Scripps Research Alcohol Center Neuroscience Course
Substance use disorders, continued

Amanda Roberts

Senior Scientific Director

Animal Models Core

Alcohol Research Center Dissemination Core
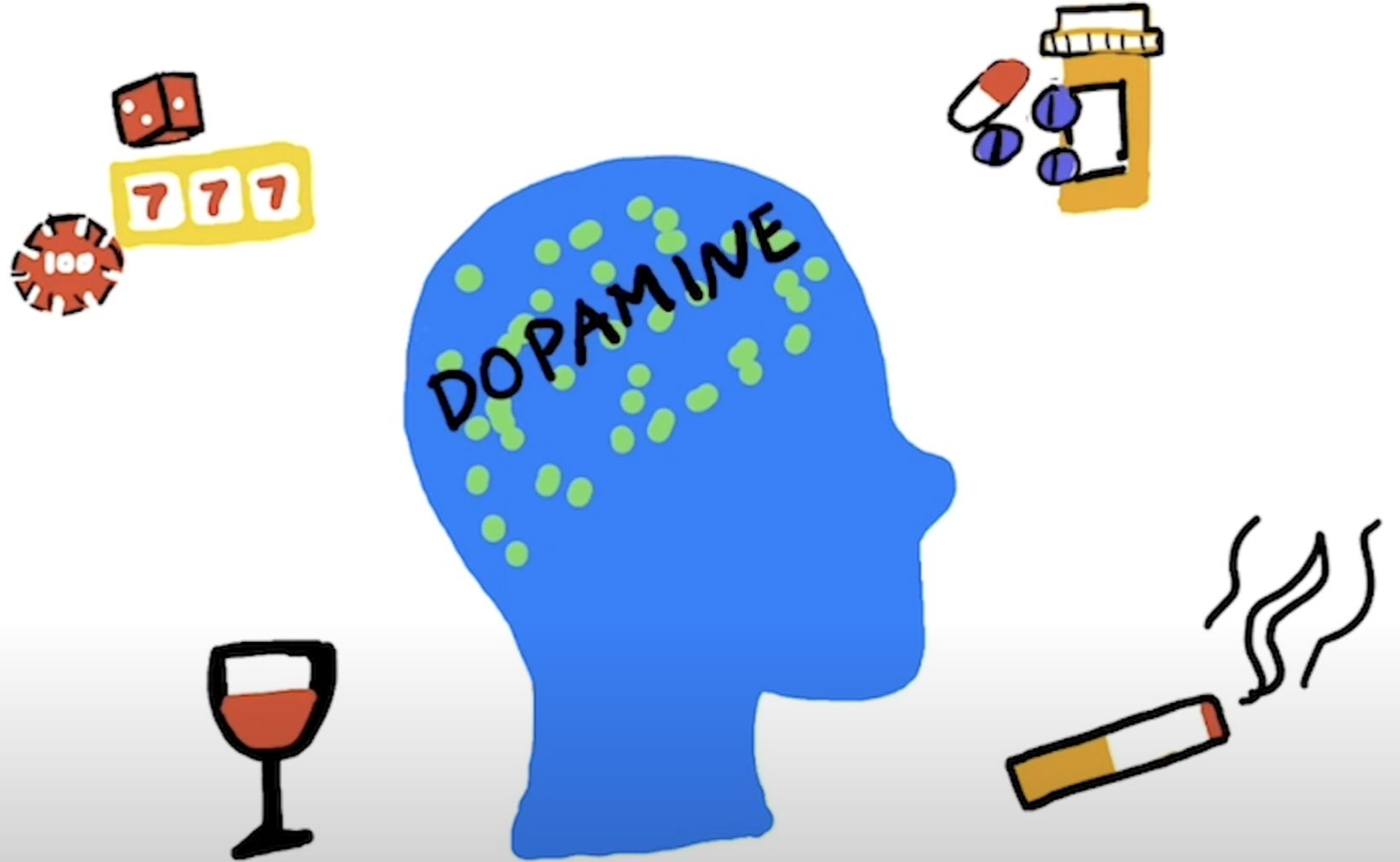
Sahithi Chekuri

Monte Clark

Interns

July 12, 2024

Scripps Research
Science Changing Life

# Today's Topics

Review of Substance Use Disorder (SUD)

How drugs are classified

Examples

Substance Use Disorder

- Chronic, relapsing disorder characterized by compulsive drug seeking and use despite adverse consequences

- Brain disorder: involves functional changes to brain circuits involved in reward, stress, and self-control

