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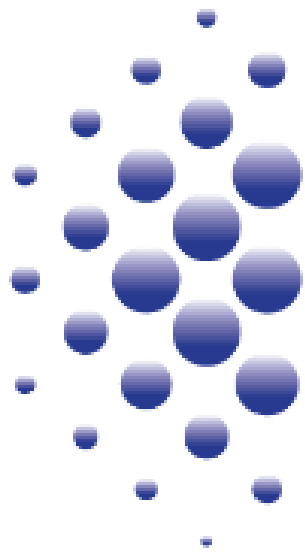
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Neurobiology of Addiction

Sept 2, 2020

Presented by: Dr. Anjali Nandi, PhD, MAC, LAC
Facilitated by: Joann Joy



BJA's

Comprehensive Opioid, Stimulant, and Substance Abuse

Program

Webinar Information

This project was supported by Grant No. 2019-MU-BX-K031 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the U.S. Department of Justice's Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and the SMART Office. Points of view or opinions in this document are those of the author and do not necessarily represent the official position or policies of the U.S. Department of Justice.

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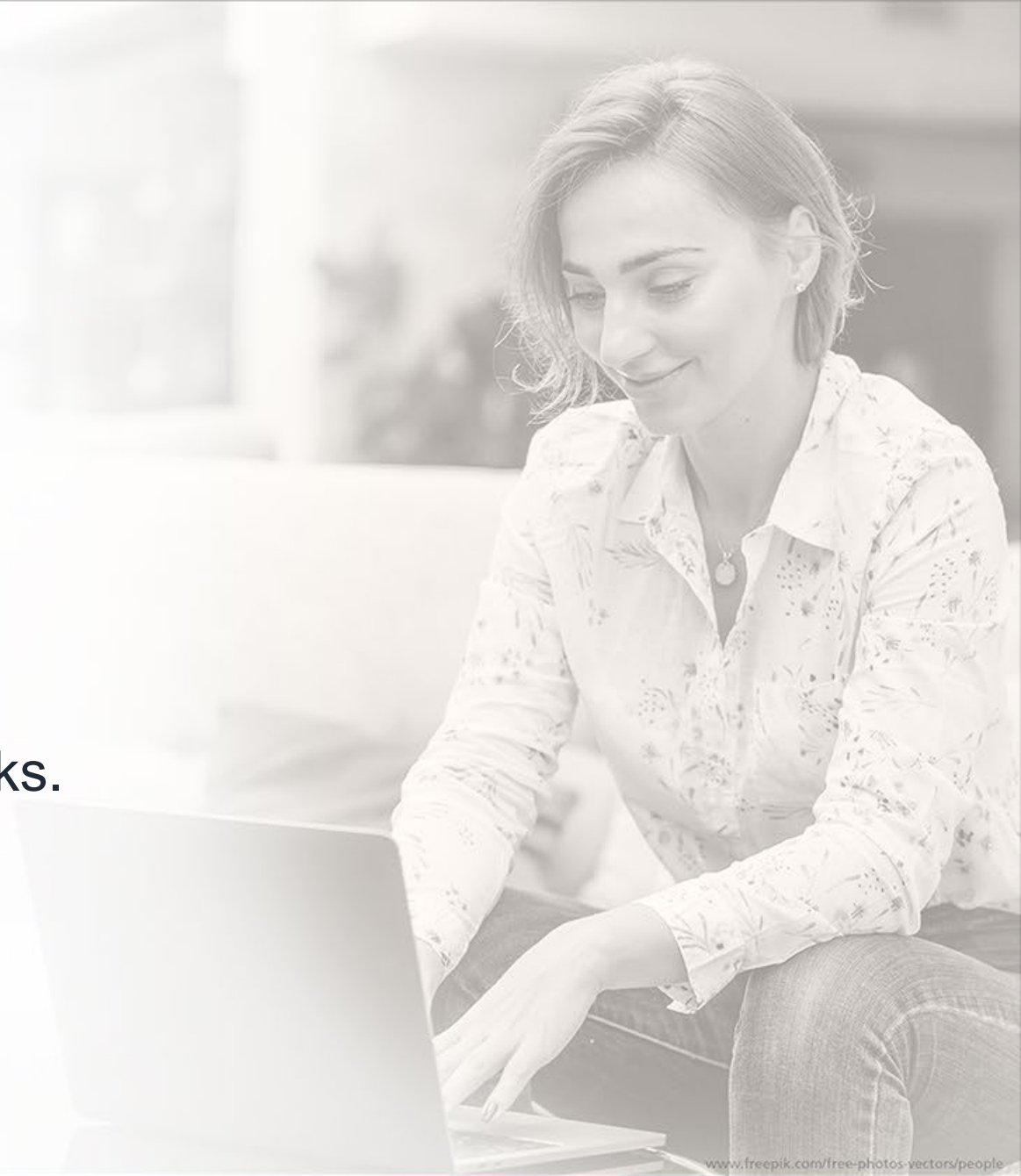


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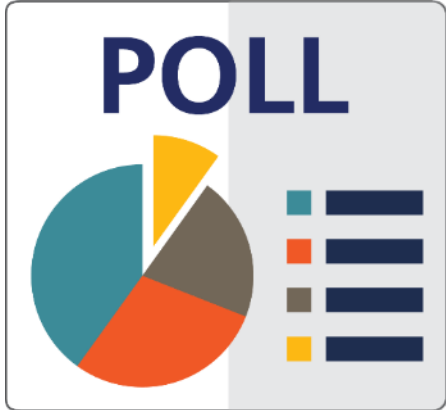
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Poll Questions

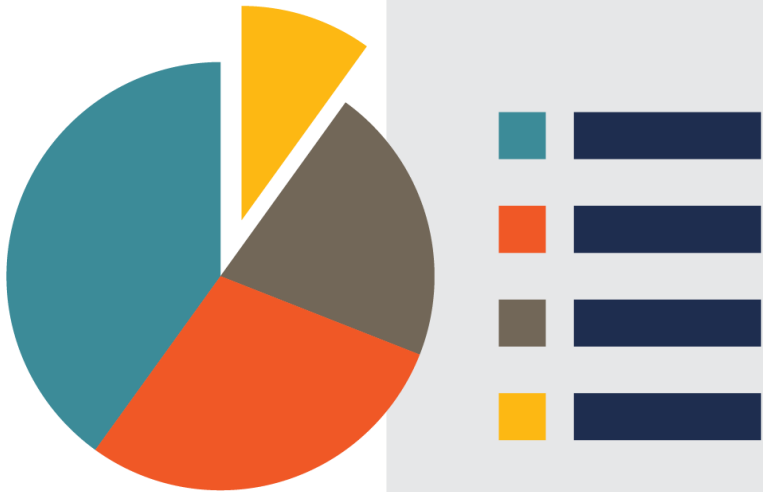
Poll questions may be asked during the webinar.

This is your time to weigh in with your thoughts.



