substance use in the multimodal treatment study of attention-deficit/hyperactivity disorder (ADHD) (MTA) as a function of childhood ADHD, random assignment to childhood treatments, and subsequent medication. *J Am Acad Child Adolesc Psychiatry*. 2013;52(3):250-263. doi:10.1016/j.jaac.2012.12.014

Stimulants and long-term SUD risk: results from prospective studies

579 children (mean age **8.5 yy**) **prosepctively** followed-up until the age of **25 yy**



Stimulants use dropped over adolescence and early adulthood (7.2%)

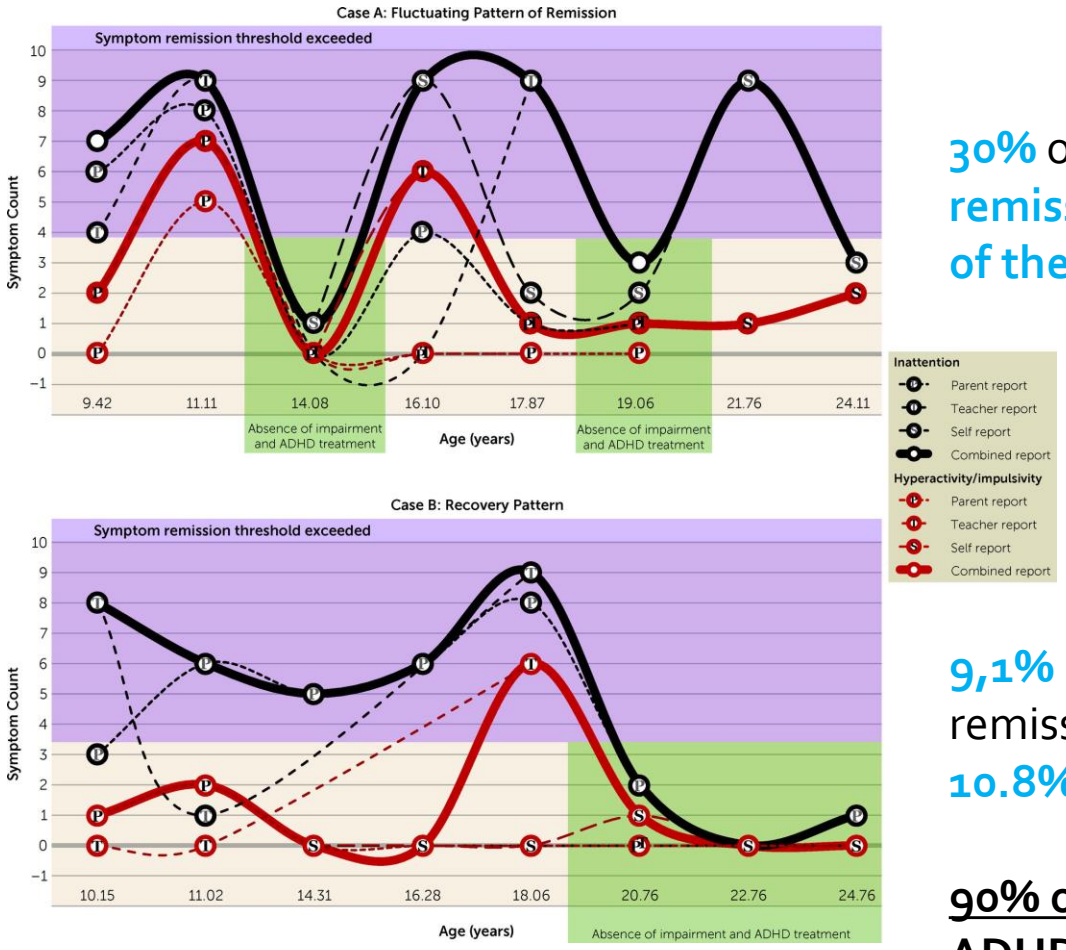
No evidence that current or prior stimulant treatment are associated with substance use after adjusting for developmental trends in substance use and age

No evidence that more years of stimulant treatment or continuous, uninterrupted stimulant treatment are associated with adulthood substance use

Molina BSG, Kennedy TM, Howard AL, Swanson JM, Arnold LE, Mitchell JT, Stehli A, Kennedy EH, Epstein JN, Hechtman LT, Hinshaw SP, Vitiello B. Association Between Stimulant Treatment and Substance Use Through Adolescence Into Early Adulthood. JAMA Psychiatry. 2023

Most ADHD have fluctuating symptoms from childhood to young adulthood

579 children (mean age **8.5 yy**) **prosepctively** followed-up until the age of **25 yy**



30% of children experience **full remission** at some point **but 60% of them experience recurrence**

9,1% recovery (sustained remission)
10.8% stable ADHD persistence

<u>90% of subjects with childhood ADHD still face ADHD in adulthood</u>

Molina BSG, Kennedy TM, Howard AL, Swanson JM, Arnold LE, Mitchell JT, Stehli A, Kennedy EH, Epstein JN, Hechtman LT, Hinshaw SP, Vitiello B. Association Between Stimulant Treatment and Substance Use Through Adolescence Into Early Adulthood. JAMA Psychiatry. 2023

Stimulants and SUD

Do stimulants in ADHD increase the risk of subsequent SUD?