- Changes may last a long time after a person has stopped taking drugs

Scripps Research
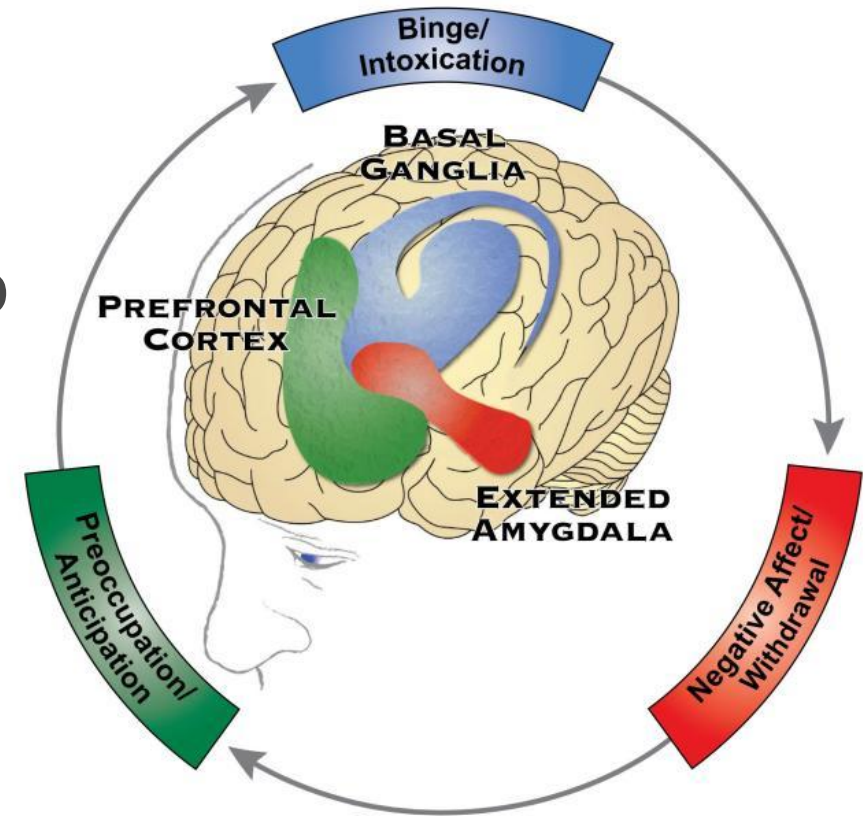
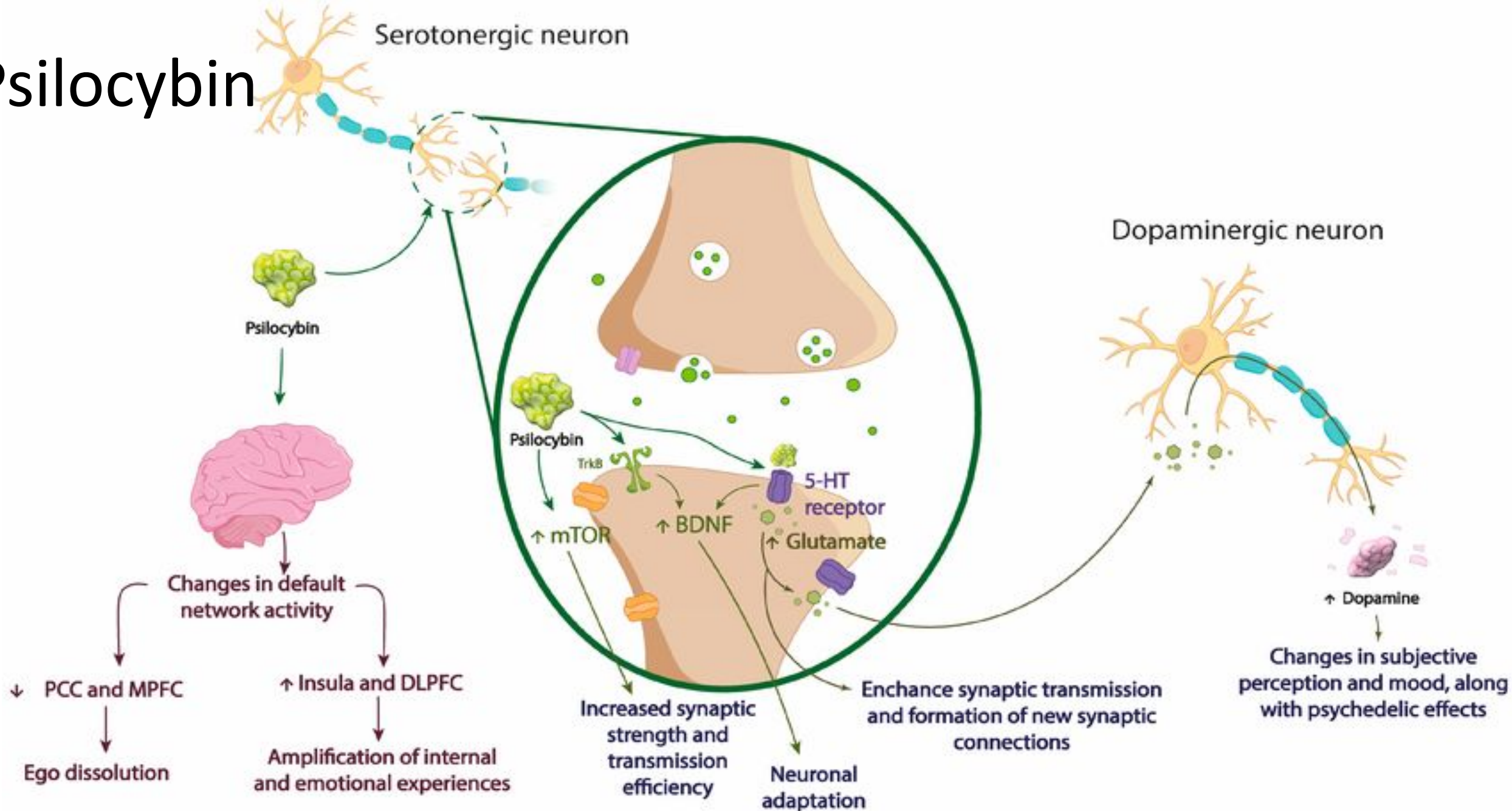All drugs of abuse either directly or indirectly increase dopamine levels in our reward circuitry

