



Legalization of Marijuana

Mental Health, Substance Use Disorder

Effects, Consequences

Sheila Specker, MD
Addiction Psychiatrist
University of Minnesota
MPS President



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Marijuana and Legalization



- Addiction
- Effects on youth brain development
- Mental Health effects

NIDA, MNSAM, ASAM, MPS, SAM

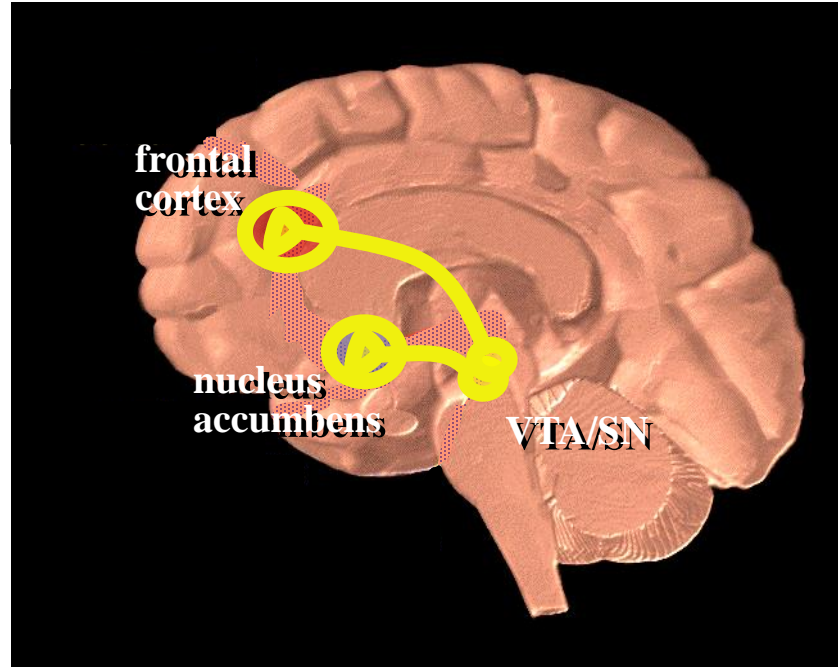


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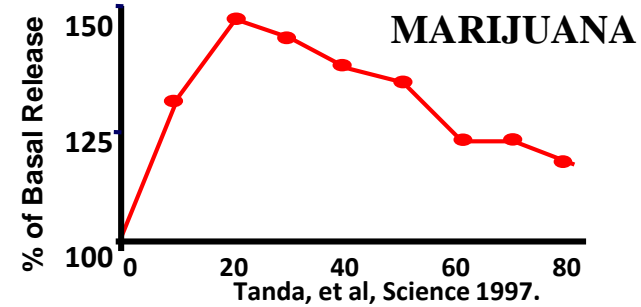
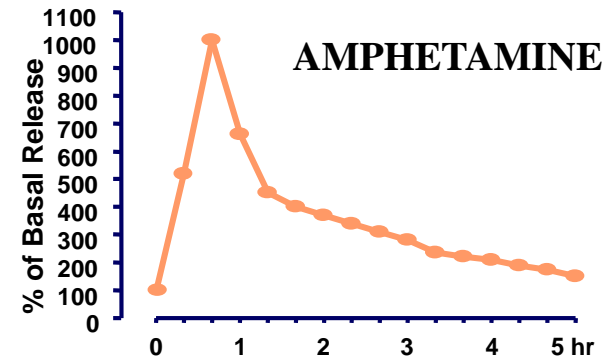
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The Reward Circuit



