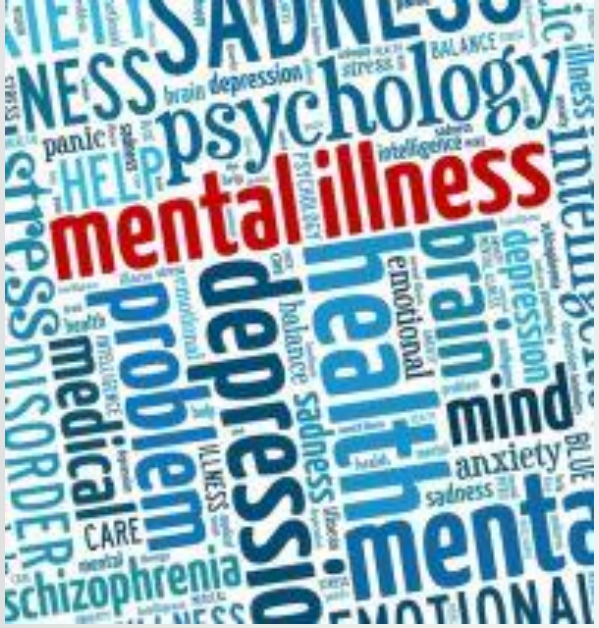

Neuroscience of Mental Health Disorders Part 5

Prepared by:

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Substance Use Disorders

What is Addiction?

Addiction is a brain disease

Characterized by:

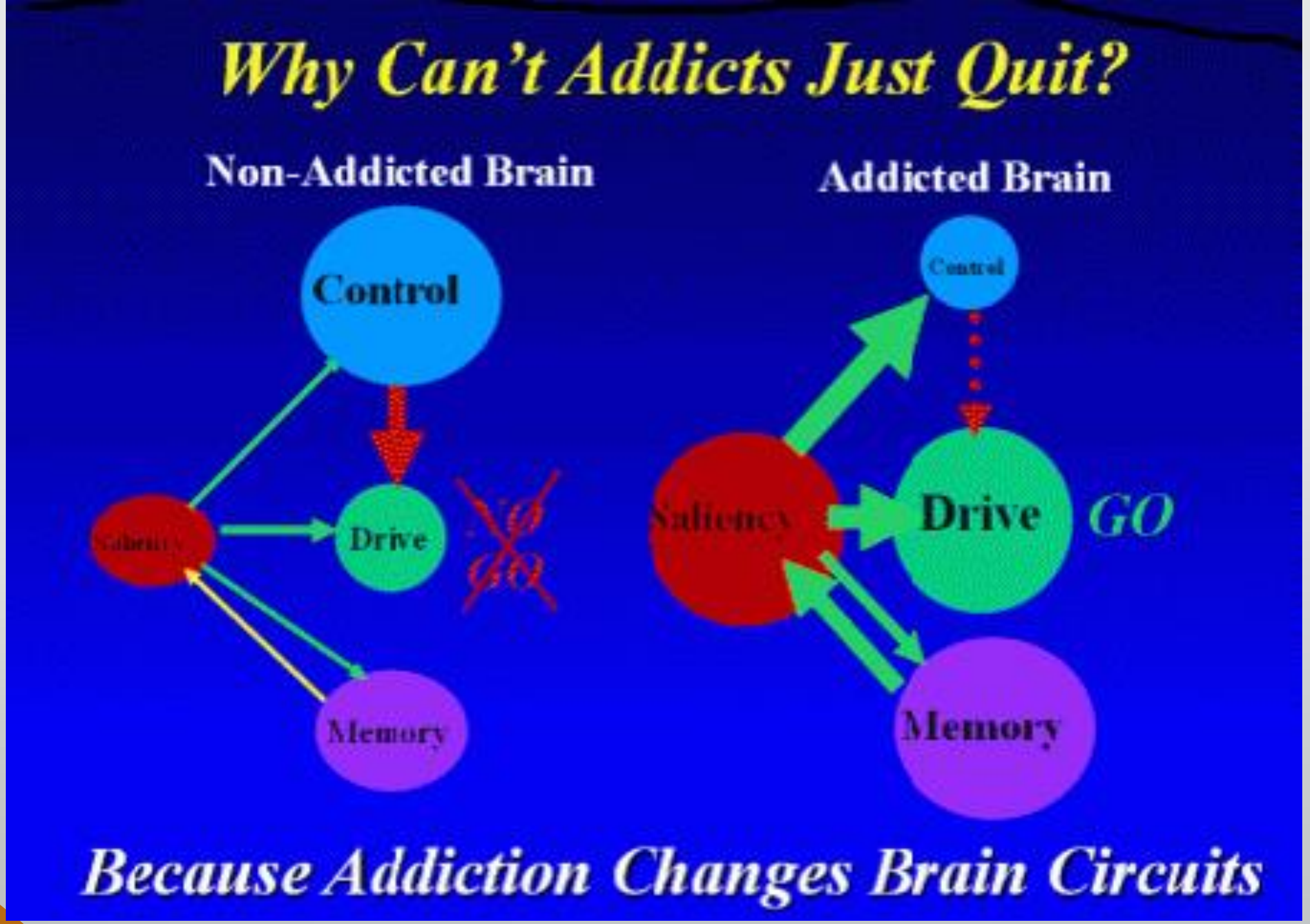
- Compulsive behavior
- Continued abuse of drugs despite negative consequences
- Persistent changes in the brain's structure and function

Addictive Brain Response

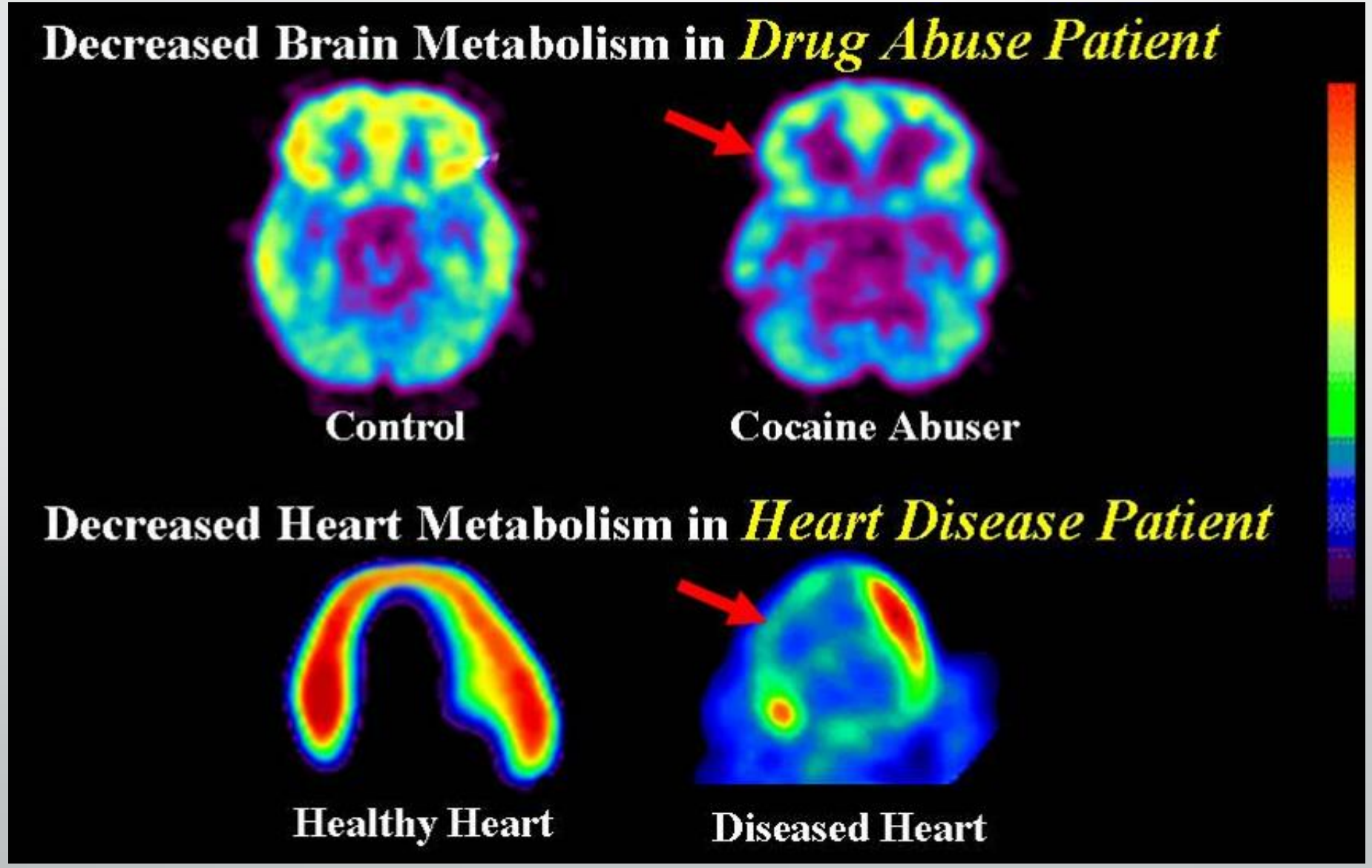
If alcohol or other drugs makes a person feel really good the person is at high risk of addiction