https://www.nature.com/articles/npp201632
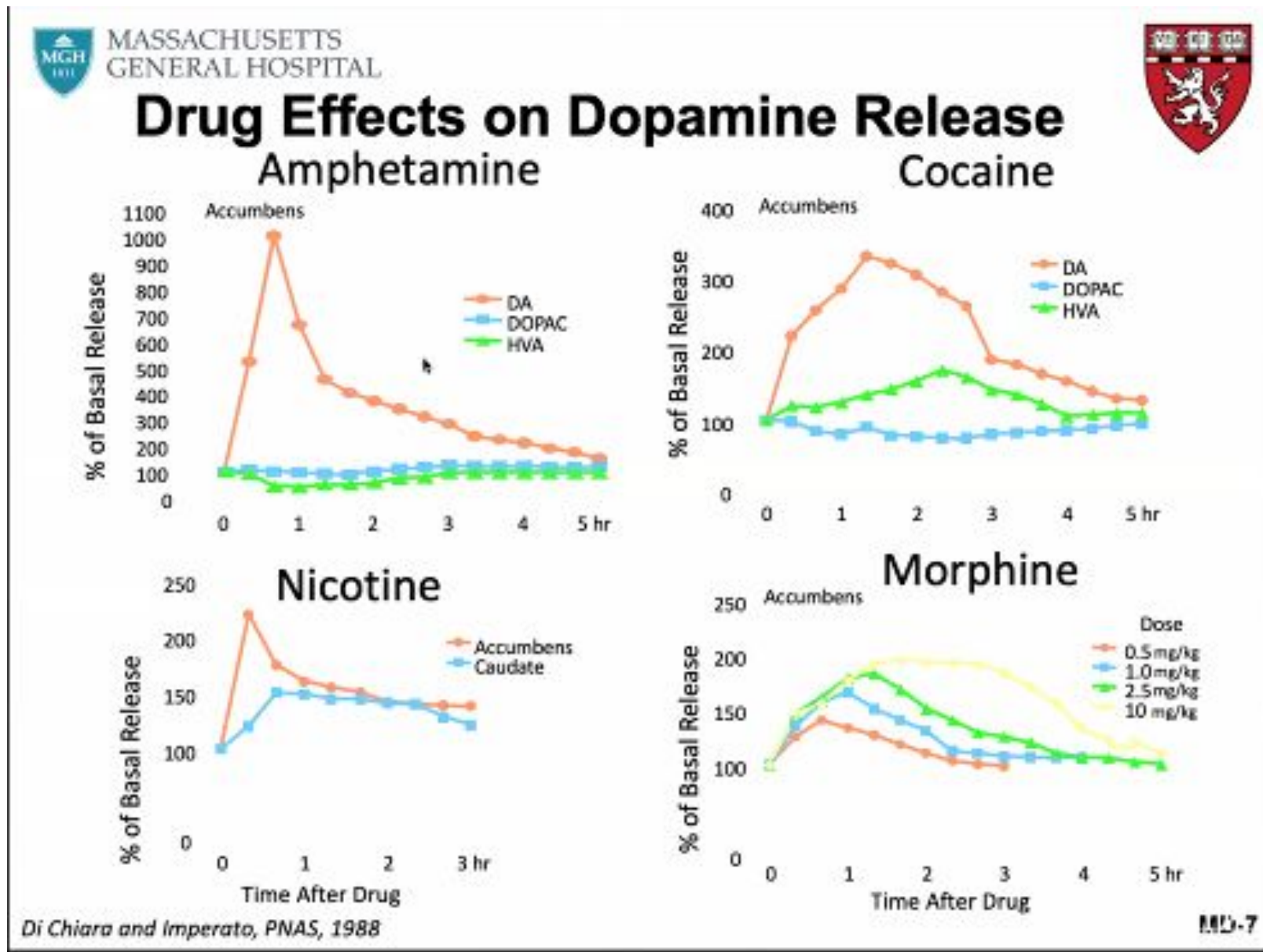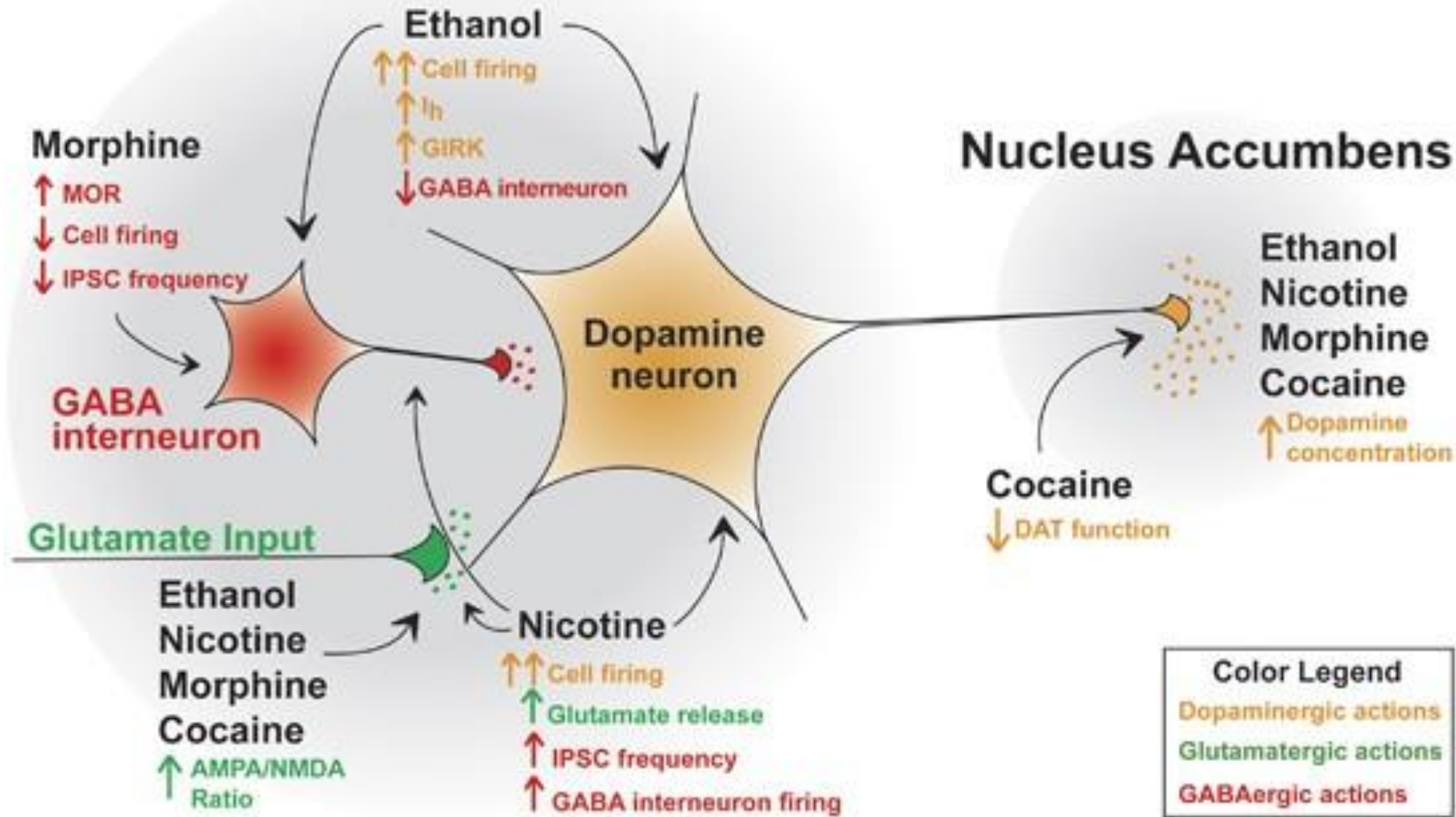
Psilocybin

