



UNDERSTANDING ADDICTION: NOW APPEAL

Definition; Disease of Addiction



- AMERICAN SOCIETY ADDICTION MEDICINE defines Addiction

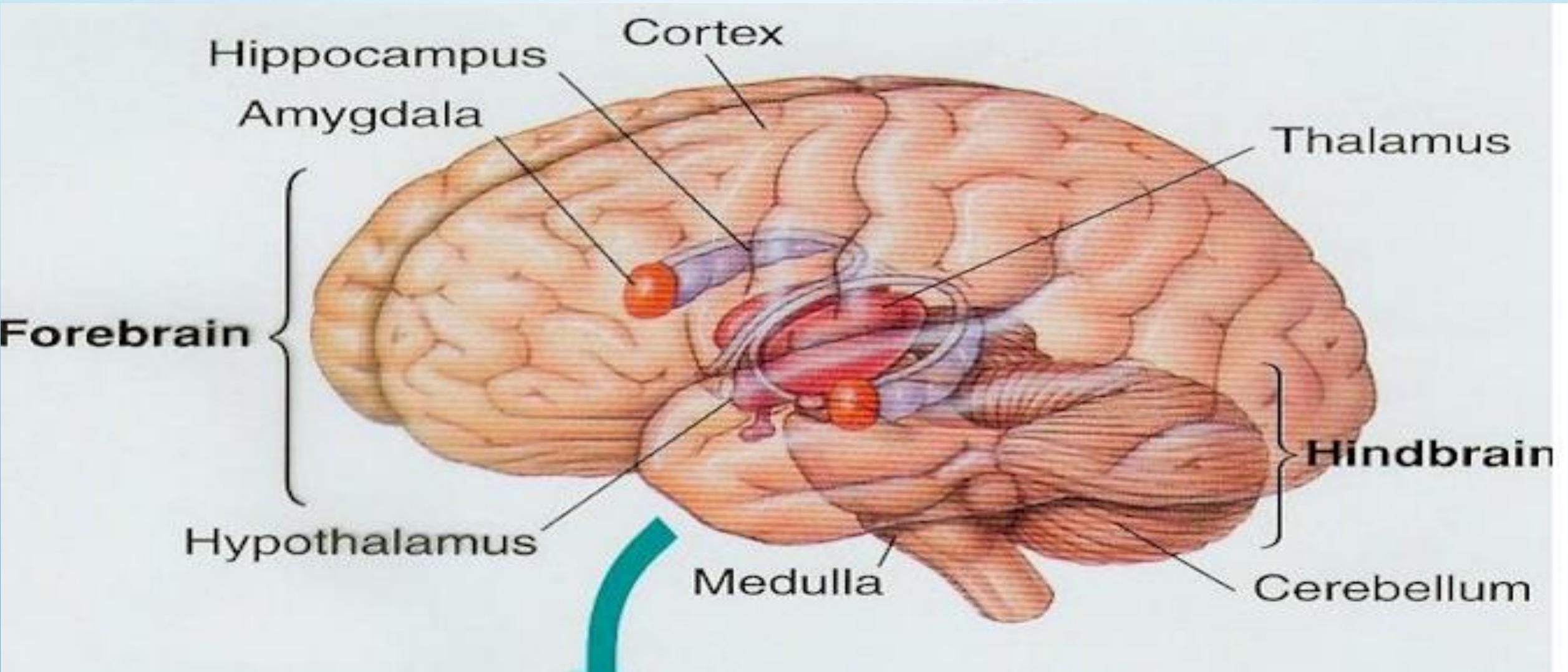
as a primary, chronic disease of the brain reward, memory, motivation and related circuits. Addiction is characterized by inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one's behaviors and interpersonal relationships, and a dysfunctional emotional response

ADDICTION BRAIN STATES

- Addiction is a process connecting reward to decision making in the moment, goal seeking habits develop over time.
- Addictive behavior is involuntary driven by cues not consequences
- Addiction is not a monolithic, it includes transitory states
 - Impulsivity
 - Reflection
 - Emotion(shame and guilt)
- Addiction comprises a recurrent series of brain states underlying a recurrent set of choices whereby habit is interspersed with unexpected opportunities for change
- The recursive nature of this sequence provides a window for the present self to influence future decisions, like the desire to quit.