This is because alcohol and drugs:

- Flood the brain with pleasure chemicals
- Deprive the brain of warning chemicals
- Create euphoria
- Inhibit anxiety and fear even when in real threat
- Impair judgment and impulse control


Why Can't Addicts Just Quit?
Non-Addicted Brain
Control
Drive
Memory
Addicted Brain
Control
Drive
GO
Memory
Because Addiction Changes Brain Circuits

Addiction is a Disease of the Brain
It affects the Tissues of the Brain



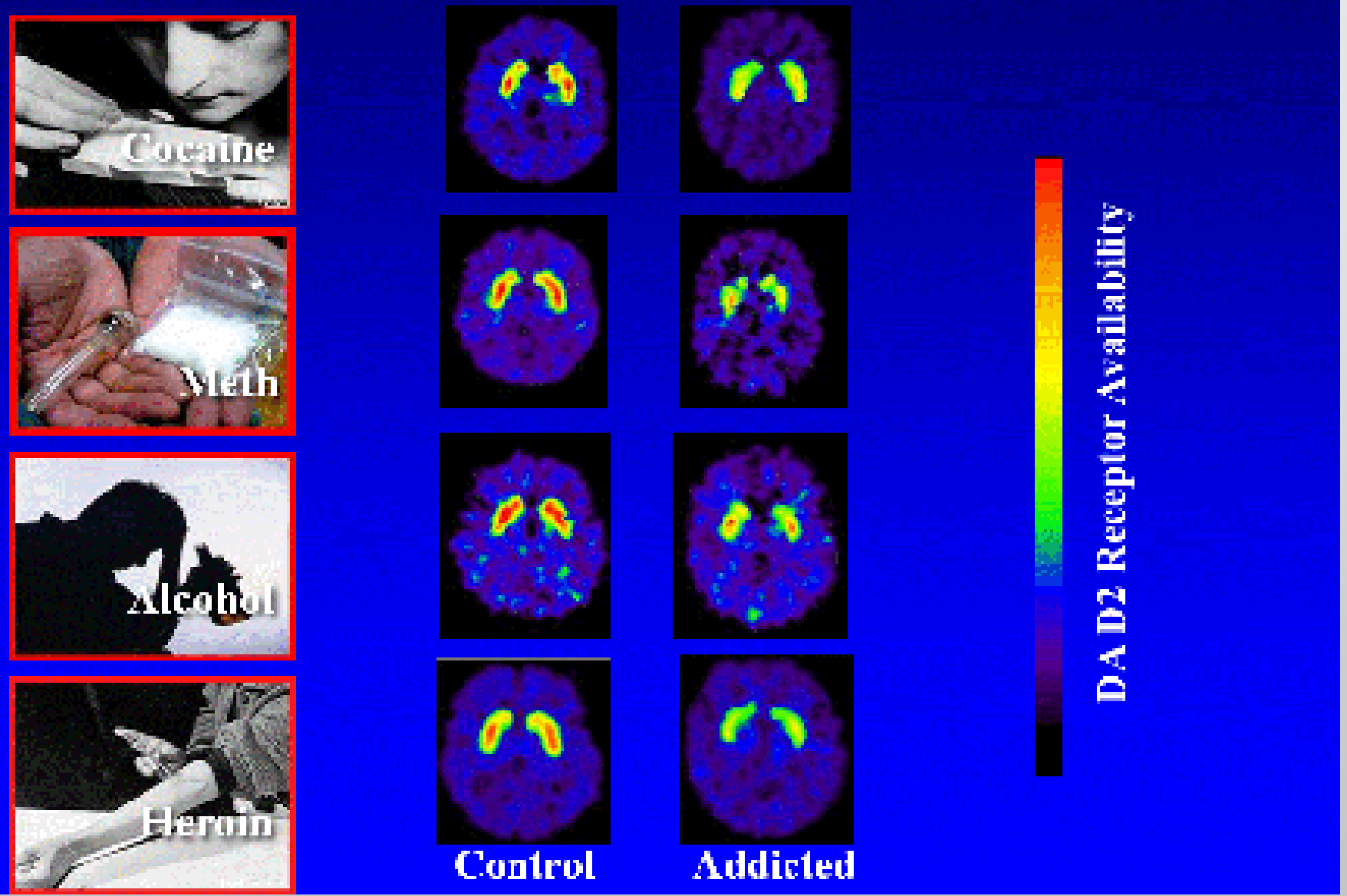
Addiction is Like any other Disease

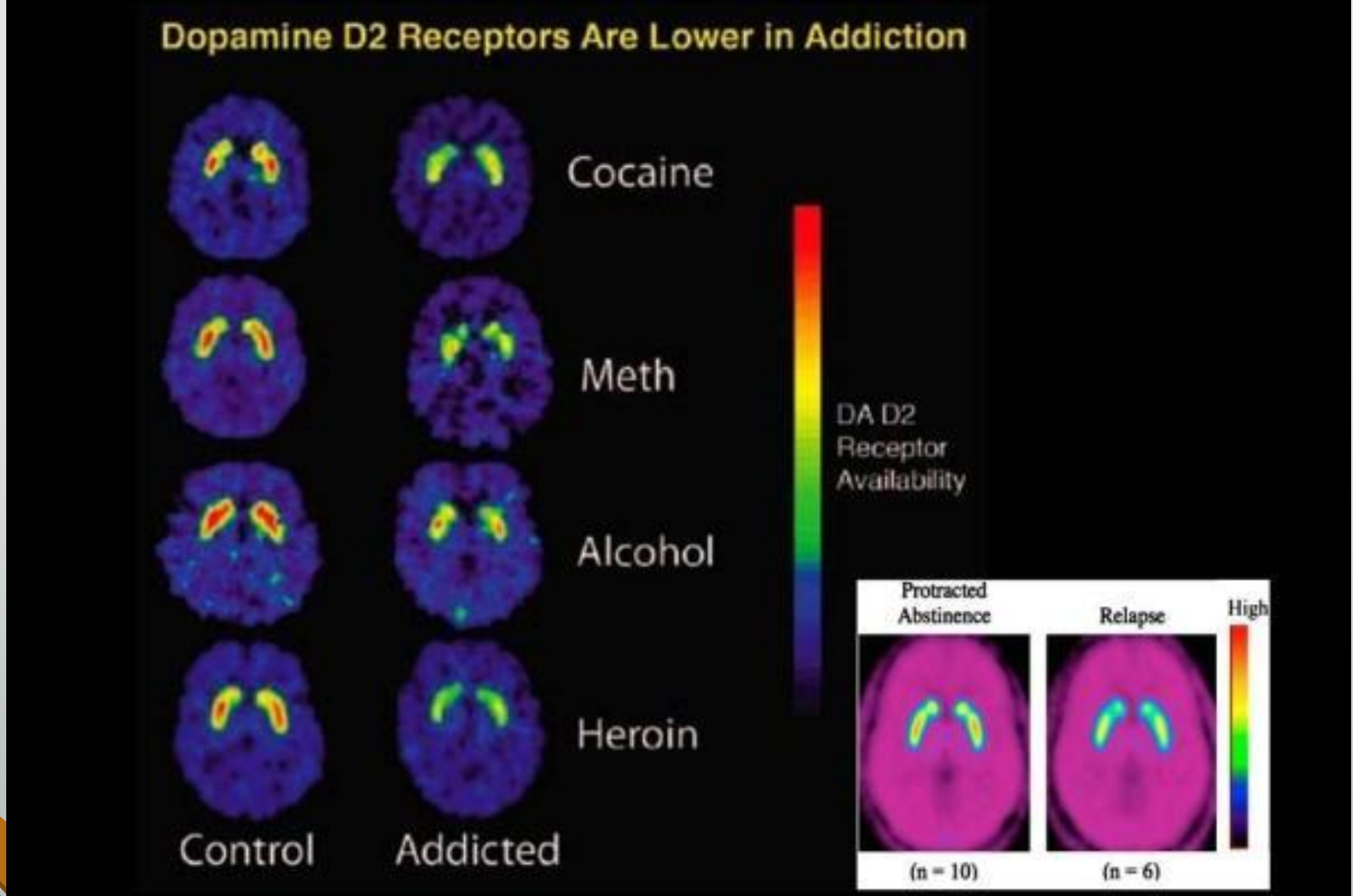
It is:

- Preventable
- Treatable
- It changes the biology of the body
- If untreated it lasts a lifetime

Functionally…

Dopamine D2 Receptors are Decreased by Addiction




Dopamine D2 Receptors Are Lower in Addiction
Cocaine
Meth
Alcohol
Heroin
Control
Addicted
DA D2
Receptor
Availability
Protracted
Abstinence
Relapse
High
(n = 10)
(n = 6)

Alcohol Use Disorder

So What is Alcohol Use Disorder?