Please respond promptly; polls are open for a short period of time.

POLL



Which of the following best describes your role?

- Victim Services / Victim Advocate
- Probation / Community Corrections
- Law Enforcement
- CAC Worker, Social Worker, Mental Health Worker
- Other

Learning Objectives

- ① Understand the impact of addiction on the brain.
- ② Explore the latest research on evidence-based practices and Medication Assisted Treatments.
- ③ Implement strategies to effectively facilitate long-term behavior change out of a pattern of addiction.



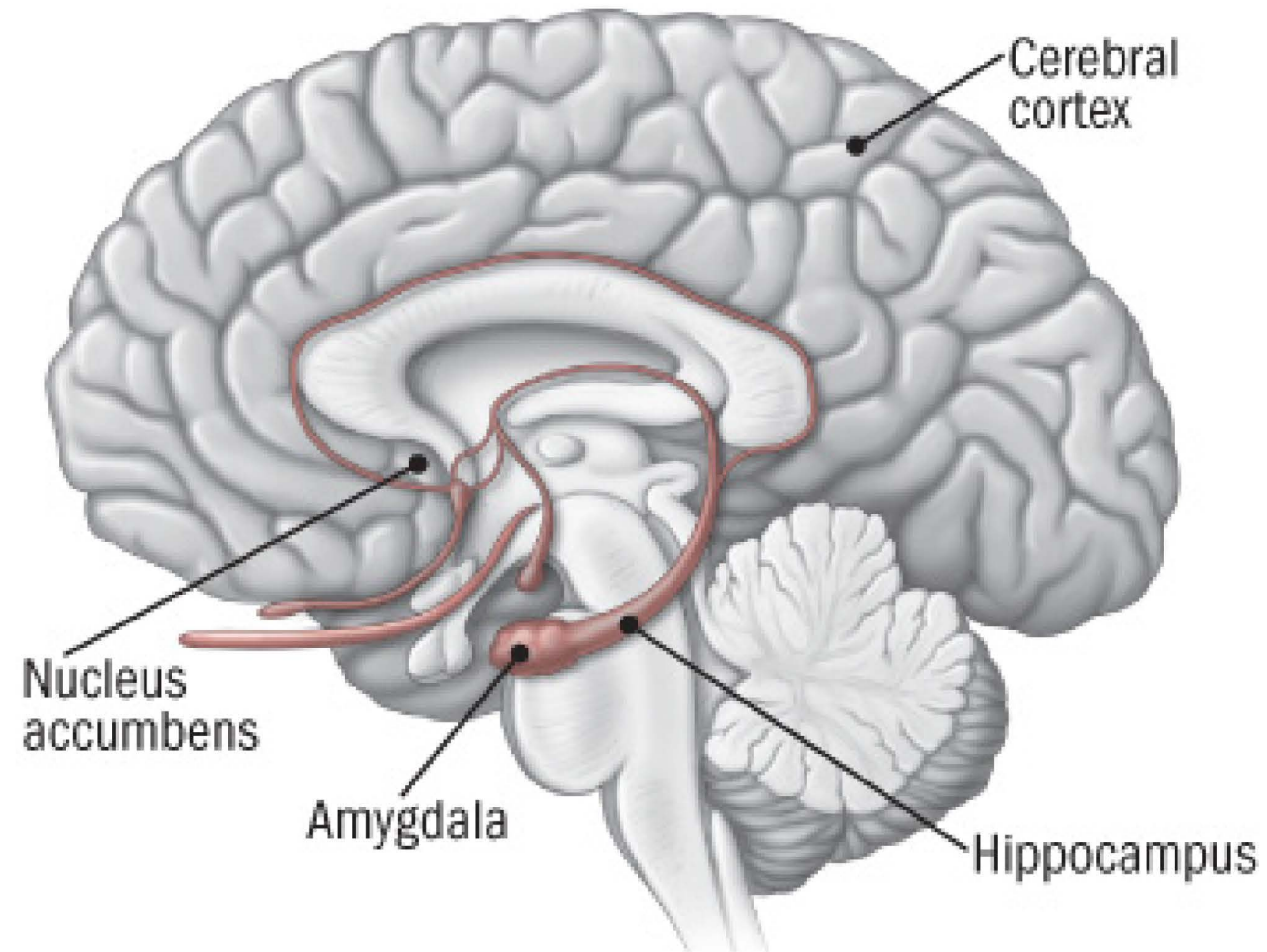
Today's Presenter

Anjali Nandi, PhD, MAC, LAC
Associate,
National Criminal Justice Training Center



What is Addiction?

- Treatable brain disease
- Chronic, recurring, relapsing illness
- Characterized by craving and seeking
- Persists in spite of negative consequences
- Behavior is harmful by some acceptable standard
- Diagnosable



