Substance Use Disorders 101

UNDERSTANDING THE BASICS

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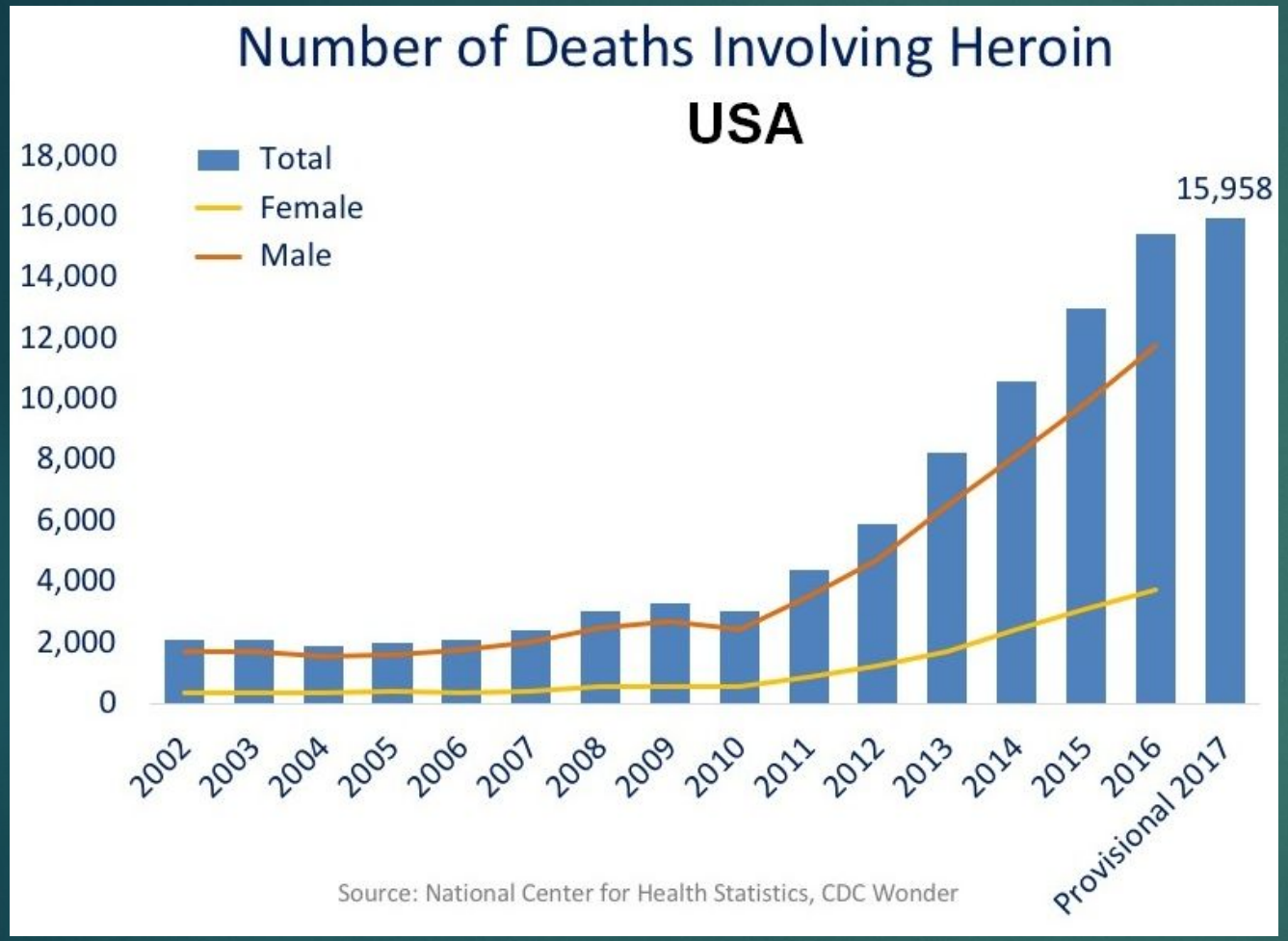
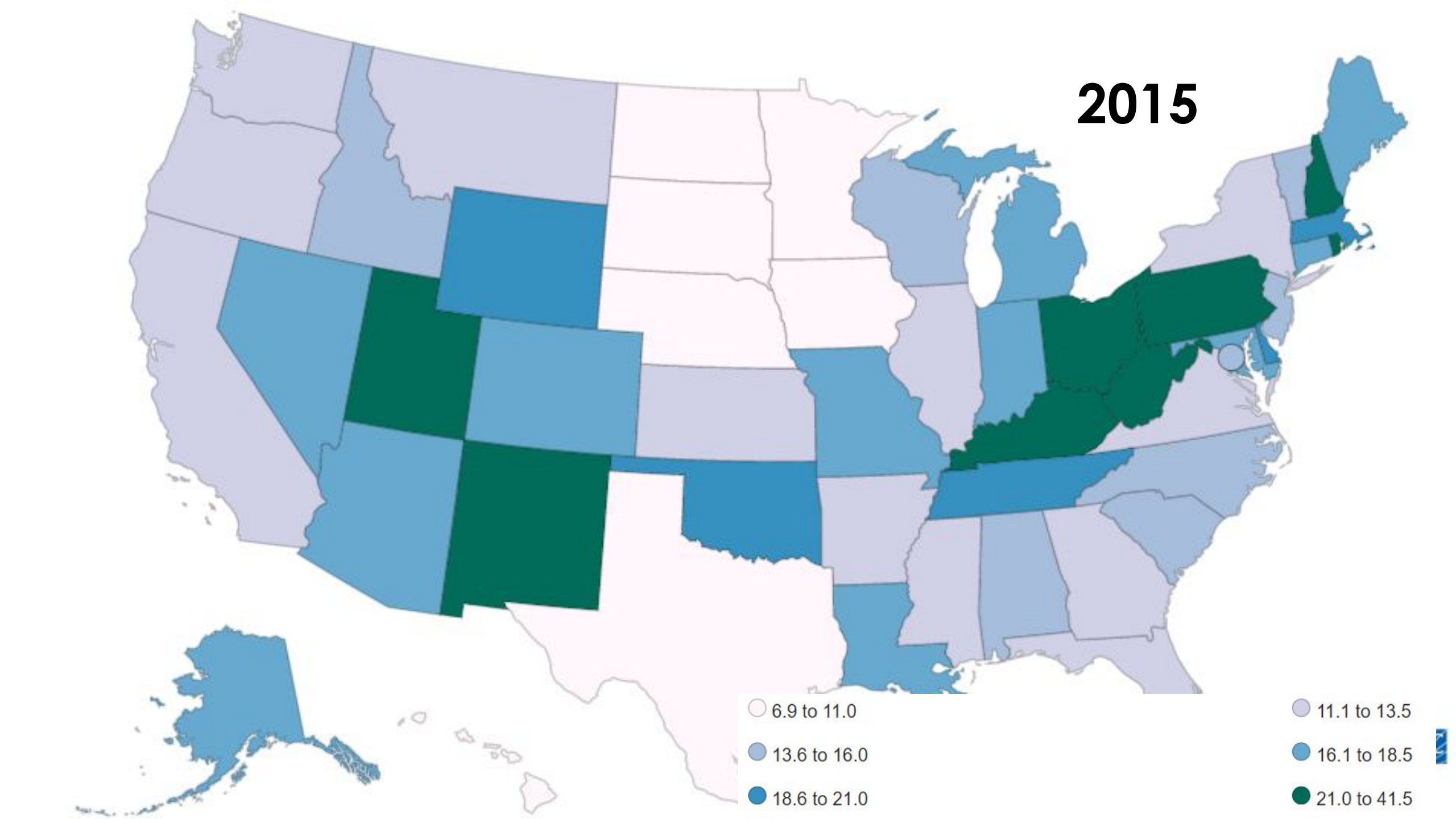
Objectives

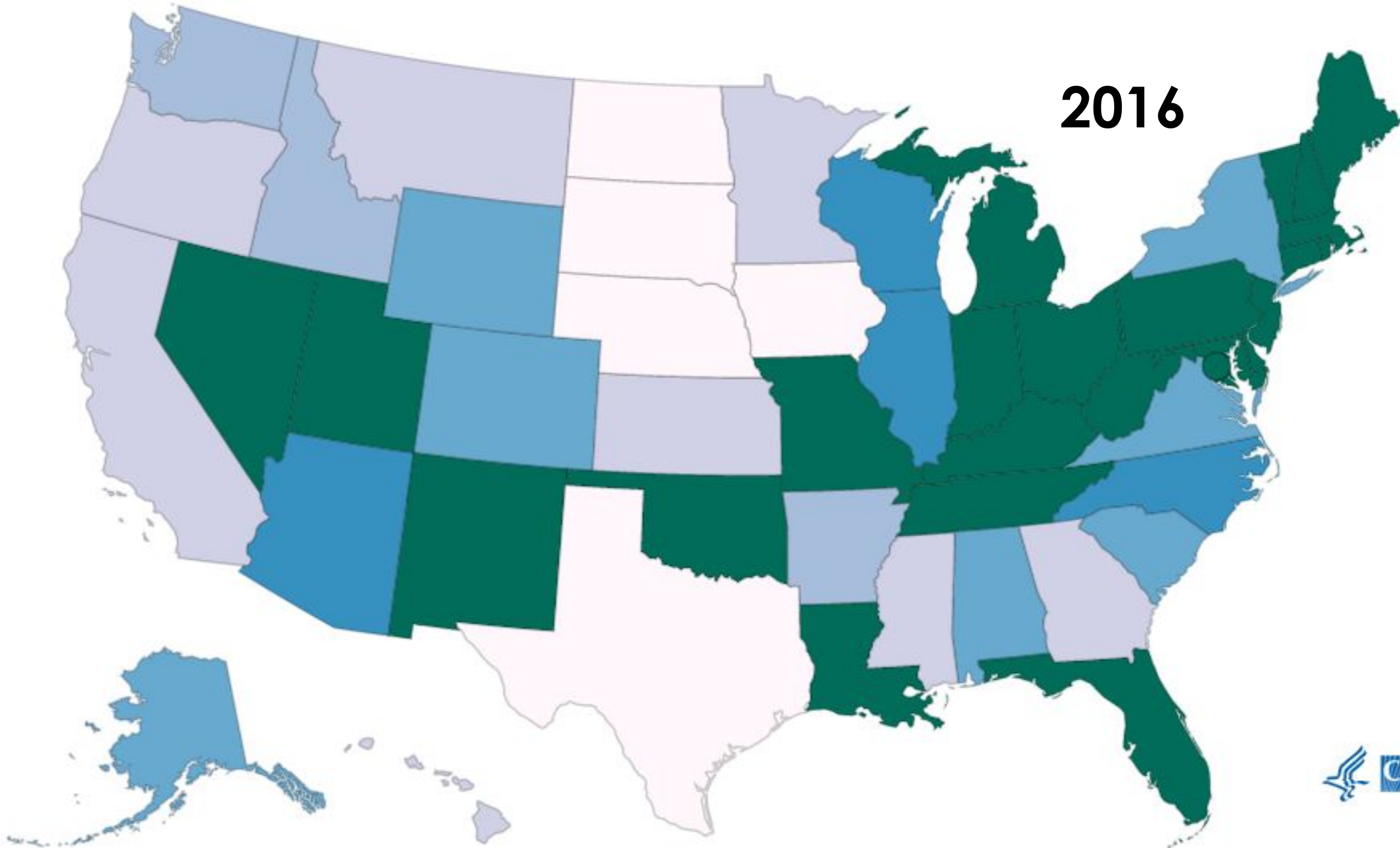
Discuss	• What is a substance use disorder and basic neurobiology of addiction
Describe	• The Disease Model of Addiction
Explore	• Explore concepts of stigma and dignity related to SUD

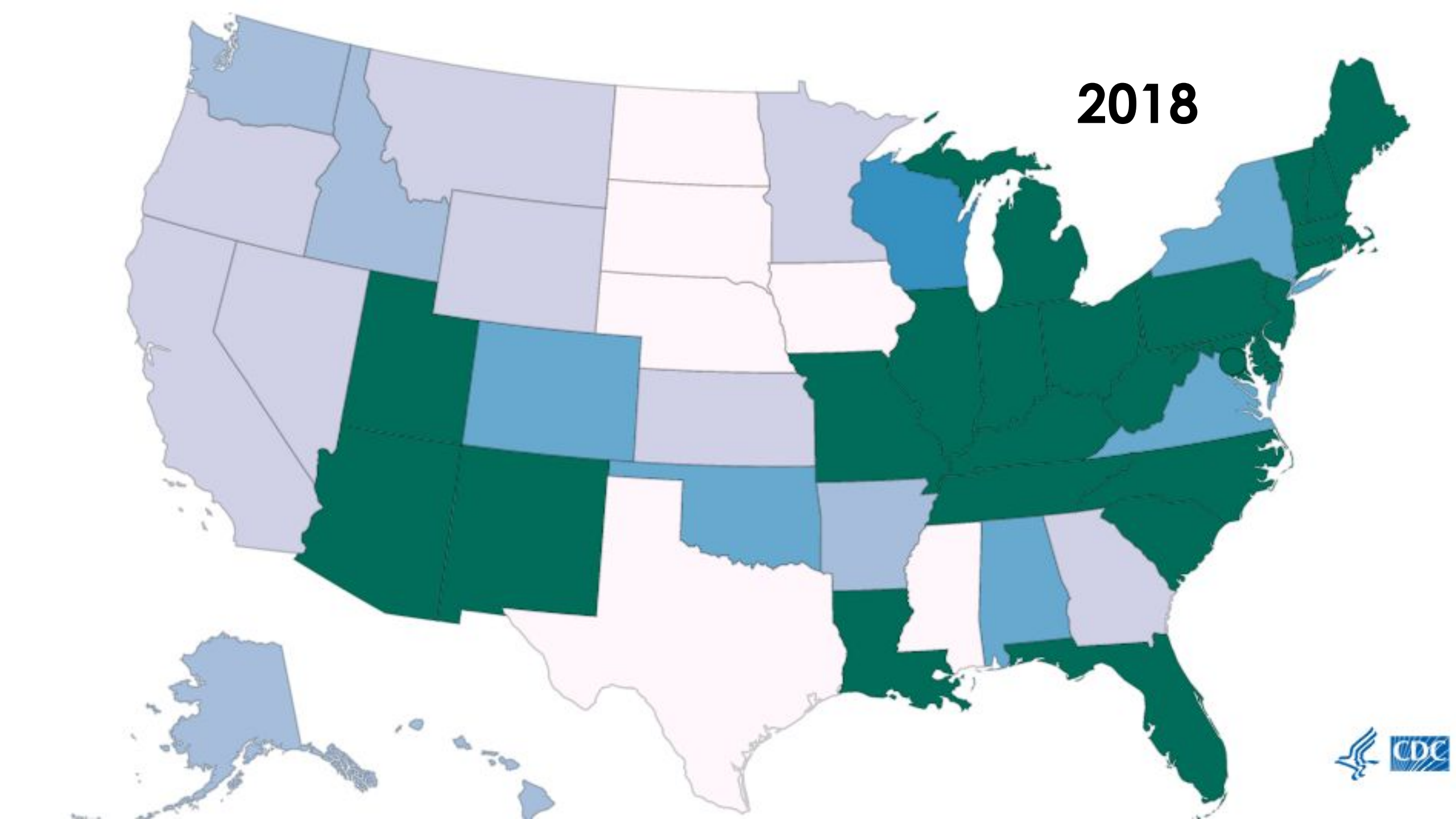


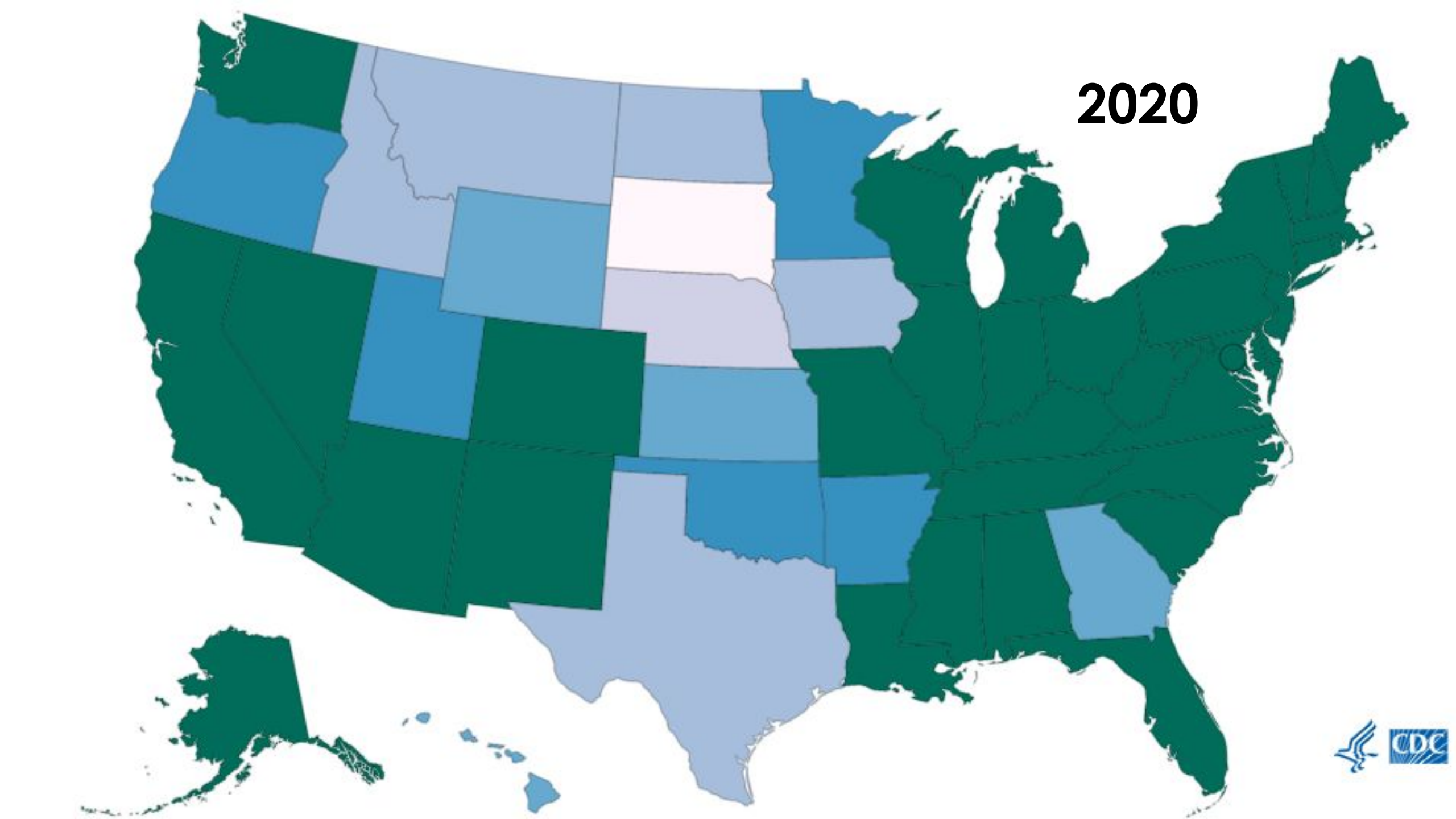
The Problem has Changed over Time

2015, NH was ranked 2nd in OD deaths per capita, 2018 we were 3rd .
In 2020 we were 22nd —why is that?