Signs of Alcohol Use Disorder are:

- Alcoholic beverages found missing from the home storage cabinet
- Alcohol or mouthwash (used to cover up alcohol) breath or hangover symptoms (nausea, vomiting, or headache), if recently used

One has an alcohol problem if the person's use of alcohol interferes with personal health or daily living.

- People develop alcoholism if they physically or emotionally depend on alcohol to get them through their day.
- People who drink alcohol are more likely to engage in high-risk sexual behavior, have poor grades or job performance, use tobacco products, and experiment with illegal drugs.
- Alcohol and drug use may be an unconscious attempt at self-treatment for another problem, such as depression.

Physiological Effects of Alcohol Use Disorder

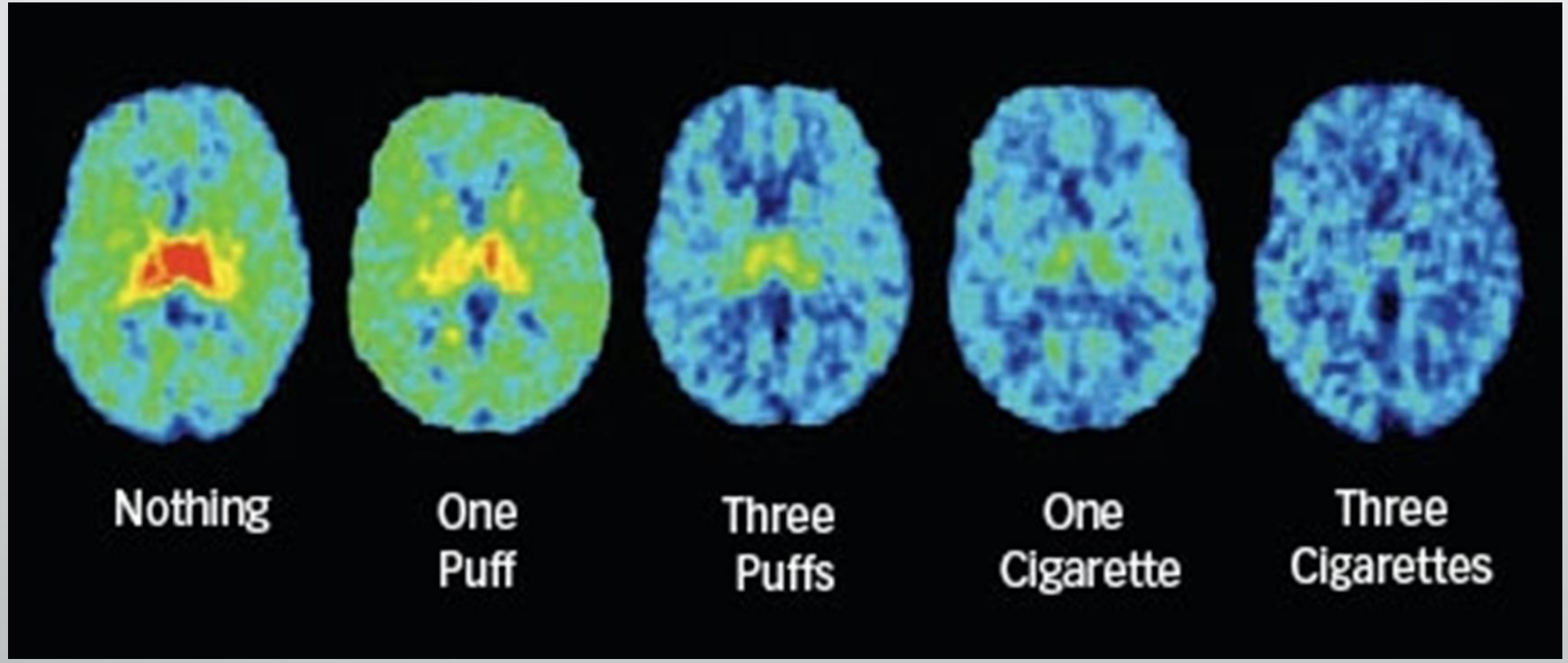
- Although many people have a drink as a "pick me up," alcohol actually depresses the brain.
- Alcohol lessens inhibitions, slurs speech, and decreases muscle control and coordination, and may lead to severe alcohol use disorder
- Long-term heavy drinking damages the liver, nervous system, heart, and brain - Alcohol is the most common cause of liver failure in the US.
- Alcohol can cause heart enlargement and cancer of the esophagus, pancreas, and stomach.
- It can lead to high blood pressure, stomach problems, medicine interactions, sexual problems, osteoporosis, and cancer
- Withdrawal from alcohol can cause anxiety, irregular heartbeat, tremor, seizures, and hallucinations.
- In its severest form, withdrawal combined with malnutrition can lead to a life-threatening condition called delirium tremens (DTs).


Sober
Intoxicated

Social Impact of Alcohol Use Disorder?

- Alcohol use disorder can also lead to violence, accidents, social isolation, jail or prison time, and problems at work and home.
- Symptoms of an alcohol problem include personality changes, blackouts, drinking more and more for the same "high," and denial of the problem.
- A person with an alcohol problem may gulp or sneak drinks, drink alone or early in the morning, and suffer from the shakes.
- He or she may also have family, school, or work problems or get in trouble with the law because of drinking.
- The use of alcohol with medicines or illegal drugs may increase the effects of each

Tobacco Use Disorder



Signs and Symptoms of Tobacco Use Disorder

A person who is dependent on tobacco can be identified by:

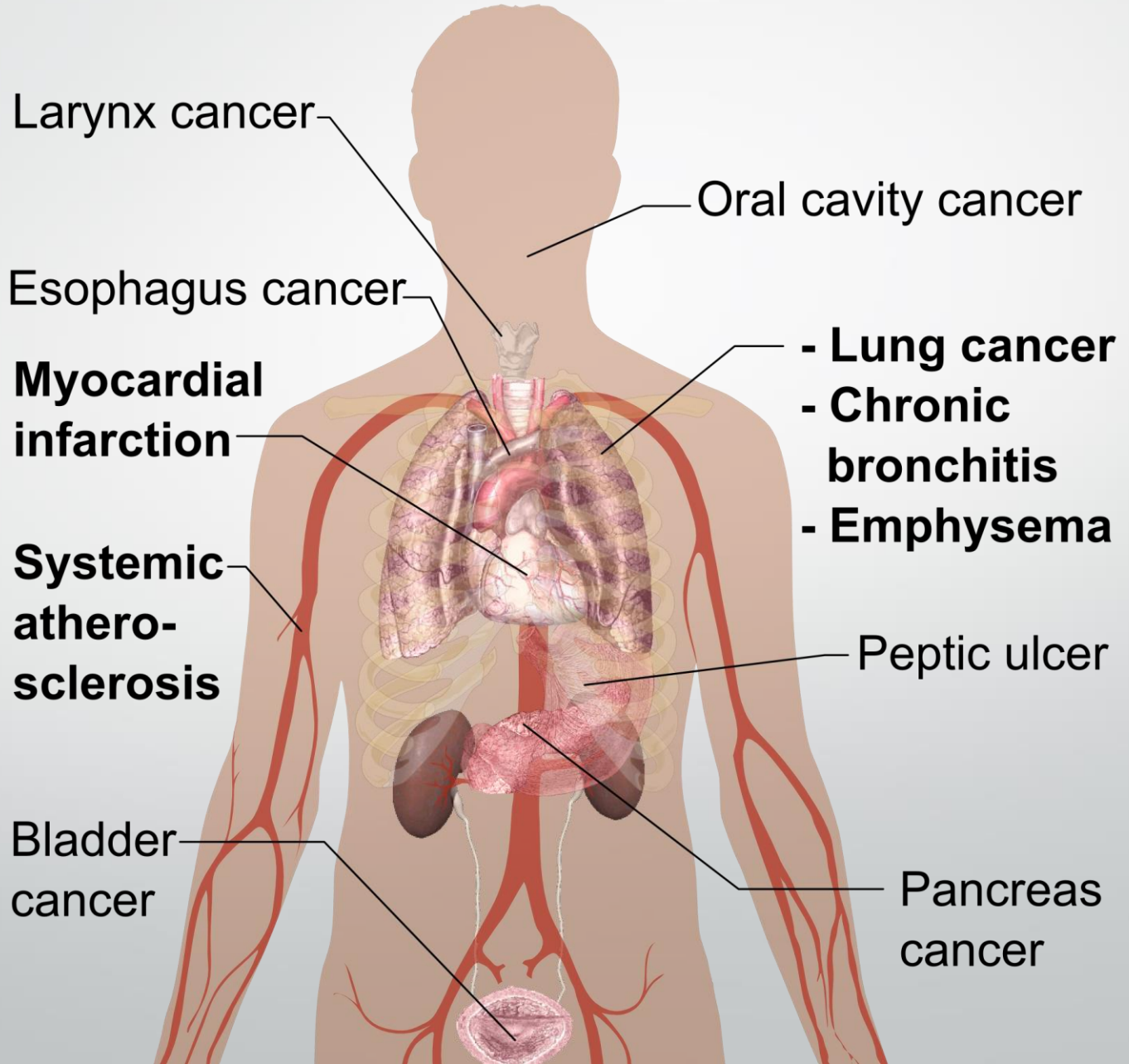
- A distinctive smell on the breath and clothing
- Cigarettes and lighter in his or her possession
- Cigarette butts outside a bedroom window or in other odd places around the home

Impact of Tobacco Use Disorder

- People cite many reasons for using tobacco, including pleasure, improved performance and vigilance, relief of depression, curbing hunger, and weight control.
- The primary addicting substance in cigarettes is nicotine.
- But cigarette smoke contains thousands of other chemicals that also damage health.
- Hazards include heart disease, lung cancer and emphysema, peptic ulcer disease, and stroke.
- Withdrawal symptoms of smoking include anxiety, hunger, sleep disturbances, and depression.
- Smoking is responsible for nearly a half million deaths each year. Tobacco use costs the nation an estimated $100 billion a year, mainly in direct and indirect health care costs.