No they do not increase the risk of SUD

Do stimulants in ADHD reduce the risk of subsequent SUD?

Mixed evidence, postitive evidence in register studies but negative in prospective studies (of note signficant decrease in stimulants use from childhood to adolescence and adulthood)

ADHD+SUD

TREATMENT

ADHD+SUD: principles of treatment

The treatment of ADHD should be integrated in the treatment of SUD and vice versa (ADHD symptoms could interfer with SUD treatment and SUD can complicate ADHD treatment: e.g. lower effect of stimulants)

First start SUD treatment, than treat ADHD

Risk of misuse and diversion of stimulants in SUD patients is higher in adolescents and young adults**: close monitoring and prefer extended release formulations**

Treatment of ADHD+SUD

PHARMACHOTHERAPY

High dose MAS-ER for ADHD and cocaine

126 adults ADHD+CUD pts
13 weeks randomization to:
MAS-ER 80 mg (+CBT) vs MAS-ER 60 mg (+CBT) vs Placebo (+CBT)

Both the 80 mg and 60 mg were superior to placebo for ADHD symptoms improvment (the 60 mg group superior to the 80 mg group, probably to agitation in the 80 mg group)

Both the 80 mg and 60 mg were superior to placebo for reduction of cocaine-positive weeks (the 80 mg group superior to the 60 mg group but not statistically significantly)

Both the 80 mg and 60 mg were superior to placebo for proportion of abstinence in the last 3 weeks (the 80 mg group superior to the 60 mg group (30.2% vs 17.5 % (vs 7% for placebo), but not statistically significantly)

Well tolerated but final average doses according to tolerability of the 80 mg and 60 mg groups were 70.8 mg and 53.3 mg

Levin FR, Mariani JJ, Specker S, et al. Extended-Release Mixed Amphetamine Salts vs Placebo for Comorbid Adult Attention-Deficit/Hyperactivity Disorder and Cocaine Use Disorder: A Randomized Clinical Trial. *JAMA Psychiatry*. 2015;72(6):593-602.

Temporal improvement of cocaine use after MAS-ER

126 adults ADHD+CUD pts

13 weeks randomization to:

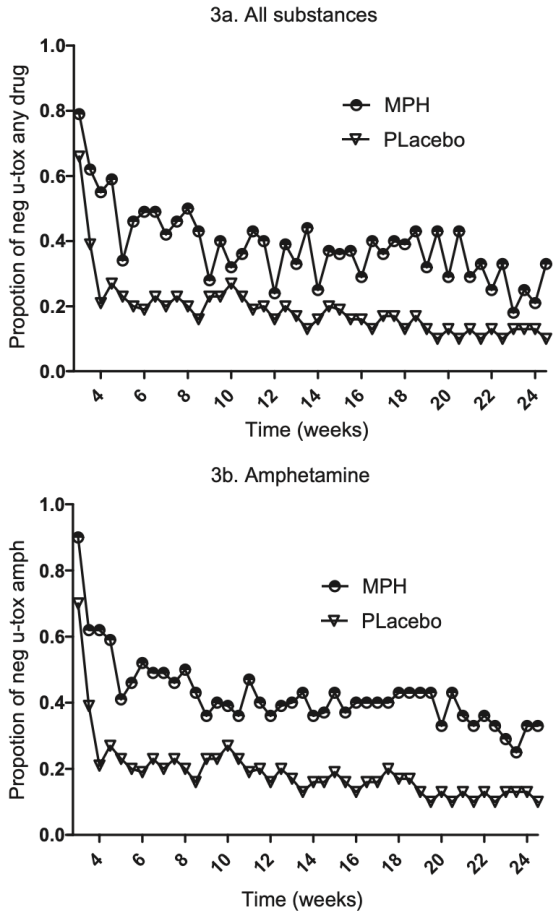
MAS-ER 80 mg (+CBT) vs MAS-ER 60 mg (+CBT) vs Placebo (+CBT)

24%	**ADHD improves before cocaine abstinence**
12%	**Cocaine abstinence occurs before ADHD improvement**
6%	**ADHD improvement and abstinence occur during the same week**
34%	**ADHD improves but abstinence never achieved**
6%	**Abstinence achieved but ADHD never improves**
18%	**Neither ADHD improvement nor abstinence**

Levin FR, Mariani JJ, Specker S, et al. Extended-Release Mixed Amphetamine Salts vs Placebo for Comorbid Adult Attention-Deficit/Hyperactivity Disorder and Cocaine Use Disorder: A Randomized Clinical Trial. *JAMA Psychiatry*. 2015;72(6):593-602.