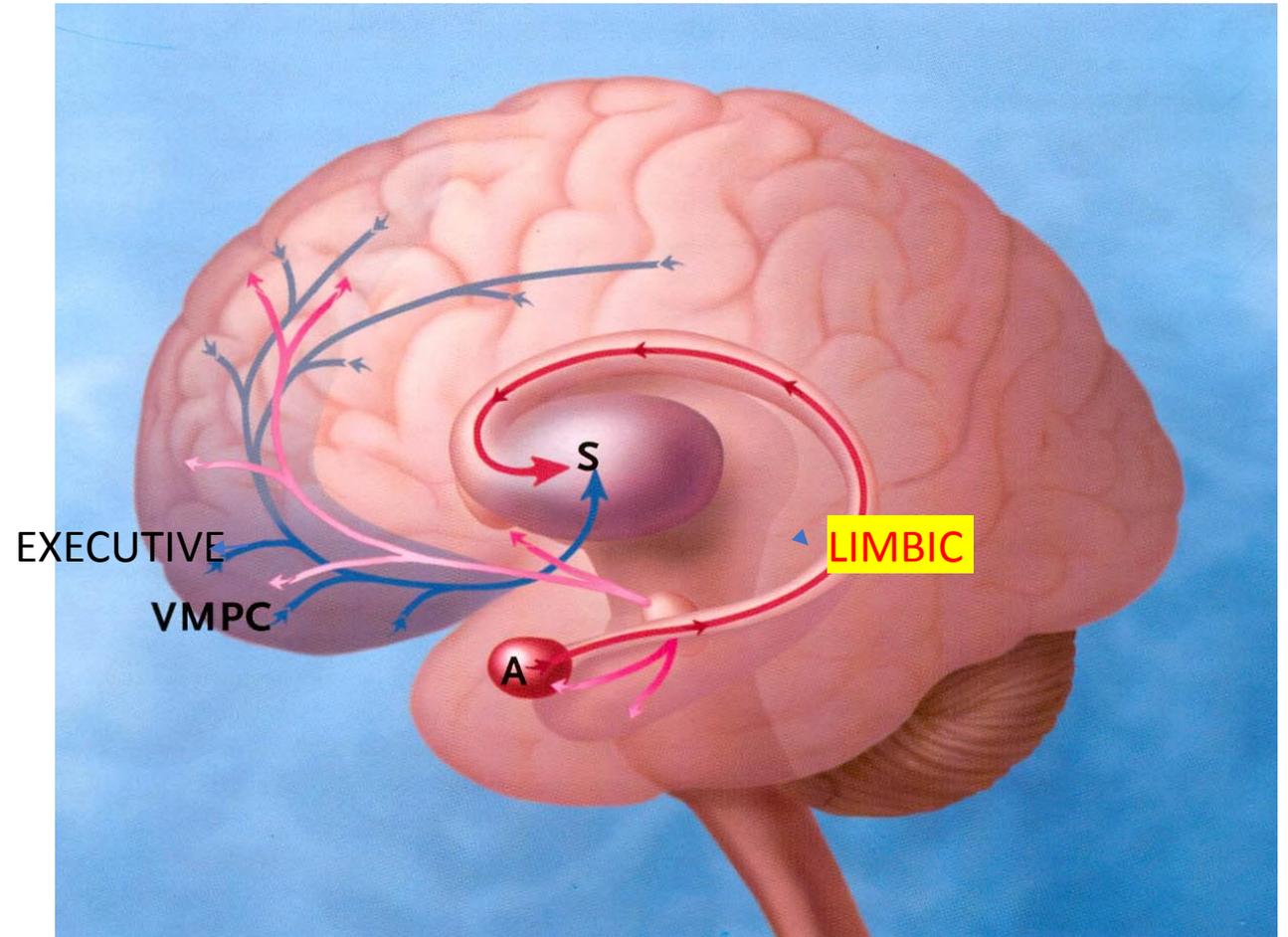
ASSOCIATIVE LEARNING

AMYGDALA → FRONTAL CORTEX → HIPPOCAMPUS



HOW BRAIN WORKS

- LIMBIC SYSTEM IS SURVIVAL DRIVEN. FOCUS IS ON NEXT 30 MINUTES. INSTANT GRATIFICATION. IT WILL FEEL GOOD OR AVOID PAIN NOW.
- EXECUTIVE SYSTEM LOOKS AT LONG/SHORT TERM FACTORS, LIFE GOALS/VALUES TO DECIDE BEST ACTION TO TAKE NOW
- EXECUTIVE AND LIMBIC SYSTEM WORK TOGETHER TO OPTIMIZE OUR WELL-BEING AT ANY GIVEN MOMENT
- EXECUTIVE INHIBITS LIMBIC WHILE IT DECIDES BEST OPTION



HOW BRAIN DETERMINES VALUE OF DIFFERENT BEHAVIORAL OPTIONS

- PREVIOUS EXPERIENCES
 - OUR BELIEFS AND EXPECTATIONS
 - SOCIAL NORMS
 - SOCIAL APPROVAL
 - ASSOCIATIONS
-
- PHYSIOLOGICAL STATE
 - EMOTIONAL STATE
 - LONG TERMS GOALS, VALUES
 - DRUGS OF ABUSE

HOW BRAIN MAKES CHOICES

- Weighs options and considers their expected value.
- It tracks opportunities to improve our lives based on past experiences. if opportunities are rare brain seeks any reward even if it is short term. If you feel deprived, helpless, hopeless or stressed it is hard to resist instant gratification
- If life is full of opportunities to improve immediate well being brain slows down and focuses on long term goals

A. FIRST EXPERIENCE OF DRUG REWARD



B. NEXT DRUG EXPOSURE AND CUE



C. REPEATED EXPOSURE TO DRUG



SECOND STAGE OF ADDICTION

- NATURAL REWARDS

POWER OF DOPAMINE

- Dopamine(DA) is not reward. It causes craving/wanting rather than liking