NIDA Scientists

Virtual Q&A

on Substance Use
and Addiction

NIH> National Institute
on Drug Abuse

Drug Classification (Police)

Central Nervous System (CNS) Depressants

- CNS depressants slow down the operations of the brain and the body. Examples of CNS depressants include alcohol, barbiturates, anti-anxiety tranquilizers (e.g., Valium, Librium, Xanax, Prozac, and Thorazine), GHB (gamma hydroxybutyrate), Rohypnol, and many other anti-depressants (e.g., Zoloft, Paxil).

CNS Stimulants

- CNS stimulants accelerate the heart rate and elevate the blood pressure and "speed-up," or over-stimulate, the body. Examples of CNS stimulants include cocaine, "crack" cocaine, amphetamines, and methamphetamine ("crank").

Hallucinogens

- Hallucinogens cause the user to perceive things differently than they actually are. Examples include LSD, peyote, psilocybin and MDMA (Ecstasy).

Dissociative Anesthetics

- Dissociative anesthetics include drugs that inhibit pain by cutting off or dissociating the brain's perception of the pain. PCP, its analogs, ketamine, and dextromethorphan are examples of dissociative anesthetics.

Narcotic Analgesics

- Narcotic analgesics relieve pain, induce euphoria, and create mood changes in the user. Examples of narcotic analgesics include opium, codeine, heroin, demerol, darvon, morphine, methadone, Vicodin, and oxycontin.

Inhalants

- Inhalants include a wide variety of breathable substances that produce mind-altering results and effects. Examples of inhalants include Toluene, plastic cement, paint, gasoline, paint thinners, hair sprays, and various anesthetic gases.