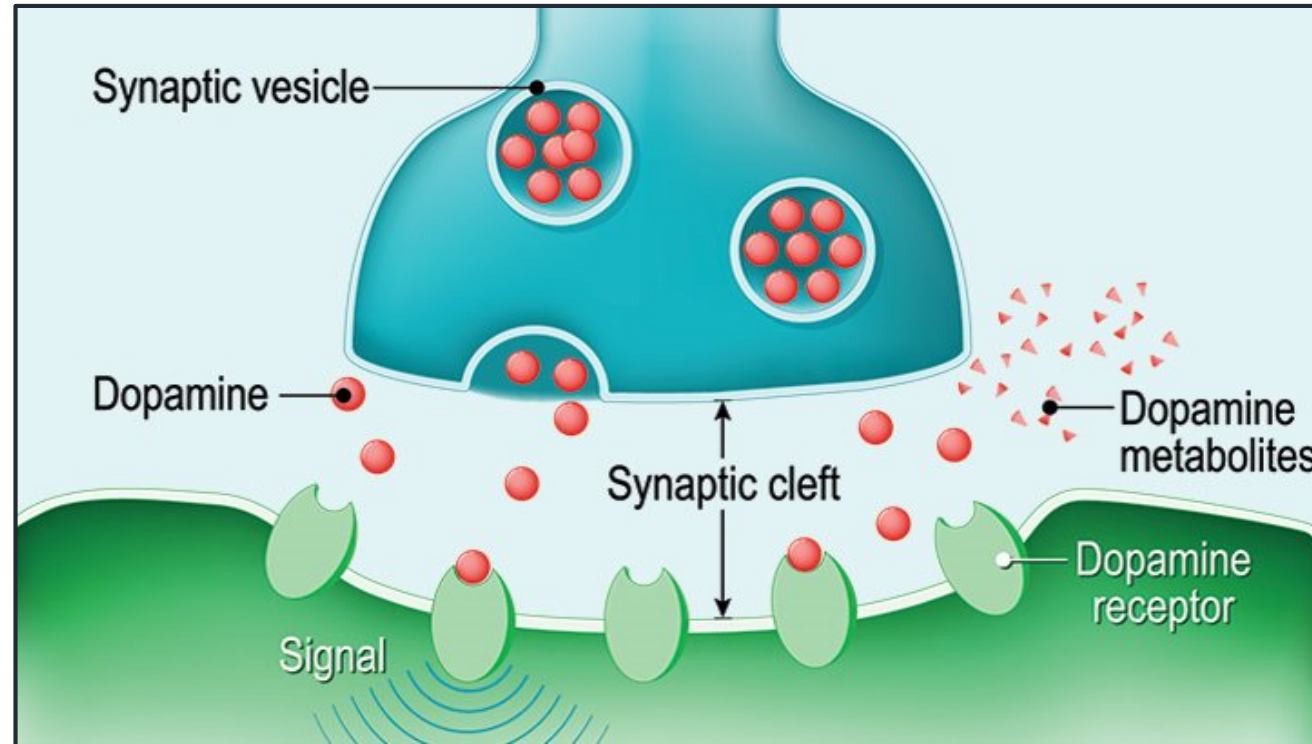


Rewards

Just Ahead

- Reward circuit: motivation, memory, pleasure, learning.
- Addictive substances and behaviors stimulate the same circuit—and then overload it.
- Liking becomes wanting; wanting becomes seeking for survival

Understanding the Impact

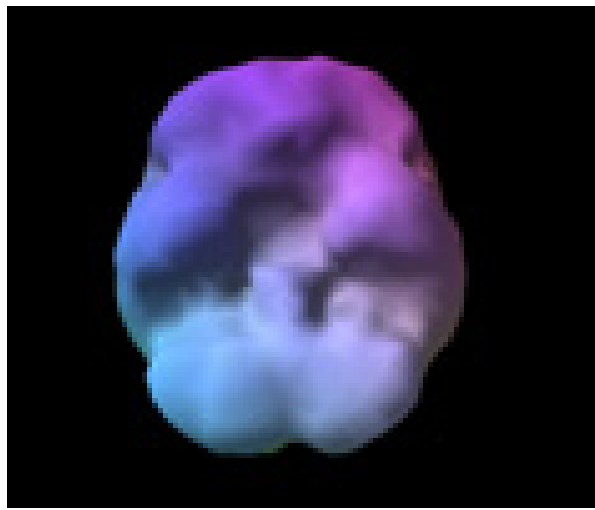


- Exogenous versus endogenous Dopamine
- Relative Craving

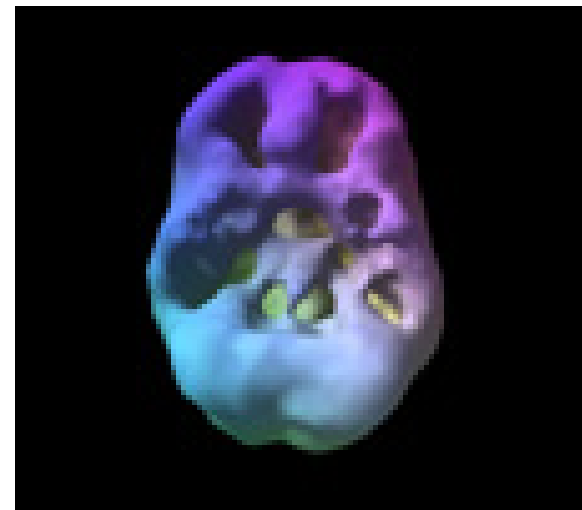


CONDITIONS ASSOCIATED WITH CRAVING

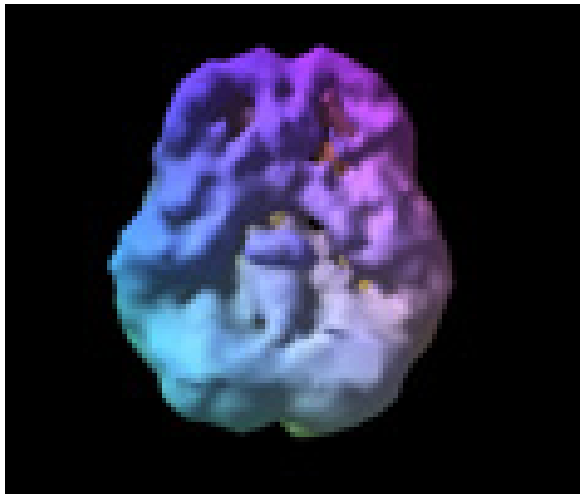
- Cognitive awareness of drug availability
- Presentation of the drug
- Stress
- Stimuli associated with drugs



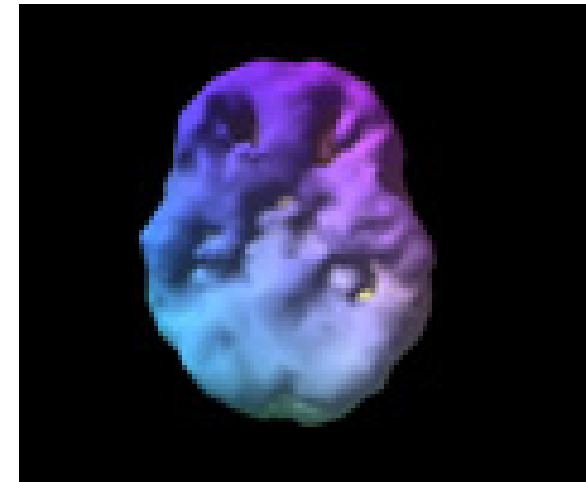
Surface of a normal brain



18 y/o 2-year weekend use of marijuana



44 y/o 17-year weekend use of alcohol



One year free from AOD

SPECT scan of a normal brain...



SPECT scan of one affected by methamphetamine abuse

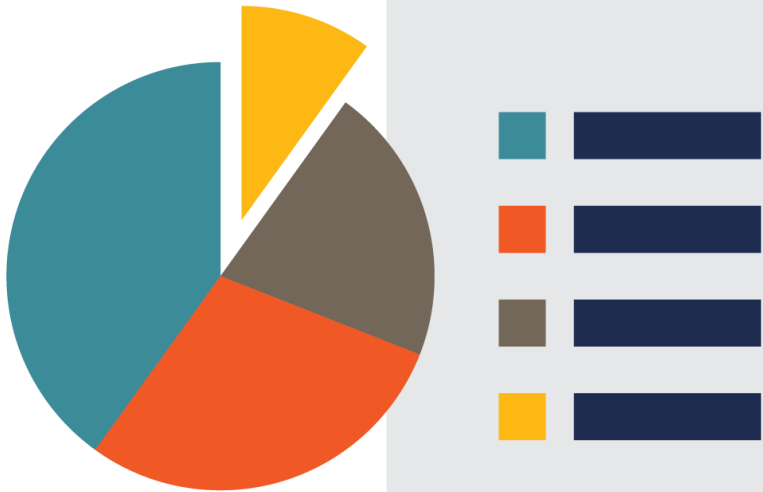




Addiction as a Complex System

- Developing neural pathways
- Affects behavioral processes like delayed gratification and elasticity
- Behavioral subsystems form
- Forms a self-organizing system that is stable
- Moves from synaptic to nervous system adaptations