Common adverse effects of

Tobacco smoking



What is Substance Use Disorder

Substance use disorder includes the use of illegal drugs:

- Marijuana
- Methamphetamines
- Cocaine,
- Heroin, or other "street drugs"

And use of legal prescription and nonprescription drugs.

- Some people use drugs to get a "high" or to relieve stress and emotional problems.

General Signs of substance abuse:

- Changes in sleeping patterns
- Changes in appetite or weight loss
- Changes in dress
- Loss of interest and motivation
- Hoarseness, wheezing, or persistent cough

Signs of various Substance Use Disorders

Inhalants

- Chemical breath, red eyes, or stains on clothing or face, if recently used
- Soaked rags or empty aerosol containers in the trash

Club drugs

- Skin rash similar to acne
- Small bottles with liquid or powder in his or her possession

Stimulants

- Persistent runny nose and nosebleeds, injection marks on arms or other parts of the body, or long periods of time without sleep
- Possession of drug paraphernalia, such as syringes, spoons with smoke stains, small pieces of glass, and razor blades

LSD or other hallucinogens

- Trance-like appearance with dilated pupils, if recently used
- Small squares of blotter paper (sometimes stamped with cartoon characters) or other forms of the drug in his or her possession

Heroin

- Very small pupils and a drowsy or relaxed look, if recently used
- Possession of injecting supplies, called an outfit or rig, that may consist of a spoon or bottle cap, syringe, tourniquet, cotton, and matches

Anabolic steroids

- An unpleasant breath odor
- Mood changes, including increased aggression
- Changes in physical appearance that can't be attributed to expected patterns of growth and development
- Possession of medicines or syringes

Marijuana Use Disorder

Signs of Marijuana abuse

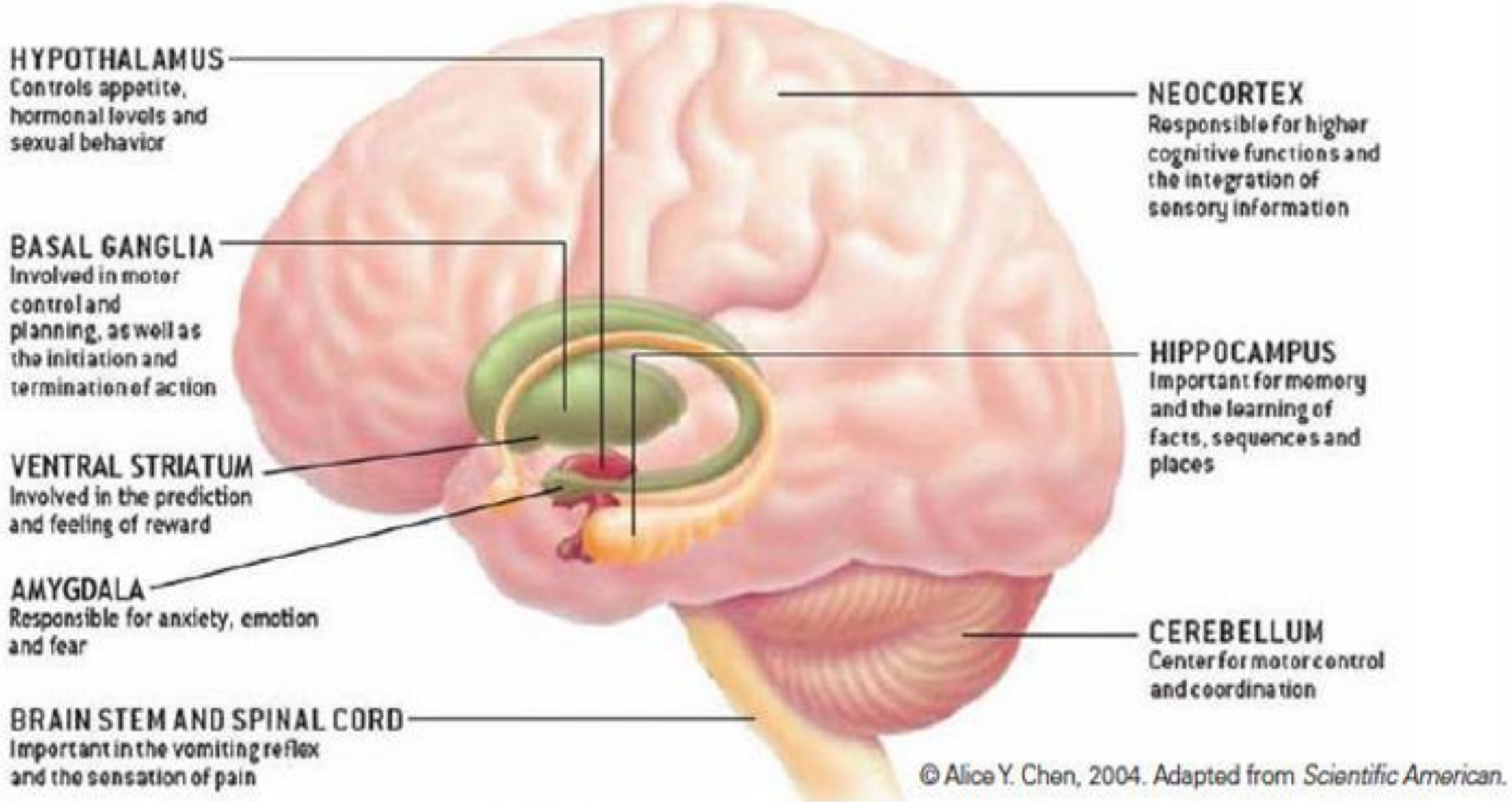
A person who is abusing marijuana can be identified by:

- Sweet smell on clothing or bloodshot eyes, if recently used, and frequent use of eyedrops to reduce the redness
- Drug paraphernalia (pipes) in his or her possession
- Carelessness in grooming, increased fatigue, and changes in eating and sleeping patterns, if using regularly