Cannabis

- Cannabis is the scientific name for marijuana. The active ingredient in cannabis is delta-9 tetrahydrocannabinol, or THC. This category includes cannabinoids and synthetics like Dronabinol.

https://www.theiacp.org/7-drug-categories

Drug Scheduling (DEA)

Drugs, substances, and certain chemicals used to make drugs are classified into five (5) distinct categories or schedules depending upon the drug's acceptable medical use and the drug's abuse or dependency potential.

Schedule I

- no currently accepted medical use and a high potential for abuse.
- heroin, lysergic acid diethylamide (LSD), marijuana (cannabis), 3,4-methylenedioxymethamphetamine (ecstasy), methaqualone, and peyote.

Schedule II

- drugs with a high potential for abuse, with use potentially leading to severe psychological or physical dependence. These drugs are also considered dangerous.
- combination products with less than 15 milligrams of hydrocodone per dosage unit (Vicodin), cocaine, methamphetamine, methadone, hydromorphone (Dilaudid), meperidine (Demerol), oxycodone (OxyContin), fentanyl, Dexedrine, Adderall, and Ritalin

Schedule III

- drugs with a moderate to low potential for physical and psychological dependence.
- products containing less than 90 milligrams of codeine per dosage unit (Tylenol with codeine), ketamine, anabolic steroids, testosterone
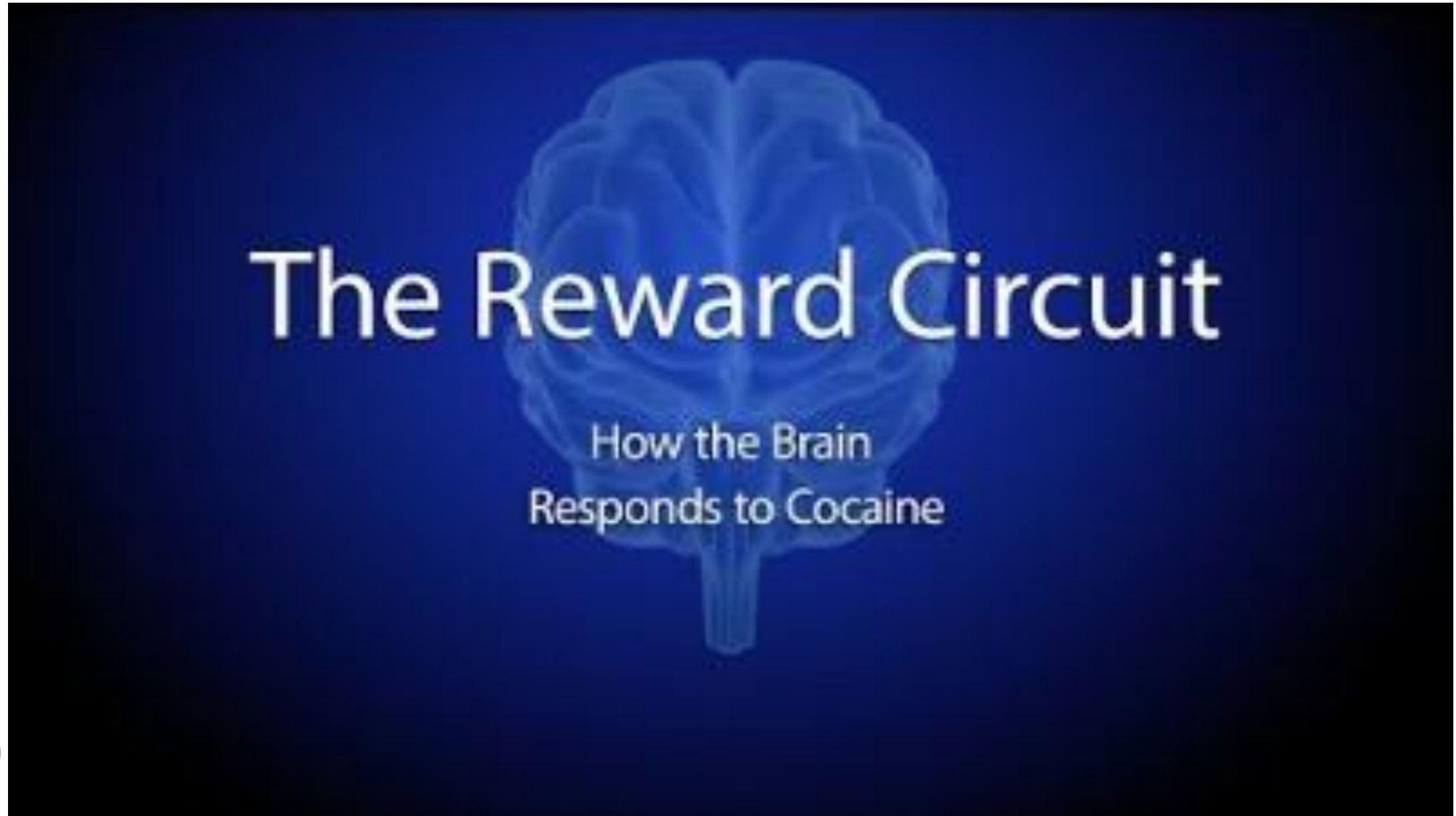
Schedule IV