- DA is key for motivating, directing goal related behavior
- When a reward is possible brain is flooded with DA and the value of drug use skyrockets
- Dopaminergic circuit of brain not designed for rational decision making, its job is to activate power of cues
- Dorsal and lateral areas of prefrontal cortex have to correct DA impatience through a reflective consideration of options and consequences

NOW APPEAL

- **DELAY DISCOUNTING**
 - Humans value immediate rewards over delayed rewards
 - Discount negative consequences
 - Discount future punishment or pain over immediate ones
- **DELAYED DISCOUNTING = NOW APPEAL= ADDICTION**
- **Now appeal is strengthened by negative emotional states and high levels of uncontrollable stress**

NOW APPEAL, cont.

- Addiction pits present tense against future tense
- Now appeal rises rapidly as the possibility of a reward gets closer
- Near term reward is overvalued, overvaluation accelerates rapidly when reward is imminent
- Activity in the striatal and orbitofrontal cortex, critical for assigning value, peak just before drug use and decreases after use.

NOW APPEAL, cont.

- Incentive salience = cue triggered wanting/now appeal
- Cue become salient(powerful) with repeated use, when drug and stimuli are paired
- DA increases impact of cue in
 - NAC which motivates reward seeking
 - Amygdala= emotional conditioning
 - Orbitofrontal cortex=assigning value

NOW APPEAL, cont.