Impact of Marijuana Use Disorder

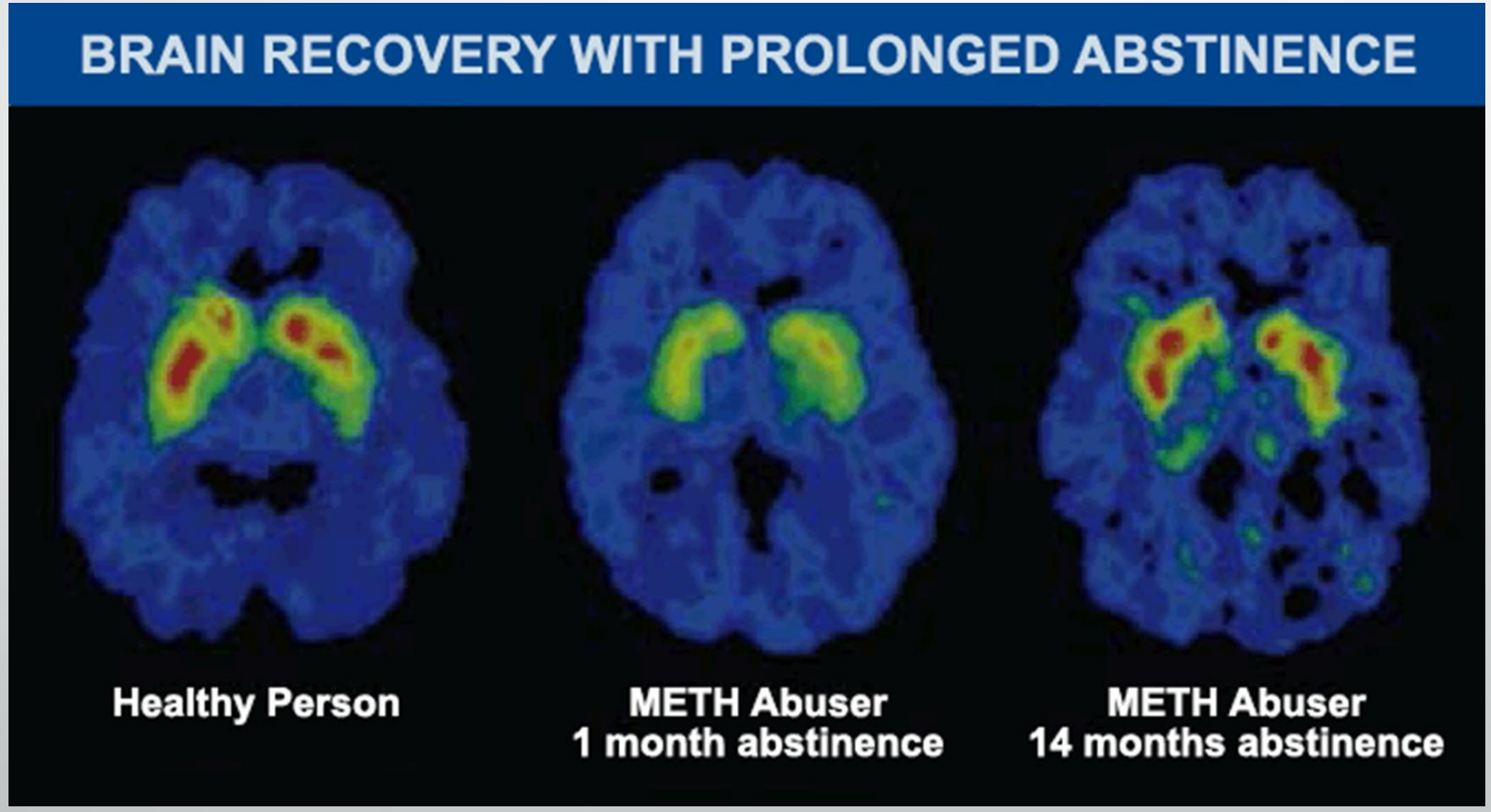
Marijuana is also known as grass, pot, weed, herb.

- Marijuana comes from the plant Cannabis sativa and is the most commonly used illegal drug in the United States. The plant produces delta-9-tetrahydrocannabinol (THC), the active ingredient associated with intoxication.
- Marijuana resin, called hashish, contains an even higher concentration of THC.
- The drug is usually smoked, but it can also be eaten. Its smoke irritates lungs more and contains more cancer-causing chemicals than tobacco smoke.
- Common effects of marijuana use include pleasure, relaxation, and impaired coordination and memory.
- Often, the first illegal drug people use, marijuana is associated with increased risk of progressing to more powerful and dangerous drugs such as cocaine and heroin. The risk for progressing to cocaine is 104 times higher if you have smoked marijuana at least once than if you never smoked marijuana.



When marijuana is smoked, its active ingredient, THC, travels throughout the body, including the brain, to produce its many effects. THC attaches to sites called cannabinoid receptors on nerve cells in the brain, affecting the way those cells work. Cannabinoid receptors are abundant in parts of the brain that regulate movement, coordination, learning and memory, higher cognitive functions such as judgment, and pleasure.

Methamphetamine Use Disorder



Impact of Meth Use Disorder

- Methamphetamines is also known as meth, crank, ice, speed, crystal.
- Methamphetamine is a powerful stimulant that increases alertness, decreases appetite, and gives a sensation of pleasure.
- The drug can be injected, snorted, smoked, or eaten.
- It shares many of the same toxic effects as cocaine-heart attacks, dangerously high blood pressure, and stroke.
- Withdrawal often causes depression, abdominal cramps, and increased appetite.
- Other long-term effects include paranoia, hallucinations, weight loss, destruction of teeth, and heart damage.