2015
6.9 to 11.0
11.1 to 13.5
13.6 to 16.0
16.1 to 18.5
18.6 to 21.0
21.0 to 41.5

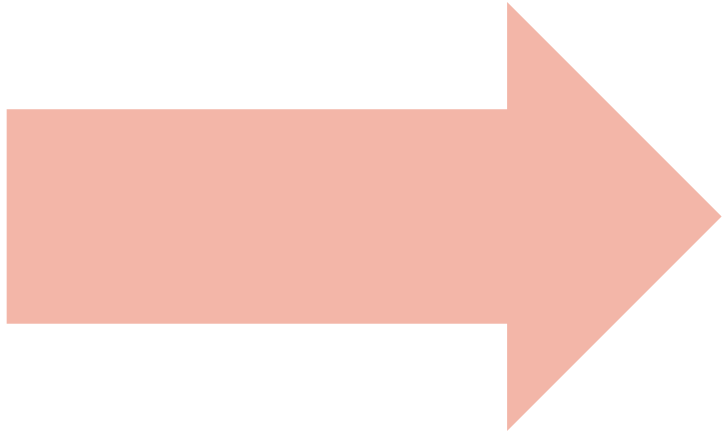

2016


2018


2020

Drug Poisoning

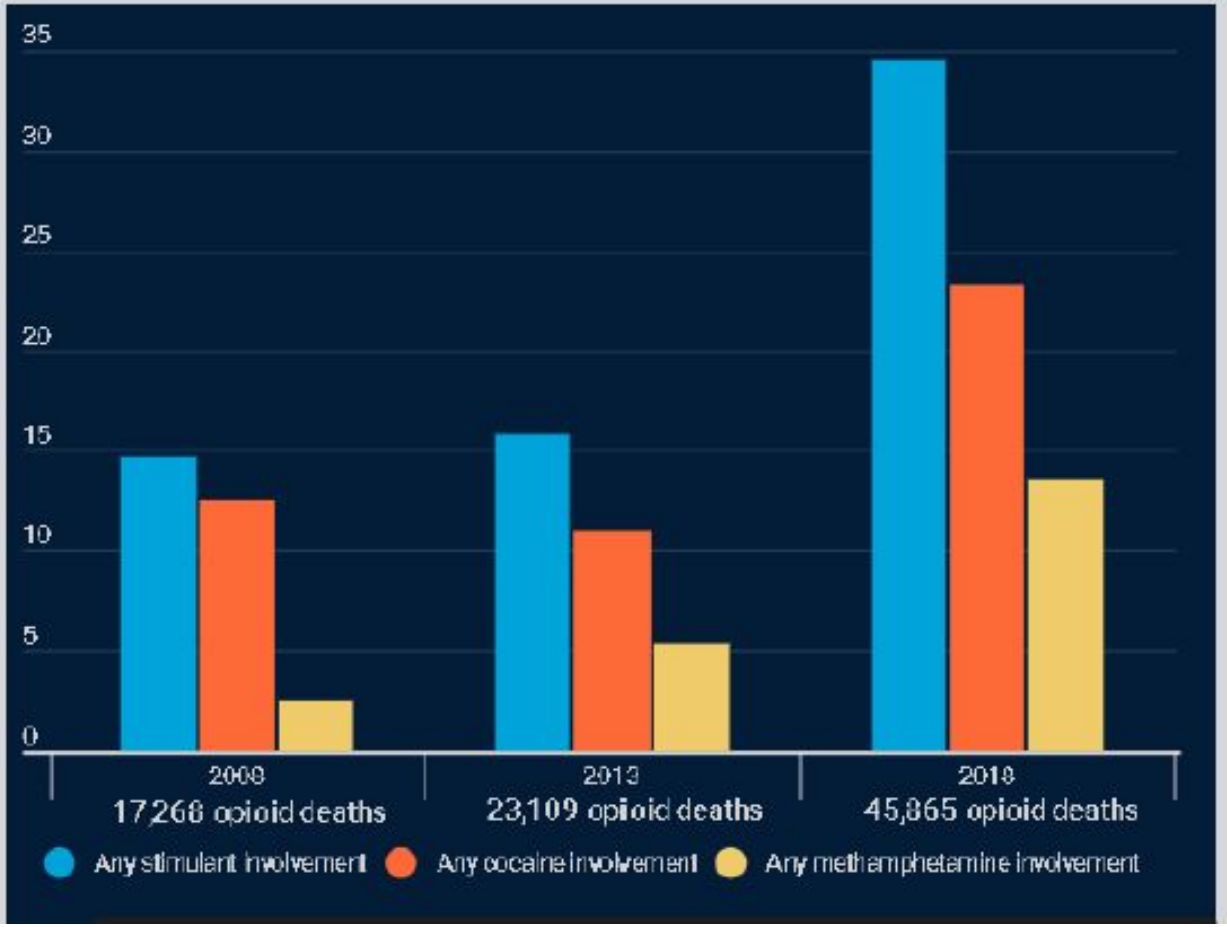
The rate of drug overdose deaths involving synthetic opioids (other than methadone) increased 22%, while the rate of deaths involving heroin declined 32%, 2020-2021.



Fentanyl: Any pill or powder can contain fentanyl.

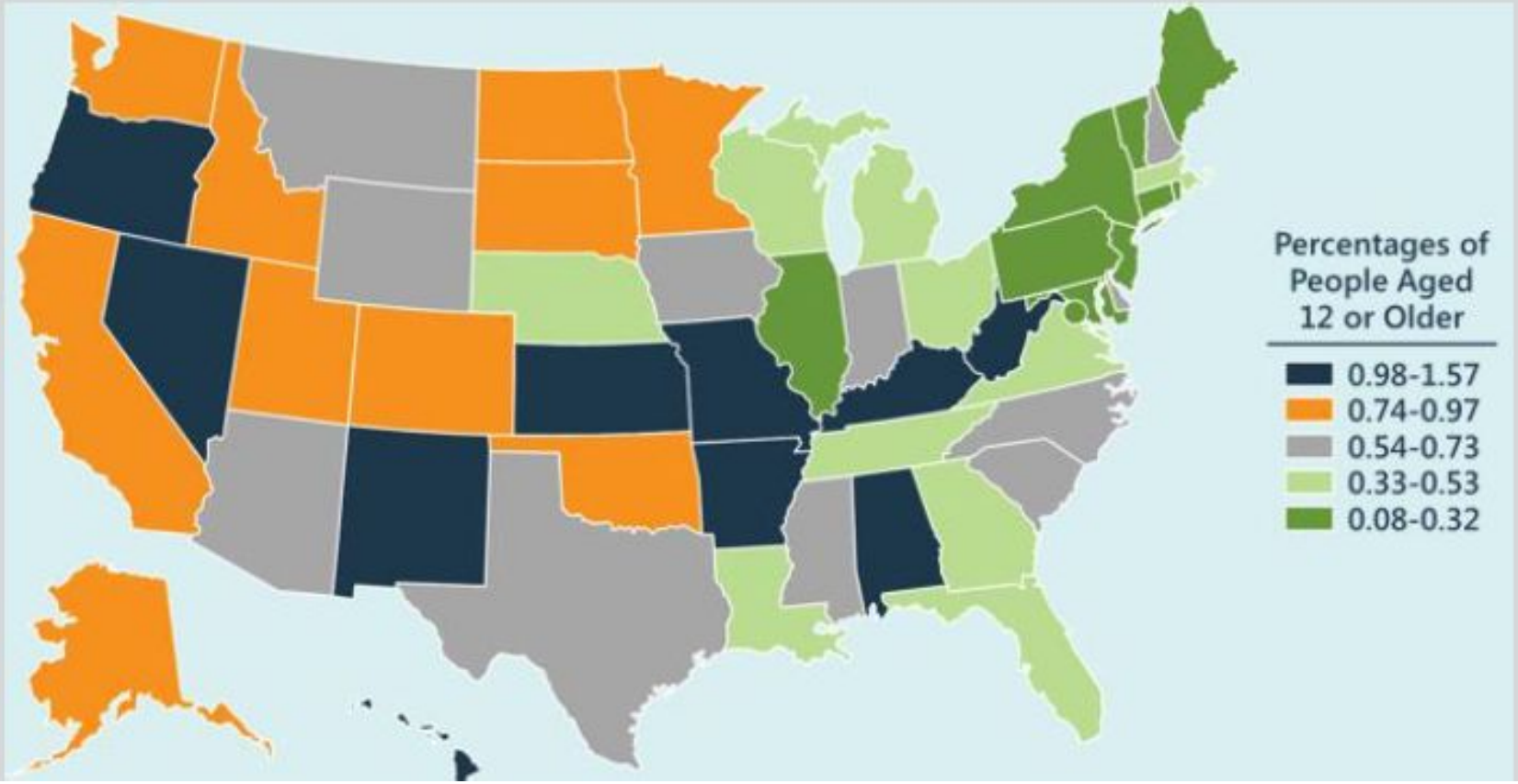
Xylazine, an animal tranquilizer being added to fentanyl to make duration of effects last longer.

A Growing Percentage of Opioid-Related Deaths also Involve Stimulants

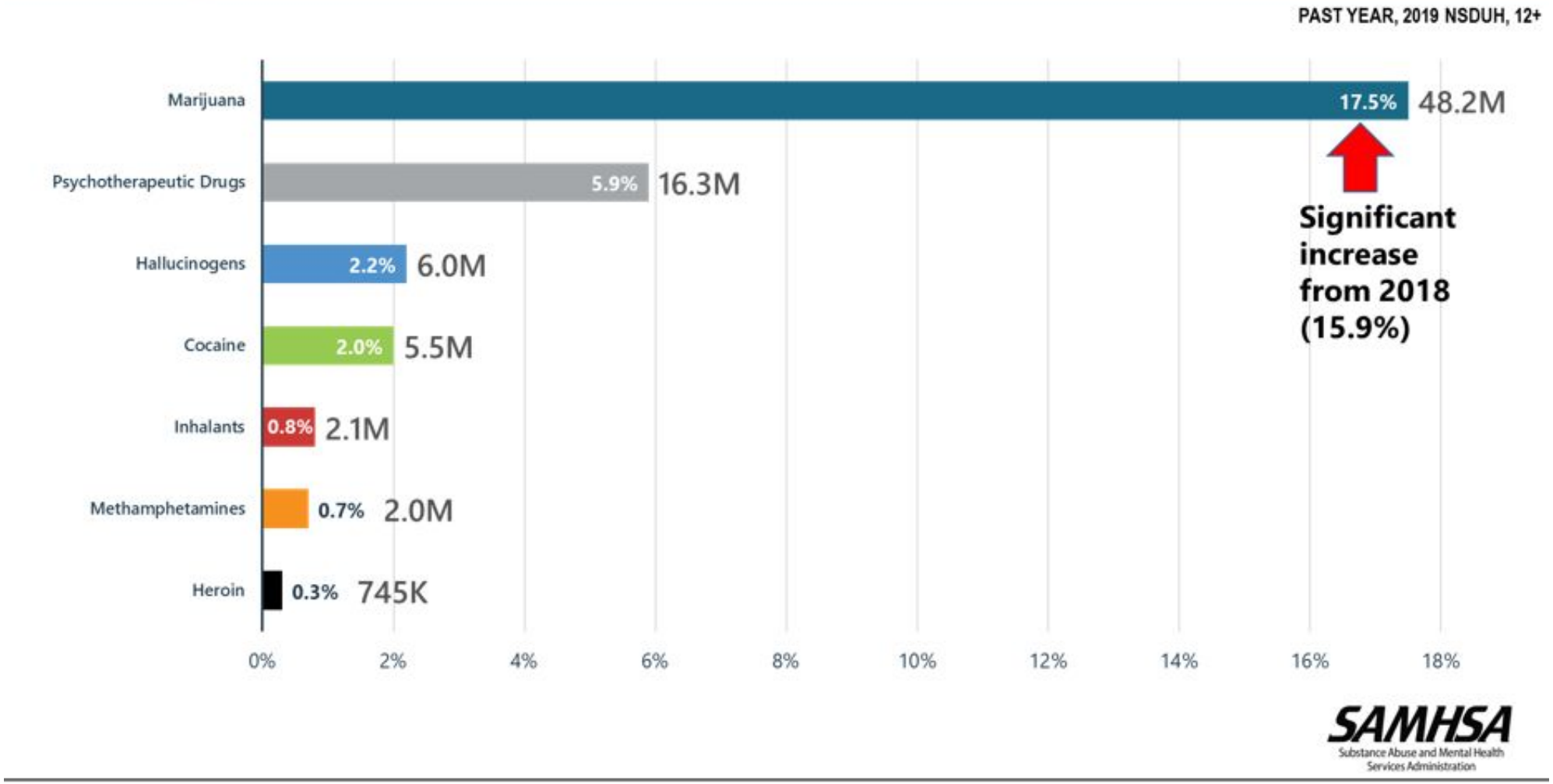


2000 2013 2018

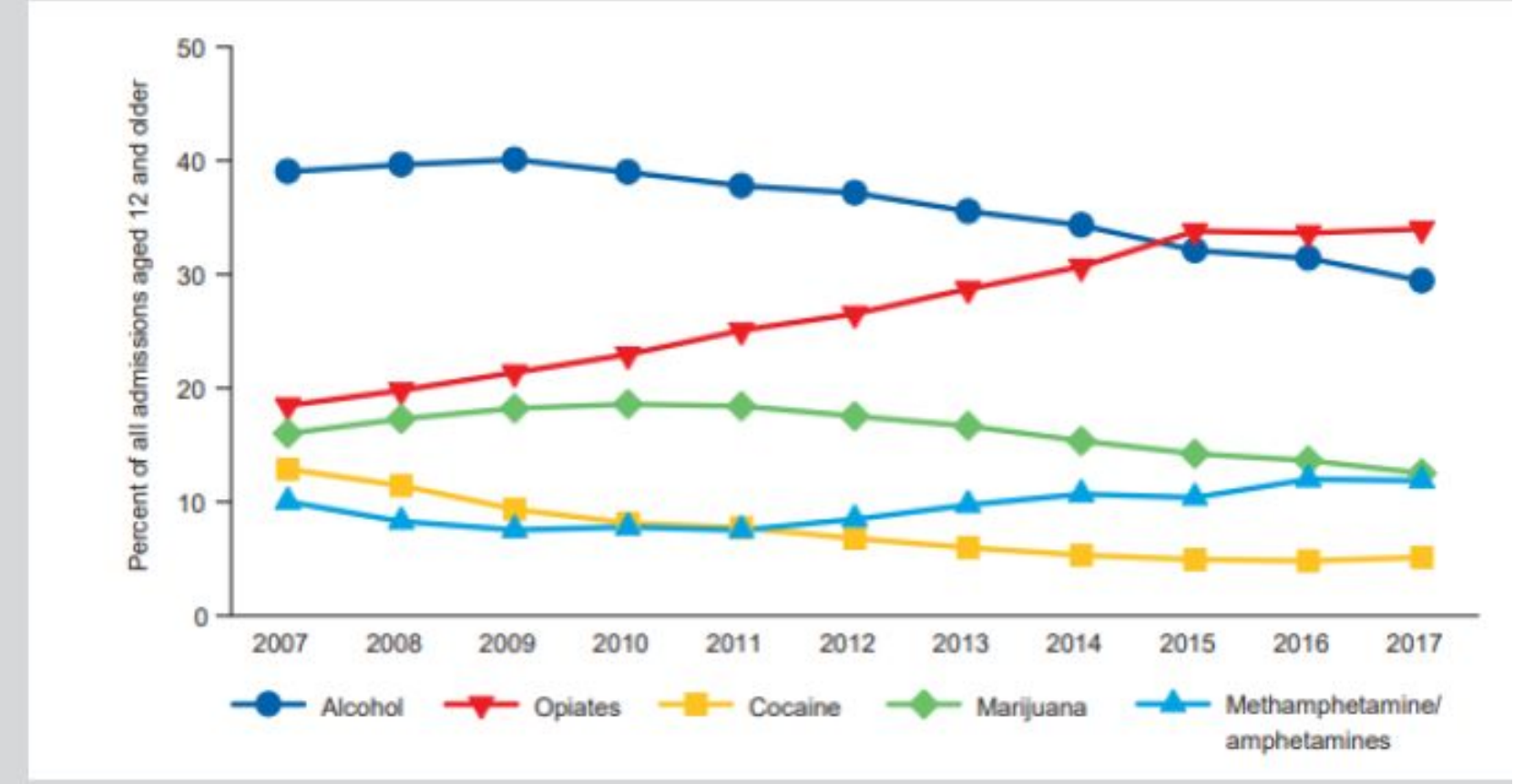
Past Year Use of Methamphetamine by State, 2016-2017