POLL

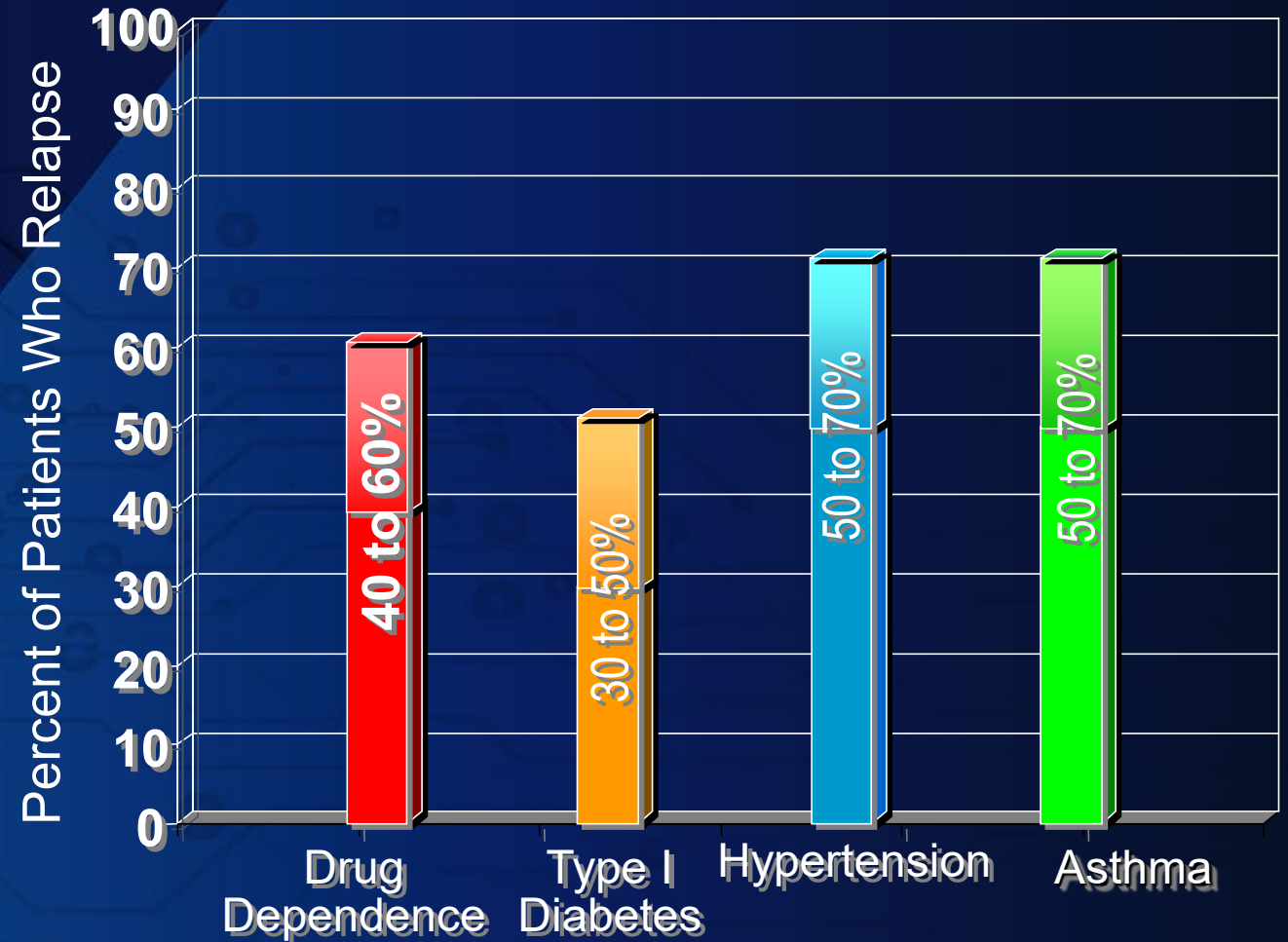


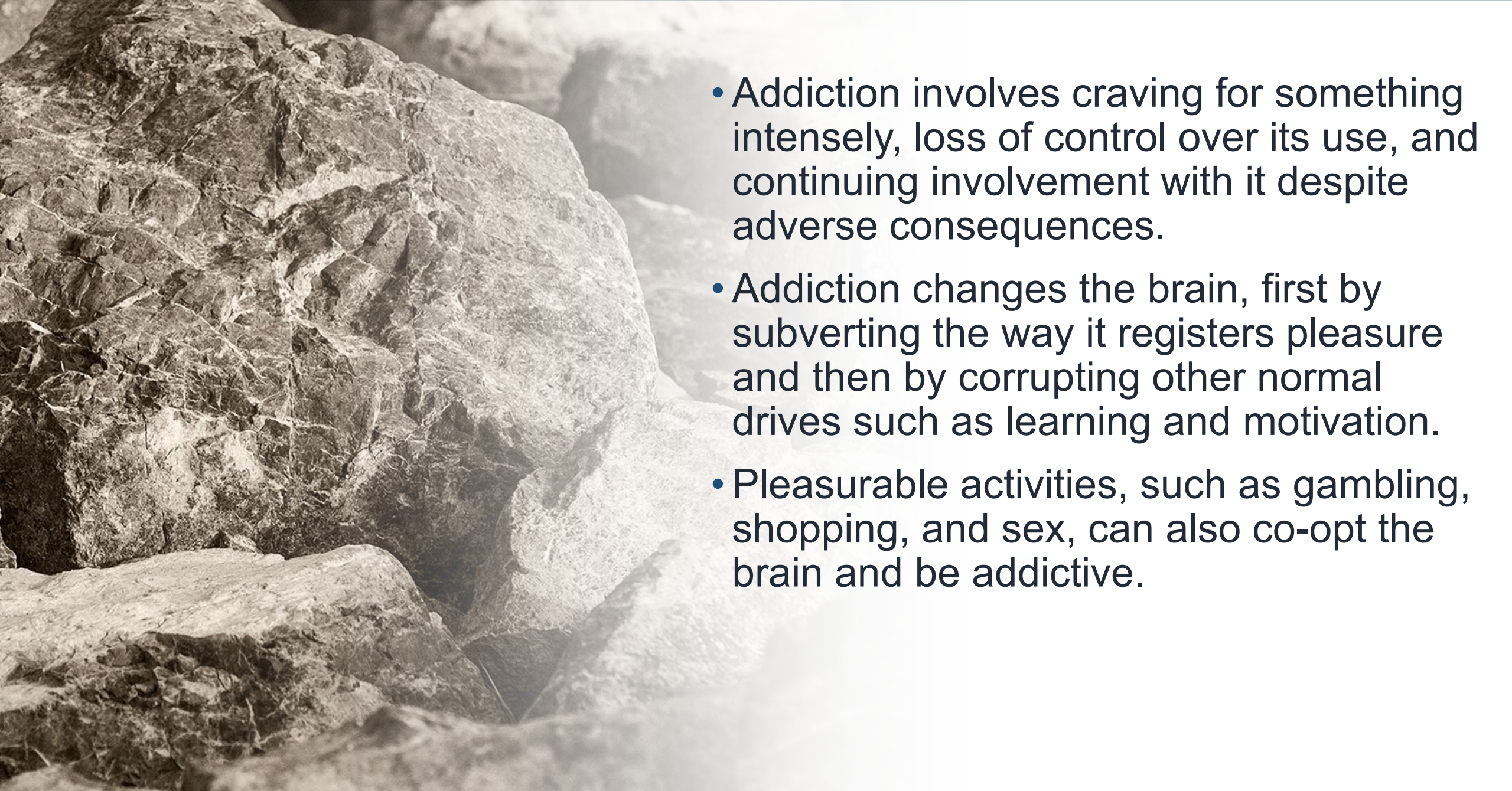
Do you find your clients appreciate understanding about the impact of addiction on the brain?