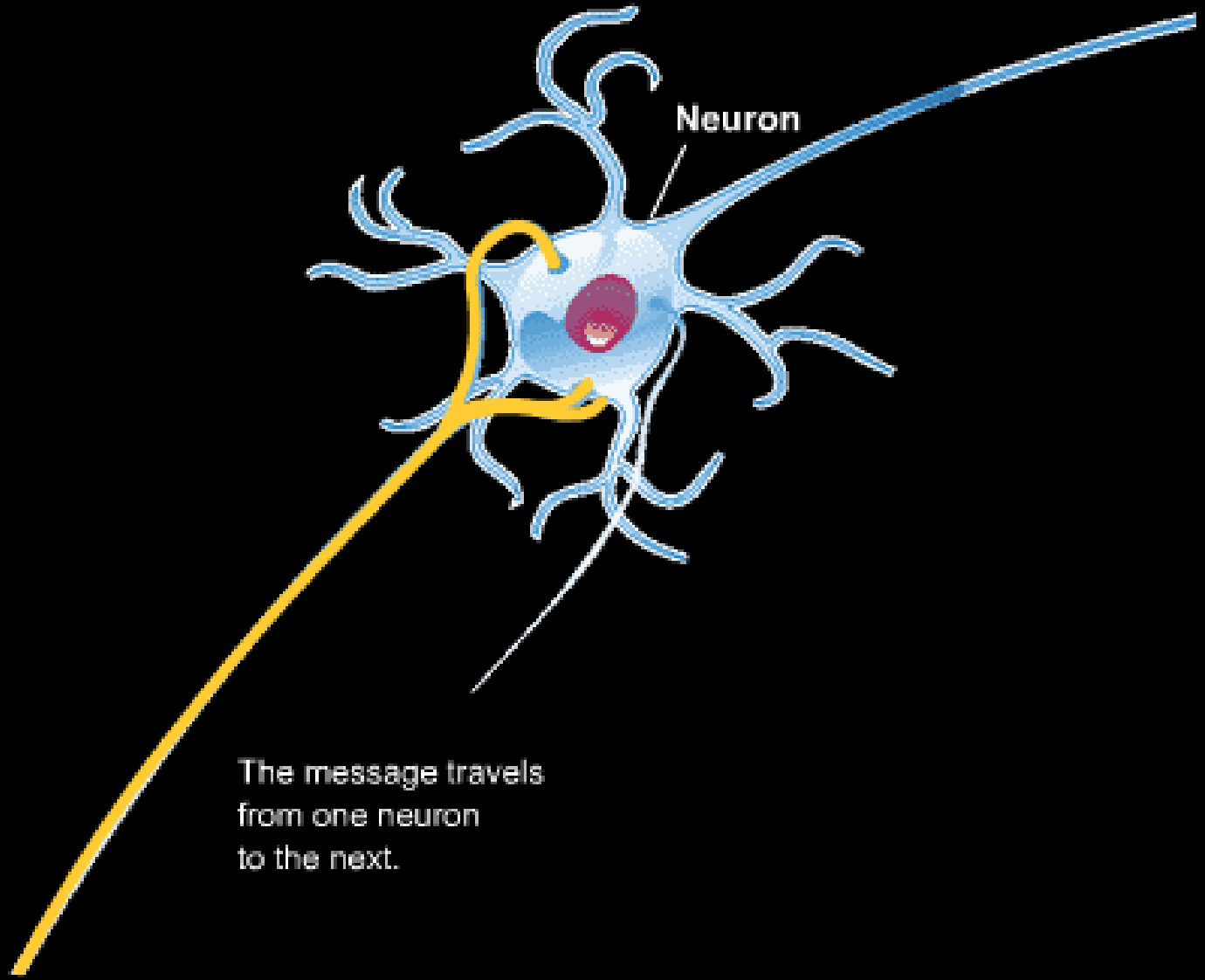
THE

USER

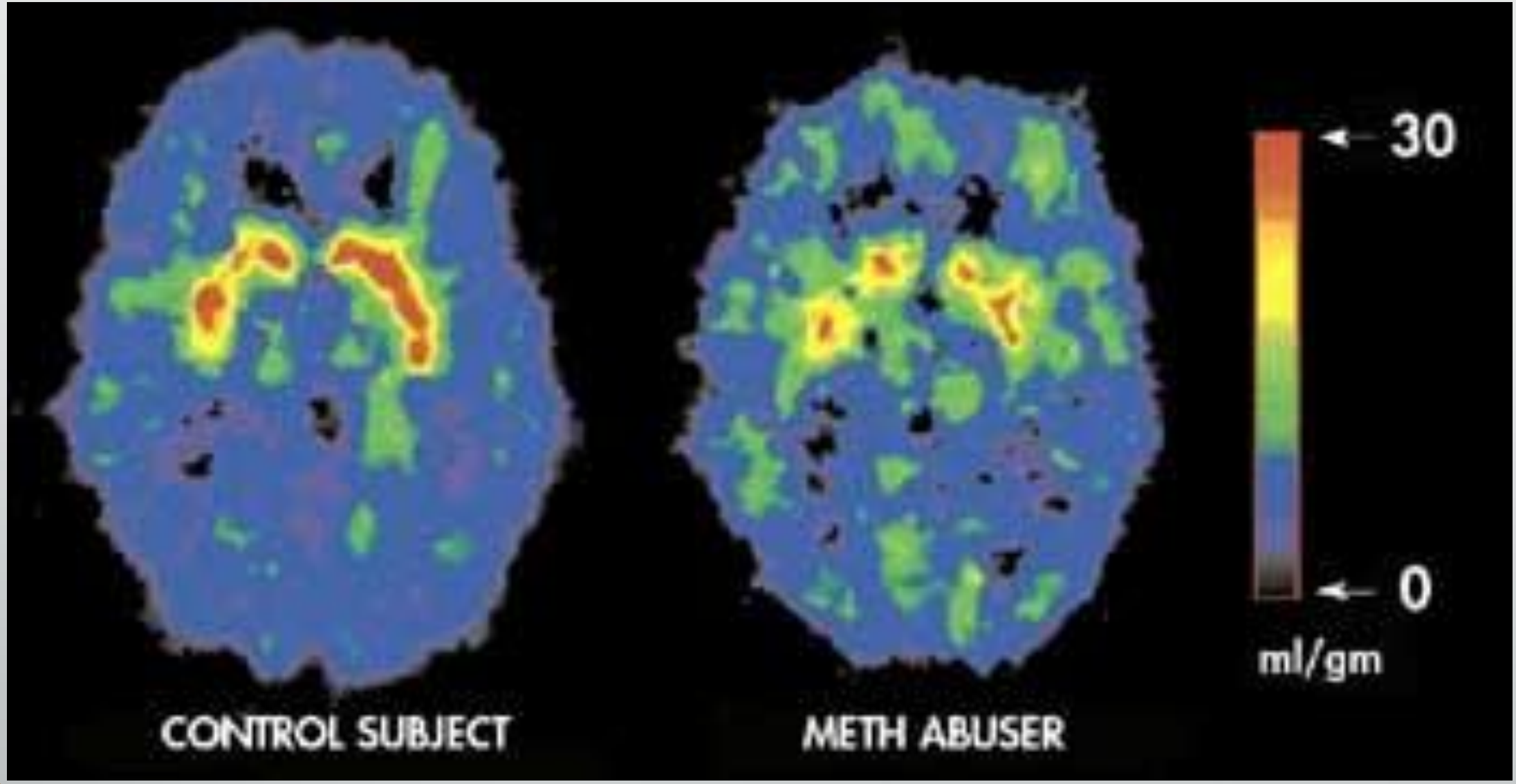
METH AND THE BRAIN

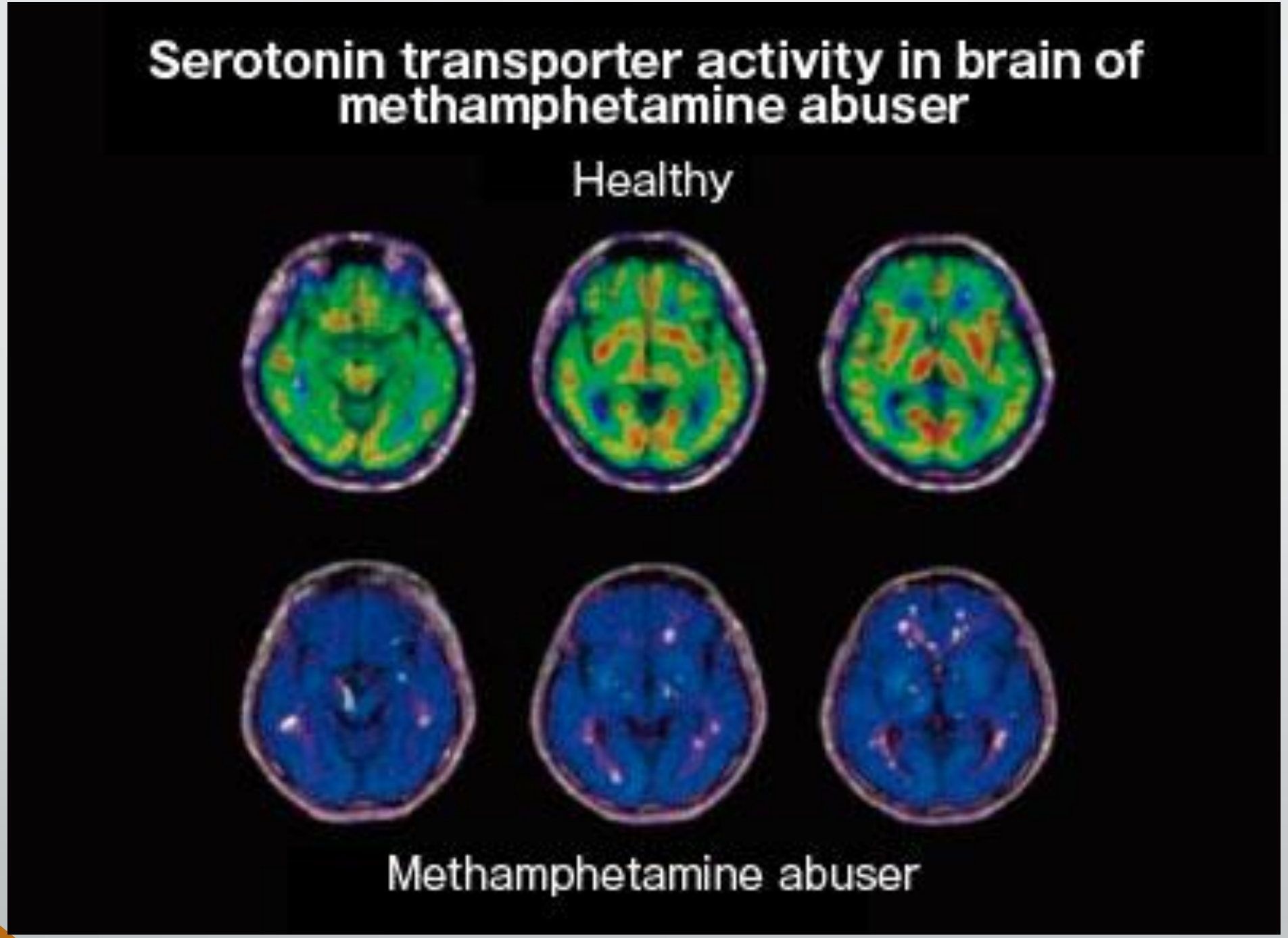
Methamphetamine enters the brain through the blood stream.

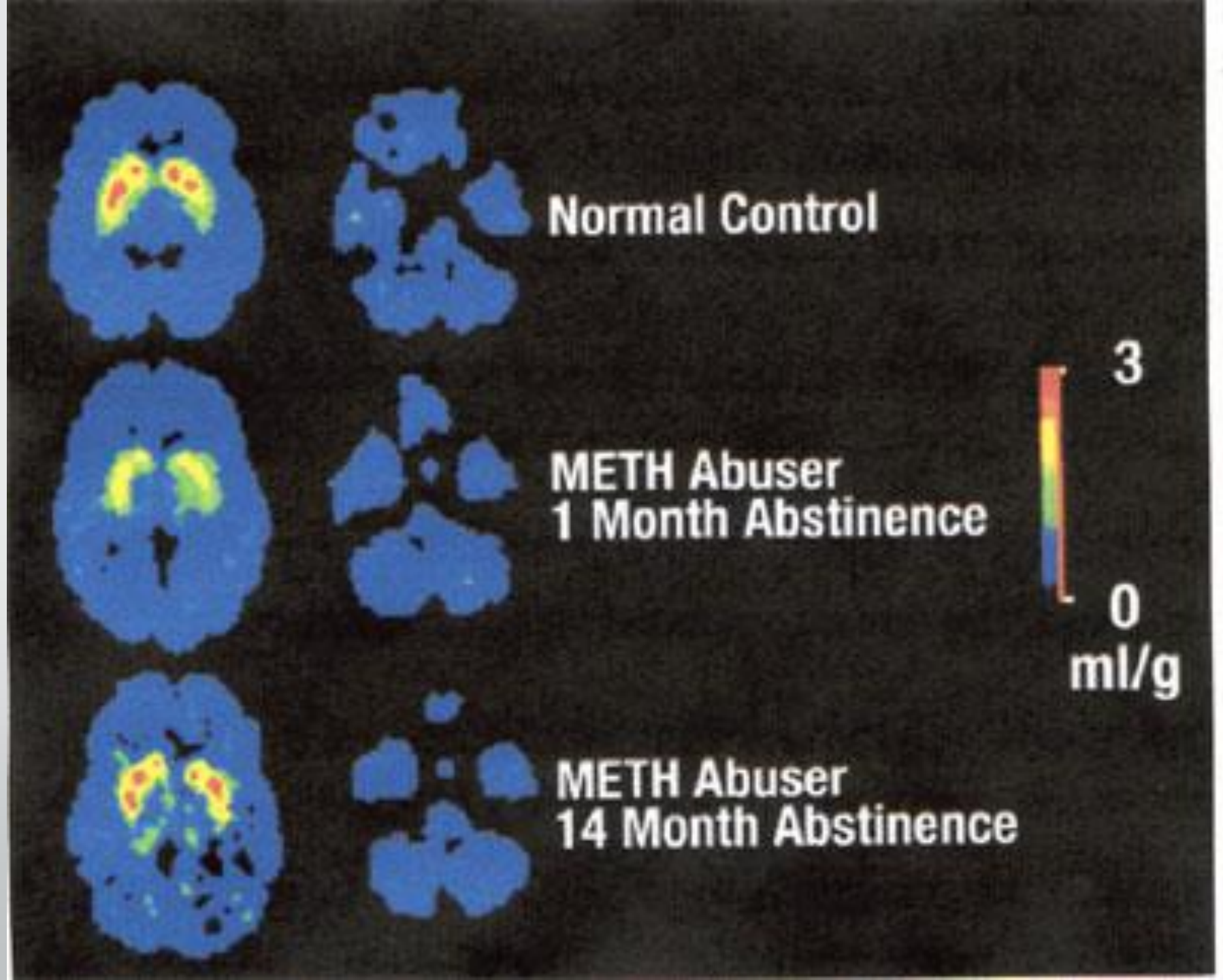
The drug stimulates a region of the brain that releases dopamine. Dopamine belongs to a class of chemicals called neurotransmitters, which carry messages from one brain cell, or neuron, to another. In a normal brain, neurons release dopamine in response to things that bring pleasure.



