MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

Adolescent Substance Use and Use Disorders

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Faculty Disclosure

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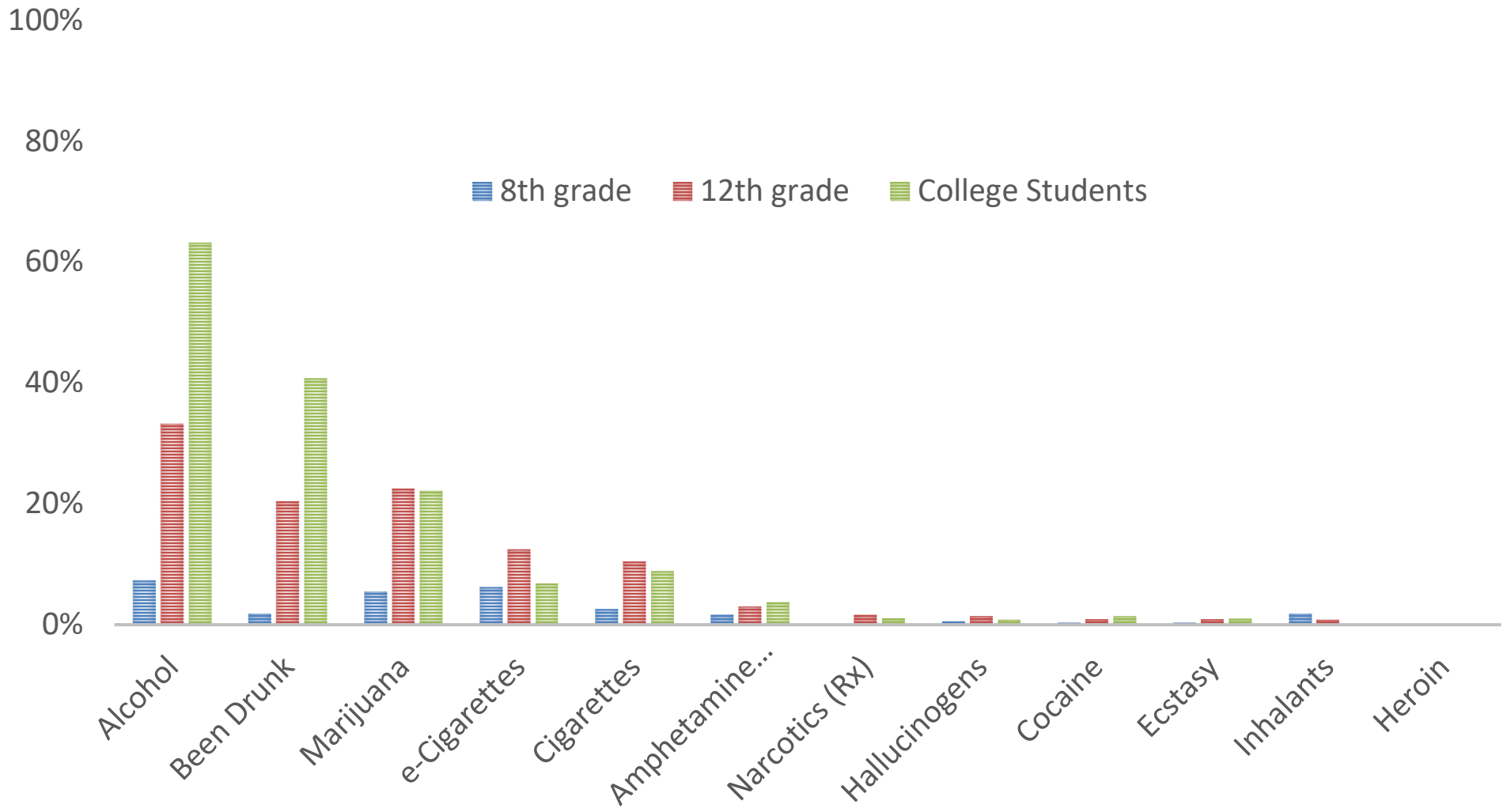
- Kempharm, Otsuka, NIH (NIDA), Ironshore, Vallon
- Licensing agreement with Ironshore (Before School Functioning Questionnaire)
- Clinical care: MGH, Bay Cove Human Services, Gavin/Phoenix, National Football League (ERM Associates), Major/Minor League Baseball
- (Co)Edited Straight Talk About Psychiatric Medications for Kids (Guilford); ADHD Across the Lifespan (Cambridge) , MGH Comprehensive Clinical Psychiatry (Elsevier), MGH Psychopharmacology and Neurotherapeutics (Elsevier)