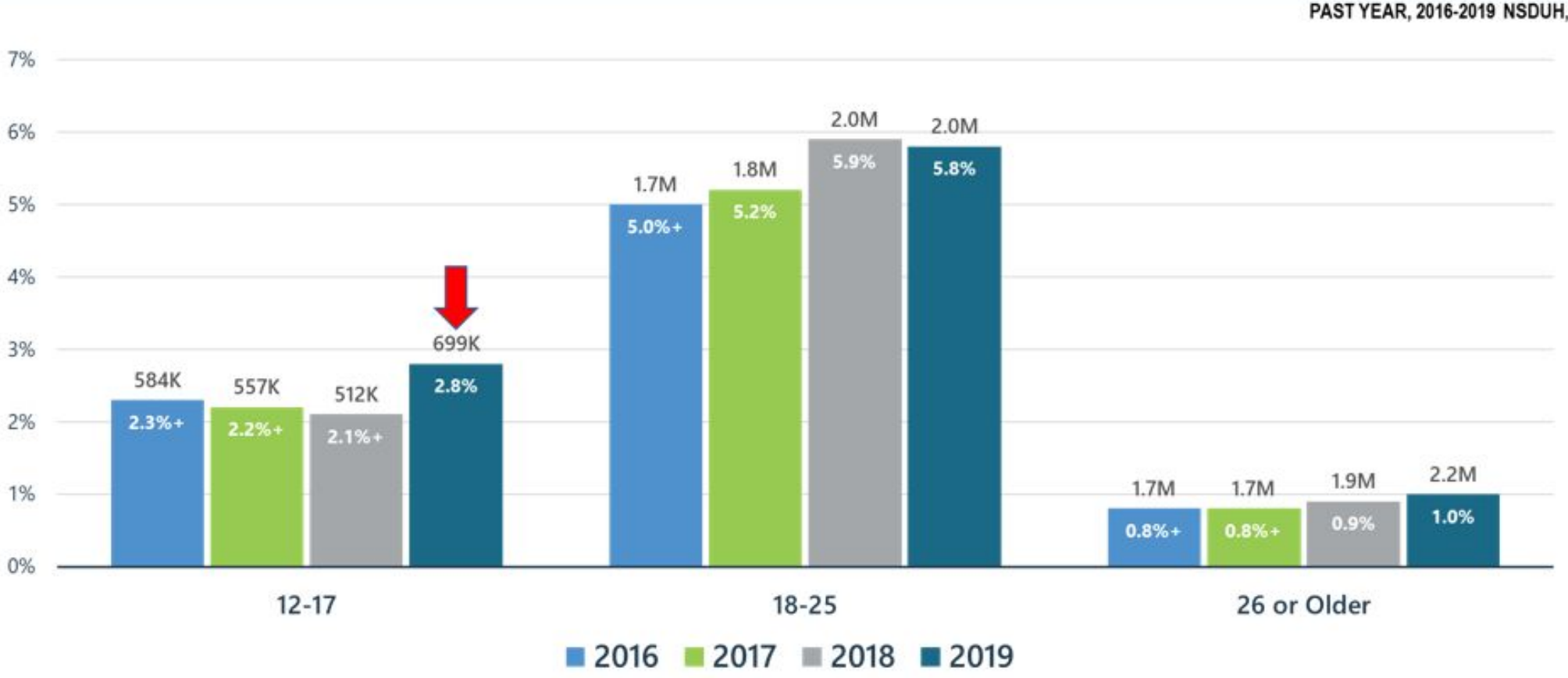
Illicit Drug Use: Major Concerns: Opioids, Marijuana, Methamphetamines



Primary Substance of Abuse at Admission, 2007-2017



Marijuana Use Disorder: Significant Increase for 12-17 y.o.

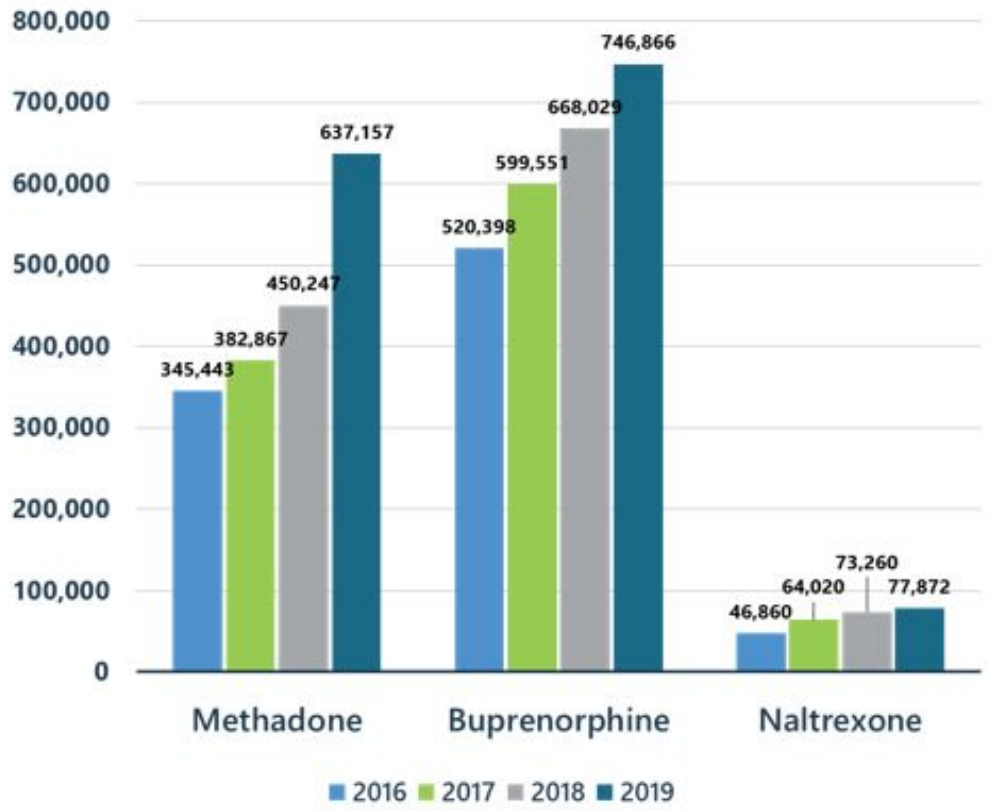


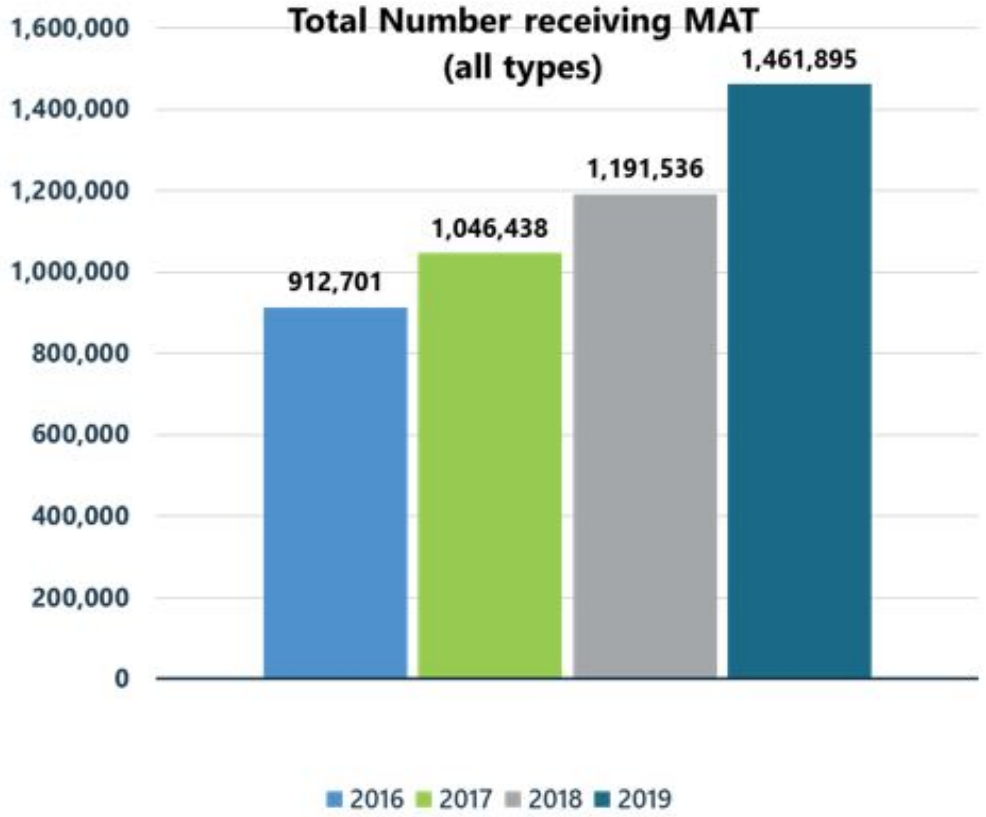
+ Difference between this estimate and the 2019 estimate is statistically significant at the .05 level.

SAMHSA
Substance Abuse and Mental Health Services Administration

Alcohol Use Disorder

Treatment Gains: Number of Individuals Receiving Pharmacotherapy for Opioid Use Disorder (MAT)





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Brain Injury and Drug Overdose

- In 2021, 106,699 Americans died as a result of drug poisoning.
- +/- 25% in BI rehab are there as a result of drugs or alcohol
- 50 percent receiving Tx for SUD have a history of at least one brain injury.

ASAM Definition

"Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors."

American Society of Addiction Medicine, April 2011


MORALS


GOOD
BAD

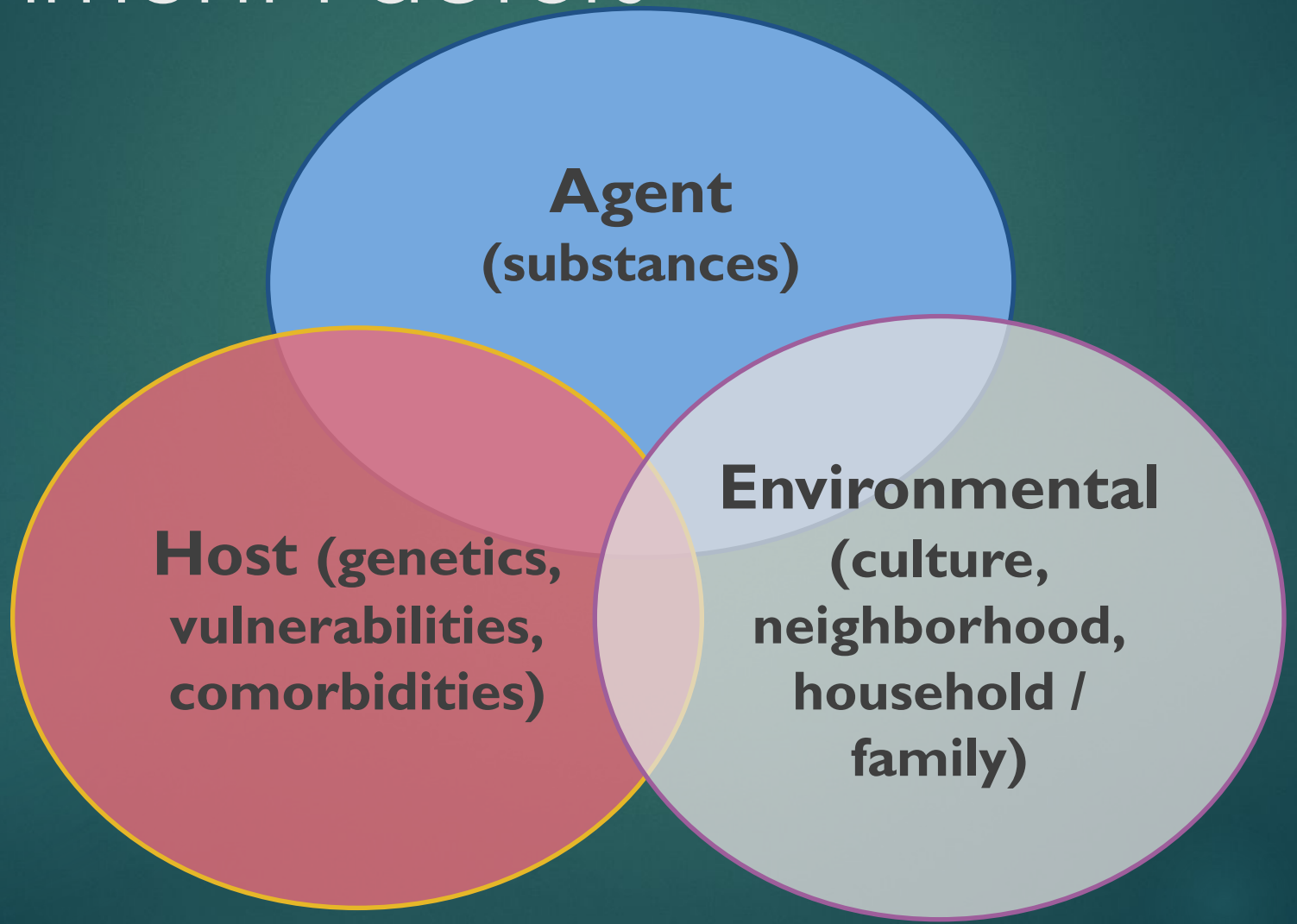
Table 3. Comparison of Claims Made by Disease and Learning Models of Addiction and Sample Evidence for Learning.*

Disease Model	Learning Model	Evidence for Learning
Addiction is characterized by a shift from impulsive to compulsive processing, loss of free will, and a shift of activation to dorsal striatum.	All behavioral habits devolve to stimulus–response mechanisms; automatization is a normal outcome of learning.	Dorsal striatal activation or behavioral automatization is seen with practice of even simple (e.g., motor) tasks; for people with addiction, operant contingencies facilitate the choice to abstain from using drugs.
Functional connectivity between striatum and PFC is lost, with reduced synaptic density in specific PFC regions.	When planning and decision making are bypassed, PFC demand is reduced; extended plasticity is normal; underused synapses may be pruned.	Immediate or valued rewards lead to increased striatal activation and decreased dorsolateral PFC activation and cognitive control; synaptic density in the PFC has been shown to rebound with recovery.
Sensitization to drug cues is increased (and enduring), mediated by increased mesolimbic dopamine uptake.	Sensitization to valued rewards is normal; an ongoing need or desire leads to ongoing sensitization (e.g., love, attachment, wealth acquisition, religious practice).	Motivated goal pursuit leads to increased dopamine, cue sensitization, and learning; high emotional salience facilitates lasting synaptic alterations (e.g., after trauma).
Ongoing drug use leads to loss of receptor availability or sensitivity and reduced pleasure (dopaminergic blunting).	Adversity, trauma (with or without drug use), isolation, and overstimulation lead to reduced dopamine-receptor response or pleasure.	Loss of social status or trauma leads to reduced D2 or D3 receptor availability; high levels of mating behavior, eating, engagement with pornography, and Internet use lead to a hypodopaminergic system.

* PFC denotes prefrontal cortex.

Disease Model --NEJM

Combination of Agent – Host – Environment Factors



Risk Factors

- Genetics
- Psychological Influences
  - Adverse Childhood Events
  - Trauma
- Environmental Influences
  - Family and community view on substance use
- Age of first substance use
- Route of substance use

Addiction ‘Resides’ in our brain

Addiction ‘resides’ in multiple brain regions which undergo neuroplasticity with the onset of addiction:

Hippocampus

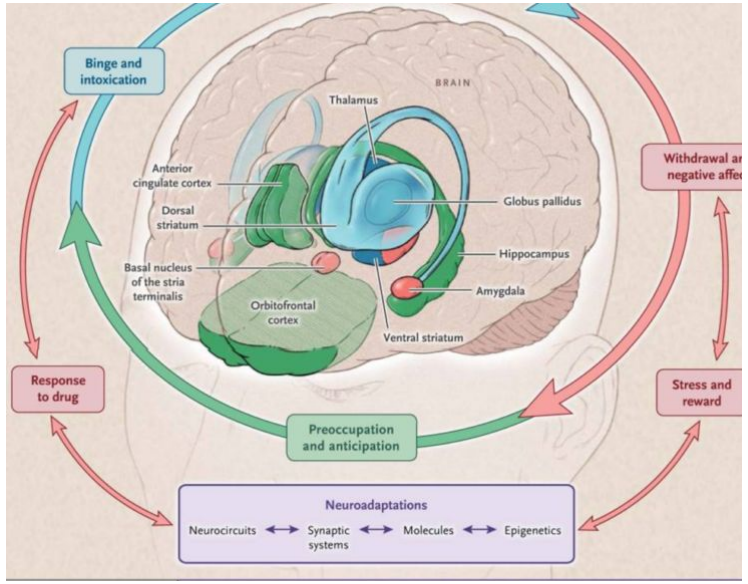
- The seat of memory, and thus of conditioned cues to use; the hippocampus is important in learning, and also remembers outcomes of previous substance use, not just rewards but also negative consequences.

Orbitofrontal Cortex

- Judgment, planning, foresight and impulse control.

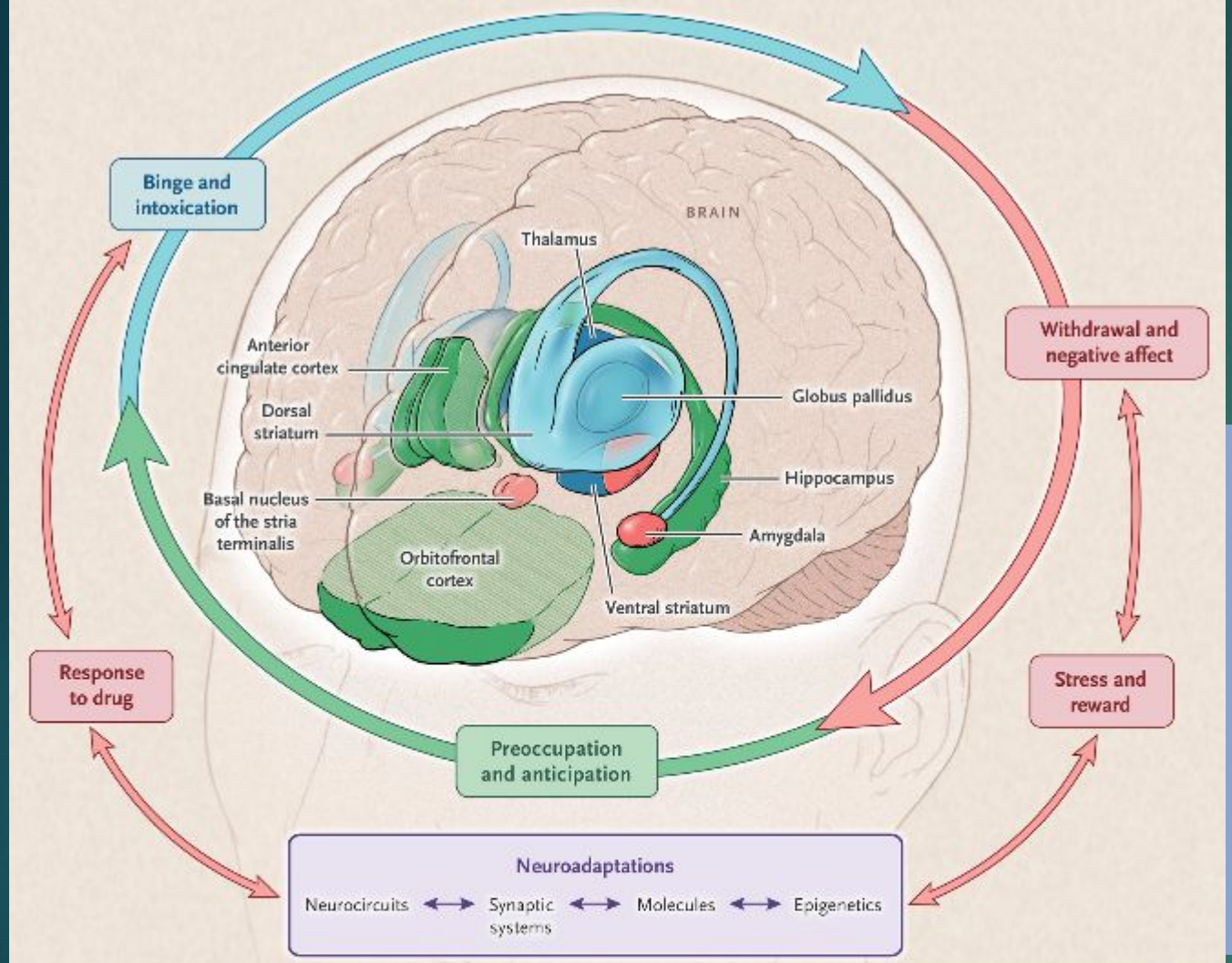
Amygdala

- Motivation and prioritization, and thus of salience; drives, cravings, and choices are here.