- Yes!
- Sometimes
- No
- Haven't shared brain info yet

Relapse rates for drug addiction
are similar to other chronic
medical conditions.

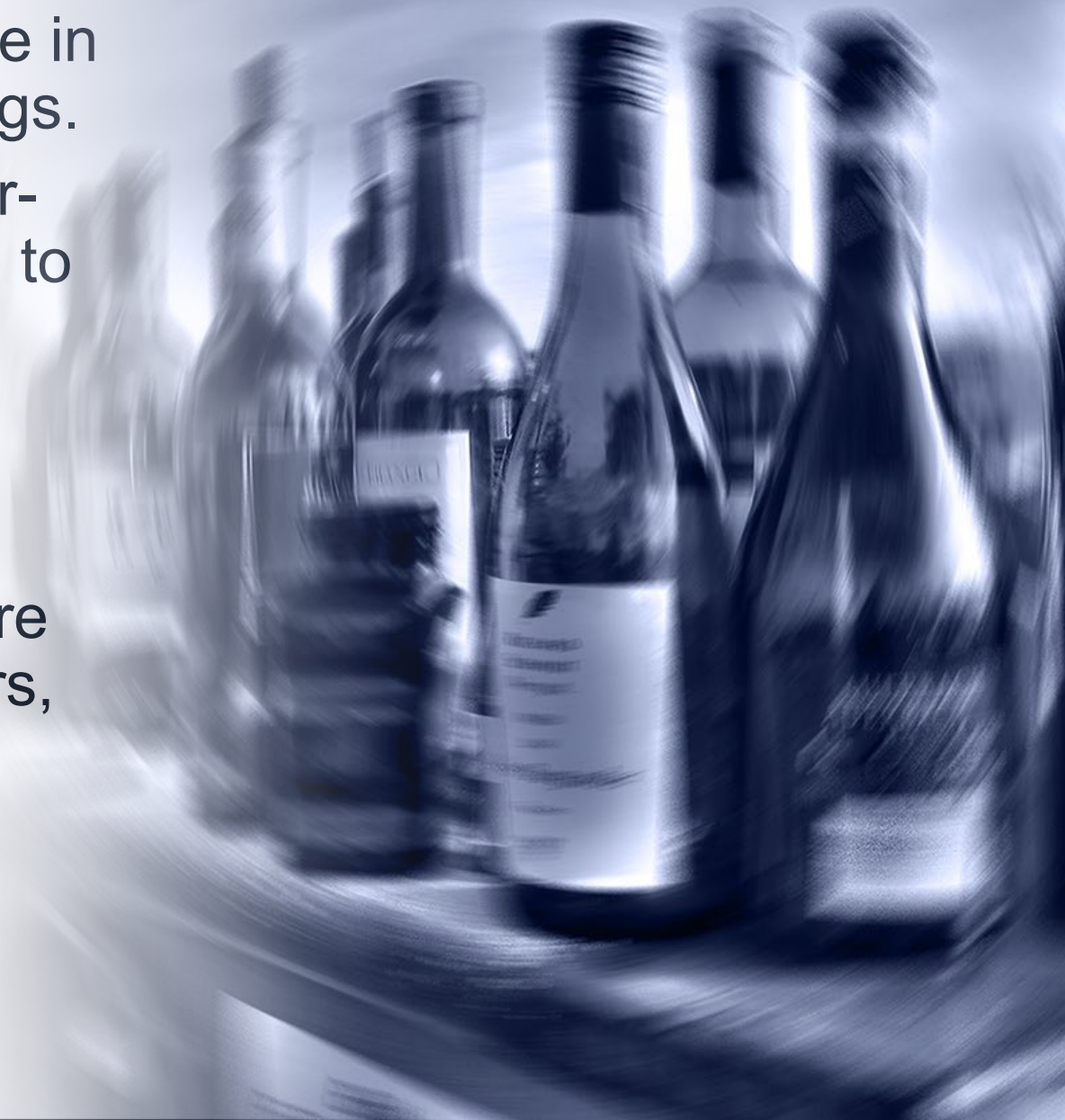
Source: McLellan, A. T. et
al., JAMA, Vol 284(13),
October 4, 2000.





- Addiction involves craving for something intensely, loss of control over its use, and continuing involvement with it despite adverse consequences.
- Addiction changes the brain, first by subverting the way it registers pleasure and then by corrupting other normal drives such as learning and motivation.
- Pleasurable activities, such as gambling, shopping, and sex, can also co-opt the brain and be addictive.

- Nearly 23 million Americans—almost one in 10—are addicted to alcohol or other drugs.
- Tribal communities are staggeringly over-represented in substance use according to a recent survey on drug use.
- More than two-thirds of people with addiction abuse alcohol.
- The top three drugs causing addiction are marijuana, opioid (narcotic) pain relievers, and cocaine.