High dose MPH in criminals with ADHD+SUD

54 adults ADHD+i.v. AMP use disorder pts
24 weeks randomization to:
OROS-MPH up ti 180 mg vs Placebo
Treatment starts 2 weeks before release



The MPH-treated group reduced their ADHD symptoms during the trial (*P* = 0.011) and had a **significantly higher proportion of drug-negative urines compared with the placebo group** (*P* = 0.047), including **more amphetamine-negative urines** (*P* = 0.019)

MPH treatment was well tolerated and SE were mainly mild

Konstenius M, Jayaram-Lindström N, Guterstam J, Beck O, Philips B, Franck J. Methylphenidate for attention deficit hyperactivity disorder and drug relapse in criminal offenders with substance dependence: a 24-week randomized placebo-controlled trial. *Addiction*. 2014;109(3):440-449. doi:10.1111/add.12369

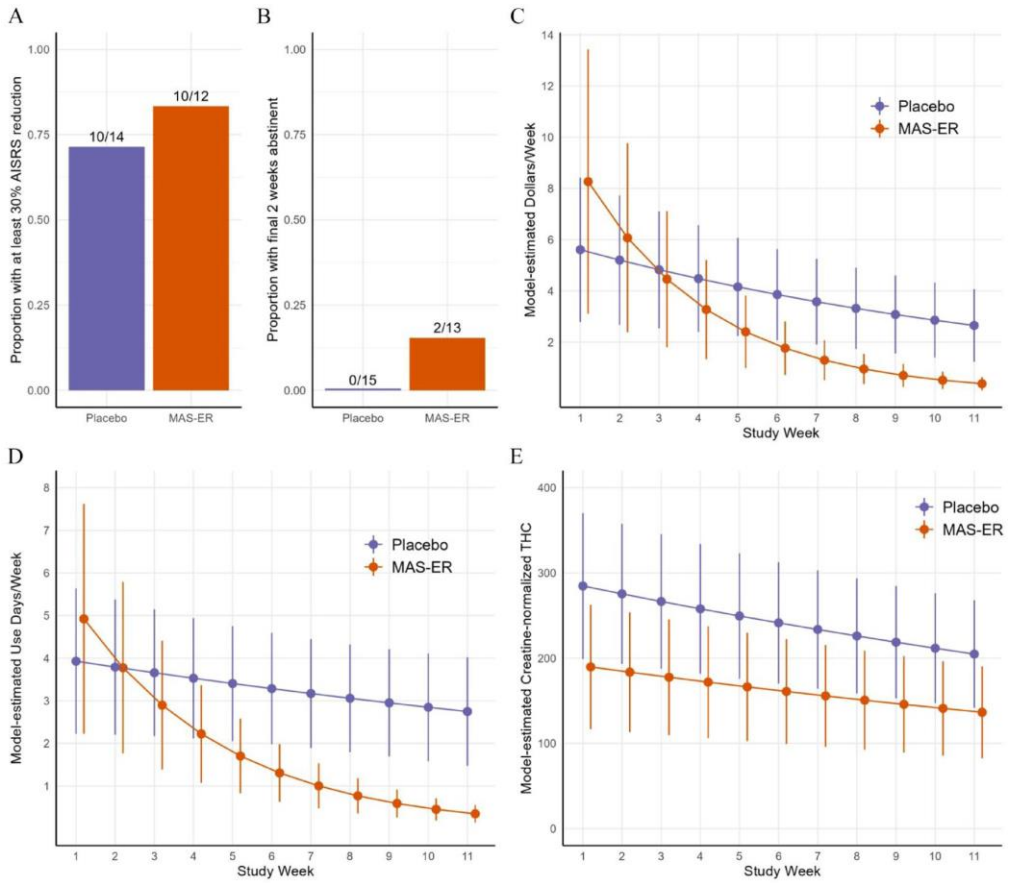
High dose MAS-ER for ADHD and cannabis

33 adults ADHD+CUD pts
12 weeks: **MAS-ER 80 mg** or **Placebo**
High dose since usual doses related to mixed results

Cannabis use decrease over time in the MAS-ER gorup but **% of abstinence at study-end did not differ** comapared to placebo

MAS-ER did not differ to placebo on ADHD response when using 30% symptom reduction criterium, but was **substantially superior to placebo when using 50% symptom reduction** criterium