Stage of Addiction	Shifting Drivers Resulting from Neuroadaptations		
Binge and intoxication	Feeling euphoric	Feeling good	Escaping dysphoria
Withdrawal and negative affect	Feeling reduced energy	Feeling reduced excitement	Feeling depressed, anxious, restless
Preoccupation and anticipation	Looking forward	Desiring drug	Obsessing and planning to get drug

The Cycle of Addiction - Tri-Phasic Model



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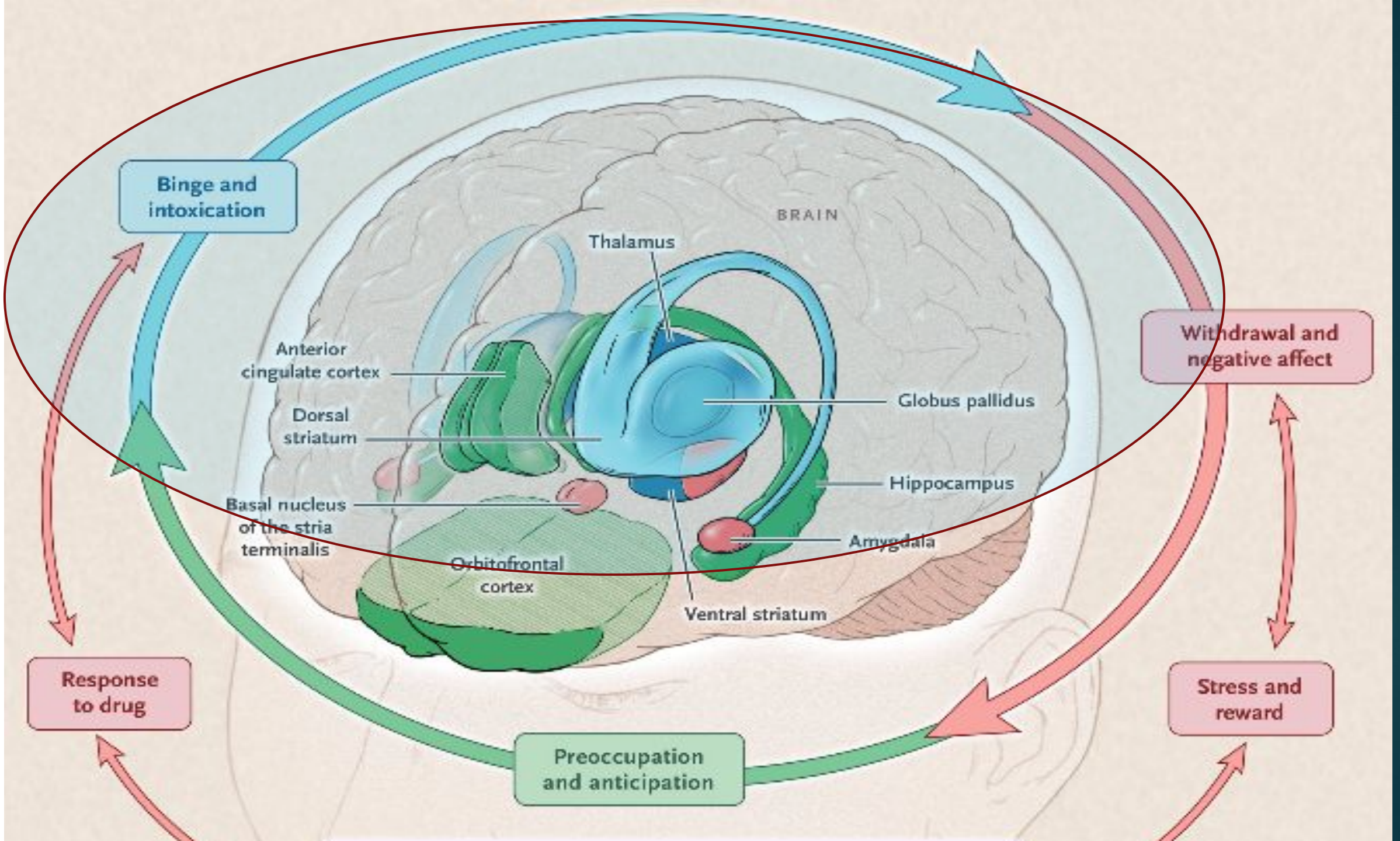
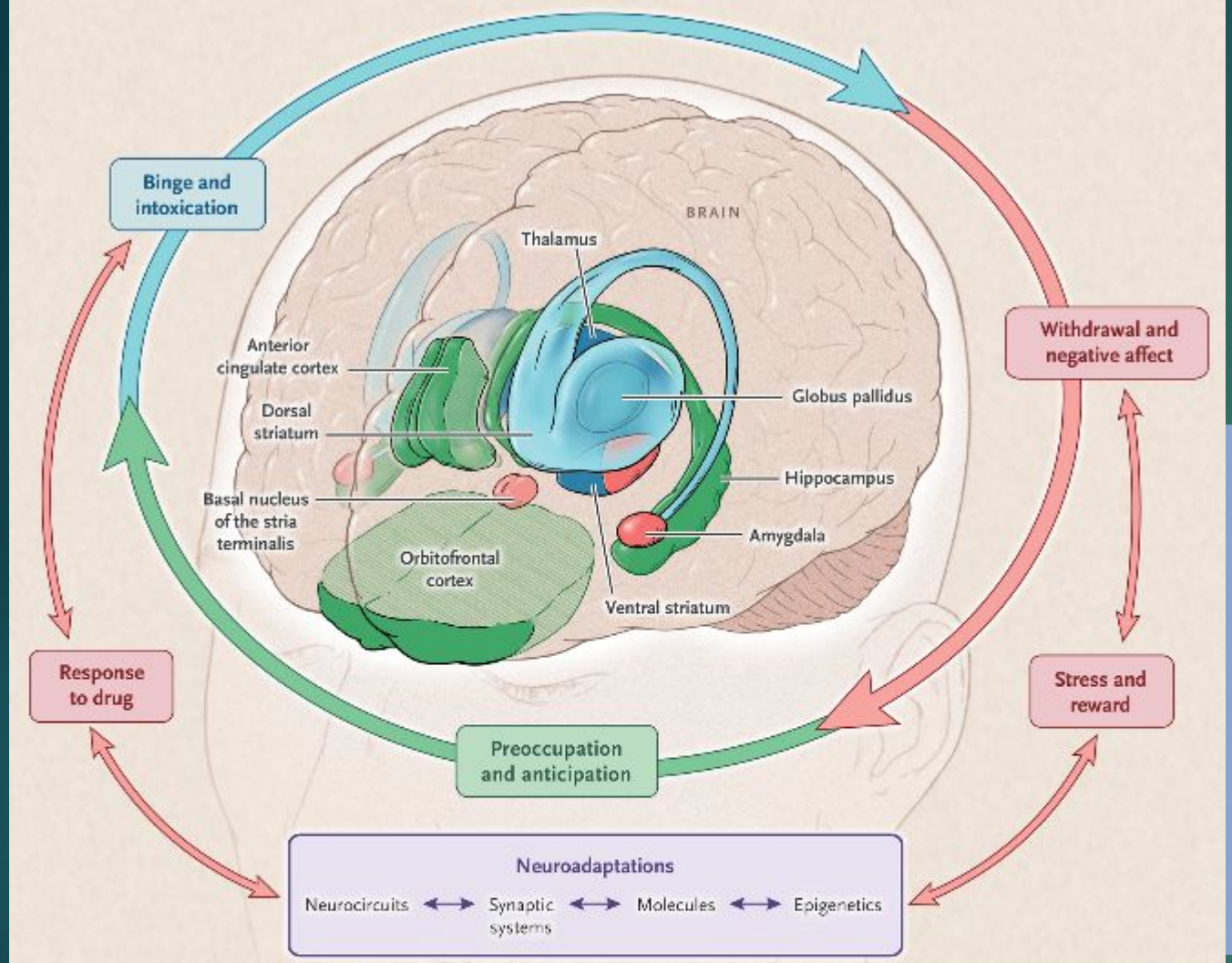
Behavioral Changes		
Voluntary action Abstinence Constrained drug taking	Sometimes taking when not intending Sometimes having trouble stopping Sometimes taking more than intended	**Impulsive action** Relapse Compulsive consumption

Binge and Intoxication


Binge and intoxication
Withdrawal and negative affect
Response to drug
Stress and reward
Preoccupation and anticipation
BRAIN
Thalamus
Anterior cingulate cortex
Dorsal striatum
Globus pallidus
Hippocampus
Basal nucleus of the stria terminalis
Amygdala
Orbitofrontal cortex
Ventral striatum



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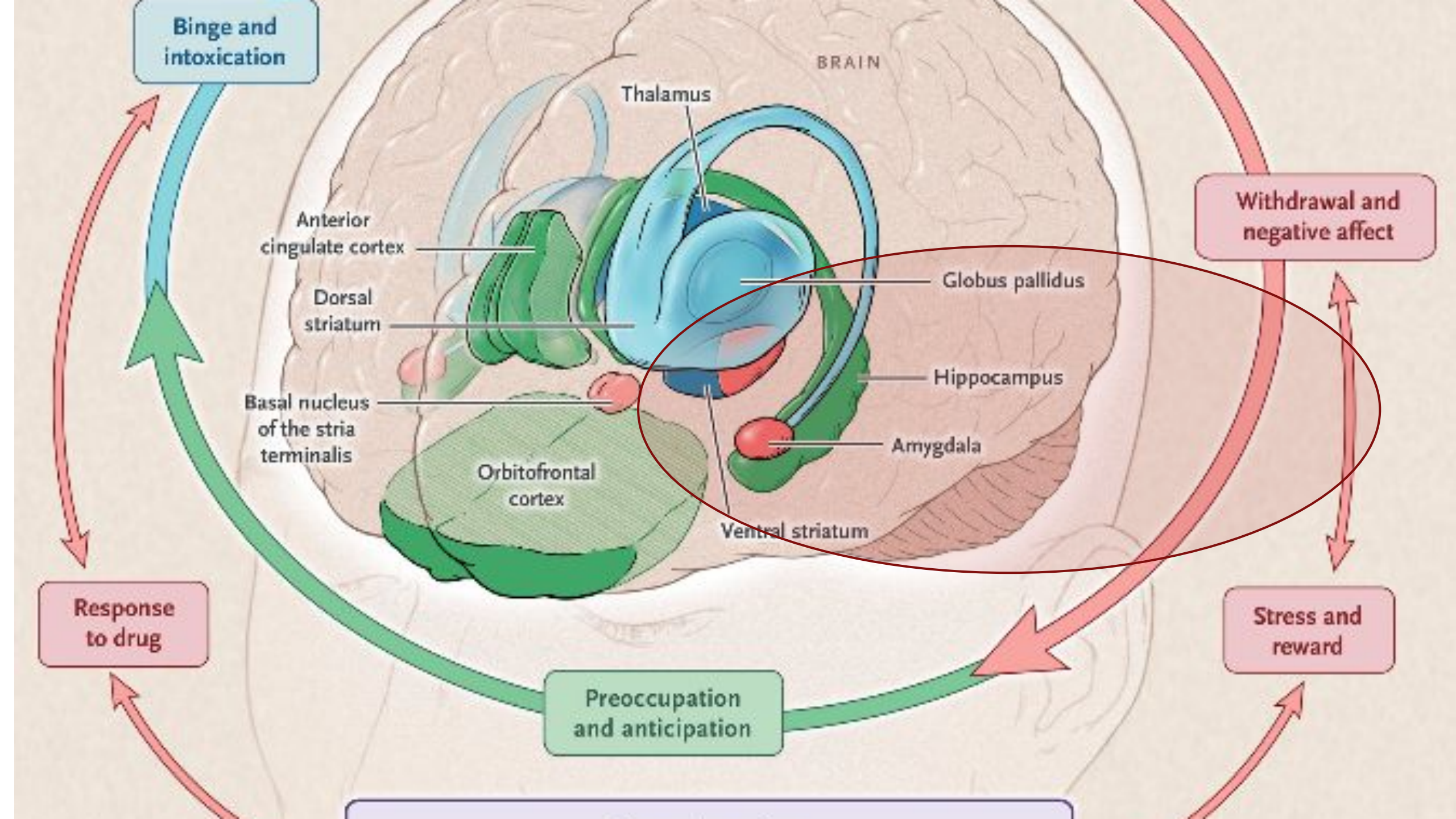
Withdrawal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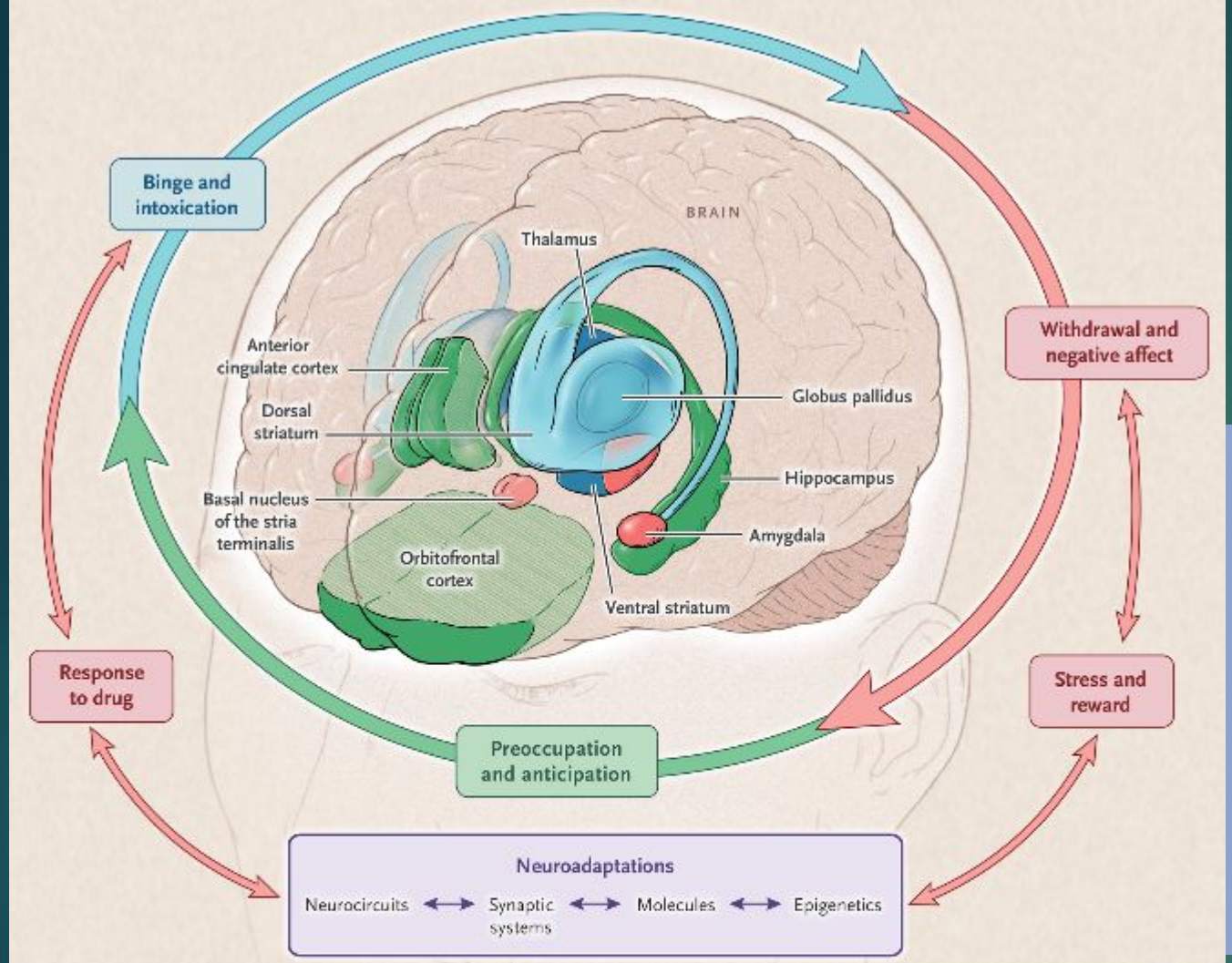