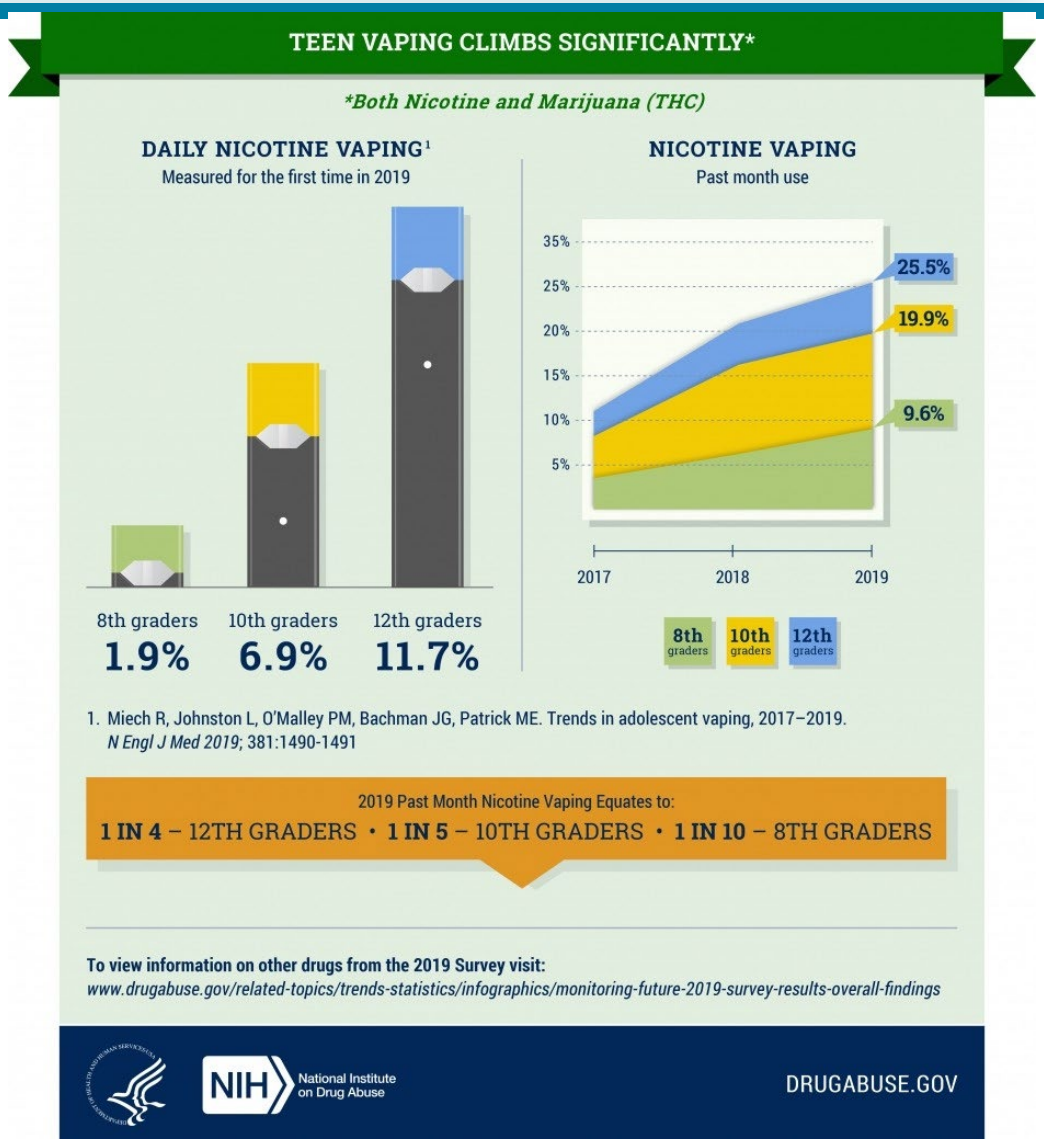
Some of the medications discussed may not be FDA approved in the manner in which they are discussed including diagnosis(es), combinations, age groups, dosing, or in context to other disorders (e.g., substance use disorders)