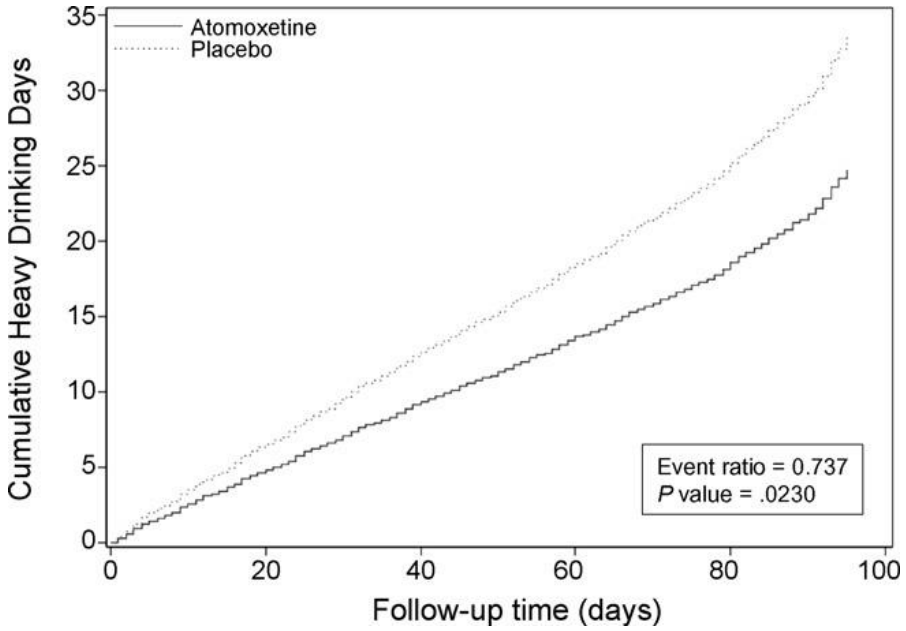
One pt had atrial fribirllation



Levin FR, Mariani JJ, Pavlicova M, et al. Extended-Release Mixed Amphetamine Salts for Comorbid Adult Attention-Deficit/Hyperactivity Disorder and Cannabis Use Disorder: A Pilot, Randomized Double-Blind, Placebo-Controlled Trial. J Atten Disord. 2024;28(11):1467-1481.

ATX for ADHD+AUD

80 adults ADHD+AUD pts (abstinence from at leats 4 days and mx 30 days)
12 weeks randomization to:
Atomoxetine 25-100 mg vs Placebo



ATX superior to placebo for ADHD symptoms

No significant differences between treatment groups occurred in time-to-relapse of heavy drinking (*P* = .93). However, **cumulative heavy drinking days were reduced 26% in atomoxetine-treated subjects versus placebo** (event ratio = 0.74, *P* = .023).

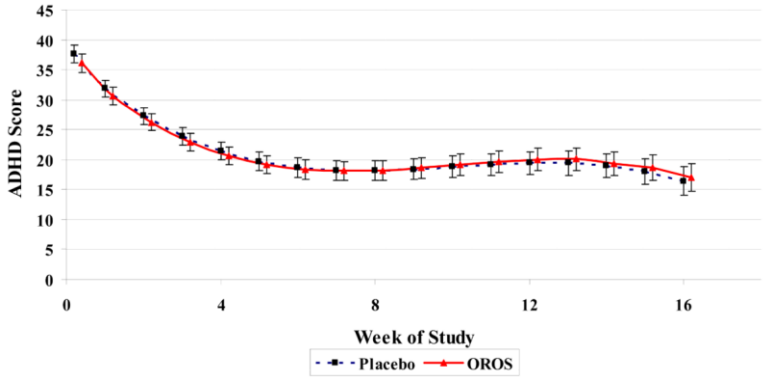
Wilens TE, Adler LA, Weiss MD, et al. Atomoxetine treatment of adults with ADHD and comorbid alcohol use disorders. *Drug Alcohol Depend*. 2008;96(1-2):145-154. doi:10.1016/j.drugalcdep.2008.02.009

OROS-MPH for ADHD and substance use in adolescents

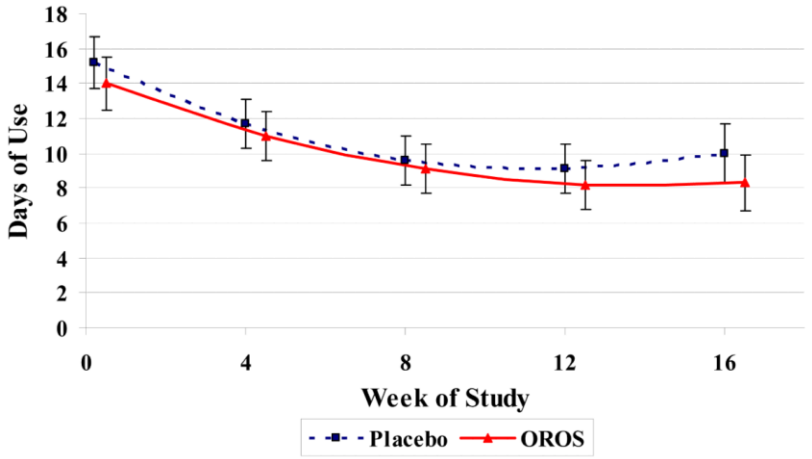
303 adolescents ADHD+SUD (non-tobacco) pts

16 weeks randomization to:

OROS-MPH 72 mg + CBT vs Placebo + CBT



OROS-MPH not superior to placebo for ADHD symptoms



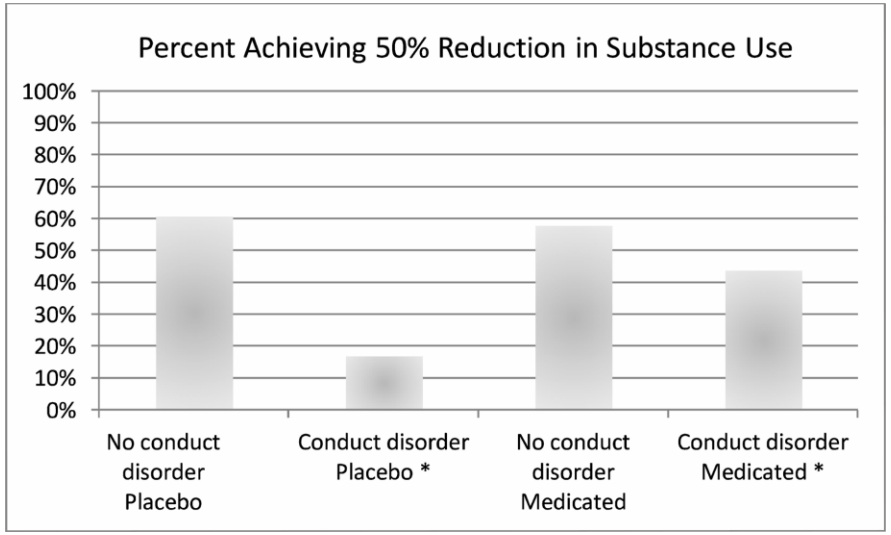
OROS-MPH did not differ on Change in Past 28 Day Non-Tobacco Drug Use

Riggs PD, Winhusen T, Davies RD, et al. Randomized controlled trial of osmotic-release methylphenidate with cognitive-behavioral therapy in adolescents with attention-deficit/hyperactivity disorder and substance use disorders. *J Am Acad Child Adolesc Psychiatry*. 2011;50(9):903-914.

OROS-MPH for ADHD and substance use in adolescents: predictors

303 adolescents ADHD+ SUD (non-tobacco) pts
16 weeks randomization to:
OROS-MPH 72 mg + CBT vs Placebo + CBT

- **SUD severity associated with poorer ADHD and SUD outcomes**
- **ADHD severity associated with better ADHD and SUD outcomes**
- **Comorbid conduct disorder, associated with poorer ADHD outcomes,**



Participants with comorbid conduct disorder who received OROS-MPH had 3.866 times the predicted odds to achieve a 50% reduction in substance abuse than those with comorbid conduct disorder who received placebo

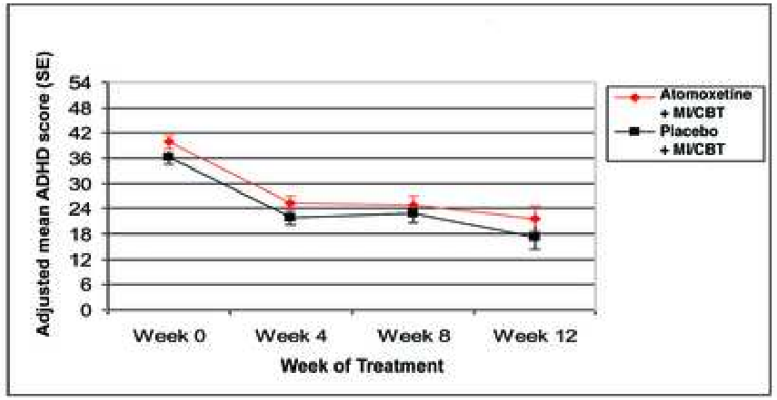
Tamm et al. Predictors of treatment response in adolescents with comorbid substance use disorder and attention-deficit/hyperactivity disorder. *J Subst Abuse Treat*. 2013;44(2):224-230.

Atomoxetine for ADHD and substance use in adolescents

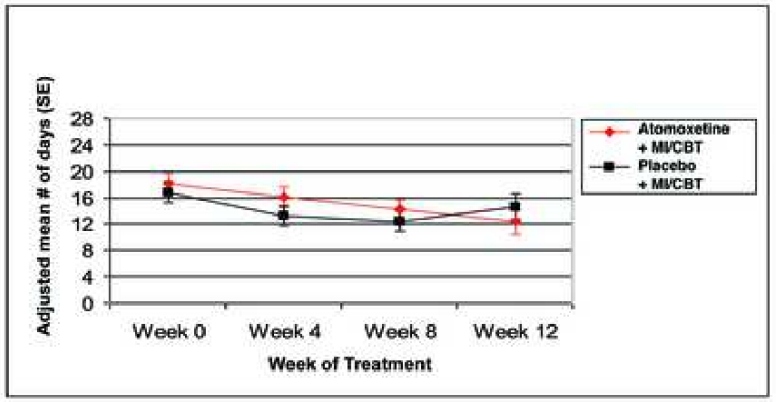
70 adolescents ADHD+ SUD (non-tobacco) pts

16 weeks randomization to:

Atomoxetine 25-100 mg + MI/CBT vs Placebo + MI/CBT



Atomoxetine not superior to placebo for ADHD symptoms



Atomoxetine did not differ on Change in Past 28 Day Non-Tobacco Drug Use

Tamm et al. Predictors of treatment response in adolescents with comorbid substance use disorder and attention-deficit/hyperactivity disorder. *J Subst Abuse Treat*. 2013;44(2):224-230.