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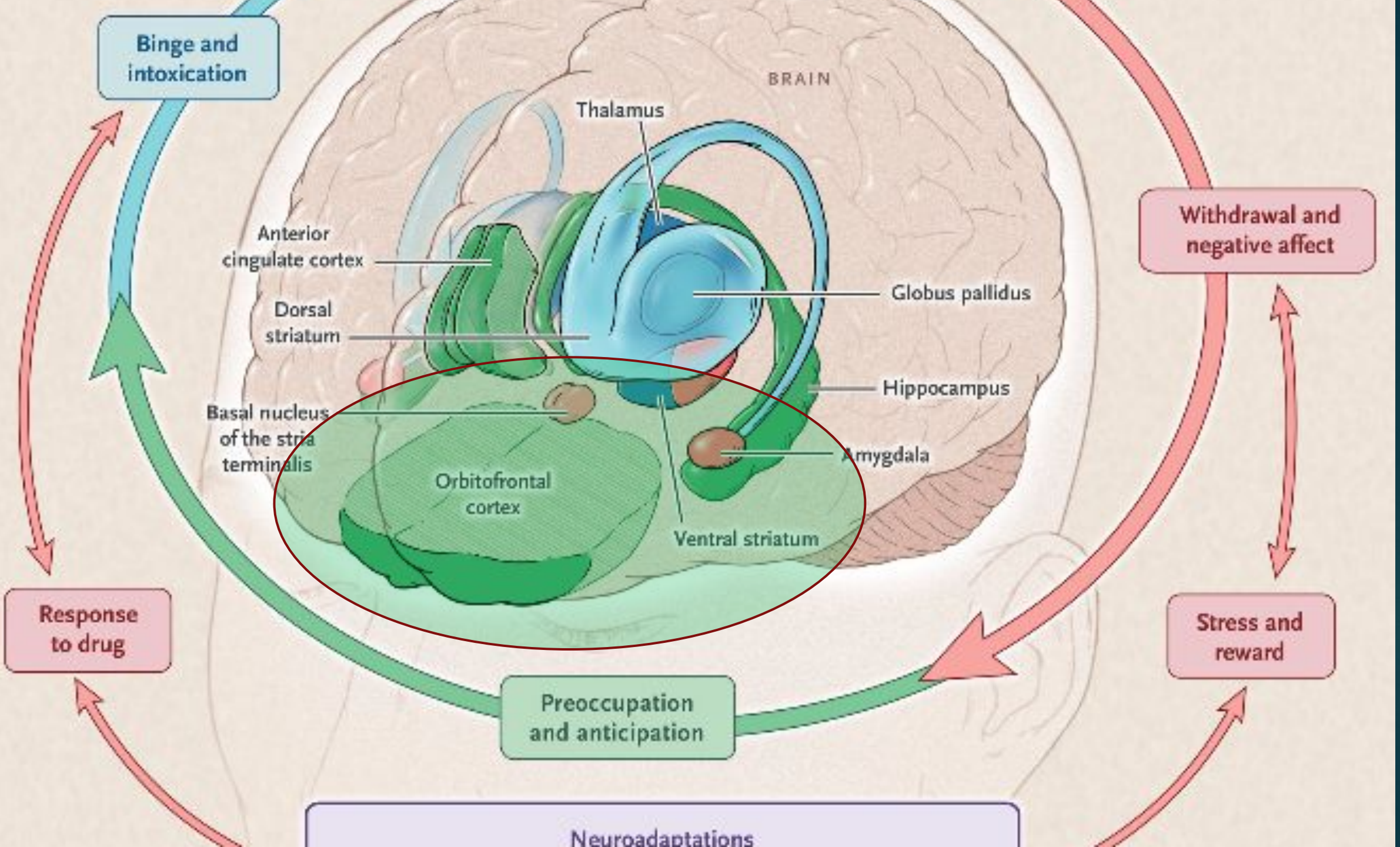
Pre-Occupation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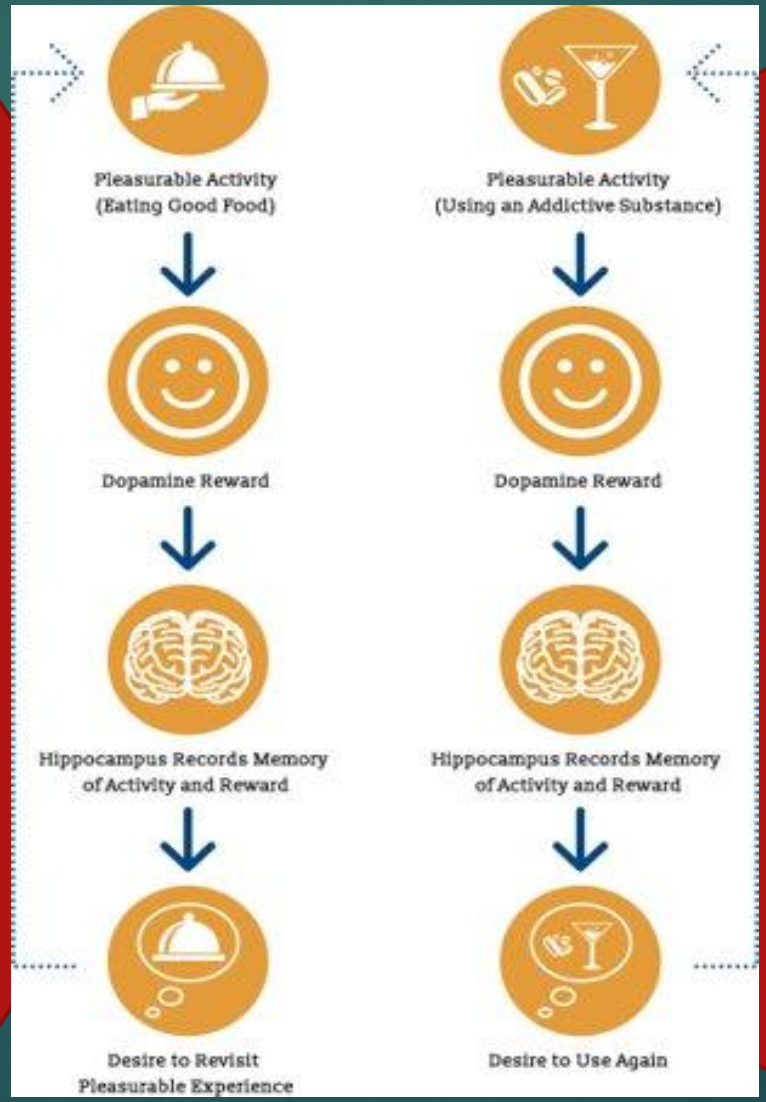
Orbitofrontal cortex
Ventral striatum
Withdrawal and negative affect
Response to drug
Stress and reward
Preoccupation and anticipation
Neuroadaptations

Why do people use/ misuse/ abuse substances?

Opioid

Euphoria – make us feel good
Escape from unpleasant feelings
Interpersonal conflicts
Internal conflicts
Pain of loss
Realities of hard life
Unresolved anger
Boredom
Self Medication
Depression
Anxiety
Insomnia
Social Anxiety
Perception of control of emotional states

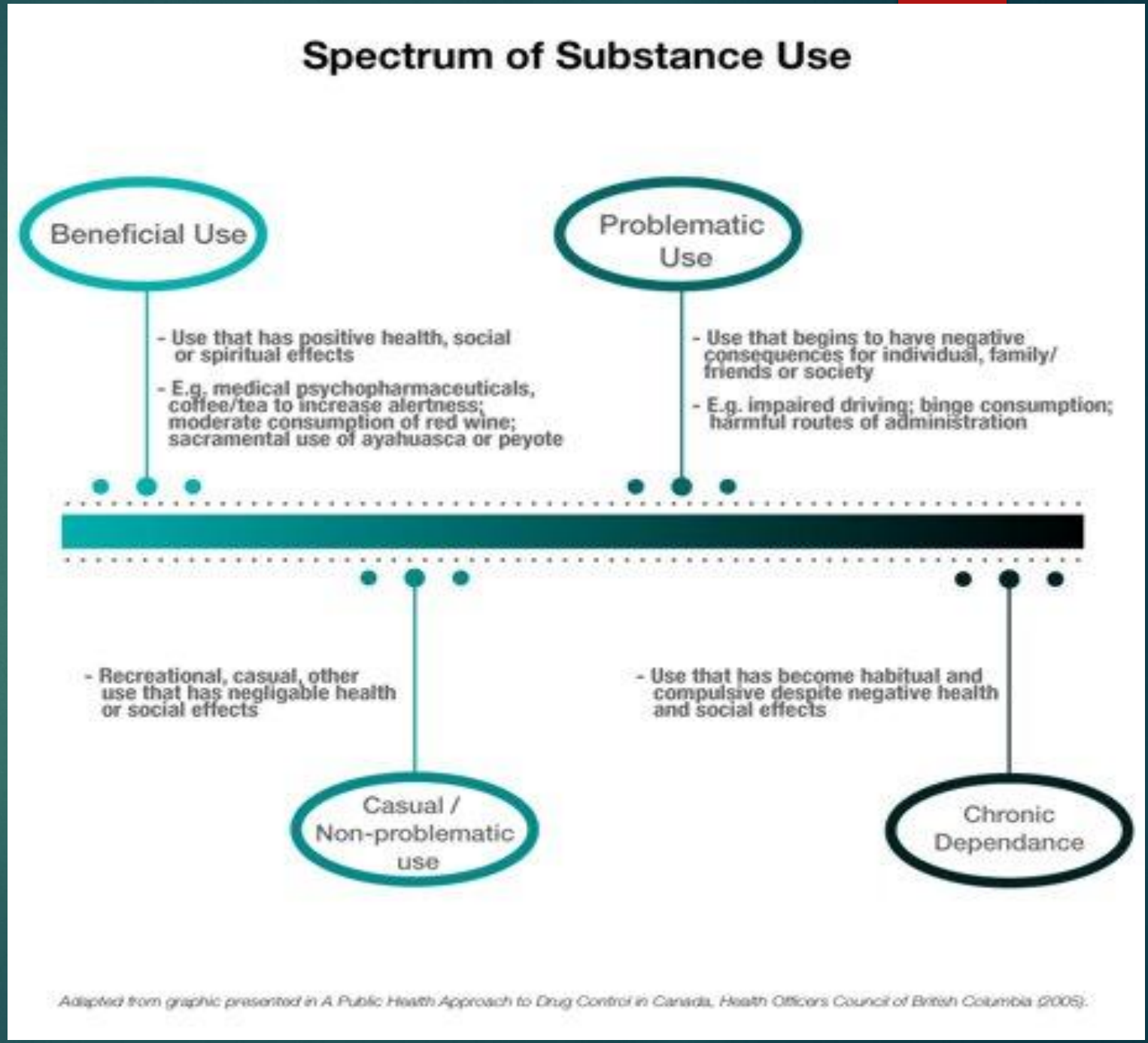


Alcohol

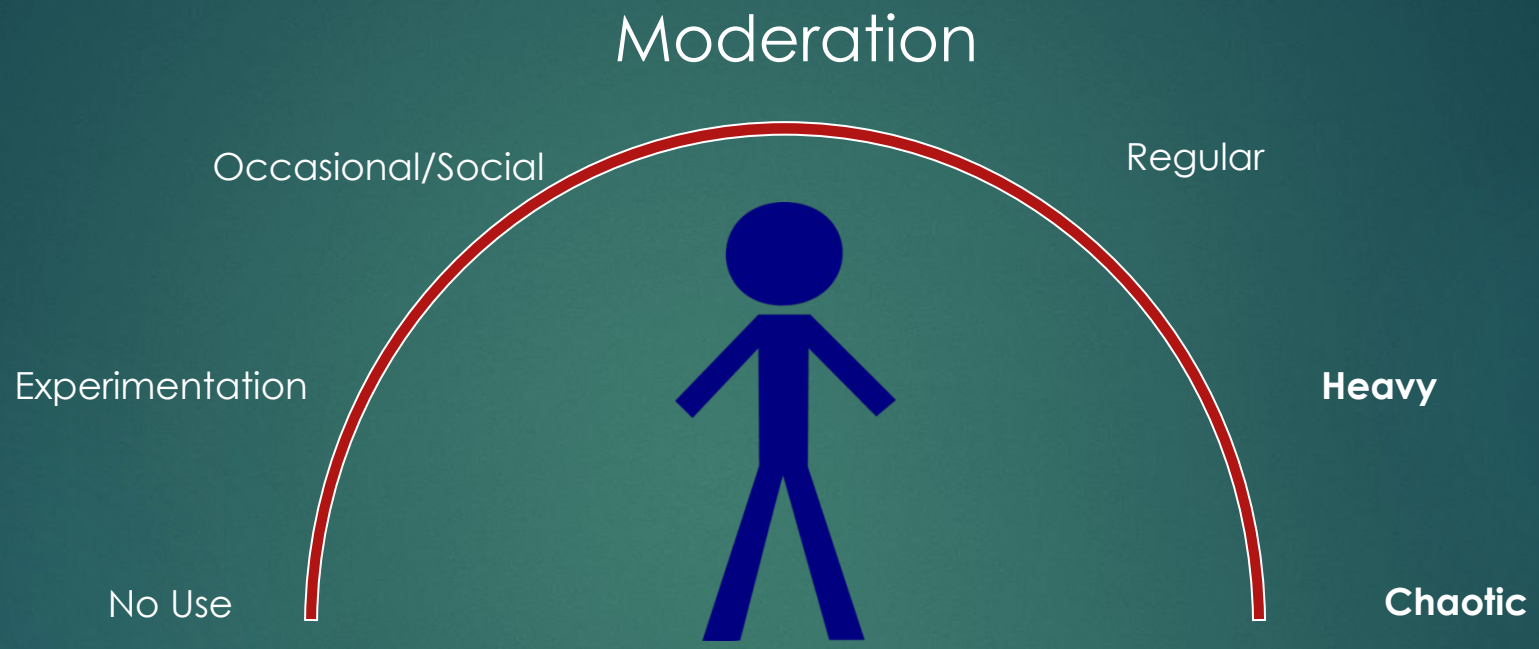
Part of their social life
De-stress
Marks the end of the day
Drink with meals
Celebrations/ reward
Forget about problems
Relive physical pain
Relive loneliness or boredom

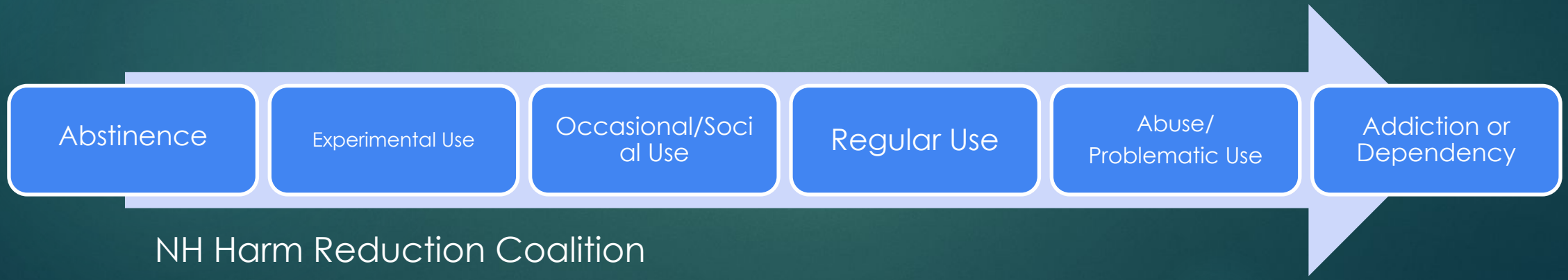
Substance Use vs. Abuse:

- Not all abused substances are illegal
- Substances in and of themselves, do not CAUSE addiction
- Many people that use various substances do not become addicted