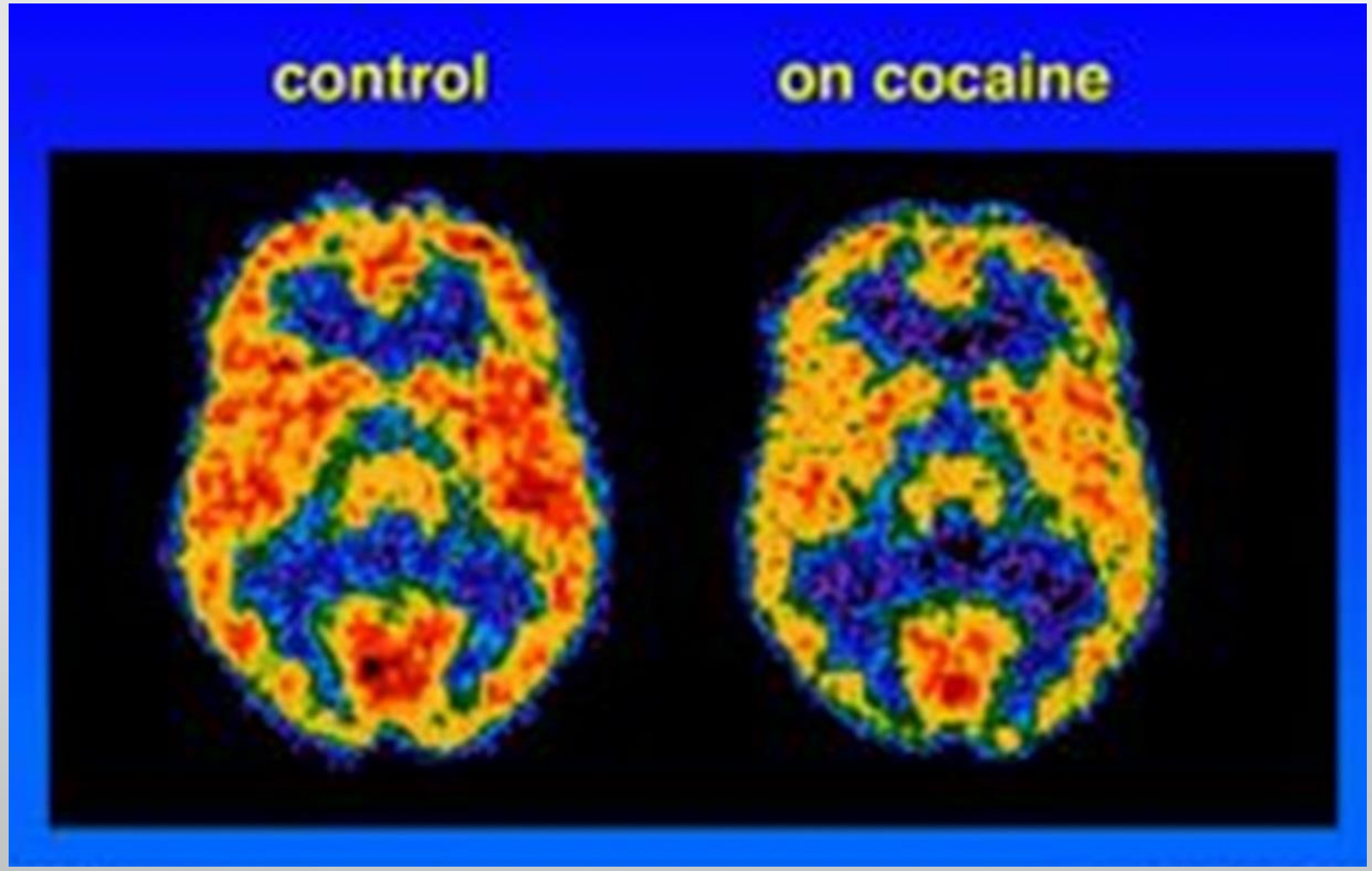
The message travels from one neuron to the next.


30
0
ml/gm
CONTROL SUBJECT
METH ABUSER


Serotonin transporter activity in brain of methamphetamine abuser
Healthy
Methamphetamine abuser


Normal Control
METH Abuser
1 Month Abstinence
METH Abuser
14 Month Abstinence
3
0
ml/g

Cocaine Use Disorder



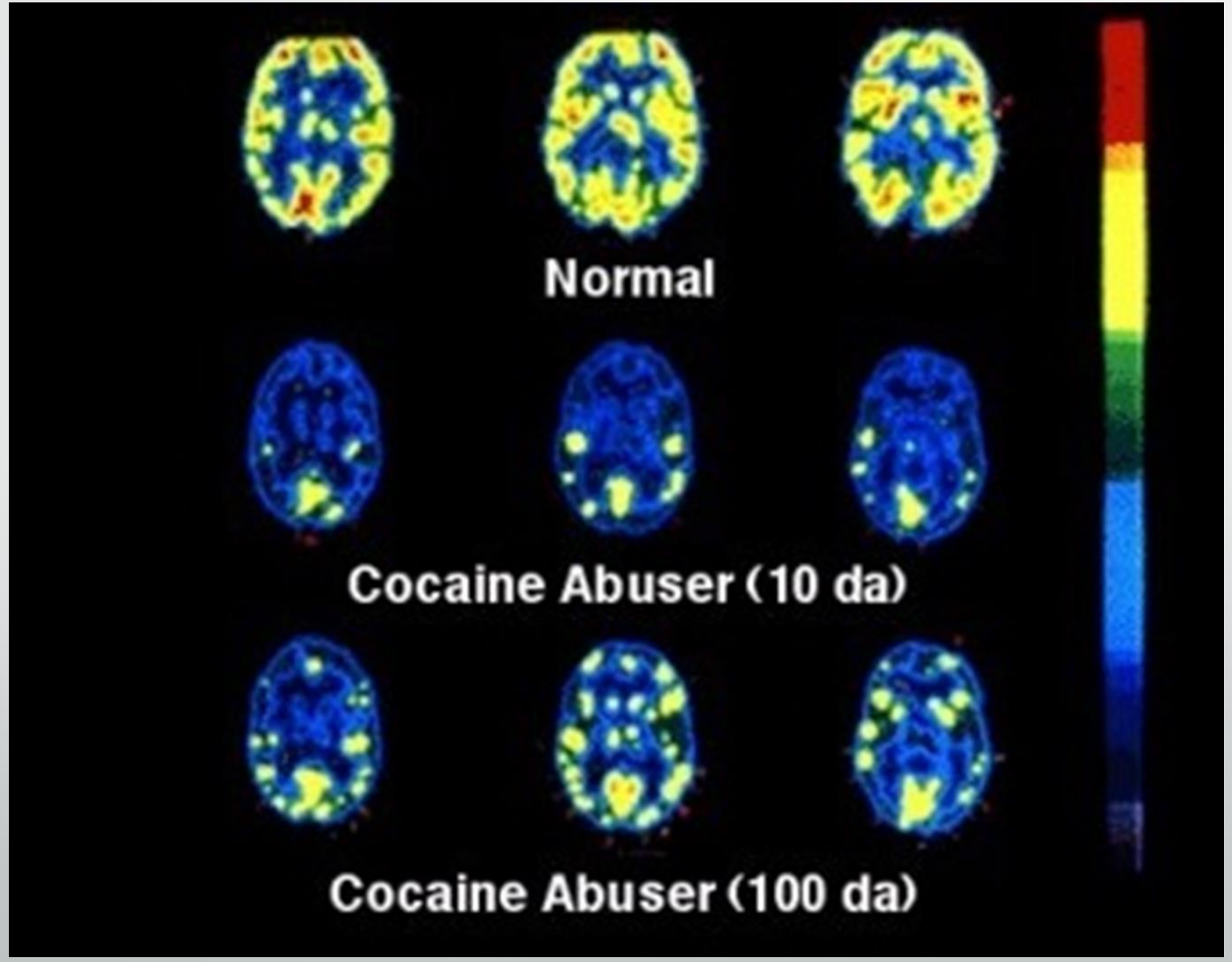
Impact of Cocaine Use Disorder

Cocaine is also known as crack, coke, snow, rock.