Past Month Substance Use in Adolescents

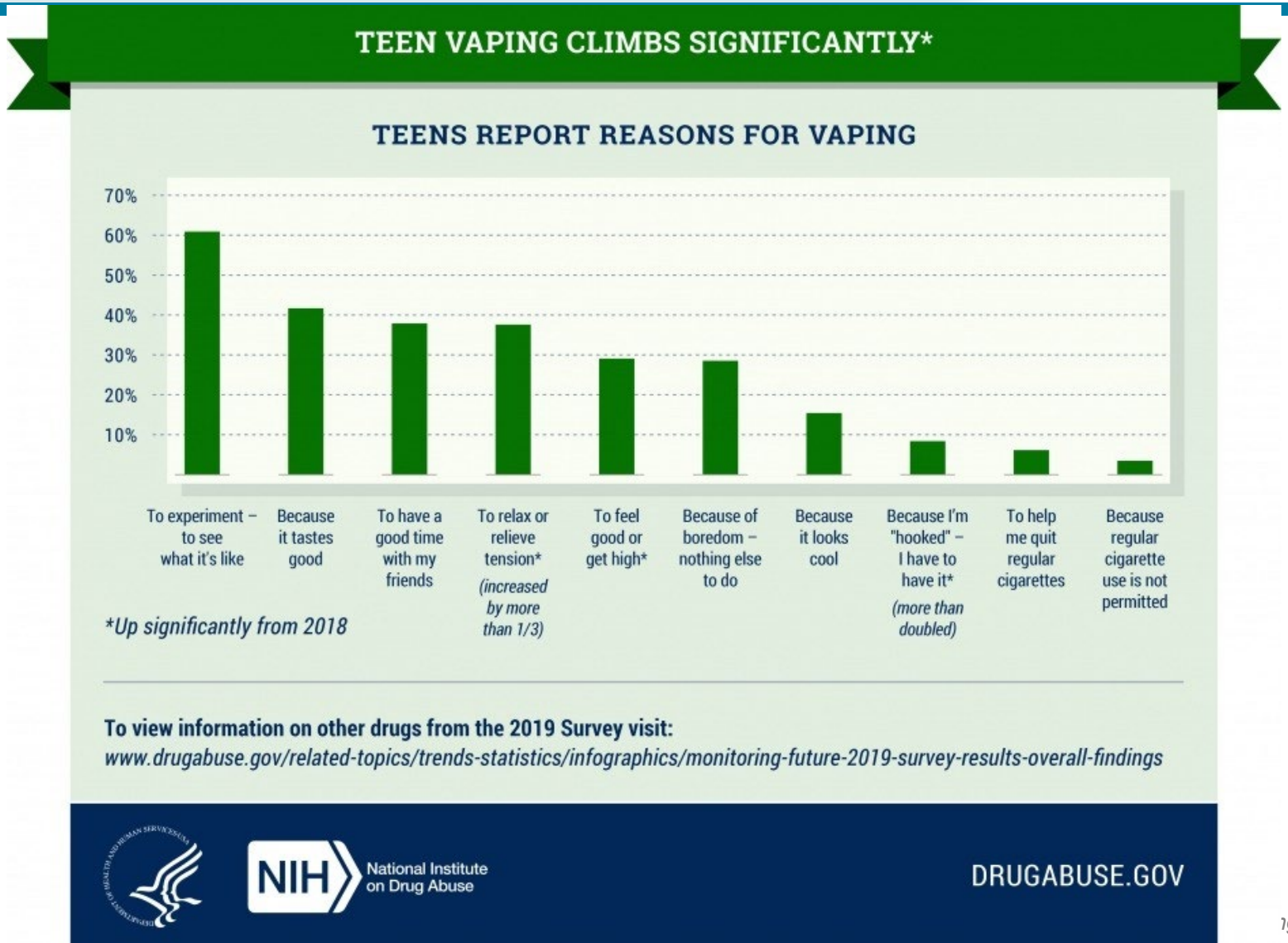


Miech et al., Monitoring the Future, 2017

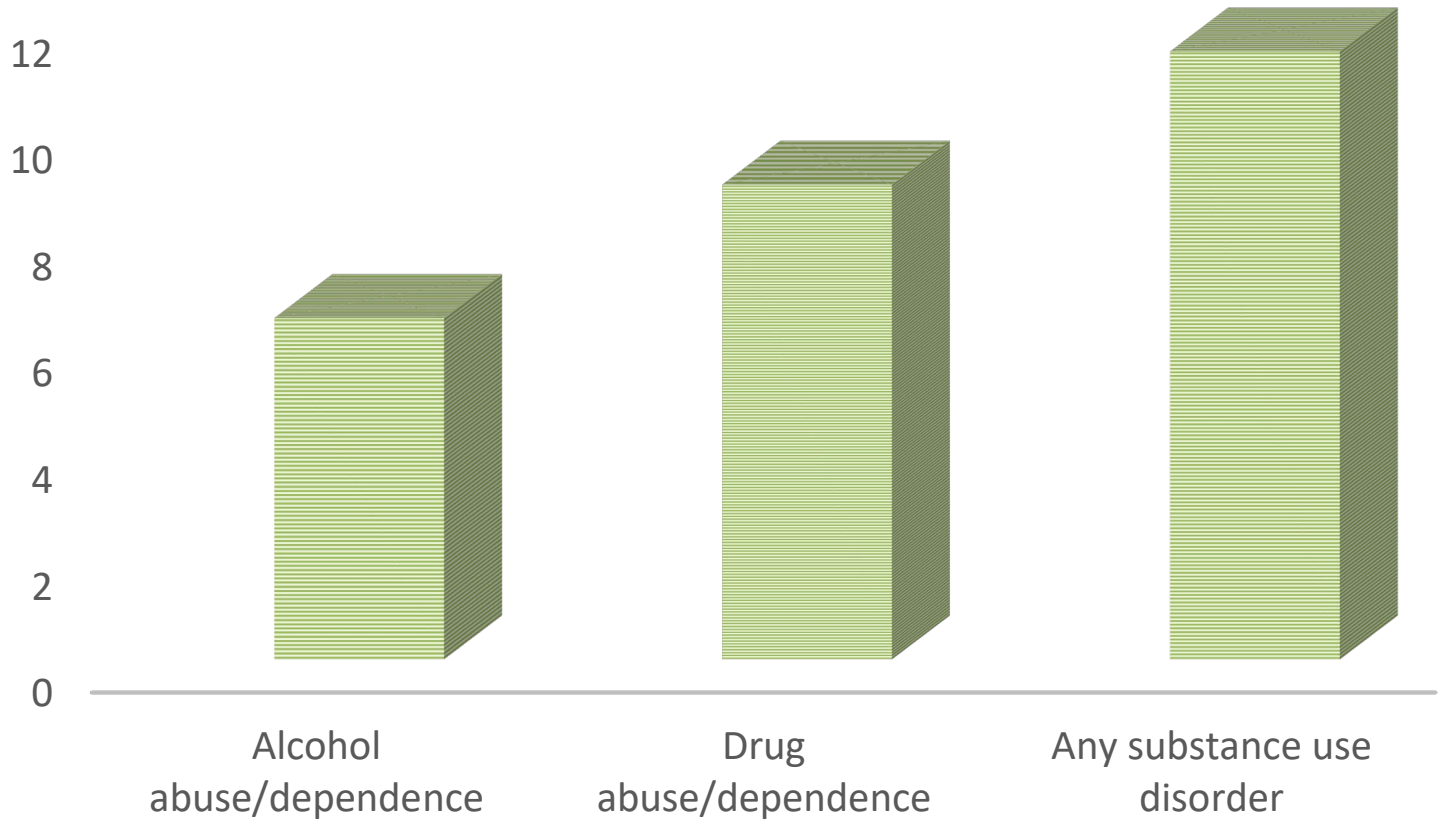
Nicotine Vaping is Increasing in Kids (Monitoring the Future, 2019)



Reasons for Teen Vaping (Marijuana)