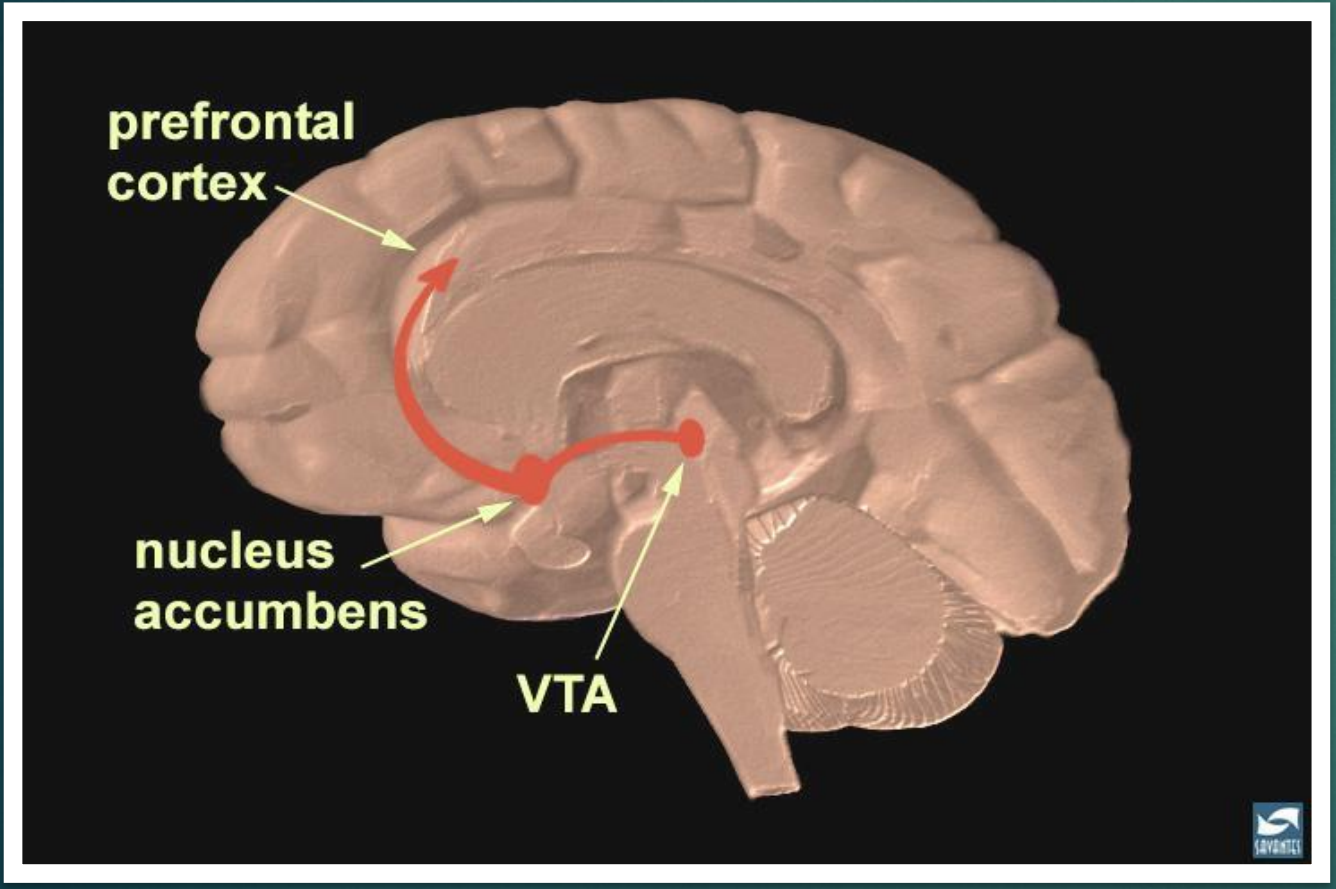
A Continuum of Substance Use





NH Harm Reduction Coalition

The reward pathway



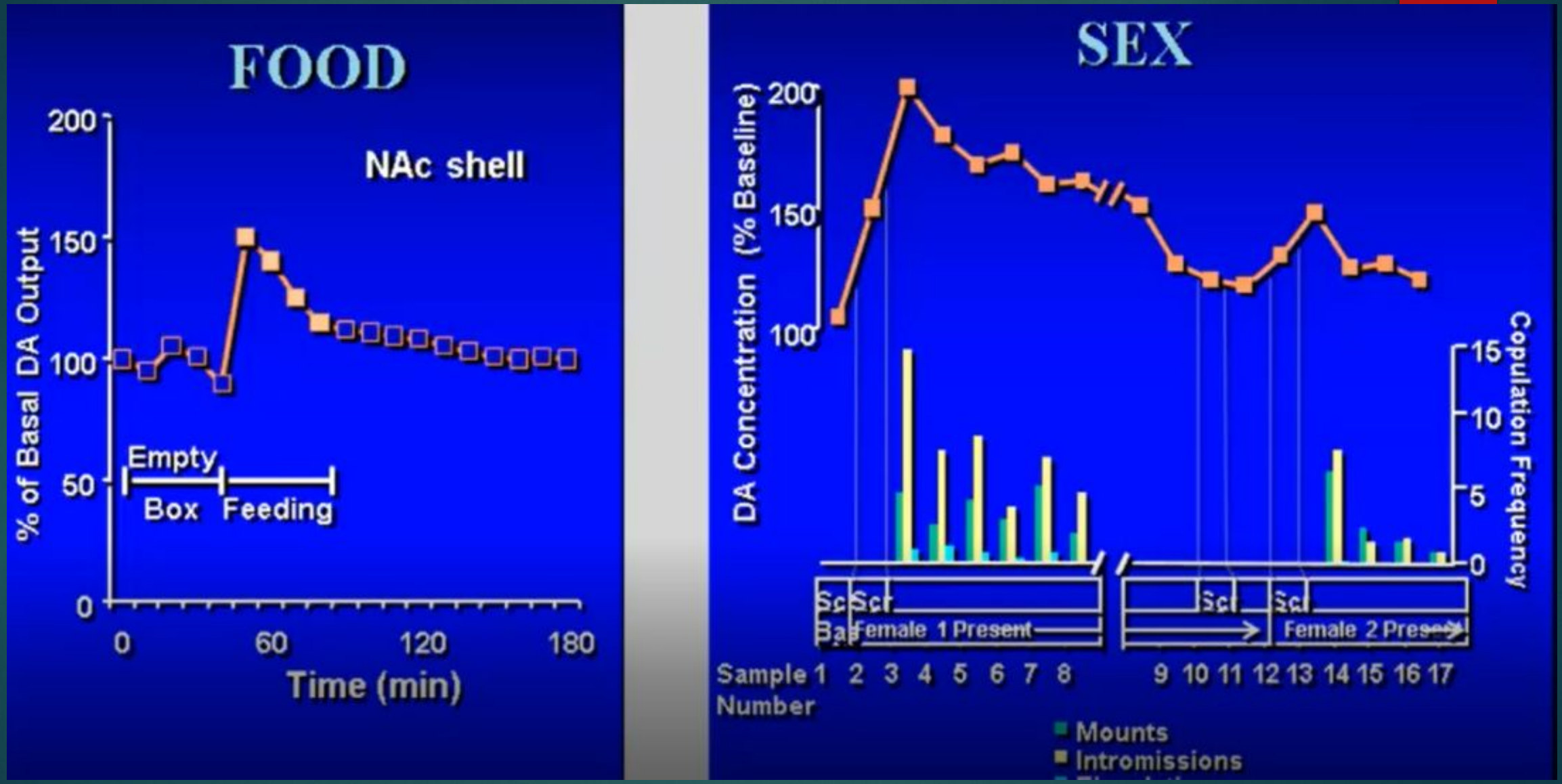
Survival

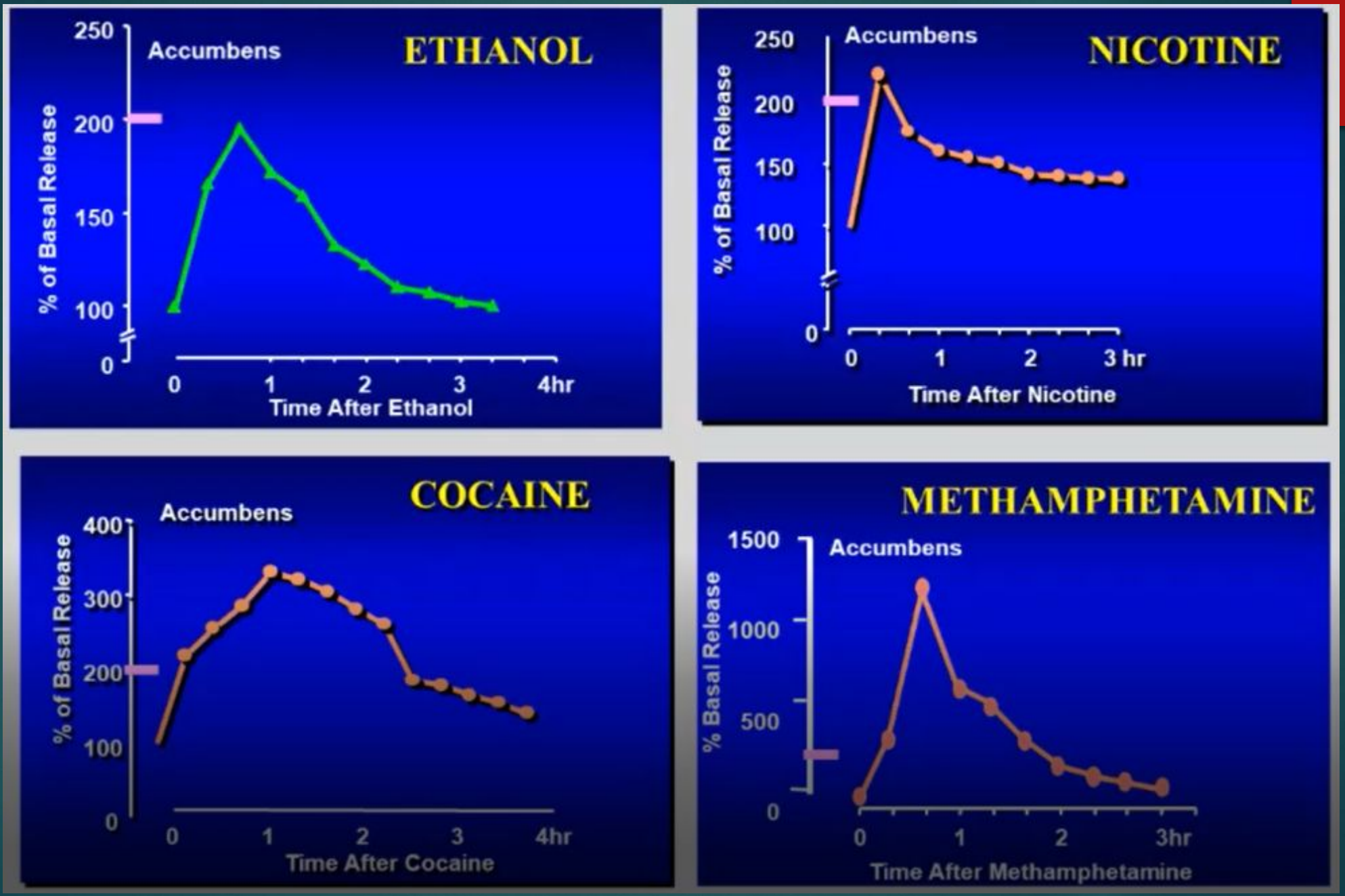
Drug

1. Eat/Drink
2. Protect/Kill
3. Procreate

Survival

1. Drug
2. Eat/Drink
3. Protect/Kill
4. Procreate


FOOD
NAc shell
% of Basal DA Output
200
150
100
50
0
Empty
Box
Feeding
0
60
120
180
Time (min)
SEX
DA Concentration (% Baseline)
200
150
100
Copulation Frequency
15
10
5
0
Female 1 Present
Female 2 Present
Sample Number
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16 17
Mounts
Intromissions


ETHANOL
Accumbens
% of Basal Release
250
200
150
100
0
0
1
2
3
4hr
Time After Ethanol
NICOTINE
Accumbens
% of Basal Release
250
200
150
100
0
0
1
2
3 hr
Time After Nicotine
COCAINE
Accumbens
% of Basal Release
400
300
200
100
0
0
1
2
3
4hr
Time After Cocaine
METHAMPHETAMINE
Accumbens
% Basal Release
1500
1000
500
0
0
1
2
3hr
Time After Methamphetamine

Addiction as a Chronic Disease

- You don't cure it, you manage it
- You remain with the patient and available to them
- You act like a medical provider!
- *After* the phase of active treatment, when the condition is stabilized and the patient is in remission, you *continue* your relationship: MAINTENANCE 'well-patient' visits, to MONITOR their status of remission.

Benefits of Chronic Disease Mgmt

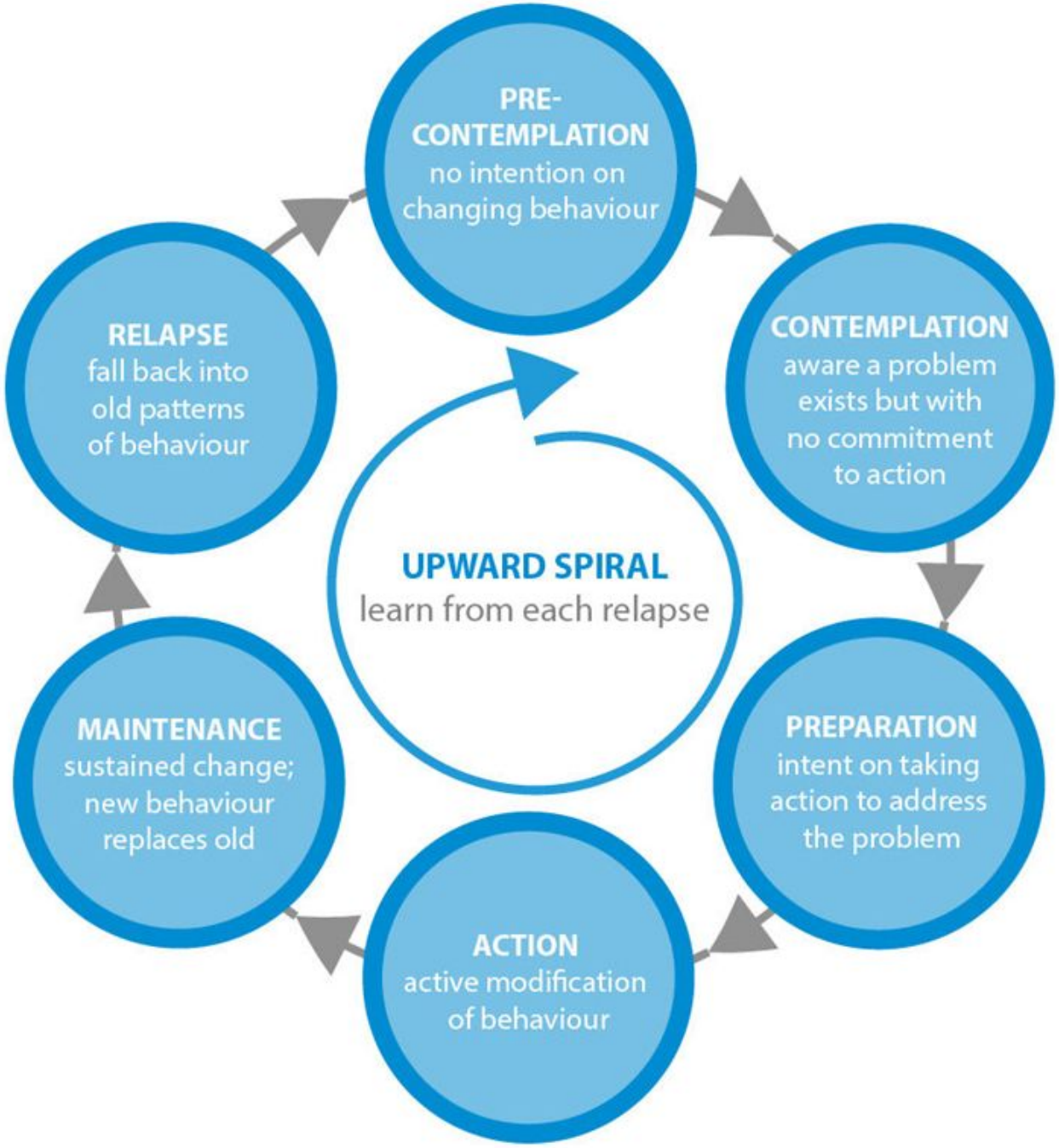
- Early detection of relapse
- Detection of risk factors for relapse
- Facilitate re-engagement with active efforts
  - Therapy for addiction
  - Self-help
  - Re-institution of pharmacotherapy?
  - Referral for co-occurring conditions (mental health issues that can set patient up to return to use)

Treatment of Addiction

- **What are the treatment goals for chronic disease management?**
- Decrease frequency of relapses
- Decrease severity of relapses
- Increase duration of remission
- Optimize level of function during remissions

DSM-5 SUD (mild 2-3 / mod 4-5 / severe6+)

1. **Using more of a substance** than intended or using it for longer than you're meant to.
2. **Trying to cut down** or stop using the substance but being unable to.
3. Experiencing **intense cravings** or urges to use the substance.
4. **Needing more** of the substance to get the desired effect — also called tolerance.
5. **Developing withdrawal** symptoms when not using the substance.
6. **Spending more time** getting and using drugs and recovering from substance use.
7. **Neglecting responsibilities** at home, work or school because of substance use.
8. **Continuing to use** even when it causes relationship problems.
9. **Giving up important** or desirable social and recreational **activities** due to substance use.
10. Using substances in **risky settings** that put you in danger.
11. Continuing to use **despite the substance causing problems** to your physical and mental health.



Trans-theoretical Model:

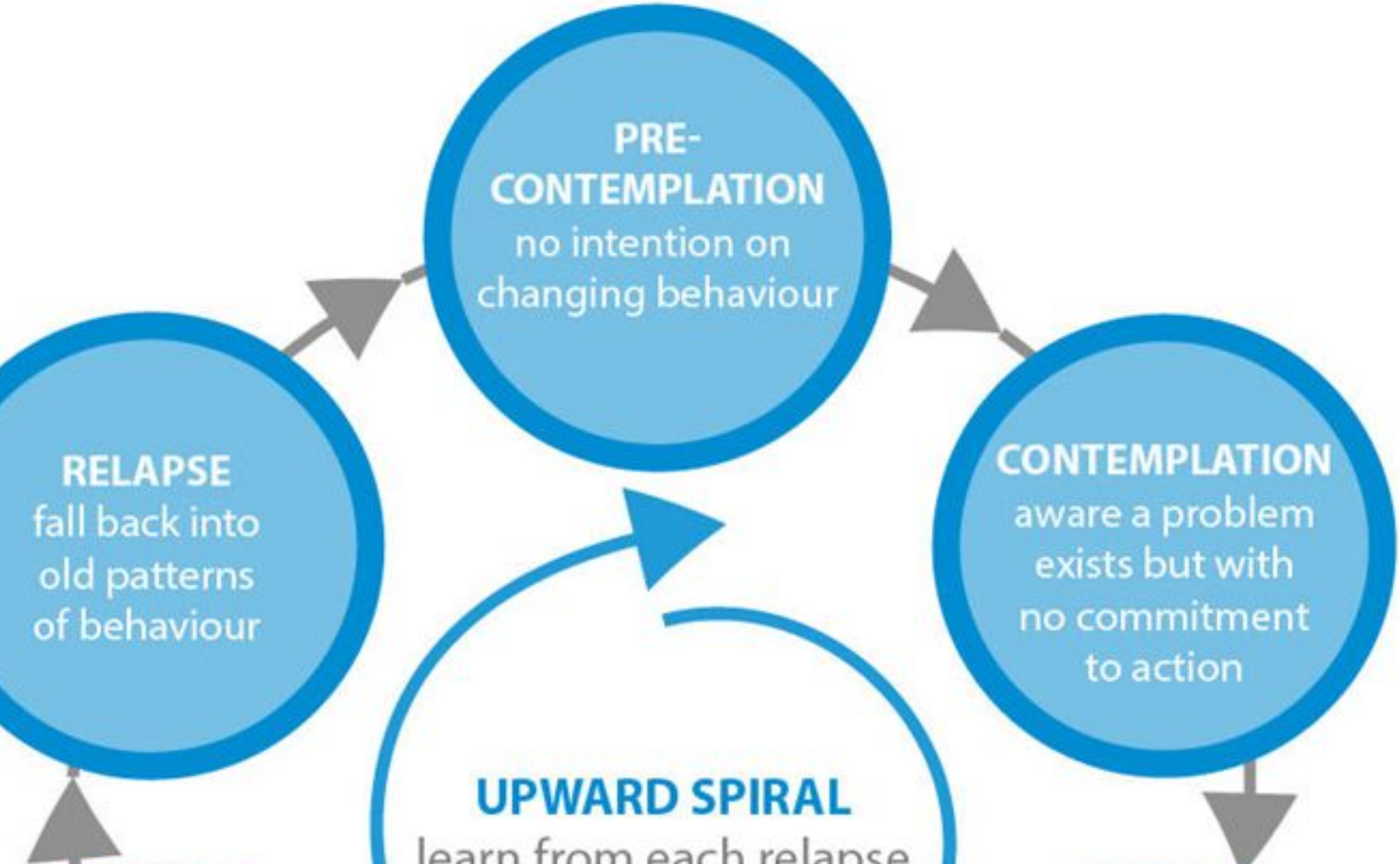
AKA—Stages of Change

Adoption of High-Risk Behaviors

- Multiple sexual partners
- Criminal Activity
- Over-achievement
- Over-eating
- Violence
- High-risk activities (speeding)
- Substance Use **(Addiction is an "unhealthy ritualized compulsive comfort-seeking")**

SUD prevention is Suicide Prevention

33% report no ACEs	51% report 1-3 ACEs	16% report 4-8 ACEs
With 0 ACEs	**With 3 ACEs**	**With 7+ ACEs**
1 in 16 smokes	1 in 9 smokes	1 in 6 smokes
1 in 69 is alcoholic	1 in 9 is alcoholic	1 in 6 is alcoholic
1 in 480 uses IV drugs	1 in 43 uses IV drugs	1 in 30 uses IV drugs
1 in 96 attempts suicide	1 in 10 attempts suicide	1 in 5 attempts suicide


PRE-
CONTEMPLATION
no intention on
changing behaviour
CONTEMPLATION
aware a problem
exists but with
no commitment
to action
RELAPSE
fall back into
old patterns
of behaviour
UPWARD SPIRAL
learn from each relapse

- Hard to see any way forward
- Very dependent on life views: (understanding poverty)
  - Negative Views About the World
  - Negative Views About Self
  - Negative Views About the Future

I don't even want to want to

Precontemplation—Unaware of the Problem or Denial of its Existence

What is Harm Reduction?

