

Introduction to addiction

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Disclosure

- None

Objectives

- By the end of this didactic, you will be able to:
- Define the neuroanatomical basics of addiction
- Relate substance use disorder behaviors as a result of diseased neuronal tissue
- Propose fundamental treatment options for patients

Question#1

- Addiction is best described as:
 - A. A moral weakness
 - B. A deficit in will power
 - C. A person's resistance to self improve
 - D. A disease state

Question#2

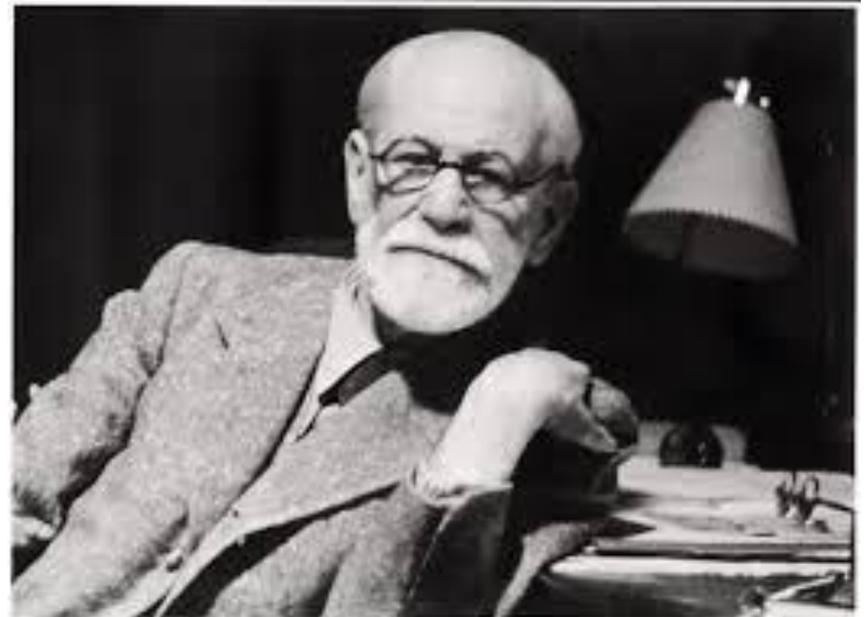
- Which model provides a viable explanation for addiction:
 - A. genetic
 - B. animal
 - C. Social engineering
 - D. Pure theoretical