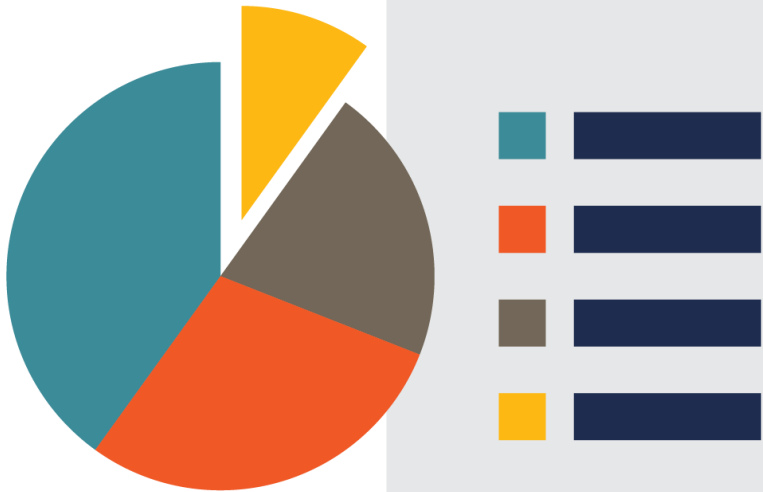
Percentages of American Indians and Alaskan Natives (AI/AN) over the age of 12 who used the following substances in the past year:

- Illicit Drug Use: 28.5%
 - Marijuana: 23%
 - Cocaine: 1.9%
 - Methamphetamine: 2.4%
 - Misuse of Prescription Stimulants: 1.4%
 - Benzodiazepines: 1.5%
 - Opioids (includes heroin, prescription pain relievers): 5.8%
- Tobacco: 44%
- Alcohol use: 55%

- 90% of alcohol sold is consumed by 30% of the drinking population
- The other 70% of drinkers consume 10% of alcohol sold



POLL

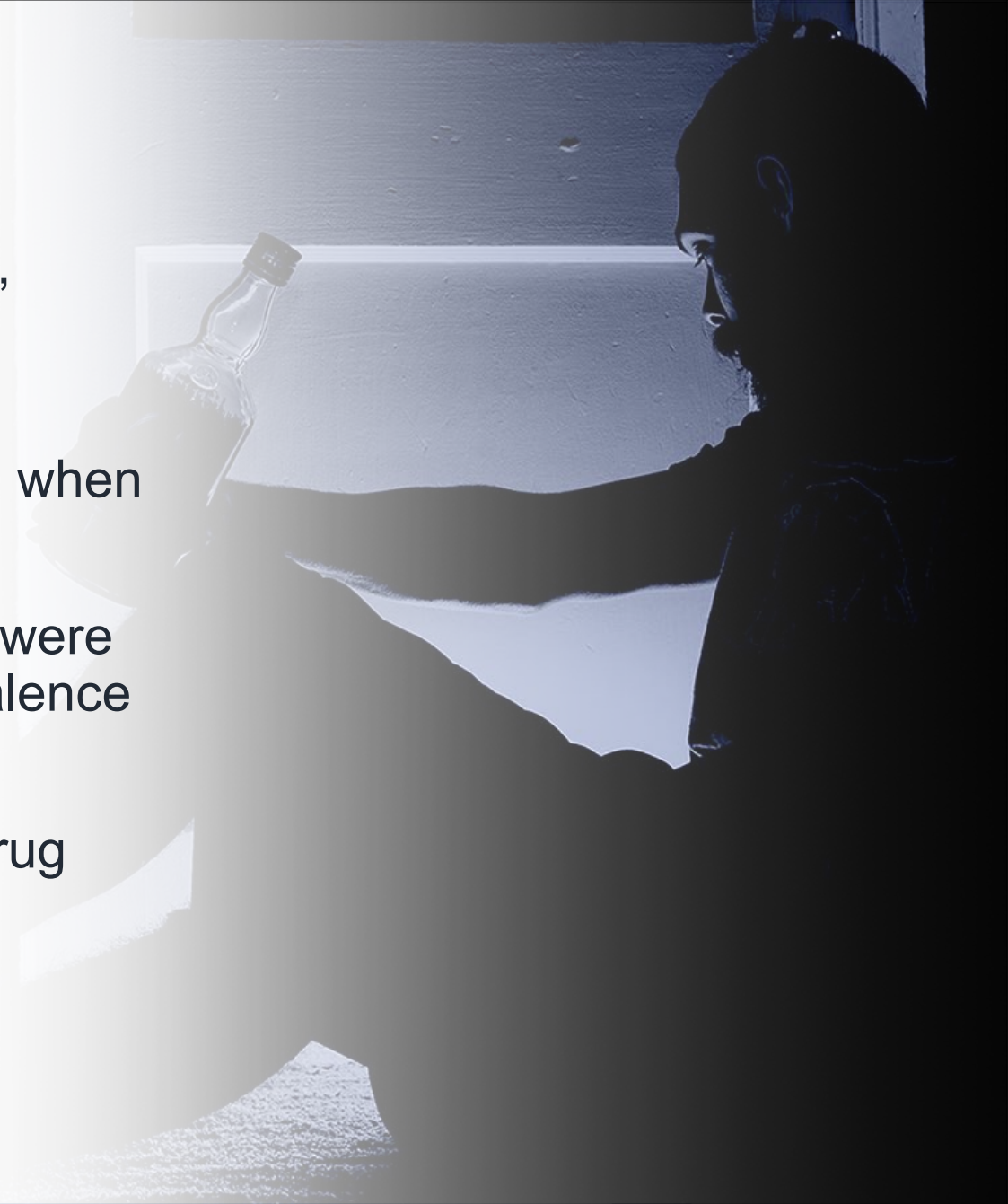


Which do you think contributes more to predicting alcohol/drug issues later in life?

- Nature (i.e., genetics)
- Nurture (i.e., upbringing)
- Both equally

Nature versus Nurture

- Addiction runs in family; more nature than nurture, provides increased biological risk
- Kids raised by adoptive parents with or without addiction had same levels of developing addiction when birth parents had no trouble w/ addiction
- Kids whose birth parents struggled with addiction were 4 times more likely to struggle regardless of prevalence in adoptive parents
- Alcoholism in family results in increased risk for drug addiction





- People are born with an initial level of tolerance determined by our genetics
- Tolerance increases as we use more
- As tolerance increases, physical tolerance increases much faster than mental tolerance



Risk

Risk/Protective factors

- Timing
- Environment
- Reinforcement
- Genetics
- Comorbidity



THC and Driving

- People report increased focus
- Because of impaired ability to:
 - Track moving objects
 - Peripheral vision
 - Multi-task
- $\text{THC} \geq 5\text{ng/ml}$ in whole blood 6.6 times risk for fatal crash (similar to 0.10 BAL)
- Among regular THC users:
 - 90 min after smoking 94% failed roadside sobriety test
 - 2.5 hours after 60% failed