Medications for ADHD+SUD: summary

In general, anti-ADHD medications have a lower effect on patients with ADHD+SUD

High dose of MAS and MPH seems to reduce cocaine and amphetamines abuse in adults

Some positive effect of Atomoxetine for alcohol use in adults

OROS-MPH has some positive effect on SUD in adolescents with severe ADHD and conduct disorder

Treatment of ADHD+SUD

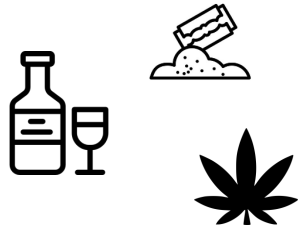
PSYCHOTHERAPY

Integreted CBT vs CBT for ADHD+SUD

119 adults ADHD+ SUD pts

randomization to:

Integrated/CBT (for both AUD and ADHD) vs CBT (for SUD)



	CBT/SUD	CBT/Integrated
Session 1	Introduction, advantages and disadvantages of substance use, effect of substance use on mental problems, enhancing motivation to become abstinent	Introduction, advantages and disadvantages of substance use, effect of substance use on mental problems, enhancing motivation to become abstinent
Session 2	Treatment goals and treatment plan	Treatment goals and treatment plan
Session 3	Self-control measures	Self-control measures
Session 4	Risk situations	Risk situations
Session 5	Analysis of functional elements in substance use	*ADHD: introduction of a cognitive model of ADHD, introduction of calendar and task list in notebook*
Session 6	Dealing with craving	Analysis of functional elements in substance use (similar to session 5 in CBT/SUD)
Session 7	Relapse and relapse prevention	*ADHD: problem solving*
Session 8	Social pressure	Dealing with craving (similar to session 6 in CBT/SUD)
Session 9	Optional theme: one of earlier themes can be repeated, or one of the themes 'changing of thoughts' or 'dealing with emotions' can be explored.	*ADHD: reducing distractibility*
Session 10	Evaluation	Relapse and relapse prevention (Similar to session 7 in CBT/SUD)
Session 11		*ADHD: mood problems*
Session 12		Social pressure (similar to session 8 in CBT/SUD)
Session 13		*ADHD: organizing paperwork*
Session 14		Optional theme: one of earlier themes can be repeated, or one of the themes 'changing of thoughts' or 'dealing with emotions' can be explored. (similar to session 9 in CBT/SUD)
Session 15		Evaluation (Similar to session 10 in CBT/SUD)

CBT/I more effective than CBT/SUD for ADHD symptoms. For other secondary outcomes, including substance use, no differences were present.

van Emmerik-van Oortmerssen K, Vedel E, Kramer FJ, et al. Integrated cognitive behavioral therapy for ADHD in adult substance use disorder patients: Results of a randomized clinical trial. *Drug Alcohol Depend*. 2019;197:28-36. doi:10.1016/j.drugalcdep.2018.12.023

Treatment of ADHD+SUD

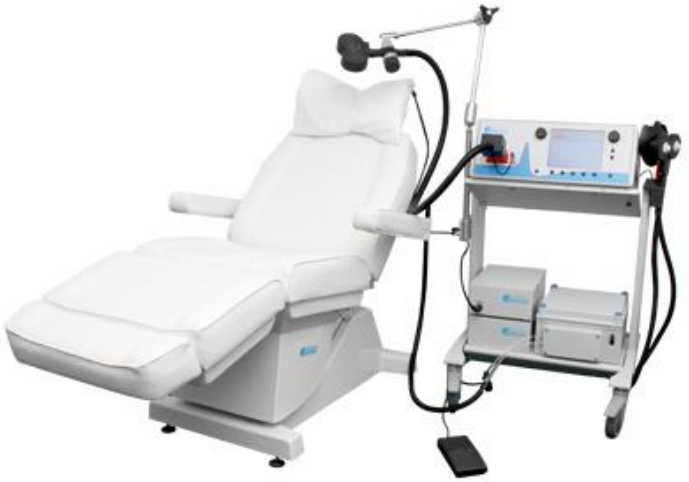
NEUROMODULATION

TMS for cocaine use disorder

Progress in Neuro-Psychopharmacology and Biological Psychiatry
Volume 116, 8 June 2022, 110513

Repetitive transcranial magnetic stimulation in treatment-seeking subjects with cocaine use disorder: A randomized, double-blind, sham-controlled trial