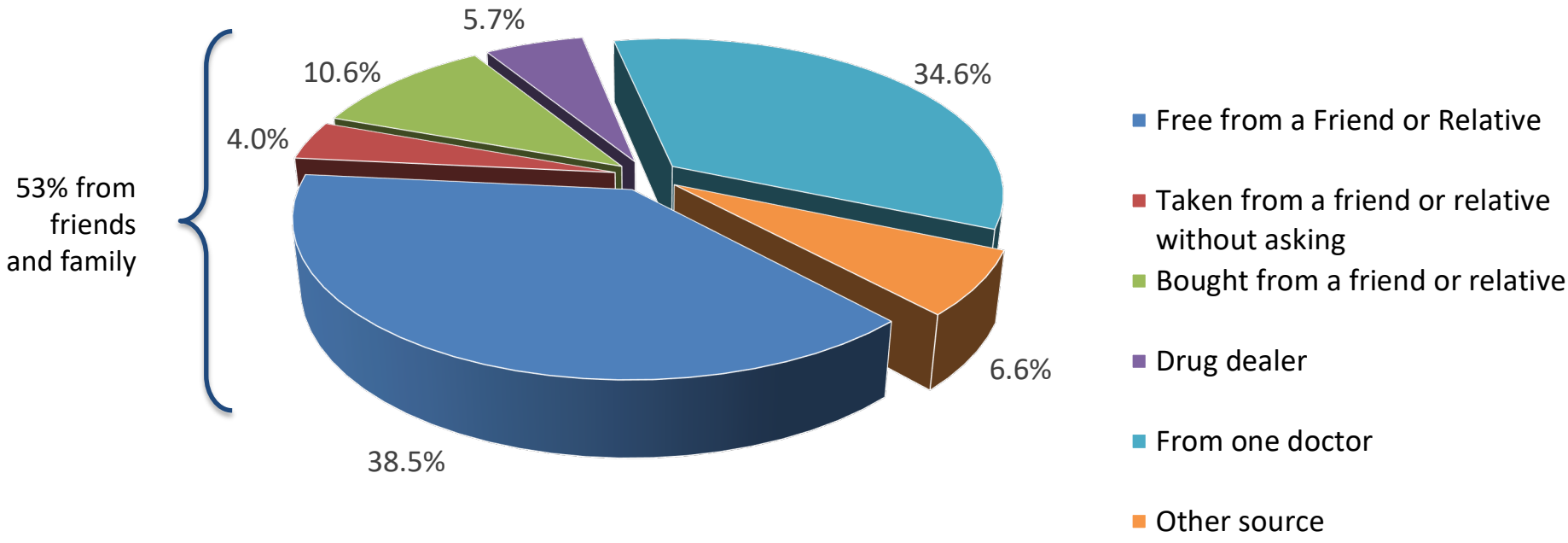


Lifetime Prevalence of DSM-IV Substance Use Disorders in the National Comorbidity Survey-Adolescent (NCS-A)



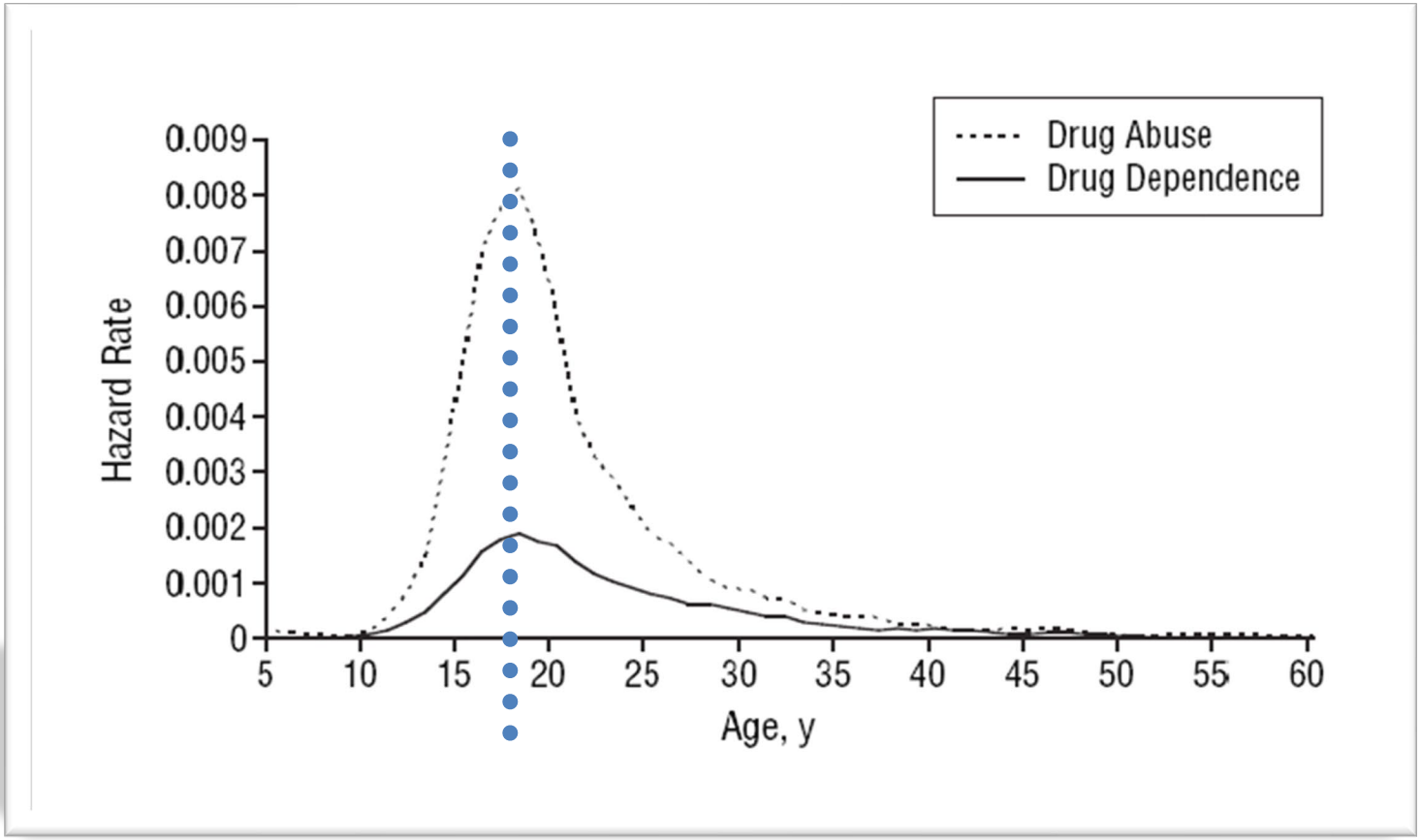
Merikangas et al. J.Am.Acad.Child Adolesc.Psychiatry, 2010;49(10):980-989

Sources of Pain Relievers for Most Recent Nonmedical Use among Past Users



Center for Behavioral Health Statistics and Quality. (2018). 2017 National Survey on Drug Use and Health: Detailed Tables. Substance Abuse and Mental Health Services Administration, Rockville, MD. www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHDetailedTabs2017/NSDUHDetailedTabs2017.pdf. Accessed June 13, 2019.