**Drugs of abuse
increase dopamine
in the reward
pathway region**

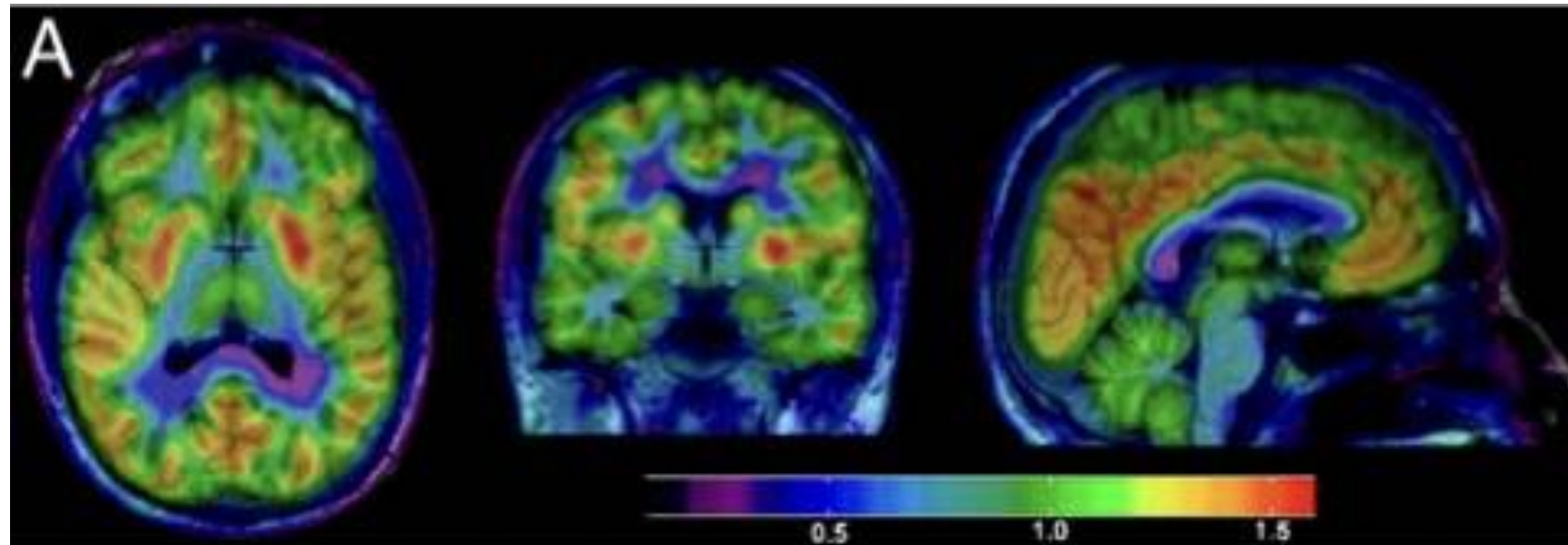


Slide courtesy of Ken Winters, Maureen Boyle, PhD





CB1 receptor distribution: limbic system, hippocampus, cerebellum



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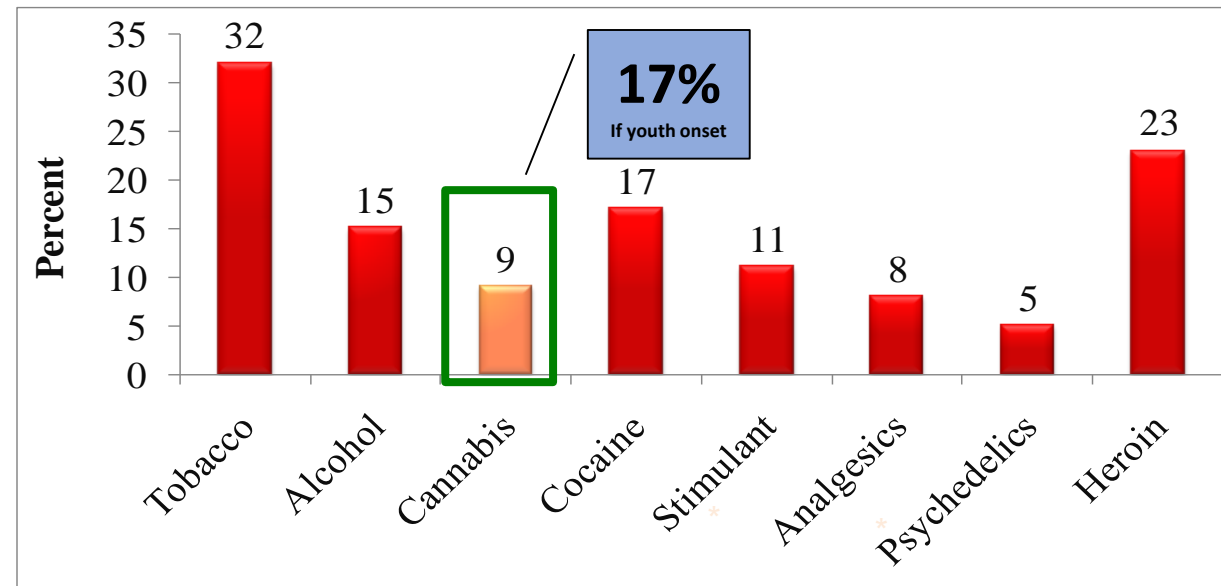
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“Addictive” Potential of Psychoactive Substances

Estimated Prevalence of Dependence Among Users (lifetime; age 15-54)



Source: Anthony JC et al., 1994

K. Winters



Marijuana and addiction



- The earlier the start, the higher the risk
 - 17% who start under age 18 develop addiction BUT
 - 25-50% of teen heavy users become addicted
- Highly concentrated THC products contain up to 90% THC
- 76% of teen substance use treatment admissions



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Does marijuana decrease opioid use? Australian study



Longitudinal study of 1541 with chronic non-cancer pain on opioids. Four year follow-up data on pain, opioid, cannabis use.