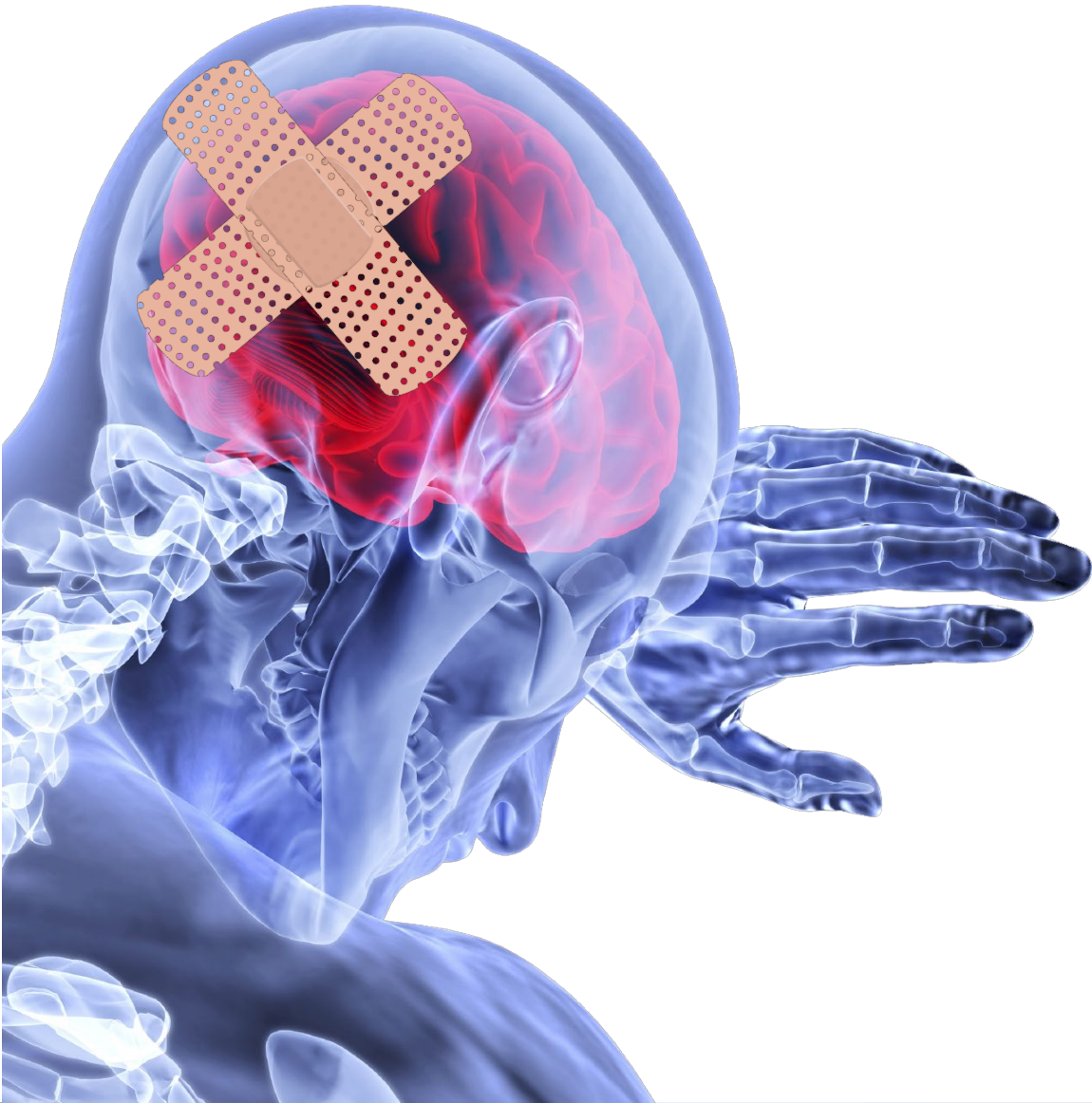
During simulator test, regular, experienced THC users:

- Slowed down
- Put more space between their cars and in front of them
- Crashed 50% more frequently
- Couldn't react to object in the middle of the road
- Couldn't stay in lane

- Impulsive
- Gregarious
- Sensation seeking (bored easily and like to experience new things)
- Rebellious (like to do things my way)



Treatment

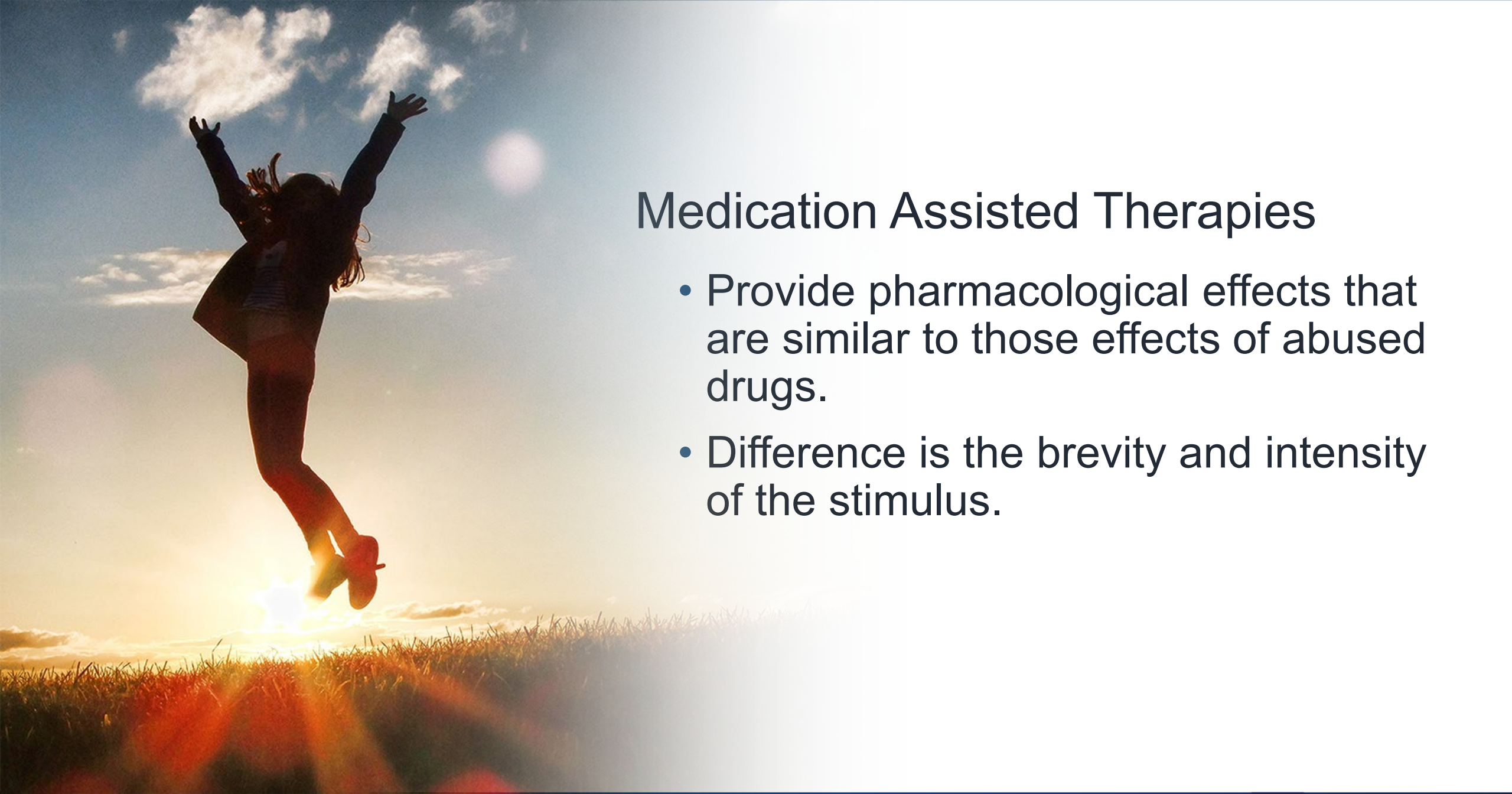


- Interacts with the process of self-change
- Is a time-limited event in the course of the larger self-change process.
- All recovery from substance abuse can be envisioned as natural recovery
- Treatment is a facilitator of that process



- Contingent positive reinforcement
- Helps combat the intense brief immediate reinforcers of drugs
- It stops the interaction of the components that compromise addiction.