Drug Use Disorders Onset in Young People



Compton et al. Arch Gen Psychiatry/ Vol 64, May 2007; 45(11): 1294 - 1303

Juvenile SUD: Overview

- Definitions
  - **Use** - at least once [often stratified in reports as past 30d, past year]
  - **Misuse** - emergence of pattern of use
  - **Substance Use Disorder (DSM V)** - pattern of misuse with impairment and/or consequences, inability to control use, use despite consequences, physiological symptoms
    - Graded mild-severe
    - No differentiation between abuse vs dependence

Major Brain Circuits Involved in Addiction

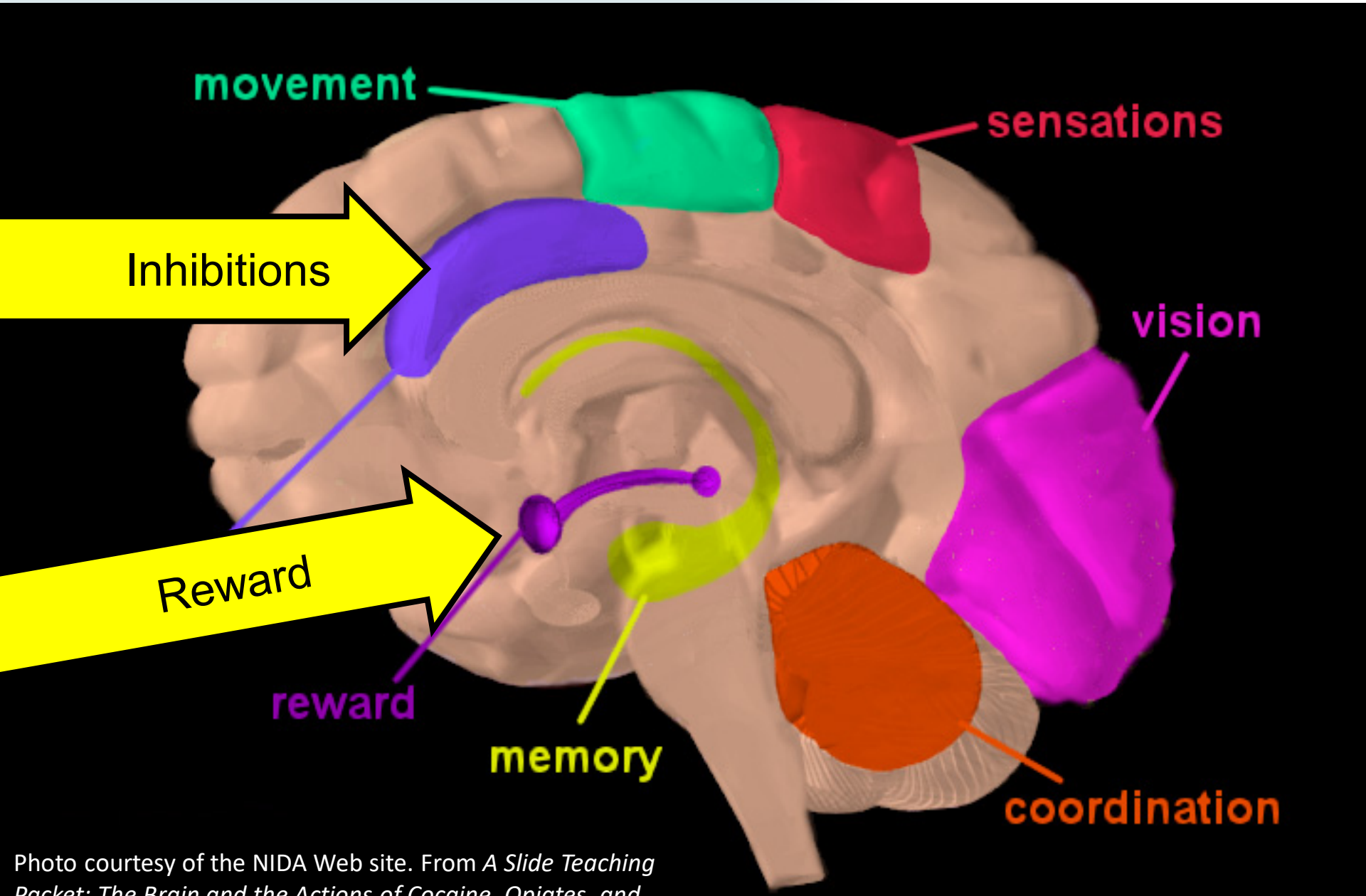


Photo courtesy of the NIDA Web site. From *A Slide Teaching Packet: The Brain and the Actions of Cocaine, Opiates, and Marijuana.*

Substance	Mechanism of Action
Alcohol	GABA, opioid agonist; NMDA antagonist
Cocaine	Blocks re-uptake of dopamine
Amphetamines	Stimulate dopamine release
PCP, ketamine	NMDA antagonist
Opioids	Mu, delta, and kappa agonism
Cannabis	CB1 agonist
MDMA (“ecstasy”)	5HT release and re-uptake inhibition; mild DA and NE reuptake inhibition
LSD (“Acid”)	5HT2a agonism leading to increased glutamate?

Addiction Pharmacology

Adapted from Textbook of SUD Tx: Galanter; APA Press 2013

Juvenile SUD: Risk and Protective Factors

Familial - runs in families

Genetic – 50% accounted for by "genes"

Environmental – Values, patterns, availability

Self medication – Symptoms, affect intolerance

Wilens et al., 2000; 2002, 2005, 2013;
Nunes et al. 2003;
Rhee et al. 2003;
Yule et al. AJA 2013