- Negative emotional states lay the foundation for relapse. Signaling the brain the environment is devoid of ways to improve immediate well being.
- HIGHLY NEGATIVE EMOTIONS makes it more likely to act on relapse cues/triggers
- Stress causes brain to focus on short term, prioritizing immediate well being. Sense of control over stressor determines severity of the stressor
- The environment you experience in early childhood can effect stress sensitivity.
- **recovery is about overcoming NOW APPEAL**

CRAVING AND ADDICTION IN THE BRAIN

PATHWAYS TO CRAVING

Desire is triggered when dopamine, which originates near the top of the brain stem, travels through pathways to act on the brain. Drugs increase the flow of dopamine.

VENTRAL TEGMENTAL AREA (VTA)

Dopamine is produced here and flows outward along neurons distributed throughout the brain's reward system.

Dorsal striatum

Neurons here help form habits by identifying enjoyable patterns, such as the anticipation of buying drugs.

PREFRONTAL CORTEX

The amino acid glutamate, produced here, interacts with dopamine to spark visualizations that cue cravings.

AMYGDALA

Neurons here are stimulated by learned emotional responses, such as memories of cravings and pleasure.

ORBITOFRONTAL CORTEX

This hot spot gives a sense of gratification but is also the first to shut down if a person has indulged too much.

VENTRAL PALLIDUM

Animal experiments show that damaging this hot spot can turn something that once gave pleasure into a source of disgust.

BRAIN STEM

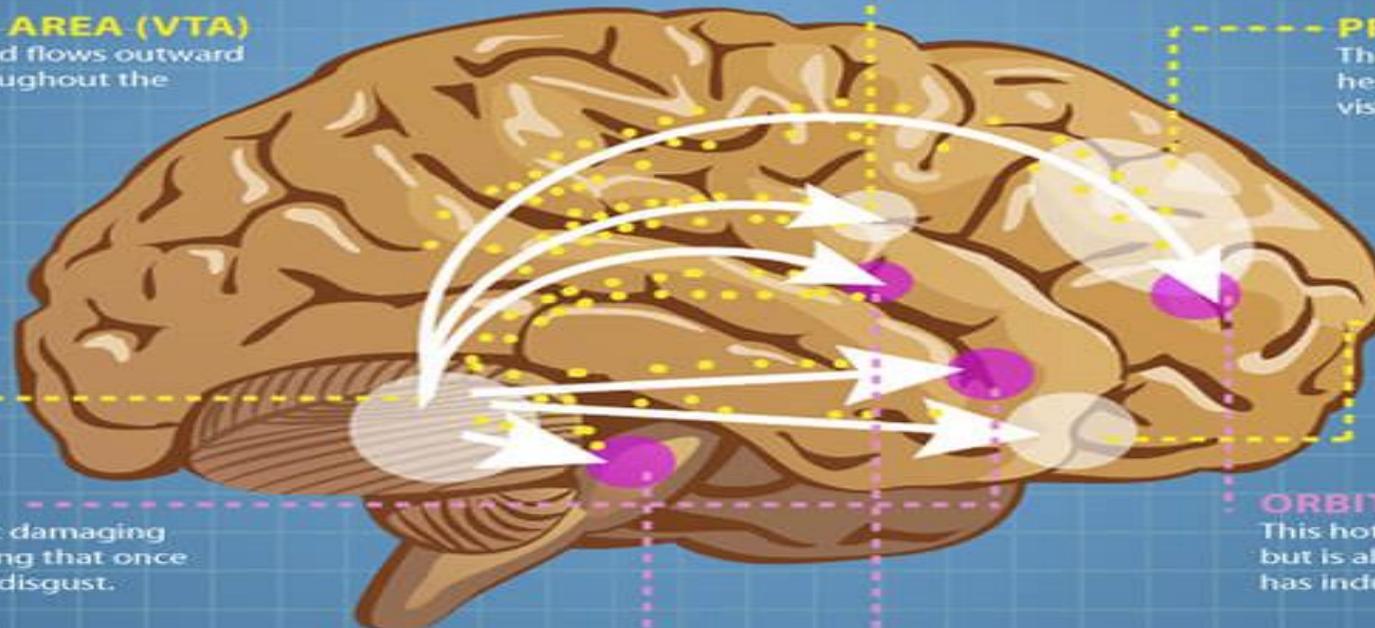
Basic visceral sensations and reactions to pleasure, such as smiling, originate from this hot spot.