- drugs with a low potential for abuse and low risk of dependence.
- Xanax, Soma, Darvon, Darvocet, Valium, Ativan, Talwin, Ambien, Tramadol

Schedule V

- drugs with lower potential for abuse than Schedule IV and consist of preparations containing limited quantities of certain narcotics.
- cough preparations with less than 200 milligrams of codeine or per 100 milliliters (Robitussin AC), Lomotil, Motofen, Lyrica, Parepectolin

Scripps Research

https://www.dea.gov/drug-information/drug-scheduling

Cocaine
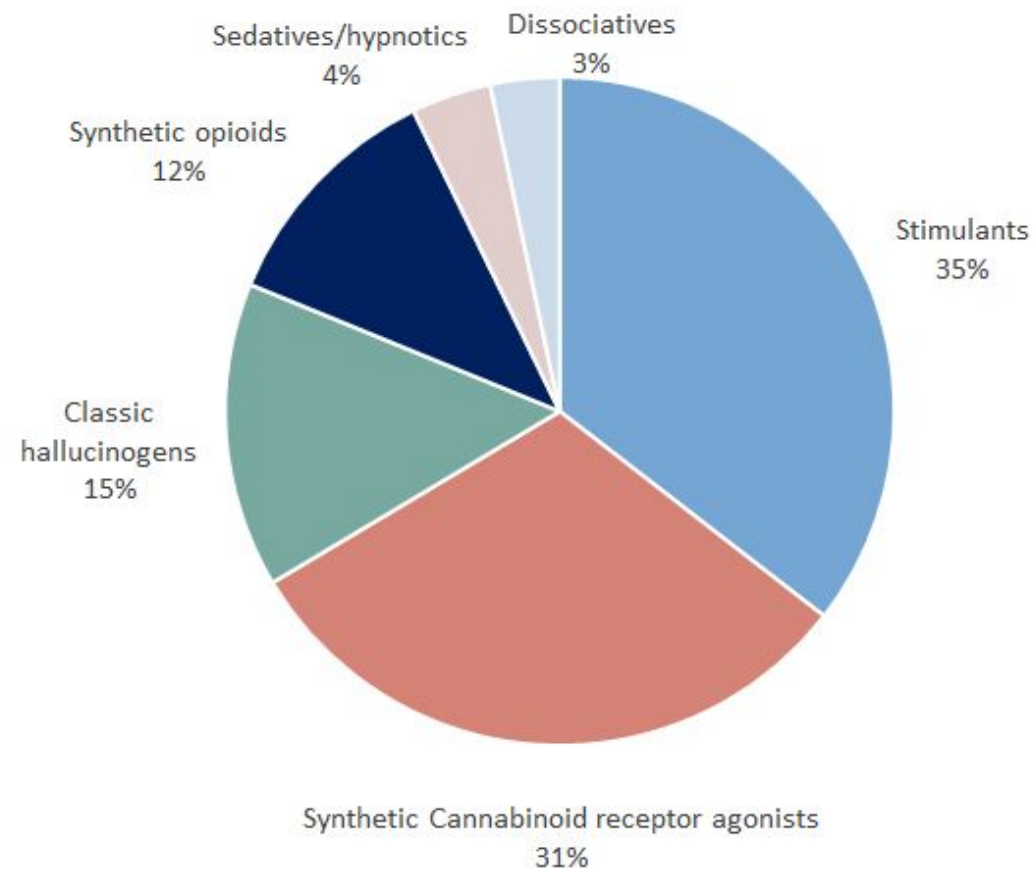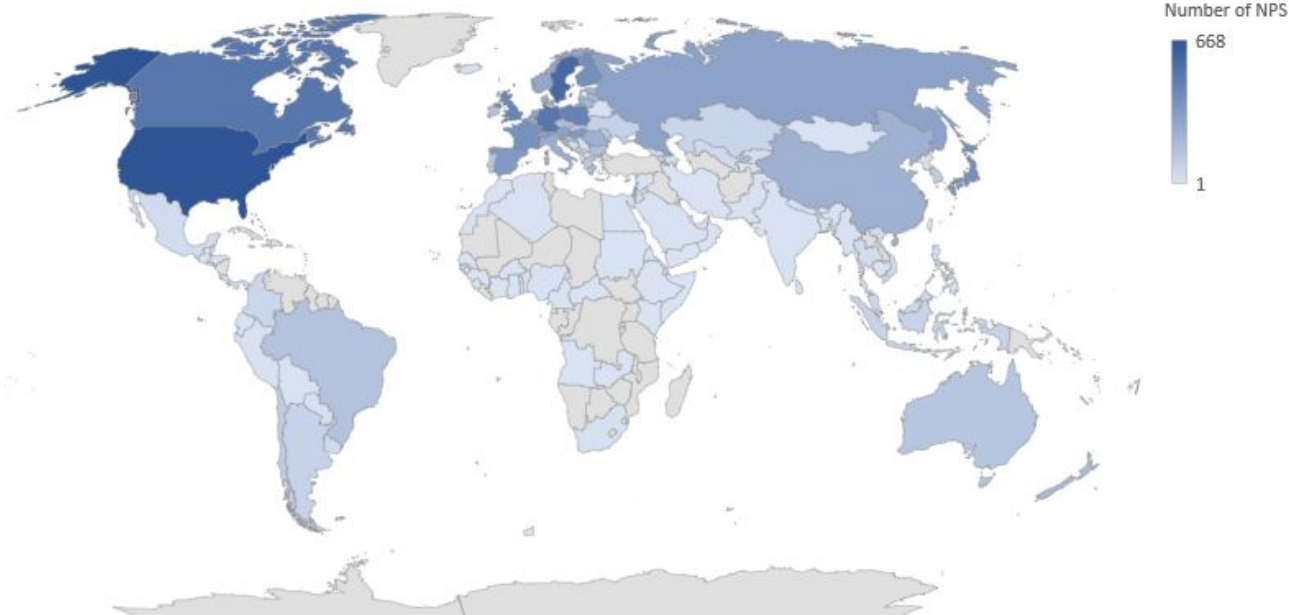
Opiates