Everyone has a place in harm reduction

Harm reduction strategies Public Health approach for reducing the risks and harms associated with drug use.

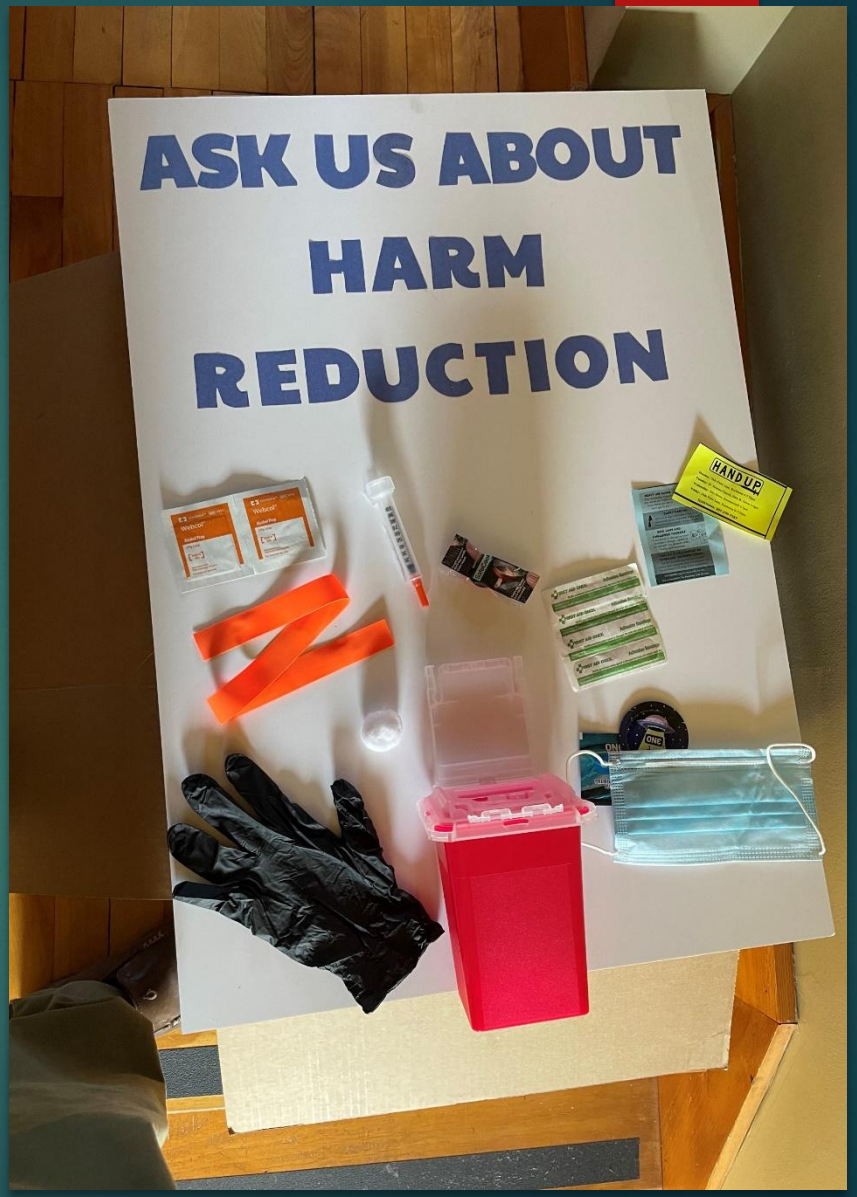
Harm Reduction is a social movement *for the rights and liberation of people who use drugs.*

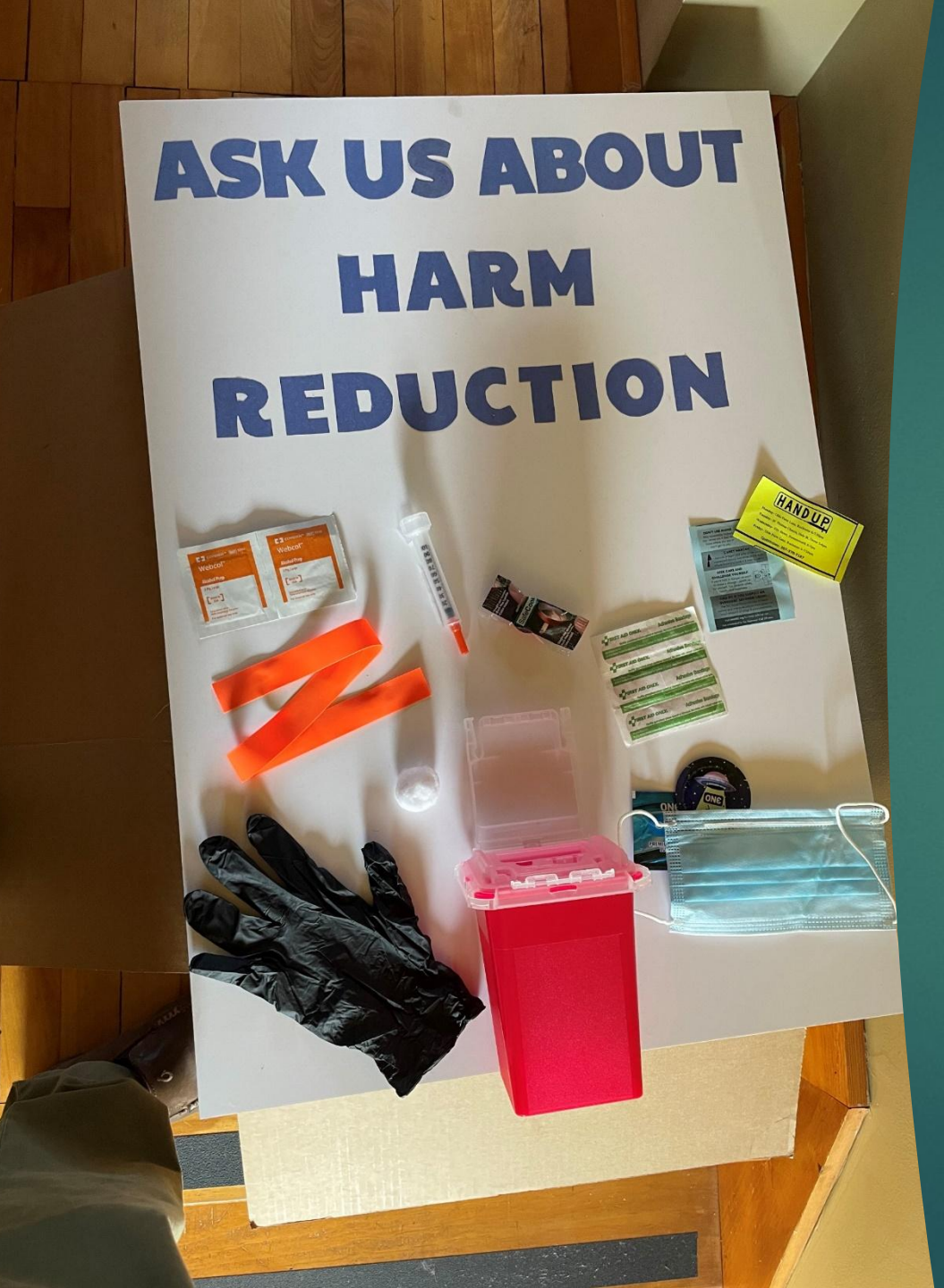
- *Support. Not Punishment.*

Conversational harm reduction: what you say and how you say it.

WDH Harm Reduction Kits

- Syringes,
- Cookers
- Cotton
- Torniquets
- Filtered water
- Condoms
- Sharps container





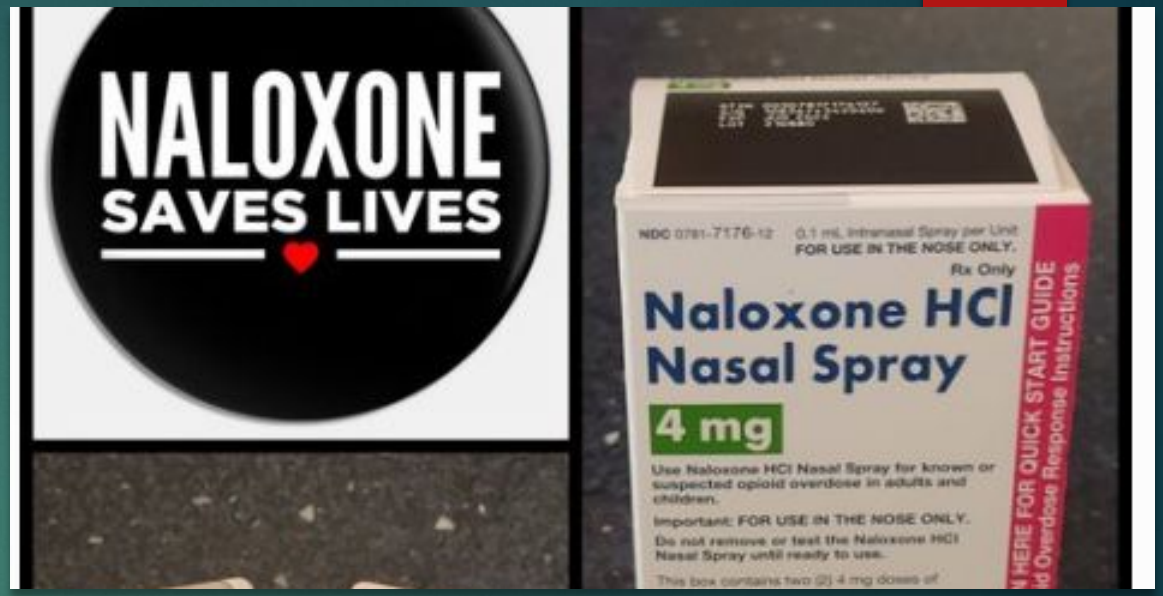
Harm Reduction Kits Cont.

- Latex Gloves
- Wound care
  - Band-aids
  - Cleaning pads
  - Neosporin
- Other options—sterile syringes
- SOS: smoking and snorting tools

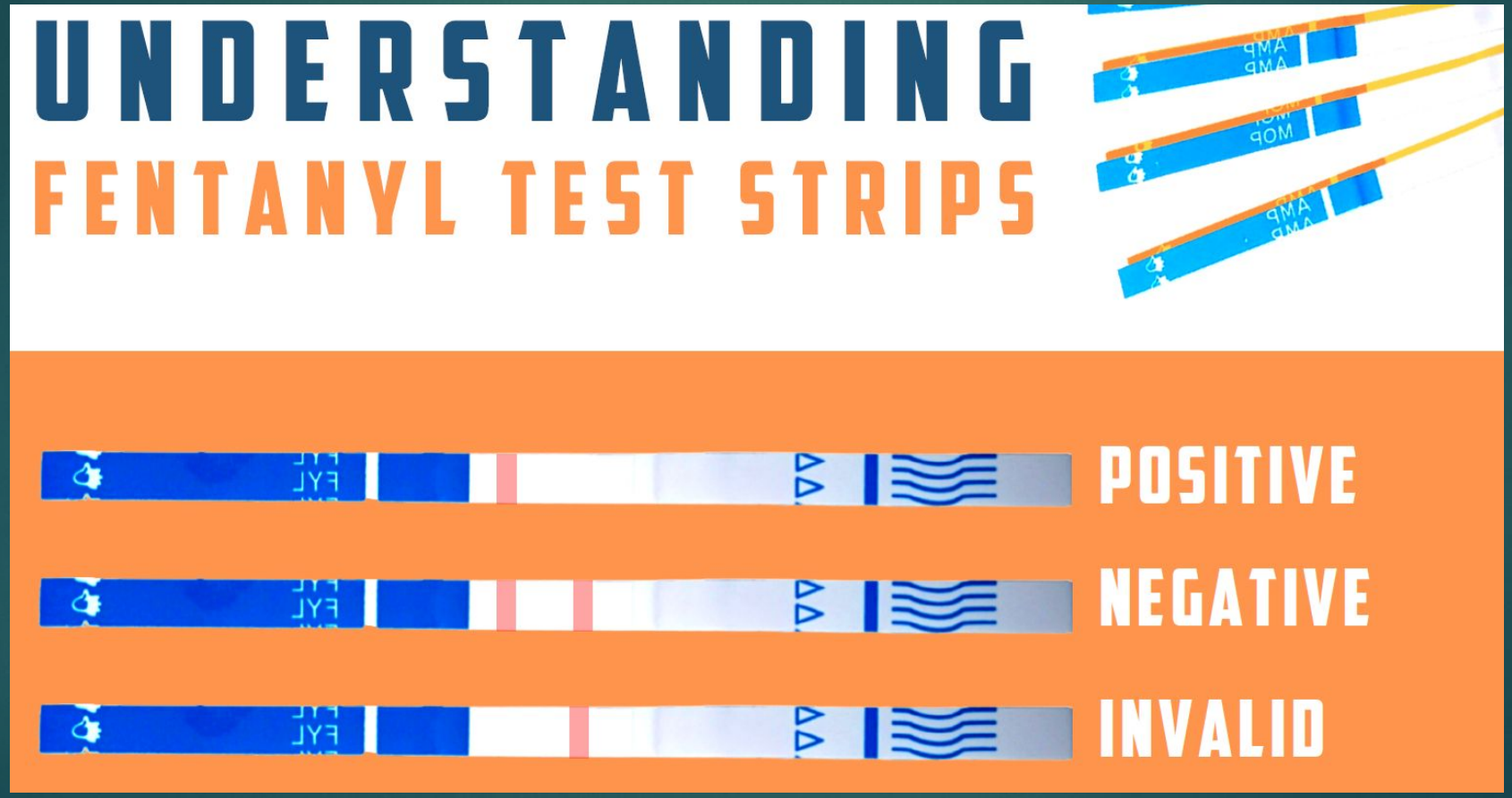
- *Community Sharps Disposal (e.g. Town of Dover, SOS, NHHRC, etc.)

Naloxone

- 4mg Intranasal Narcan (Narcan Direct)
- 8mg Intranasal Kloxxado (Hikma Pharma)
- 0.4 mg IM Naloxone (California Buyers Club)



Fentanyl Test Strips



Conversational Harm Reduction—

STIGMA

- Significant guilt and shame for individuals with substance use disorders—Is assuming morality has a hand in this.
- Using the right terminology can reduce this—How we talk matters

Research suggests that we are just as programmed to sense threat to our dignity—to our sense of worth—as we are to a physical threat

DeWall--2009

Just as our limbic system can quickly signal us to disconnect from a person who harms or threatens us, it can quickly flood us with feelings of love, empathy and compassion, compelling us to connect…

DeWall--2009

Say This, Not That

--The National Council

Try This and See What Happens

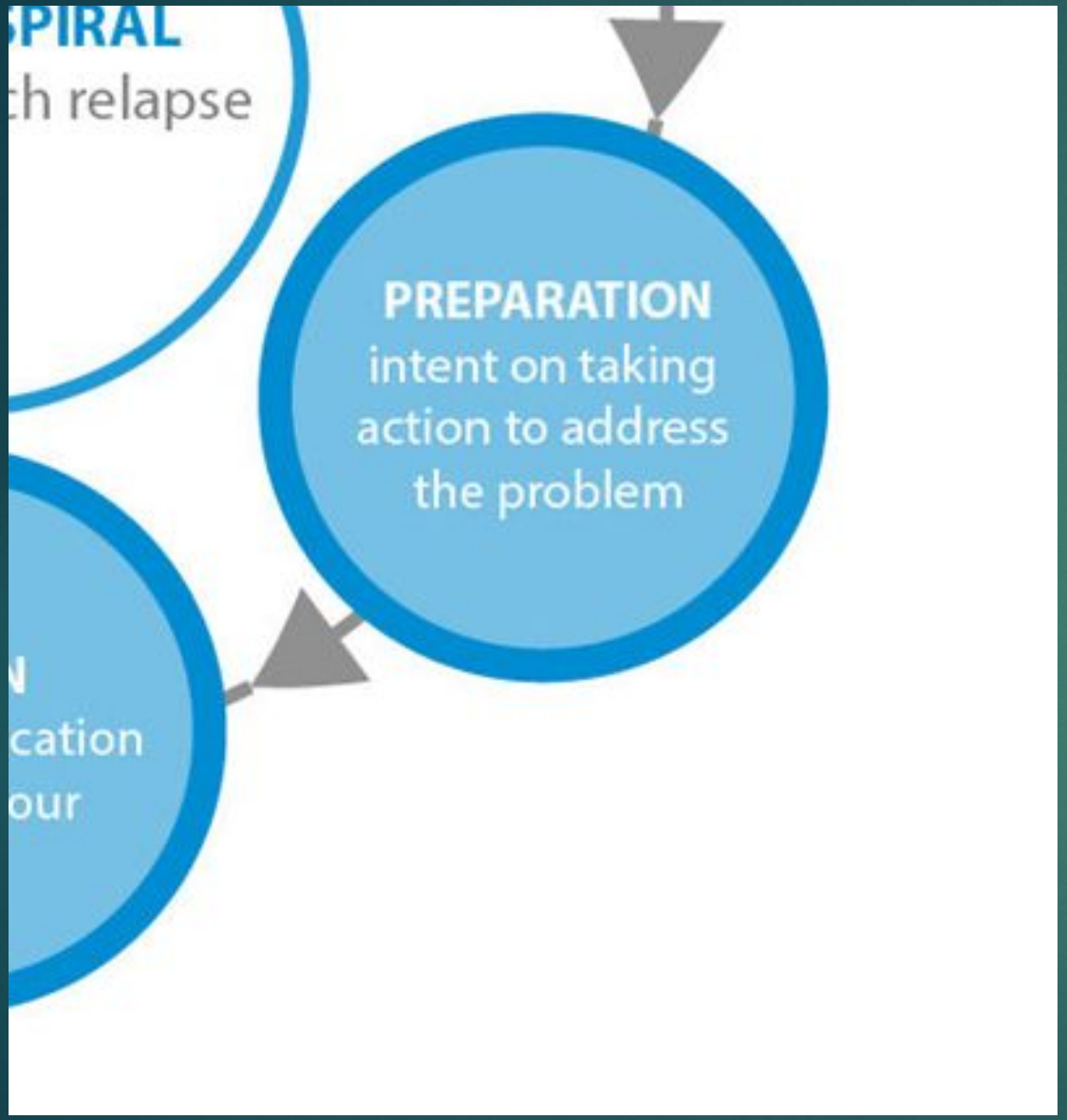
Change your language to engage with and activate your patient

Negative/Passive Words	Positive/Active Words
Suffers from	Struggles with
Refused to take	Decided against
Didn't keep appointment	Was unable to be here
Was noncompliant with	Has not seen value of
Arrived late	Was determined not to miss

Contemplation—Aware of the Problem and of the Desired Behavioral Change

- This is the prime time to use MI
  - Explore their sense of self efficacy
  - Explore expectations
  - Reflect and summarize self motivational Statement
  - Possibly consider the Readiness Ruler and/or Pros and Cons

Readiness Ruler



Preperation

Preparation—Intends to Take Action

- Offer a menu of options
- Help identify pros and cons of change options
- Identify and lower barriers to change
- Help person enlist in social supports
- Encourage person to publicly announce plans to change (accountability)

ASSESSMENT

American Society for Addiction Medicine

Six Dimensions of ASAM

Here are the six dimensions of *The ASAM Criteria*, with a brief description of each one. Think of each dimension like the side of a cube, showing something different about who you are, and an essential part to what makes you, you.