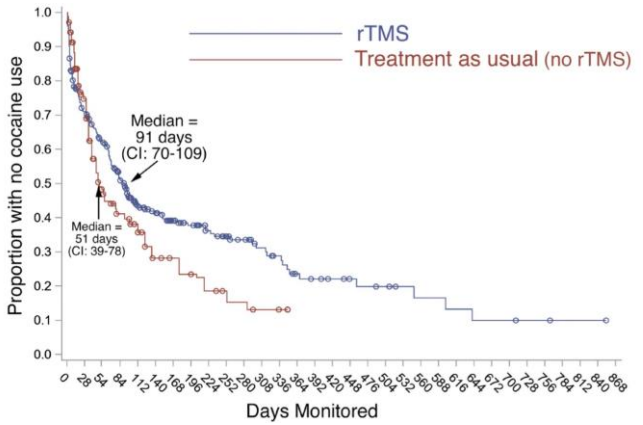
Giovanni Martinotti [a b c 1], Mauro Pettorruso [a 1], Chiara Montemitro [a d], Primavera Alessandra Spagnolo [d e], Cecilia Acuti Martellucci [f], Francesco Di Carlo [a], Fabrizio Fanella [g], Massimo di Giannantonio [a], the Brainswitch Study Group [2]



Long-Term Outcome of Repetitive Transcranial Magnetic Stimulation in a Large Cohort of Patients With Cocaine-Use Disorder: An Observational Study

*Graziella Madeo [1], Alberto Terraneo [1], Stefano Cardullo [1], Luis J. Gómez Pérez [1], Nicola Cellini [2,3], Michela Sarlo [2,3], Antonello Bonci [4] and Luigi Gallimberti [1]**

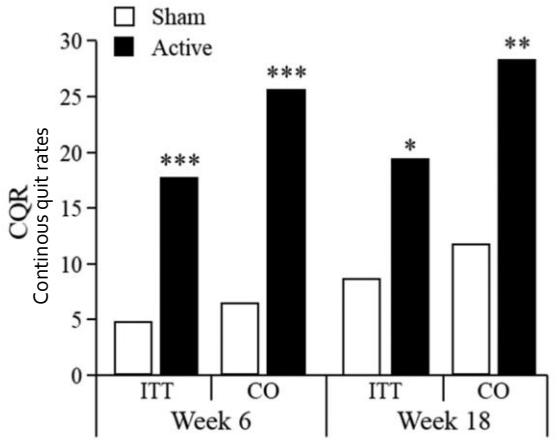
[1] Novella Fronda Foundation, Padua, Italy, [2] Department of General Psychology, University of Padua, Padua, Italy, [3] Padova Neuroscience Center, University of Padua, Padua, Italy, [4] Global Institutes on Addictions, Miami, FL, United States

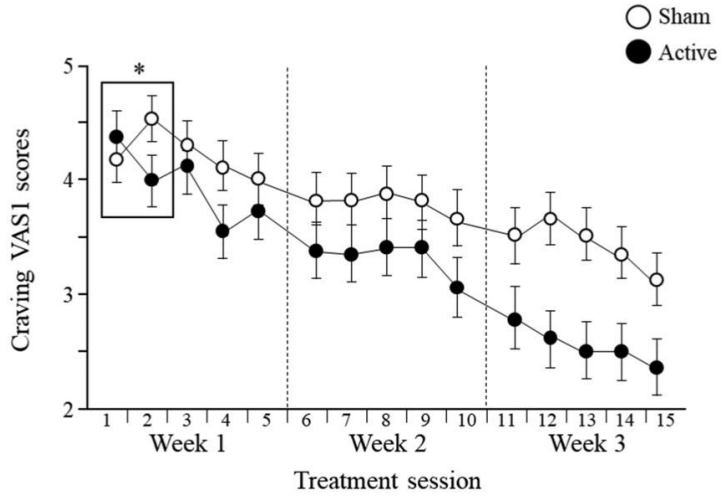


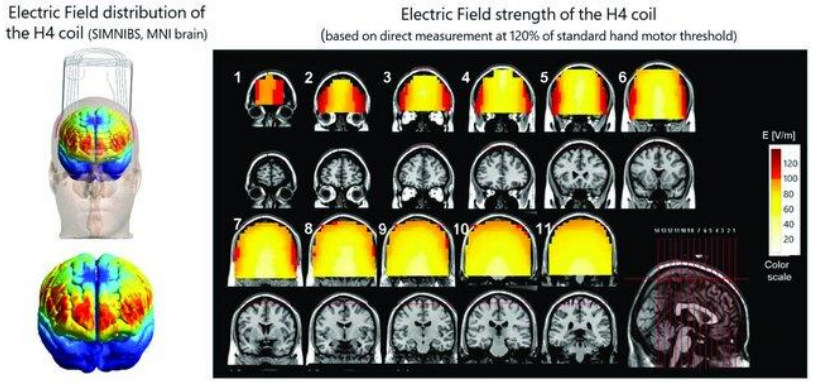
Martinotti G, Pettorruso M, Montemitro C, et al. Repetitive transcranial magnetic stimulation in treatment-seeking subjects with cocaine use disorder: A randomized, double-blind, sham-controlled trial. *Prog Neuropsychopharmacol Biol Psychiatry*. 2022;116:110513. doi:10.1016/j.pnpbp.2022.110513

dTMS for tobacco use disorder

dTMS (Brainsway H_4 coil) of bilateral insula/lateral preforntal cortex preceded by symptoms provocation







Zangen A, Moshe H, Martinez D, et al. Repetitive transcranial magnetic stimulation for smoking cessation: a pivotal multicenter double-blind randomized controlled trial. *World Psychiatry*. 2021;20(3):397-404. doi:10.1002/wps.20905 2017

Future directions

Psychedelic Assisted Psychotherapy (PAP)

Review > J Psychoactive Drugs. 2023 Nov-Dec;55(5):612-630.
doi: 10.1080/02791072.2023.2190319. Epub 2023 Mar 18.