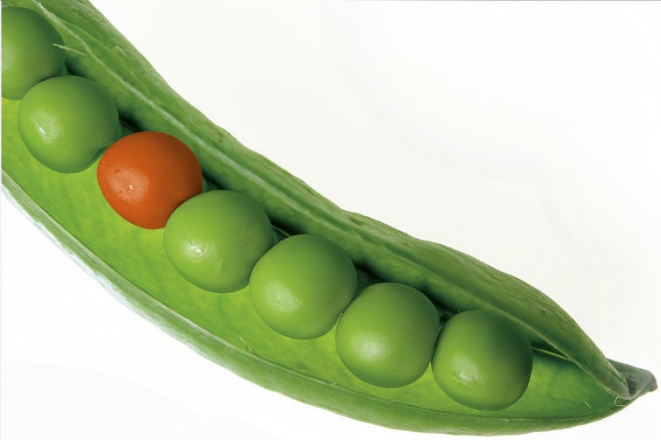
Promote what you love instead of bashing what you hate.



Medication Assisted Therapies

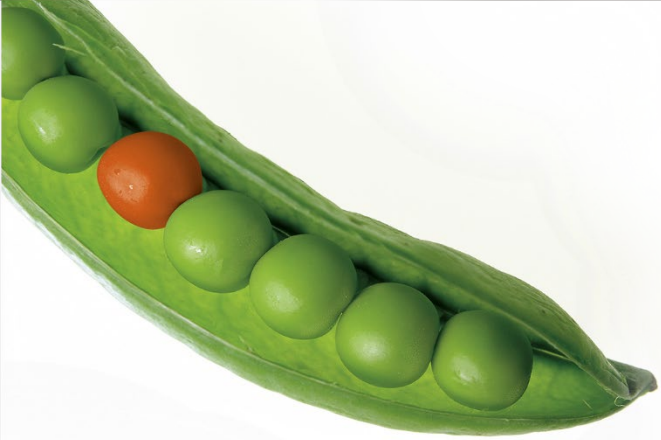
- Provide pharmacological effects that are similar to those effects of abused drugs.
- Difference is the brevity and intensity of the stimulus.





Evidence-based principles

- No single treatment is appropriate for all individuals.
 - Treatment needs to be readily available.
 - Effective treatment attends to multiple needs of the individual, not just drug use.
-
- Remaining in treatment for an adequate period of time is critical for treatment effectiveness.
 - Counseling (individual and/or group) and other behavioral therapies are critical components of effective treatment for addiction.
 - Medications are an important element of treatment for many patients, especially when combined with counseling and other behavioral therapies.

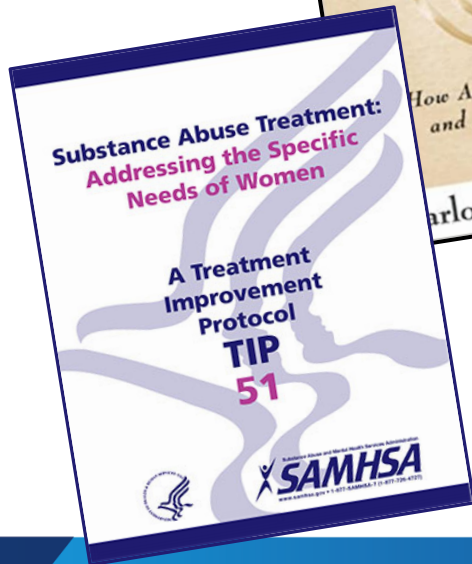
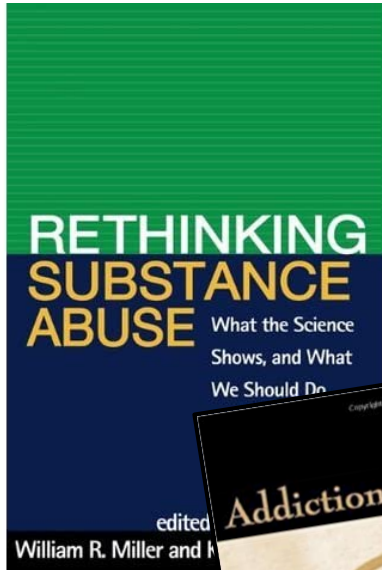


Evidence-based principles *(Cont.)*

- Addicted or drug-abusing individuals with coexisting mental disorders should have both disorders treated in an integrated way.
- Medical detoxification is only the first stage of addiction treatment and by itself does little to change long-term drug use.
- Treatment does not need to be voluntary to be effective.
- Possible drug use during treatment must be monitored continuously.
- Recovery from drug addiction can be a long-term process and frequently requires multiple episodes of treatment.

Resources

- Rethinking Substance Abuse by Miller and Carroll
- Addiction and Change: How Addictions Develop and Addicted People Recover by Carlo DiClemente
- Treatment Improvement Protocol Series from SAMHSA
- www.nida.nih.gov
- www.niaaa.nih.gov
- www.amenclinics.com







Contact Information

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Upcoming Webinars

September 29 | 1:00 PM CT

✓ *Excited Delirium Syndrome*

September 30 | 1:00 PM CT

✓ *Opioid Addiction and Medication Assisted Treatments for Tribal Communities*

October 7 | 1:00 PM CT

✓ *Nature or Nurture? The Impact of Genetics and the Environment on Addiction*

October 14 | 1:00 PM CT

✓ *Social Emotional Skill Development*

November 4 | 1:00 PM CT

✓ *Stress and the Protective Nature of Community*

November 18 | 1:00 PM CT

✓ *Underage Substance Abuse*

Registration emails coming soon...

Bureau of Justice Assistance's Comprehensive Opioid, Stimulant, and Substance Abuse Program (COSSAP) Resource Center



www.cossapresources.org

COSSAP Resources

Tailored Assistance—The COSSAP training and technical assistance (TTA) program offers a variety of learning opportunities and assistance to support local, tribal, and state organizations, stakeholders, and projects in building and sustaining multidisciplinary responses to the nation’s substance abuse crisis. ***You do not need to be a COSSAP grantee to request support.*** TTAs are provided in a variety of formats, including virtual and in-person training events, workshop and meeting presentations, and online resources. Request TTA to support your activities at <https://cossapresources.org/Program/TTA/Request>.

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