Dimension 1: Acute Intoxication and/or Withdrawal Potential

This life area explores your past and current experiences of substance use and withdrawal.

Dimension 2: Biomedical Conditions/Complications

In this life area, think about your physical health, medical problems and physical activity and nutrition.

Dimension 3: Emotional/Behavioral/ Cognitive Conditions and Complications

This life area helps explore your thoughts, emotions and mental health issues.

Dimension 4: Readiness to Change

This life area identifies what you are motivated for and your readiness and interest in changing.

Dimension 5: Relapse/Continued Use/ Continued Problem Potential

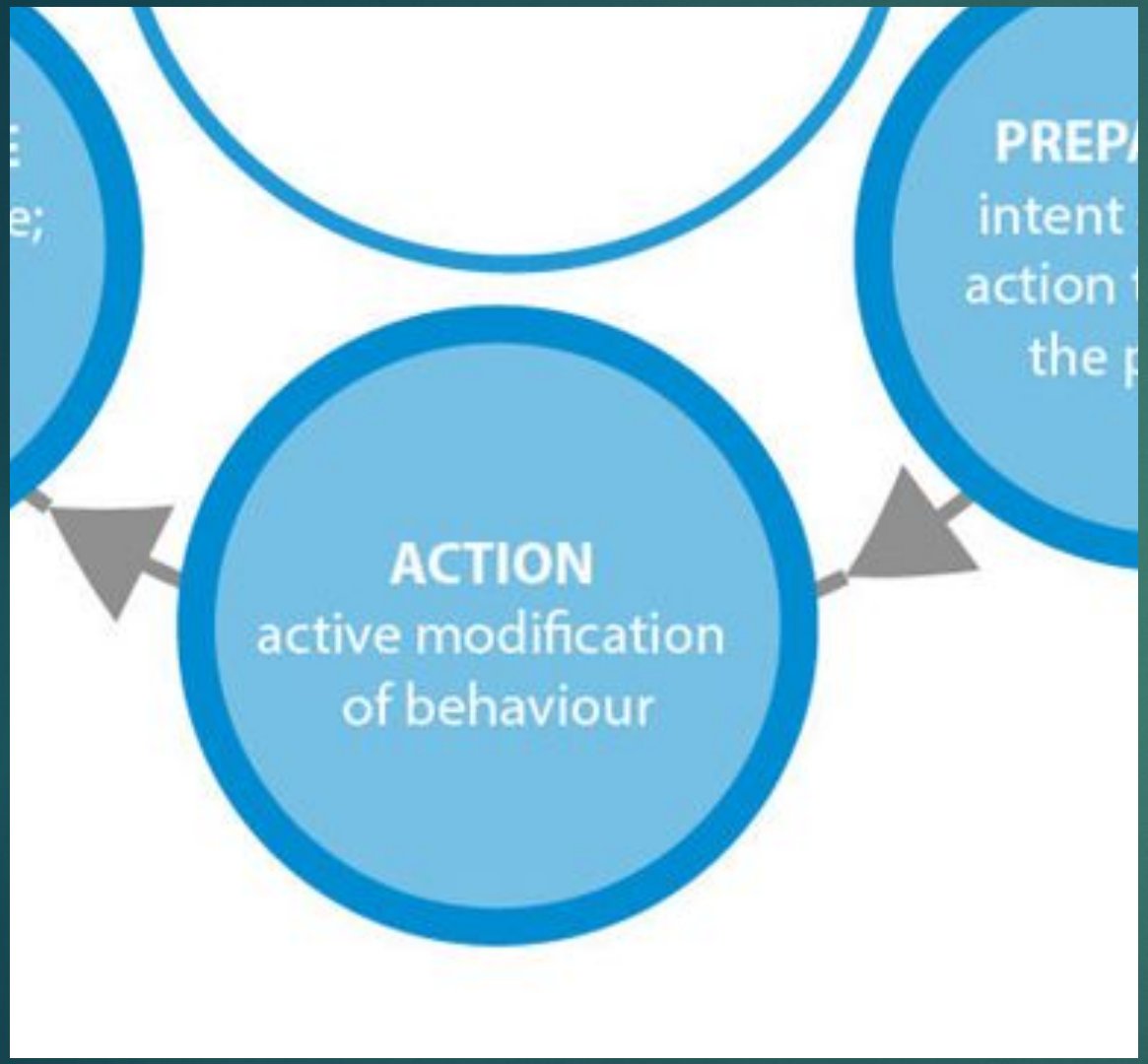
This life area addresses concerns you might have about your continued substance use, mental health or a relapse.

Dimension 6: Recovery Environment

This life area explores your living situation and the people, places and things that are important to you.

Benchmark Levels of Care

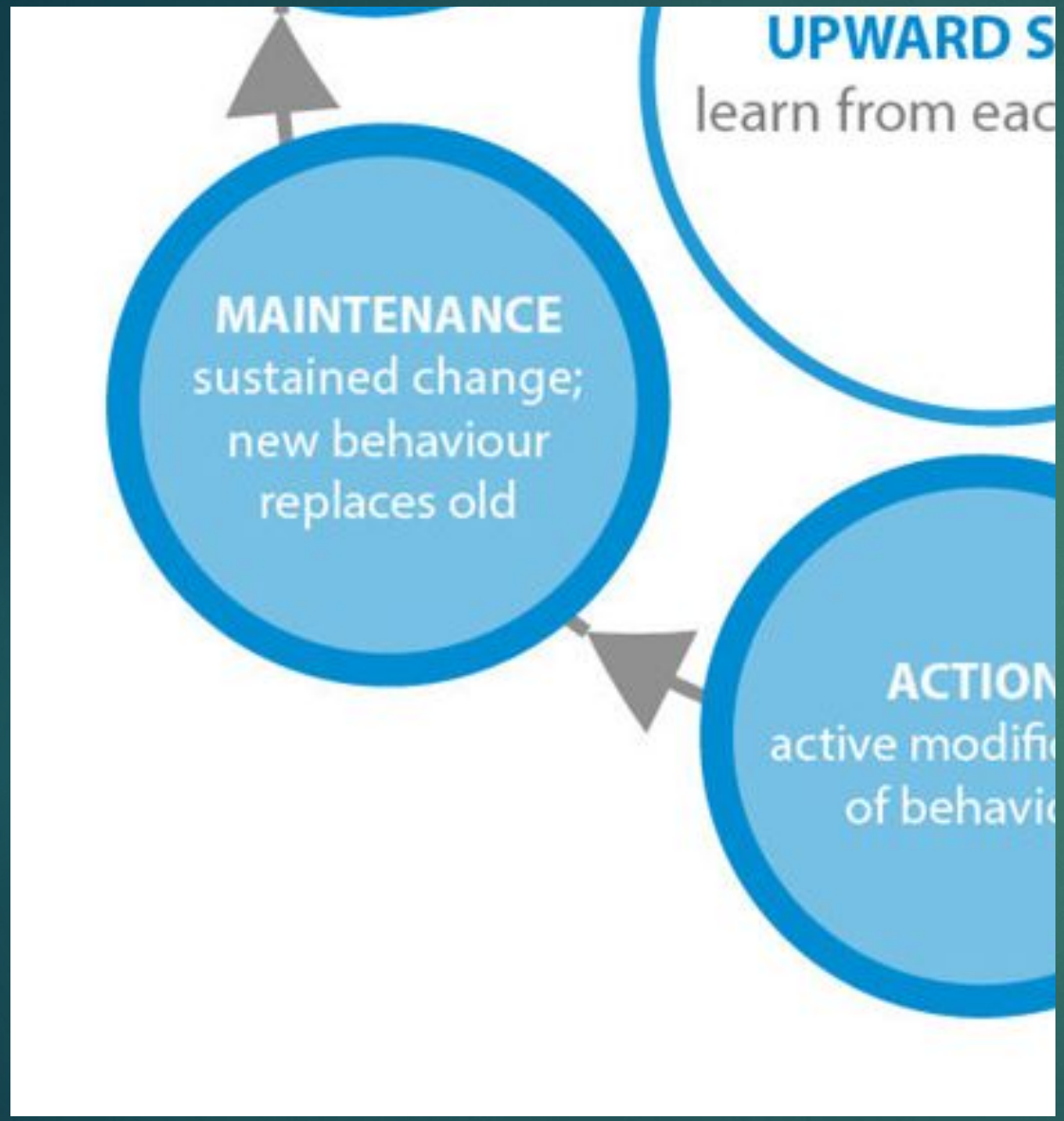
Level of Care	Adolescent Title	Adult Title	Description
0.5	Early Intervention		Assessment and education
OTP (Level 1)	*Not specified for adolescents	Opioid Treatment Program	Daily or several times weekly opioid medication and counseling available
1	Outpatient Services		Adult: Less than 9 hours of service per week Adolescent: Less than 6 hours of service per week
2.1	Intensive Outpatient Services		Adult: More than 9 hours of service per week Adolescent: More than 6 hours of service per week
2.5	Partial Hospitalization Services		20 or more hours of service per week
3.1	Clinically Managed Low-intensity Residential Services		24-hour structure with available personnel, at least 5 hours of clinical service per week
3.3	*Not available because all adolescent levels attend to cognitive/ other impairments	Clinically Managed Population-specific High-intensity Residential Services	24-hour care with trained counselors, less intense environment and treatment for those with cognitive and other impairments
3.5	Clinically Managed Medium-intensity Residential Services	Clinically Managed High-intensity Residential Services	24-hour care with trained counselors
3.7	Medically Monitored High-intensity Inpatient Services	Medically Monitored Intensive Inpatient Services	24-hour nursing care with physician availability, 16 hour per day counselor availability
4	Medically Managed Intensive Inpatient Services		24-hour nursing care and daily physician care, counseling available



Action

Action—Practices the Desired Behavior

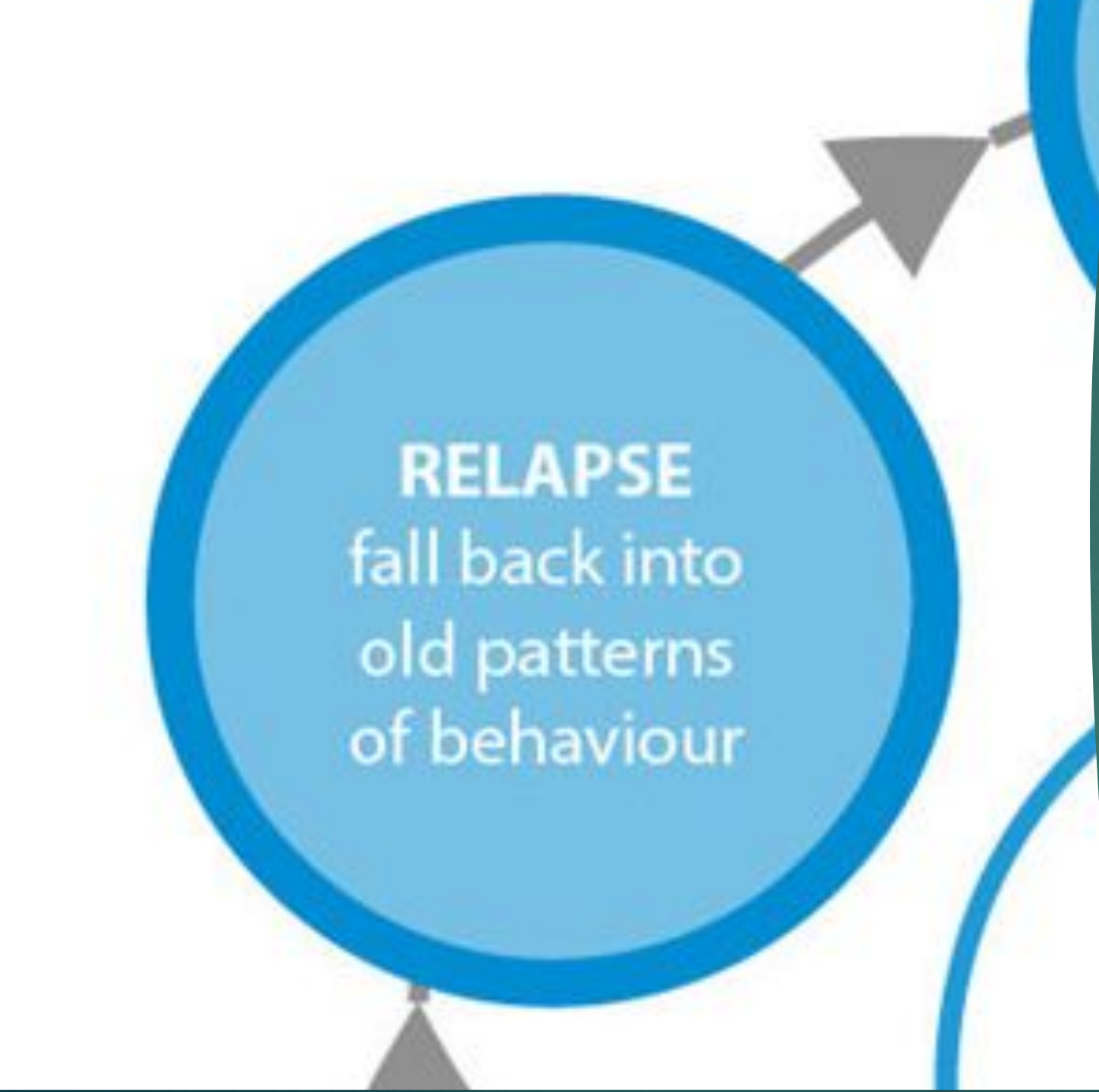
- **Support**
  - Support a realistic view of change through small steps
- **Help**
  - Help identify high-risk situations and develop coping strategies
- **Assist in**
  - Assist in finding new reinforcers of positive change
- **Help**
  - Help access family and social supports



Maintenance

Maintenance—Works to Sustain the Behavior Change

- Help identify and try alternative behaviors (drug free ones)
- Maintain supportive contact
- Help develop escape plan
- Work to set new short term and long term goals



Relapse

Recurrence

- Frame recurrence as a learning opportunity
- Explore possible behavioral psychological and social antecedents
- Help to develop alternative coping strategies
- Explain Stages of Change and encourage person to stay in the process
- Maintain supportive contact

What's wrong with the way Americans think about and react to addiction?

- They see it as an acute problem, not a chronic disease
- The health focuses on the complications of addiction and not the primary disease that leads to those complications
- Addiction treatment focuses on withdrawal management (detox) and short-term treatments (28-day rehab)
- The success of treatment is judged very differently than other medical treatments are evaluated.
- We call it a chronic illness but we treat it like a crime.

Case Example 1

DM is a 30 y/o sugar addict. He was arrested for sugar possession with intent to traffic—(He brought donuts to his job). He had 4 previous dirty blood tests with HBA1c>10. If he has 1 more dirty blood test, he will be discharged from the clinical because we only treat sugar addicts who can keep their HBA1c <7. He will be sentenced to 90 days of Intensive Nutrition Class and have 4 random blood glucose checks weekly. He also needs to attend 3 Donuts Anonymous meetings per week and get his sheet signed. If he overdoses on sugar again, and goes into DKA, he will be charged with sugar possession. After he gets out of the ICU, he will go straight to jail for a 30 day stay. That will teach him to never east sugar again.

Case Example 2

SUD is a 40yo woman with opioid use disorder. She overdosed last night on heroin. She was admitted to the CIU and treated with grace and dignity until she fully recovered. She was not discharged until she met a peer support worker and a counselor and saw psych for depression and PTSD. Her buprenorphine prescription was filled. The prior authorization was done, and the nurse taught her family how to use a naloxone kit in case of another OD. She had a follow up appt with an Addiction Medicine Specialist within 3 days of discharge. A visiting nurse checked on her daily for one-week to assess her recovery status, medication compliance and ensure rides to 12 step meetings and IOP. Her family was kept informed of the ongoing treatment plan and given information on family support groups.


Treatment
Ending dependency on alcohol and other drugs
Recovery
• A life-long journey
• Living a life free from alcohol and other drugs
• Healing the mind, body, & spirit
• Changing destructive behavior into behavior that is beneficial to society
Intervention
Everyday is a chance to start over
Prevention
Breaking the chain

?