Scripps Research

Marijuana

New Psychoactive Substances (NPS)

NPS have been known in the market by terms such as "legal highs", "bath salts" and "research chemicals"

Number of NPS
668

1

Sedatives/hypnotics
4%

Dissociatives
3%

Synthetic opioids
12%

Stimulants
35%

Classic hallucinogens
15%

Synthetic Cannabinoid receptor agonists
31%

Scripps Research

Video games
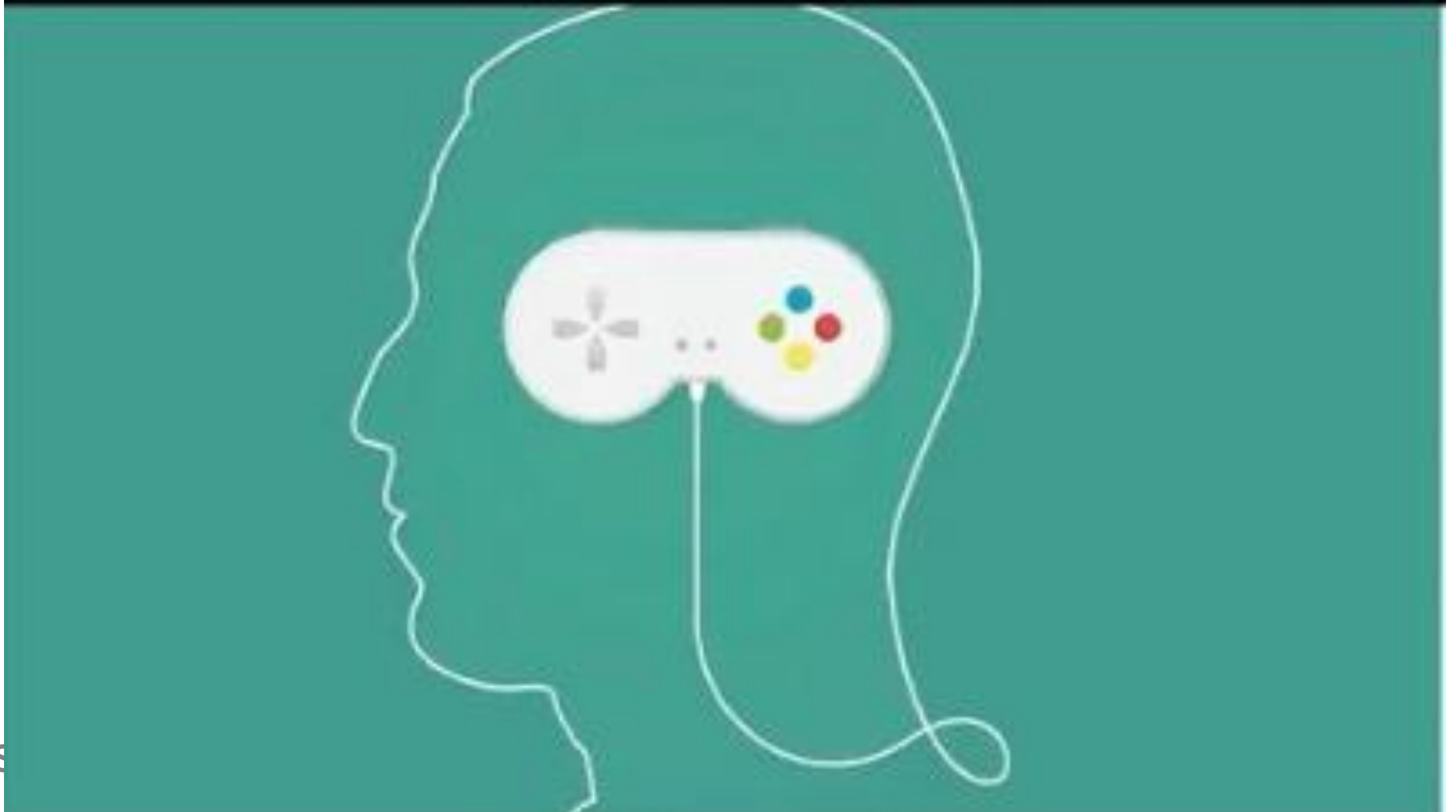
Addiction is a treatable disorder