Juvenile SUD: Risk and Protective Factors

Self esteem issues

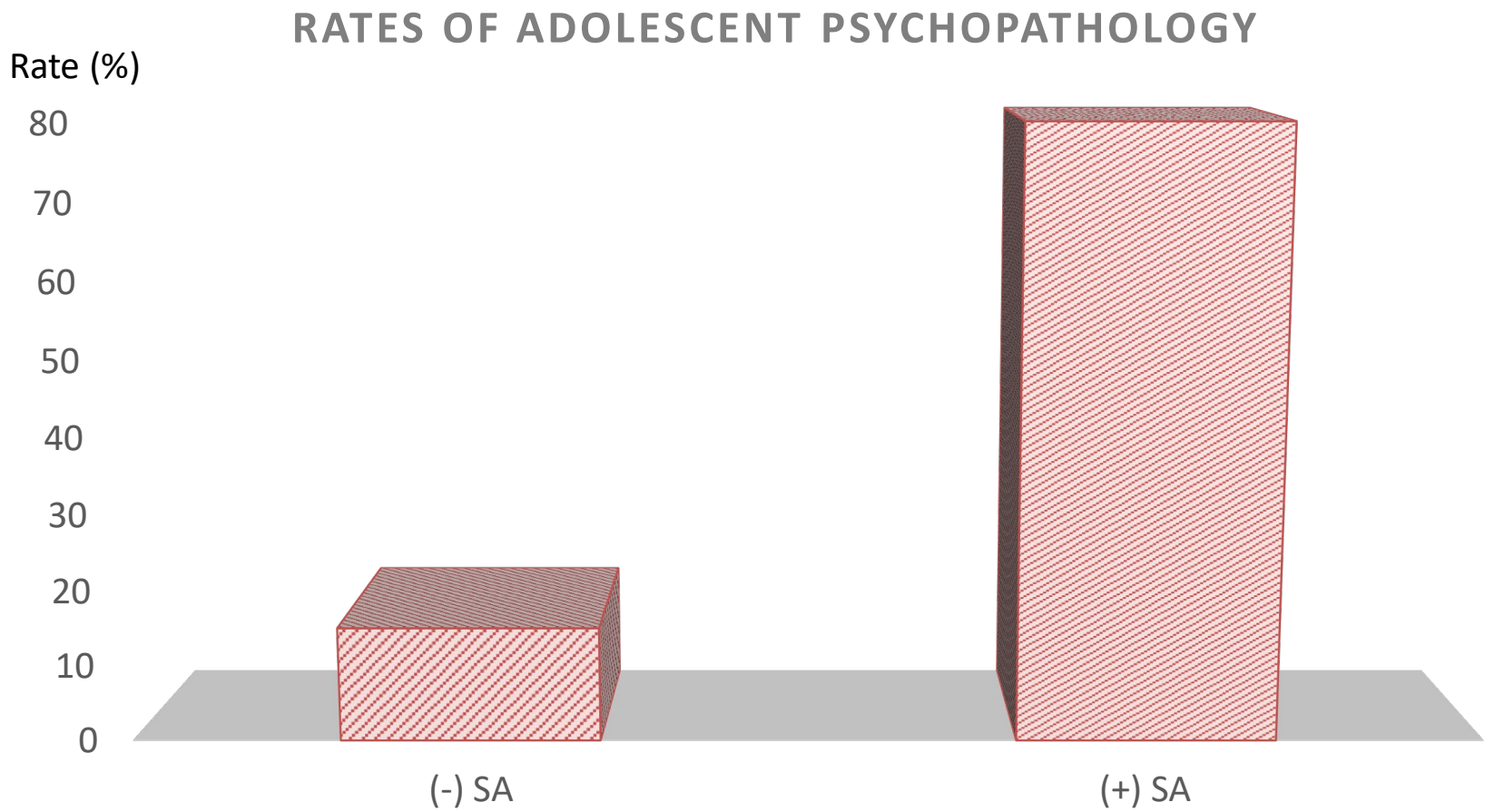
- Poor self esteem or image linked to later SUD
- Poor ego development linked to SUD
- SUD exacerbates self esteem issues

Dynamic issues

- Self-medication - amelioration of specific symptoms
- Affect tolerance - use of substance to blunt affect states
- Familial Patterns and modeling

Khantzian et al. Am J Add, 2012

Juvenile SUD Overlaps with Psychopathology



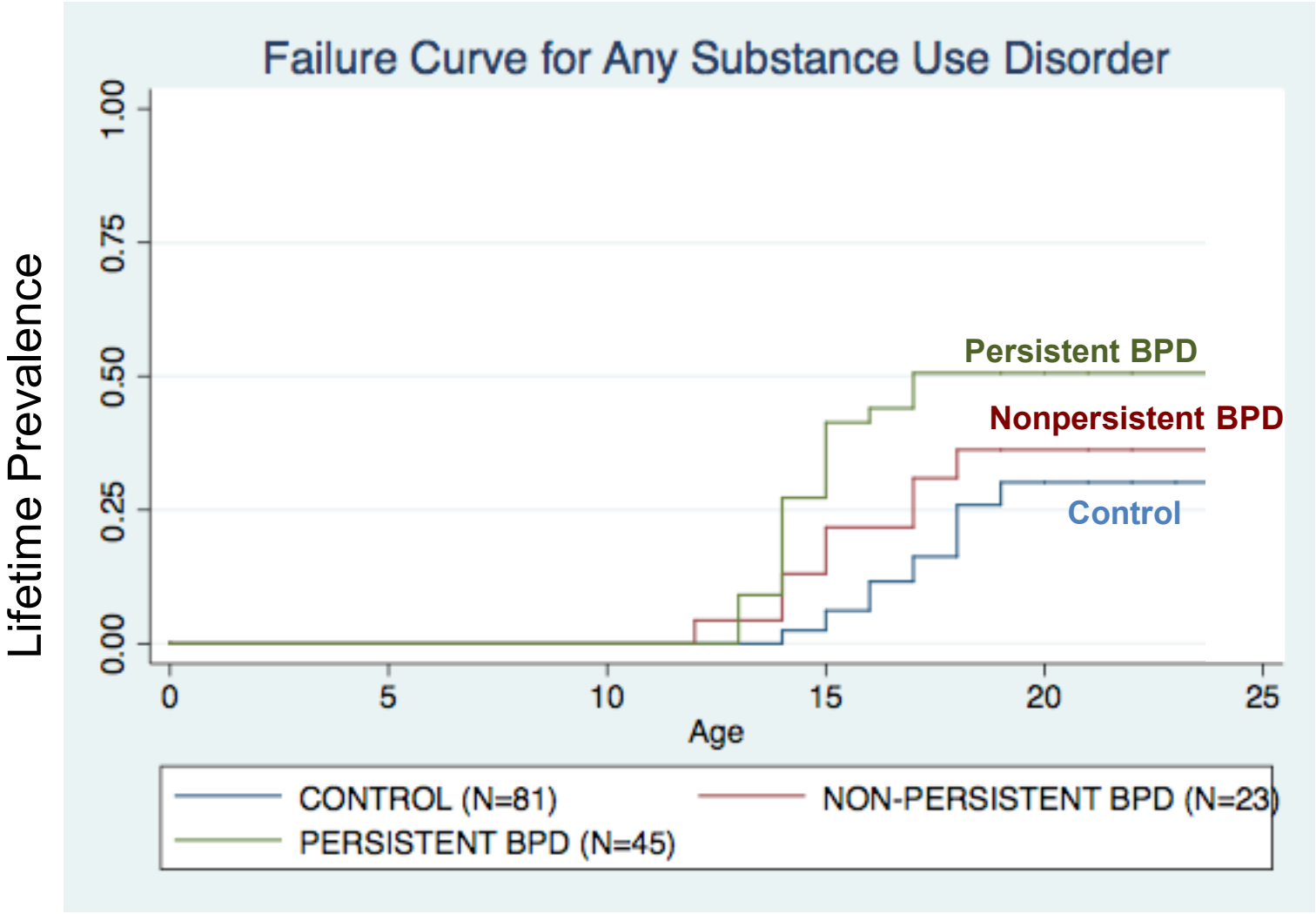
Costello et al., 1998; Buckstein 1989; Kandel, 1996; Weinberg, 1999:Kramer et al., 2003; Tims et al., 2003