PLEASURE HOT SPOTS

A system of small hedonic hot spots, unrelated to dopamine, provides temporary sensations of pleasure and forms a feedback loop with the reward system that controls desire.

NUCLEUS ACCUMBENS

A hot spot within this key part of the craving circuitry amplifies the response to pleasure.



BIOLOGY OF DESIRE

- Brain associates DA release with environmental cues(triggers) present at time of release.
- When brain observes these cues in future it triggers desire by predicting a reward is possible.
- Desire causes the motivational circuits of the brain to disconnect from the inhibitory control driving actions independent of judgement and higher goal
- As desire for immediate rewards increase desire for natural rewards decreases
- Addiction develops when impulsivity = compulsivity which results when it becomes harder to resist the temptation of a reward= **NOW APPEAL**

BIOLOGY OF DESIRE, cont

- Emotional significance of an experience increases learning by focusing attention and concentration.
- Wanting is not liking, wanting is desire
- If desire created by addictive drugs is not resisted longer term goals are sacrificed in pursuit of immediate ones
- Now appeal creates desire by pumping dopamine into motivational circuits of brain to recreate a rewarding experience. Higher the DA release higher the value assigned to an experience, repetition increases desire.



addicts/alcoholics live in a tomb of
the present driven by “now appeal”
dead because they lost their vision
of their future
they develop an addict based self-
image

Overcoming NOW APPEAL and preventing relapse

- Recovery Is a developmental process, the reverse of addiction requiring high motivation based on strong emotions and putting judgement, planning, inhibitory control back in control
- Overcome NOW APPEAL by separating desire for immediate gratification from desire for long term well-being and act on them independently.
- Environmental cues/triggers will trigger NOW APPEAL if in negative emotional or physiological state.
- Decrease power of environmental cues
 - ID triggers from ritual of use. Develop comprehensive plan to avoid/cope with them.
 - Develop cravings management tools. Assess for anti-cravings medications-Revvia, Vivatrol, Suboxone
 - ID stressors develop a comprehensive stress management plan

Overcoming NOW APPEAL and preventing relapse, cont

- Identify ways to enrich sober lives to decrease NOW APPEAL
 - Develop gratitude
 - Learn general life skills- conflict resolution, good communication skills, problem solving
 - Develop strong support system
 - Seek Counseling for family of origin issues, self-esteem and mental health
 - Spiritual Development
 - Remove self from painful situations.
- Develop a New Perspective and desire for better life
 - **RECOVERY=RELIEF, ADDICTION=PAIN**
 - **ID emotionally significant recovery goal**
 - Expand perspective from present focus to the past that shaped them and forward to a sober future that is satisfying and attainable.
 - Change the conversation in their head
 - Write their future story

Overcoming
NOW APPEAL
and preventing
relapse, cont.

- Attach desire for a better future to goals incompatible with addiction—freedom from suffering, loving relationships, attaining life goals.
- Learn to devalue addiction and value recovery
 - ID darkest moment when using and feel emotions associated with it

SUMMARY

1. In recovery you must start to separate one set of desires, NOW APPEAL, from another set of desires- a better more fulfilling life- and begin to act on these independently
2. ID and avoid or cope with environmental cues
3. Using insight, judgement and a new perspective define your sober self and what you really want out of sobriety.
4. Find ways to create value or enrichment in sobriety.
5. Envision a desirable future with motivation to achieve it. Turn off desire of NOW APPEAL and attach desire to goals incompatible w addiction- freedom from suffering, achieving life projects, loving relationships, a sense of coherence/self love resulting from abstinence