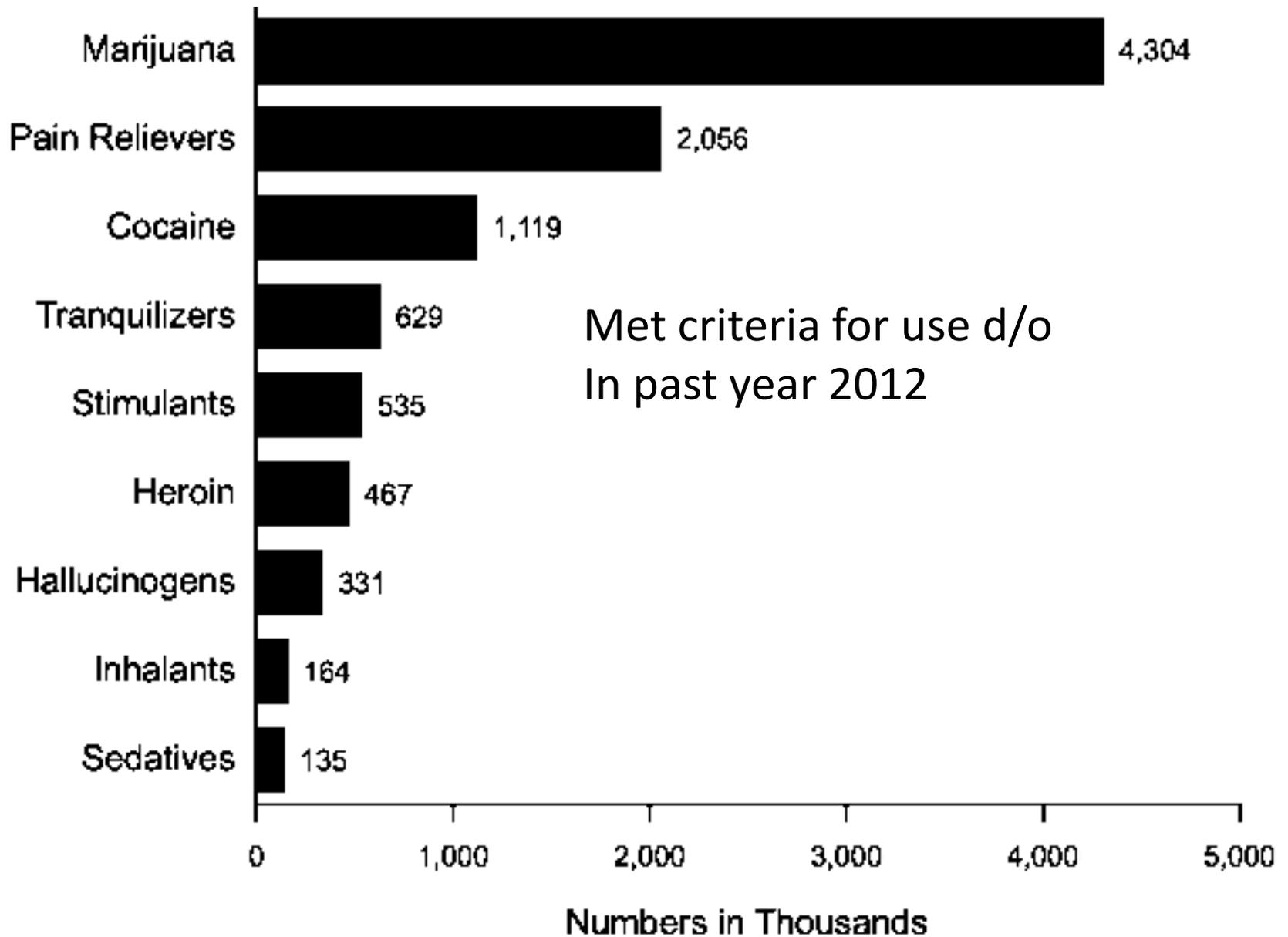
Question#3

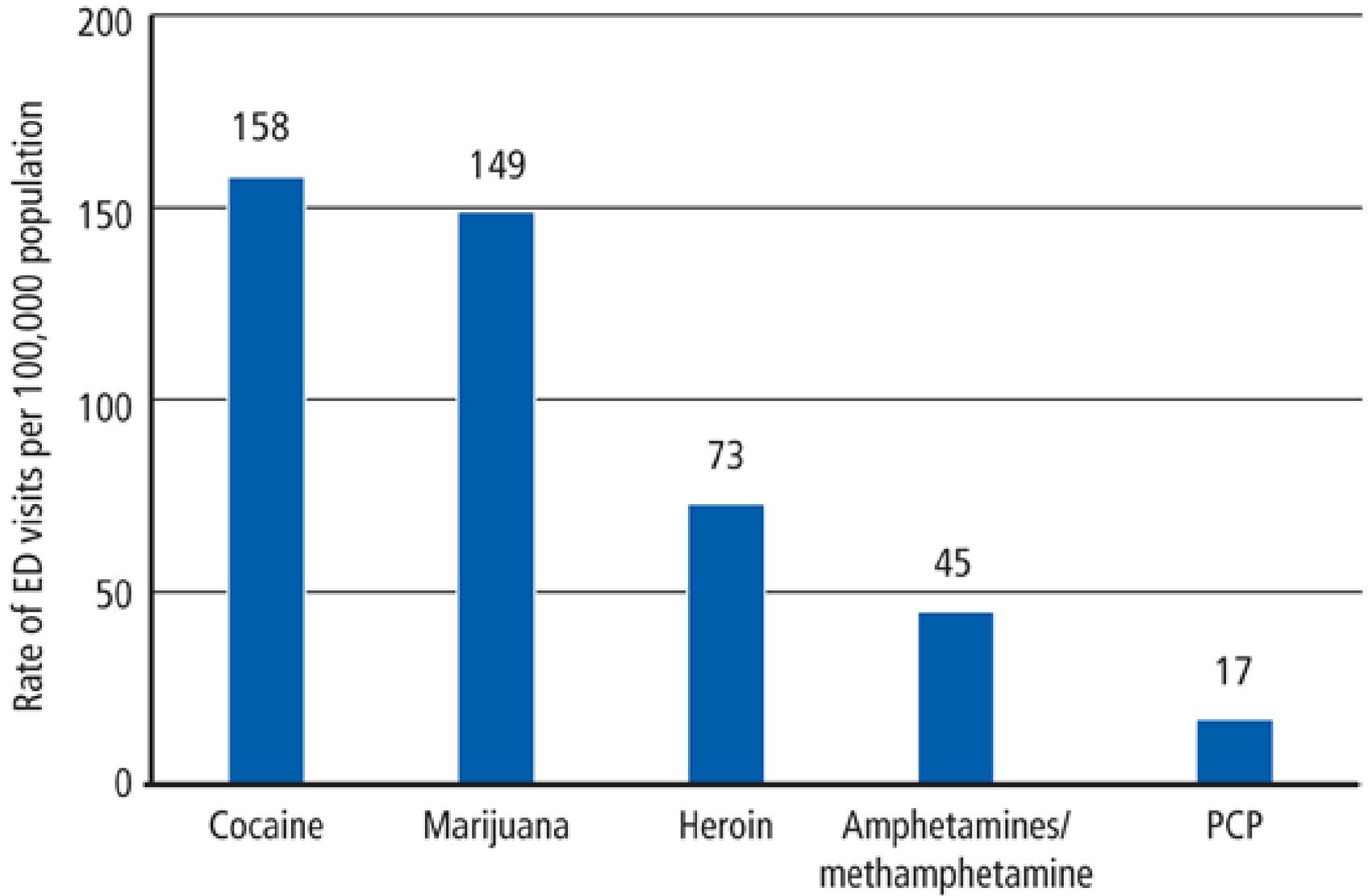
- Dopaminergic cell bodies include which answer(s):
 - A. Ventral Tegmental Area
 - B. Dorsal Raphe
 - C. Nucleus Accumbens
 - D. Locus Ceruleus