- Those using cannabis did not have better outcomes
 - No reduction in opioid use
 - No increase in opioid discontinuation
 - Greater pain severity
 - Greater pain interference score
 - Greater generalized anxiety disorder scores
 - Less self-efficacy

Campbell et al., 2018



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Developing until age 25: planning, decision making, social behavior

- Poor school performance and increased drop out rates
- Chronic use in adolescence linked to decline in IQ that doesn't recover with cessation (Meier et al. 2012)
- Cognitive impairments: impaired short-term memory
- Impaired motor coordination
- Altered judgement

SAMHSA,2019, Volkow, et al., 2014



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Marijuana and Psychosis



- Marijuana use in adolescence is associated with an increased risk for later psychotic disorder in adulthood (D'Souza, et al. 2016) , 5 fold
- Marijuana use linked to earlier onset of psychosis in youth known to be at risk for schizophrenia (McHugh, et al. 2017)
- Chronic cannabis with onset <18 had 10% risk developing schizophrenia vs 4.7% if after 18 (Dunedin Longitudinal Study)



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The contribution of cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): a multicentre case-control study

Marta Di Forti, PhD • Diego Quattrone, MD • Tom P Freeman, PhD • Giada Tripoli, MSc •

Charlotte Gayer-Anderson, PhD • Harriet Quigley, MD • et al. [Show all authors](#) •

- 901 patients with first episode psychosis across 11 clinic sites in Europe
- Compared 1237 population controls from those same sites
- Cannabis use was associated with increased odds of psychotic disorder compared with never users
 - **Daily use of low potency cannabis** = adjusted odds ratio, **3.2** (95% CI 2.2 – 4.1)
 - **Daily use of high potency cannabis** = adjusted odds ratio, **4.8** (95% CI 2.5 – 6.3)

Source: Lancet Psychiatry, 2019

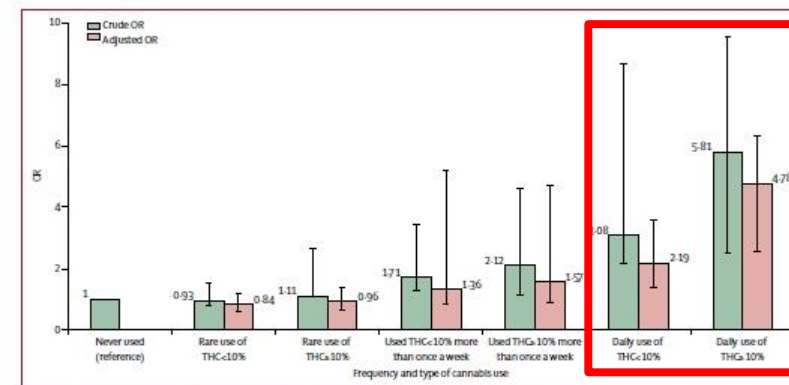


Figure 1: Crude and fully adjusted ORs of psychotic disorders for the combined measure of frequency plus type of cannabis use in the whole sample. Crude ORs are adjusted only for age, gender and ethnicity and fully adjusted ORs are additionally adjusted for level of education, employment status, and use of tobacco, stimulants, ketamine, legal highs, and hallucinogenics. Error bars represent 95% CIs. OR=odds ratio.



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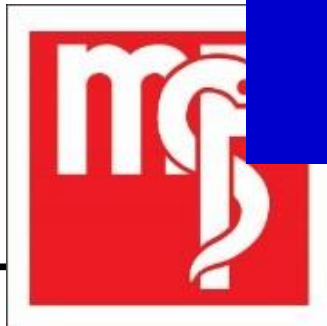


Miller's Review of the Cannabis and Mental Health Connection

Disorder	Cross-Sectional Data	Longitudinal Data
Schizophrenia	++	++
Bipolar	+	
Anxiety Disorders	+	+
Depressive Disorders	+	+
Risk of Suicide	+	

Key: ++ = several studies; + a few studies
Yellow box = risk greater when cannabis use onset during youth.

Miller, C. L. (2018). The impact of marijuana on mental health. In K. Sabet & K.C. Winters, *Contemporary health issues on marijuana*. NY: Oxford Press.





Summary

- Clear risk of addiction, greater risk with youth onset
- Brain development effected; impact on many aspects of cognitive functioning
- Increased risk of serious mental health problems
 - Psychosis
 - Depression
 - Anxiety
- Higher potency : increased risk



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