Cocaine use has gone down in the last few years; from 2007 to 2012, the number of current users in the U.S. ages 12 or older dropped from 2.1 million to 1.7 million.

- Derived from the coca plant of South America, cocaine can be smoked, injected, snorted, or swallowed. The intensity and duration of the drug's effects depend on how you take it. Desired effects include pleasure and increased alertness.
- Short-term effects also include paranoia, constriction of blood vessels leading to heart damage or stroke, irregular heartbeat, and death. Severe depression and reduced energy often accompany withdrawal.
- Both short- and long-term use of cocaine has been associated with damage to the heart, the brain, the lung, and the kidneys.

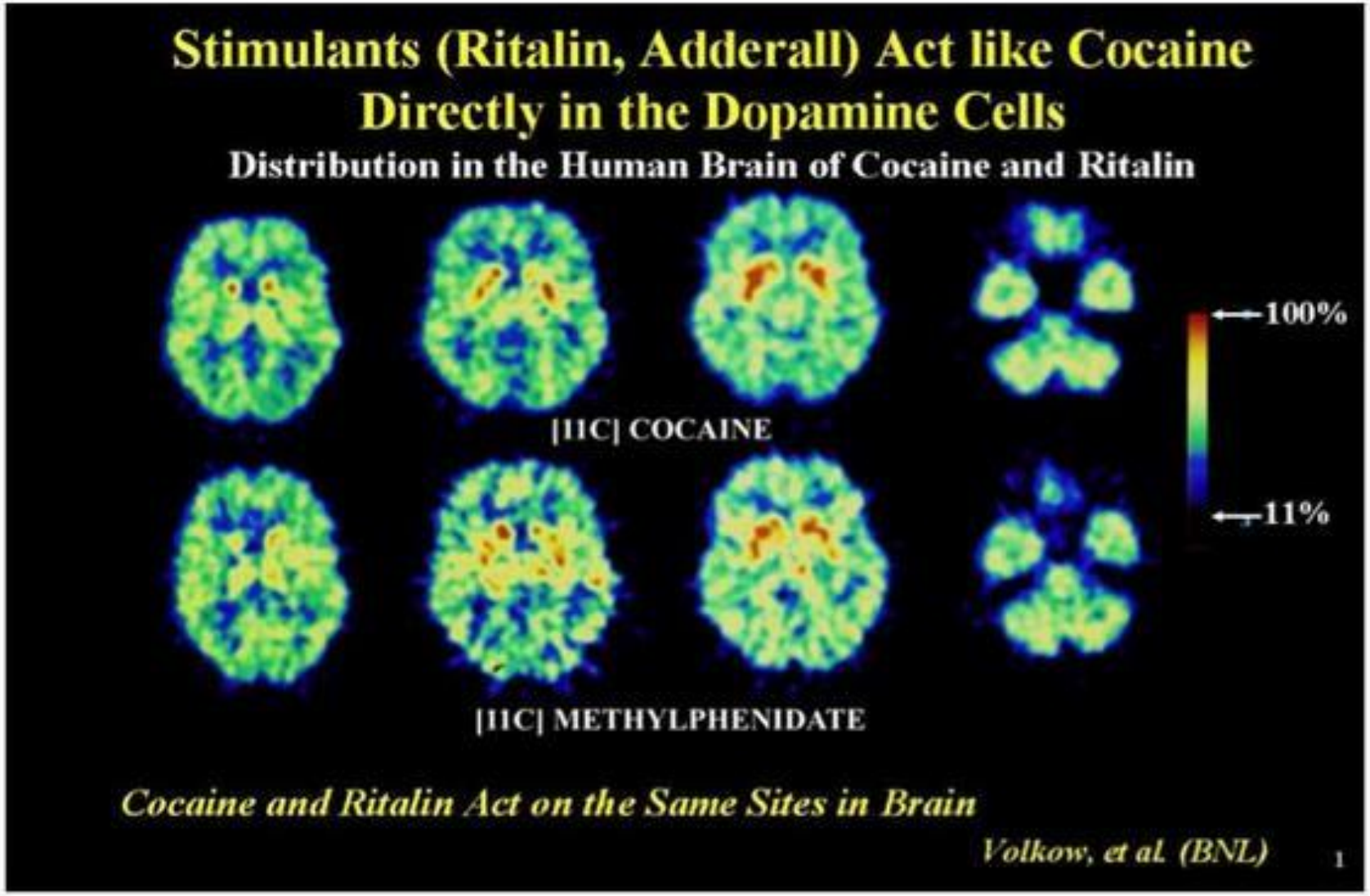
How Cocaine Affects the Brain



Commonly Abused Prescription Drugs

Amphetamines

- When prescribed, stimulants like the amphetamines Adderall and Dexedrine can help people with ADHD.
- But some people use amphetamines to get high, to increase energy and alertness, or to keep their weight down.
- One can get addicted to stimulants.
- High doses can cause a dangerous rise in body temperature, irregular heartbeat, and even cardiac arrest.
- Nicknames for amphetamines include "bennies," "black beauties," and "speed."



Ritalin, or methylphenidate, has much in common with cocaine—the two drugs bind to similar sites in the brain and both increase dopamine through the same molecular targets.

Methylphenidate

Methylphenidate is a stimulant in ADHD drugs like Concerta, Metadate, Methylin, and Ritalin.

Its nicknames include "MPH," "R-ball," "Skippy," "the smart drug," and "vitamin R."

If one take stimulants, combining them with common decongestants can cause dangerously high blood pressure or an irregular heartbeat.

Barbiturates

- Barbiturates (sedatives): phenobarbital, Mebaral, Nembutal & Seconal
- They help with anxiety, sleep problems, and some seizures. But if taken more than prescribed, one can get addicted.
- High doses can cause trouble breathing, especially if one uses them when drinking alcohol.
- If a person can't function without barbiturates, they must get help.
- Going into withdrawal can be dangerous.

Benzodiazepines

- Valium and Xanax are two examples of benzodiazepines which are sedatives that can help with anxiety, panic attacks, and sleep problems.
- Benzodiazepines work well and they're safer than barbiturates.
- But overused, they can also lead to physical dependence and addiction.
- Prescription drugs shouldn't be shared.
- They are only for the person with the prescription

Sleep Medications

- For people who have trouble sleeping, drugs like Ambien, Lunesta, and Sonata can help them get the rest they need.
- But if used longer than one's doctor suggests, a person may start to believe in the need for them in order to sleep.
- Although they are not as addictive as some sleeping pills, doctors are concerned about abuse if they are not taken as prescribed.

Codeine and Morphine

- Some of the most commonly abused prescription meds are painkillers specifically, opioids.
- These drugs dull pain, but in large doses they can also cause a euphoric high and dangerous side effects.
- Doctors usually prescribe morphine for severe pain and codeine for milder pain or coughing.
- Brands of morphine include Avinza, Kadian, MS Contin, Oramorph, and Roxanol.

Oxycodone: OxyContin and Percocet

- Oxycodone is an opioid painkiller. It's in drugs like OxyContin, Percocet, Percodan, and Roxicodone.
- People who abuse oxycodone sometimes crush it and snort it or inject it which greatly increases the risk of overdose.
- Street names include "oxy," "O.C.," and "oxycotton" for OxyContin and "percs" for Percocet or Percodan.

Hydrocodone: Vicodin, Lortab, Lorcet

- Lorcet, Lortab, and Vicodin contain the opioid hydrocodone plus acetaminophen.
- Opioids cause drowsiness and constipation.
- High doses can cause dangerous breathing problems.
- Vicodin's street names include "vike" and "Watson-387."

Dextromethorphan (DXM)

- Dextromethorphan (DXM) is a common ingredient in over-the-counter cold and cough medicines
- It helps clear out mucus.
- But large doses can get a person high and cause hallucinations.
- It's popular among teens, since cough syrup is so easy to find in medicine cabinets.
- High doses also cause vomiting, rapid heart rate, and rarely brain damage.

Pseudoephedrine

- Pseudoephedrine is a decongestant in lots of non-prescription cold medicines.
- While it helps clear up a stuffy nose, it's also an ingredient in illegal methamphetamine ("meth").
- To curb meth abuse, U.S. laws now control how one buys pseudoephedrine products.
- That's why some cold medicines are located behind the counter and why one may have to sign for some.