Healthy Person | Meth User: 1 month abstinence | Meth User: 14 months abstinence
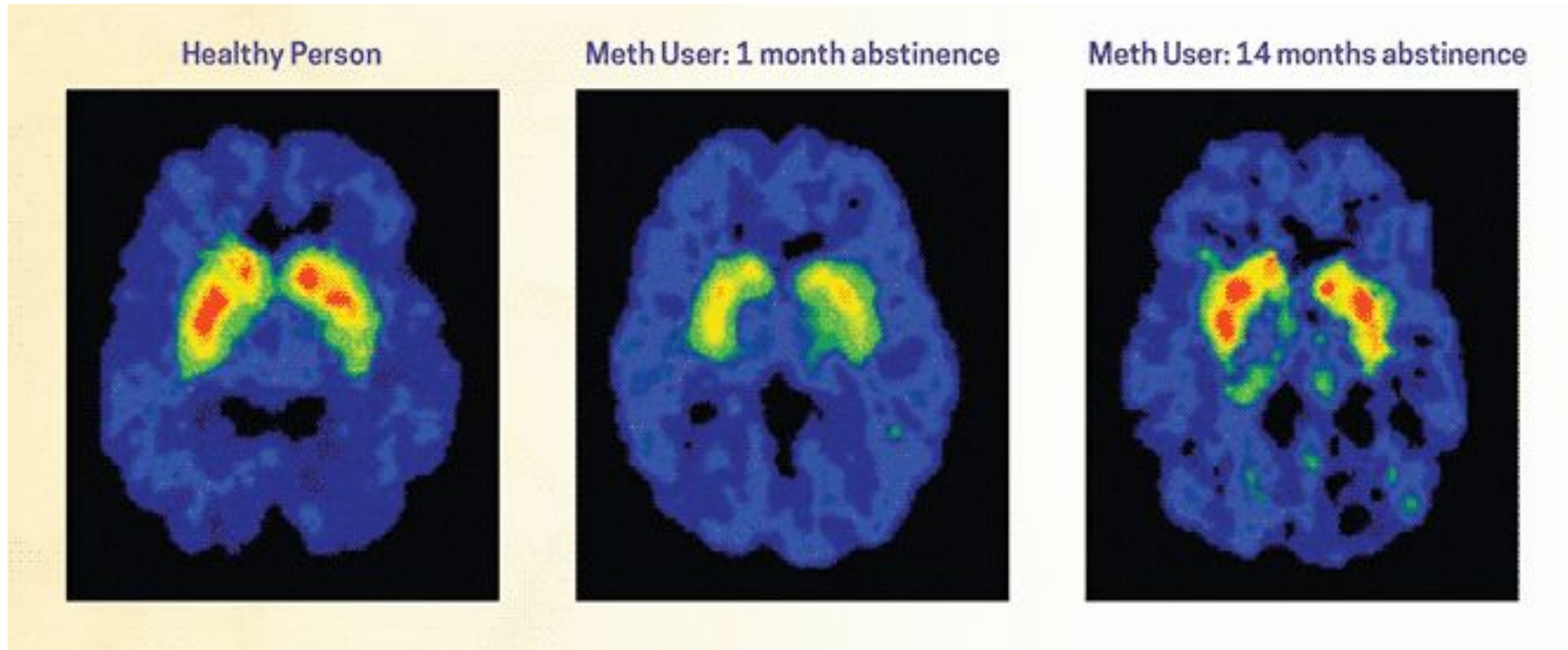
These images showing the density of dopamine transporters in the brain illustrate the brain's remarkable ability to recover, at least in part, after a long abstinence from drugs—in this case, methamphetamine.

∞ Scripps Research

The Journal of Neuroscience, 21(23):9414-9418. 2001

TWO WEEK SLEEP DIARY

AASM | SLEEP EDUCATION

INSTRUCTIONS:

(1) Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation. **(2)** Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise. **(3)** Put a "B" in the box to show when you go to bed. Put a "Z" in the box that shows when you think you fell asleep. **(4)** Put a "Z" in all the boxes that show when you are asleep at night or when you take a nap during the day. **(5)** Leave boxes empty to show when you wake up at night and when you are awake during the day.

SAMPLE ENTRY BELOW: On a Monday when I worked, I jogged on my lunch break at 1 PM, had a glass of wine with dinner at 6 PM, fell asleep watching TV from 7 to 8 PM, went to bed at 10:30 PM, fell asleep around Midnight, woke up and couldn't got back to sleep at about 4 AM, went back to sleep from 5 to 7 AM, and had coffee and medicine at 7 AM.

Date	Day of the week	Type of Day (Work, School, Day Off, Vacation)	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Midnight	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM
sample	Mon.	Work		E					A	Z			B		Z	Z	Z	Z		Z	Z	C M				

week 1