Common Psychopathology in Adol SUD

- **Conduct Disorder**
  - High risk for SUD (80-90%)
  - Examine for comorbid mood
- **ADHD**
  - 2 fold risk for SUD
  - 50% of adol SUD with ADHD
  - Treatment reduces SUD
- **Anxiety/PTSD**
  - 2 fold risk for SUD
  - Anxiety frequent “cue” for substance use
  - PTSD precedes, or is result of SUD
- **Depression**
  - 2 fold risk for SUD (precedes SUD)

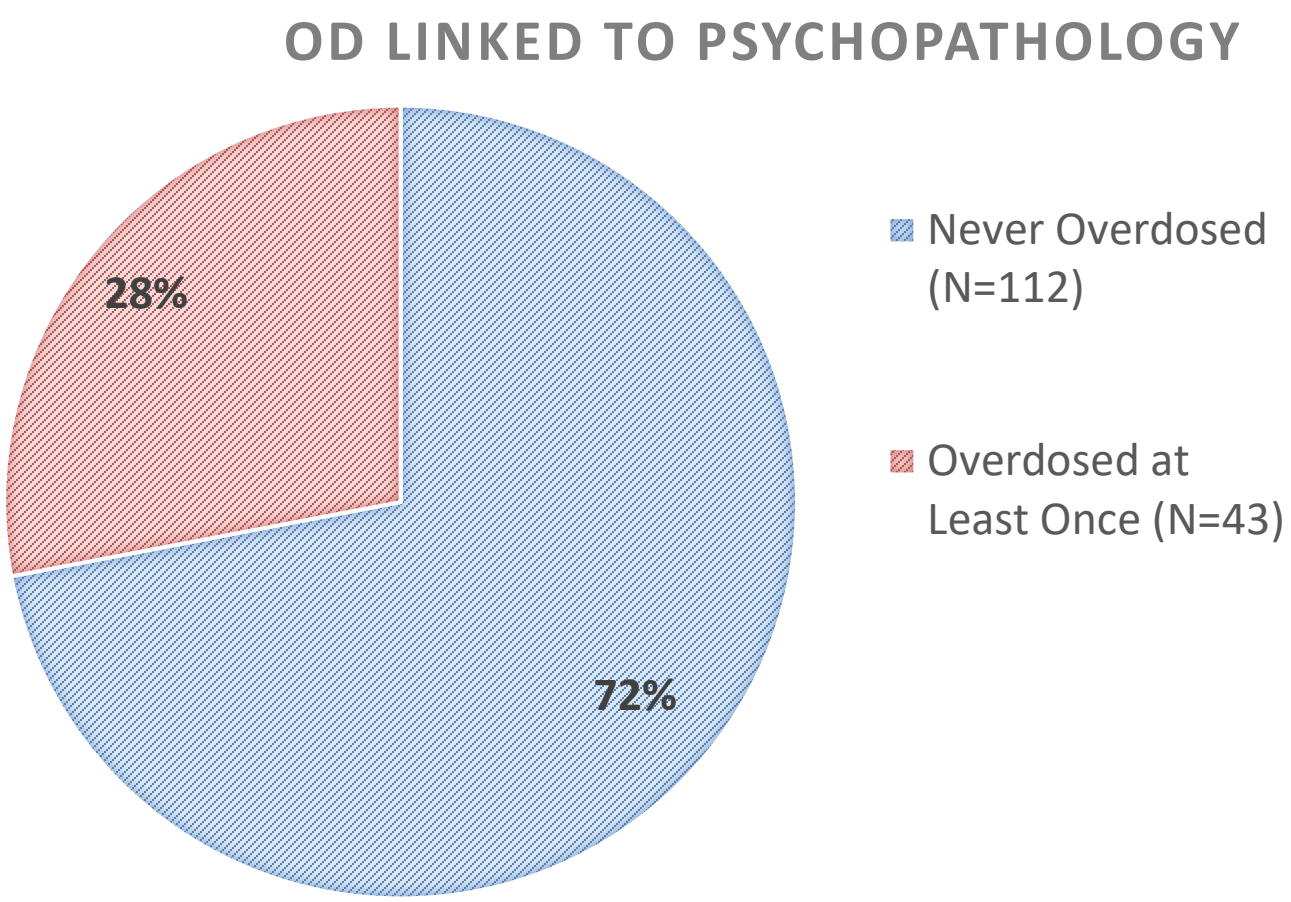
Wilens et al., JAACAP 2011, 2016; Husson Psych Add Behav 2011; Clarke et al 2004; Riggs et al 2007