Psychedelic Treatments for Substance Use Disorder and Substance Misuse: A Mixed Methods Systematic Review

Raman Sharma, Rachel Batchelor [1], Jacqueline Sin [1]

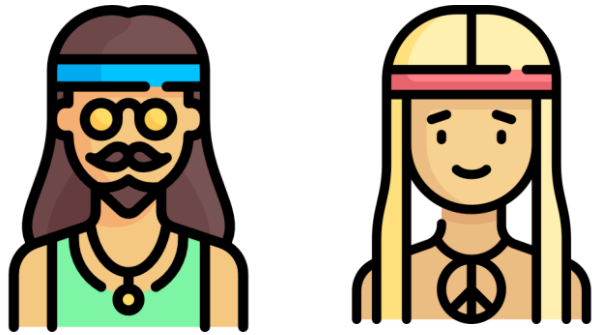
Affiliations + expand
PMID: 36933948 DOI: 10.1080/02791072.2023.2190319

Review > Pharmacol Res. 2024 Jan:199:106998. doi: 10.1016/j.phrs.2023.106998.
Epub 2023 Nov 28.

IUPHAR-review: The integration of classic psychedelics into current substance use disorder treatment models

David B Yaden [1], Andrea P Berghella [2], Peter S Hendricks [3], Mary E Yaden [4], Michael Levine [4], Julia S Rohde [4], Sandeep Nayak [4], Matthew W Johnson [4], Albert Garcia-Romeu [4]

Affiliations + expand
PMID: 38029805 DOI: 10.1016/j.phrs.2023.106998
Free article



Review > Expert Rev Neurother. 2017 Feb;17(2):203-212.
doi: 10.1080/14737175.2016.1220834. Epub 2016 Aug 12.

Psilocybin for treating substance use disorders?

Bas T H de Veen [1], Arnt F A Schellekens [2], Michel M M Verheij [1], Judith R Homberg [1]

Affiliations + expand
PMID: 27684102 DOI: 10.1080/14737175.2016.1220834

Clinical case

 28 anni
Adottato all'età di 2 anni e mezzo dopo istituzionalizzazione.
Basso peso alla nascita e scarsa crescita (trattata con somatotropina)
Tiroidite di Hashimoto e celiachia
Dislessia e discalculia diagnosticata dalle elementari
ADHD diagnosticato ma non trattato farmacologicamente (solo CBT)
Cannabis e amfetamine dall'adolescenza
Bocciato due volte per aspetti oppositivi-provocatori.
Intorno ai 17-18 anni viene prescritto valproato e risperidone con modesti effetti. A 18 anni anche scappato di casa.
In comunità dai 19 anni ai 26 anni.
Esce e ricaduta con uso quasi quotidiano di ketamina, alterazione dei ritmi, vissuti di inadegutezza su scuole serali che fanno da trigger per ricadute
Instabilità affettiva

Daridorexant / Litio / Atomoxetina
rTMS, 15 Hz left DLPFC
Psychotherapy (Motivational Interviewing/CBT)

Conclusions

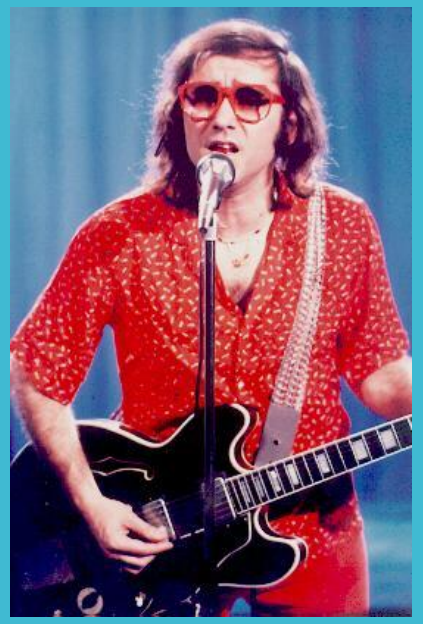
ADHD and SUD often co-occur and they negatively impact on each other

Stimulants do not increase the risk of subsequent SUD, the data on their preventive potential are mixed

The treatment of ADHD should be integrated in the treatment of SUD and vice versa

Stimulants for ADHD-SUD tend to be lesse effective and high doses should be considered

Neuromodulation (rTMS) could be an option for ADHD-SUD patients



THANK YOU FOR YOUR ATTENTION

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www.braincenterfirenze.it