Bipolar/Conduct in Adolescence Increases the Risk of SUD in Young Adults



Wilens et al. *J Clin Psych 2016*

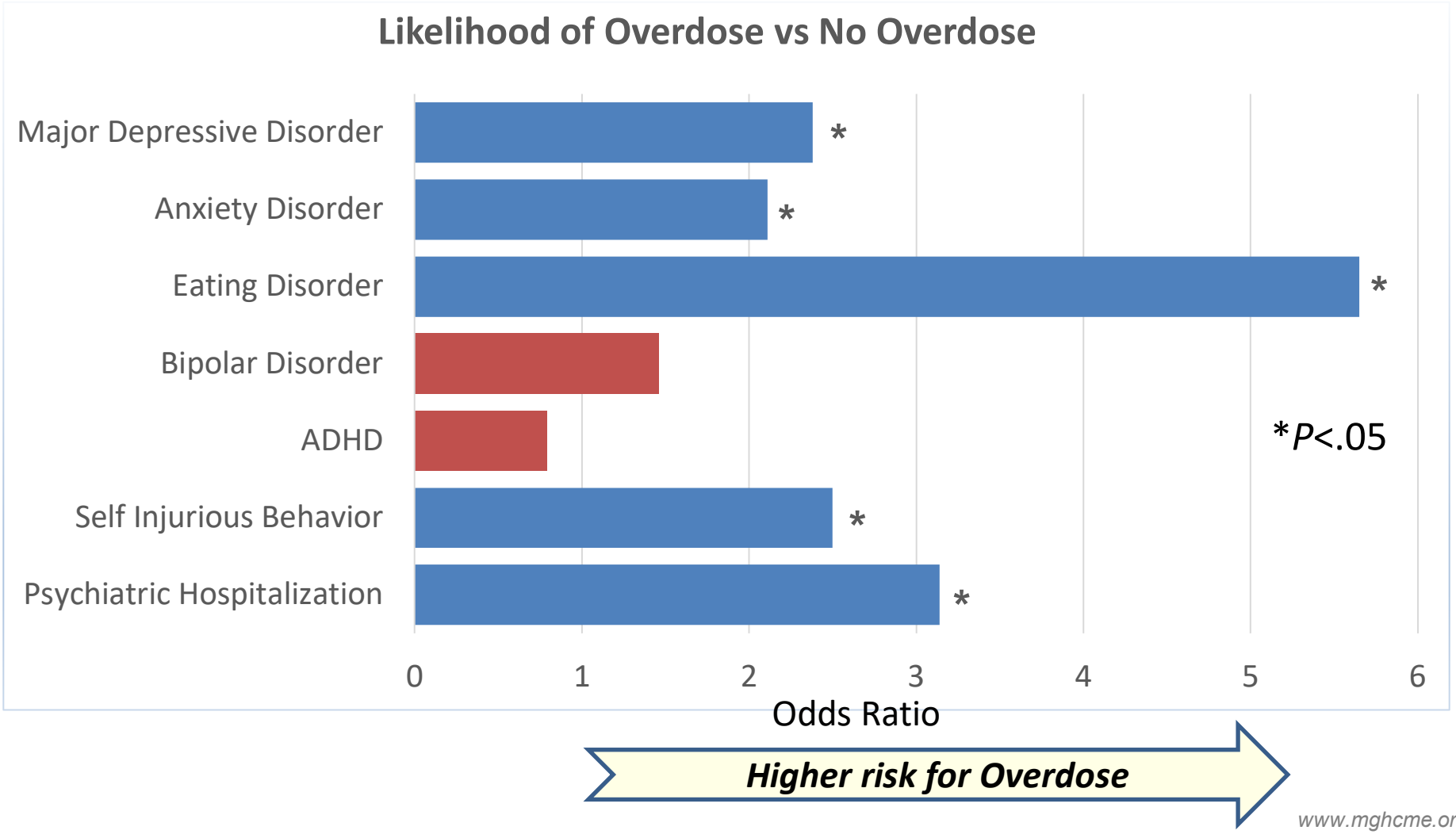
MGH Outpatient Young Person SUD Service: Rates of Overdose at Intake (N=155)



Yule et al. J Clin Psych, 2018

Psychiatric Problems Overrepresented in ODs

Yule AM, et al. *J Clin Psychiatry*. 2018;79(3).



Medical Cannabis in Children and Adolescents: A Systematic Review

- Evidence for benefit was strongest for chemotherapy-induced nausea and vomiting, and for treatment-refractory epilepsy.
- At this time, there is insufficient evidence to support use for spasticity, neuropathic pain, posttraumatic stress disorder, Tourette syndrome, or any psychiatric disorder in childhood.
- Promising data with cannabidiol (CBD) for aggression in Autism Spectrum Disorder (open reports)

Wong, S and Wilens, T. Pediatrics. 2017 Oct 23. pii: e20171818. doi: 10.1542/peds.2017-1818

Putative Medical Uses of THC vs CBD

THC

Pain
Nausea/Vomiting
Spasticity
Glaucoma
Insomnia
Appetite

CBD

Seizures
Pain
Migraines
Anxiety
Depression
Inflammatory diseases (IBD)

“Synthetic” Drugs: Synthetic Marijuana

- Synthetic Marijuana
  - Called: “K2, Spice, Herbal Incense”
  - Cannabis-like high
  - Chemicals sprayed on herbs
  - As of 2011-many components are schedule 1 Controlled substance act (illegal)
  - Reactions: agitation, convulsions/seizures, psychosis, withdrawal states after persistent use
  - Not detected by routine drug screens (does NOT result in positive cannabis)

Screening Adolescents for Drugs and Alcohol: S2BI (Levy et al, Pediatrics 2016)

In the past year, how many times have you used:

- **Tobacco?**
- **Alcohol?**
- **Marijuana?**

STOP if all "Never."

Otherwise, CONTINUE.

- **Prescription drugs that were not prescribed for you (such as pain medication or Adderall)?**
- **Illegal Drugs (such as cocaine or Ecstasy)?**
- **Inhalants (such as nitrous oxide)?**
- **Herbs or synthetic drugs (such as salvia, "K2", or bath salts)?**

https://www.drugabuse.gov/ast/s2bi/#/

Juvenile SUD: Diagnostics

- Evaluate medical condition including complications (LFT, STDs)
- Generate differential diagnosis for psychiatric/medical symptoms
- Utilize urine, saliva, or hair toxicology screens
- Toxicology Screens
  - Limitations of detection (e.g. high potency benzo's)
  - Duration of detection (marijuana-> up to 6 weeks)
  - Qualitative vs quantitative

Jackson, Yule, Wilens; *Adolescent SUD* in Handbook of Adolescent Medicine, 2nd Edition, 2017

Adolescent SUD: Part II