Importance

- Impairment in function is essential for diagnosis
- High morbidity and mortality
- Pervasive nature of addiction
- Crosses all socioeconomic statuses







Importance (cont...)

- Patients with substance use disorders did not chose this path.
The impact is global:
- Biological
- Spiritual
- Social
- Financial
- Familial

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STIGMA

Reward

- Primary Reward:
 - Eating salty and fried foods, sweets
 - Having sex
- Secondary Reward:
 - Monetary, artistic, altruistic, religious

So close...

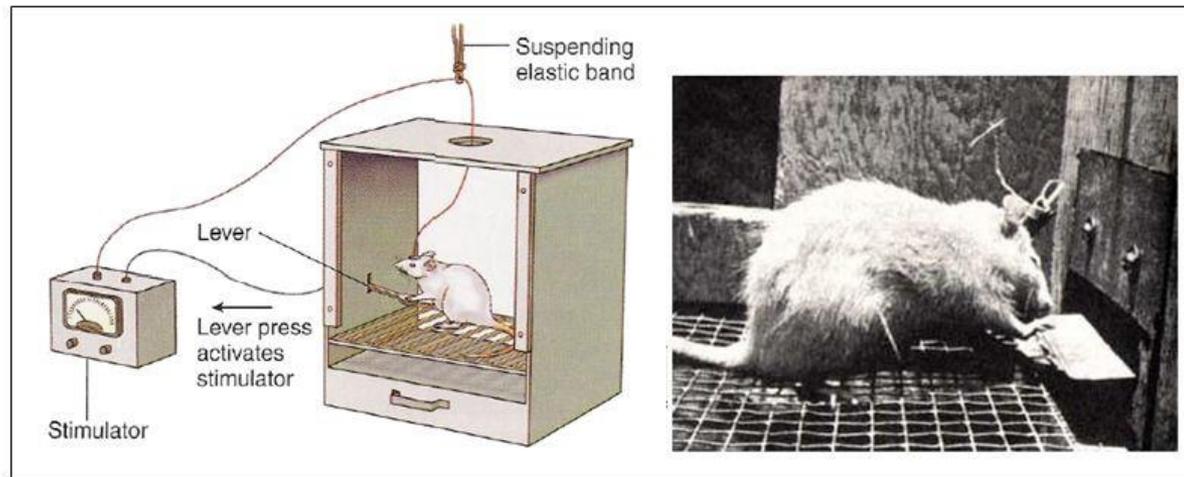


Neuronal circuitry

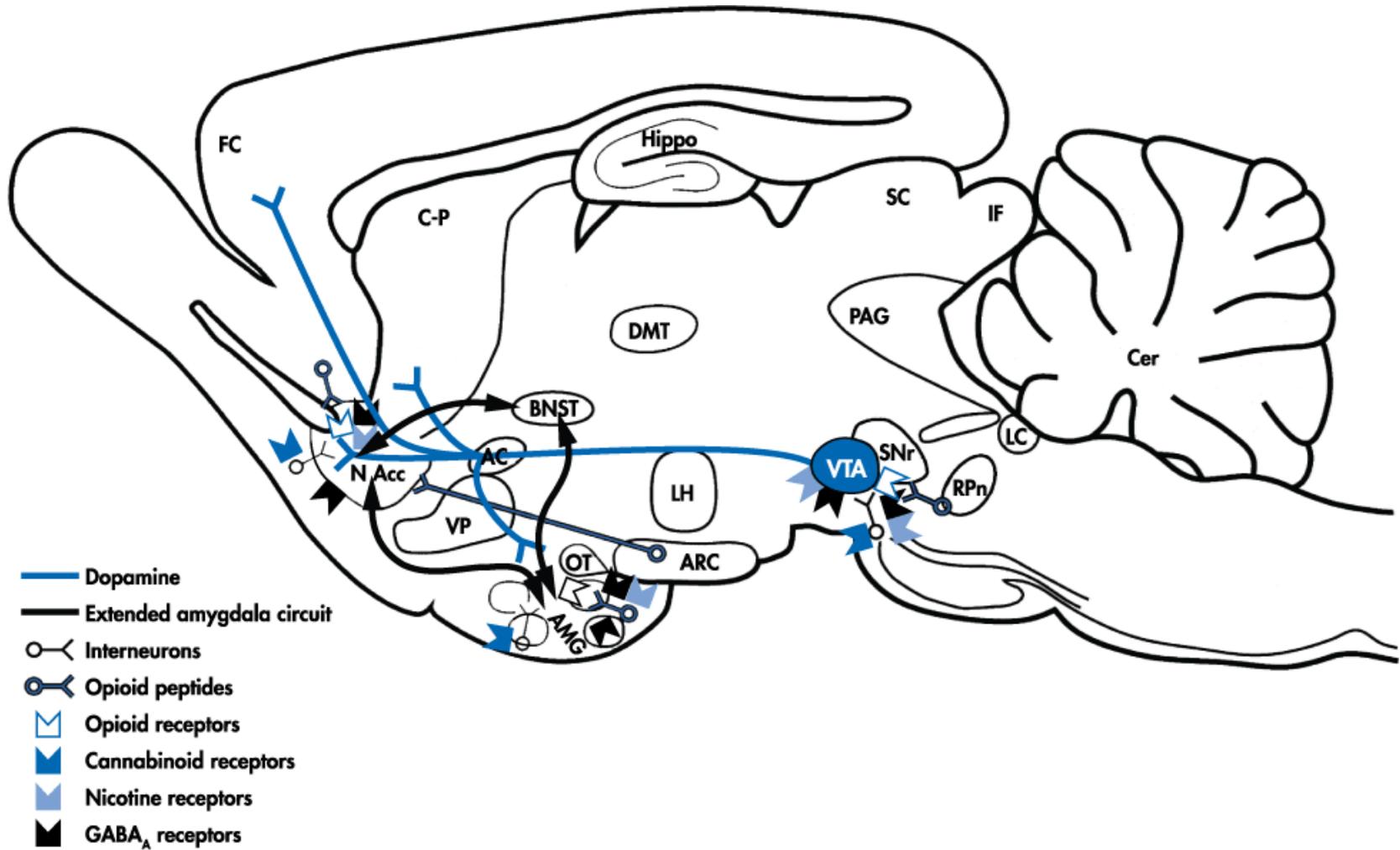
- Addiction or “reward pathway”
- Mesolimbic tracts
- Mesocortical tracts
- Dopamine and many other neurotransmitters are involved

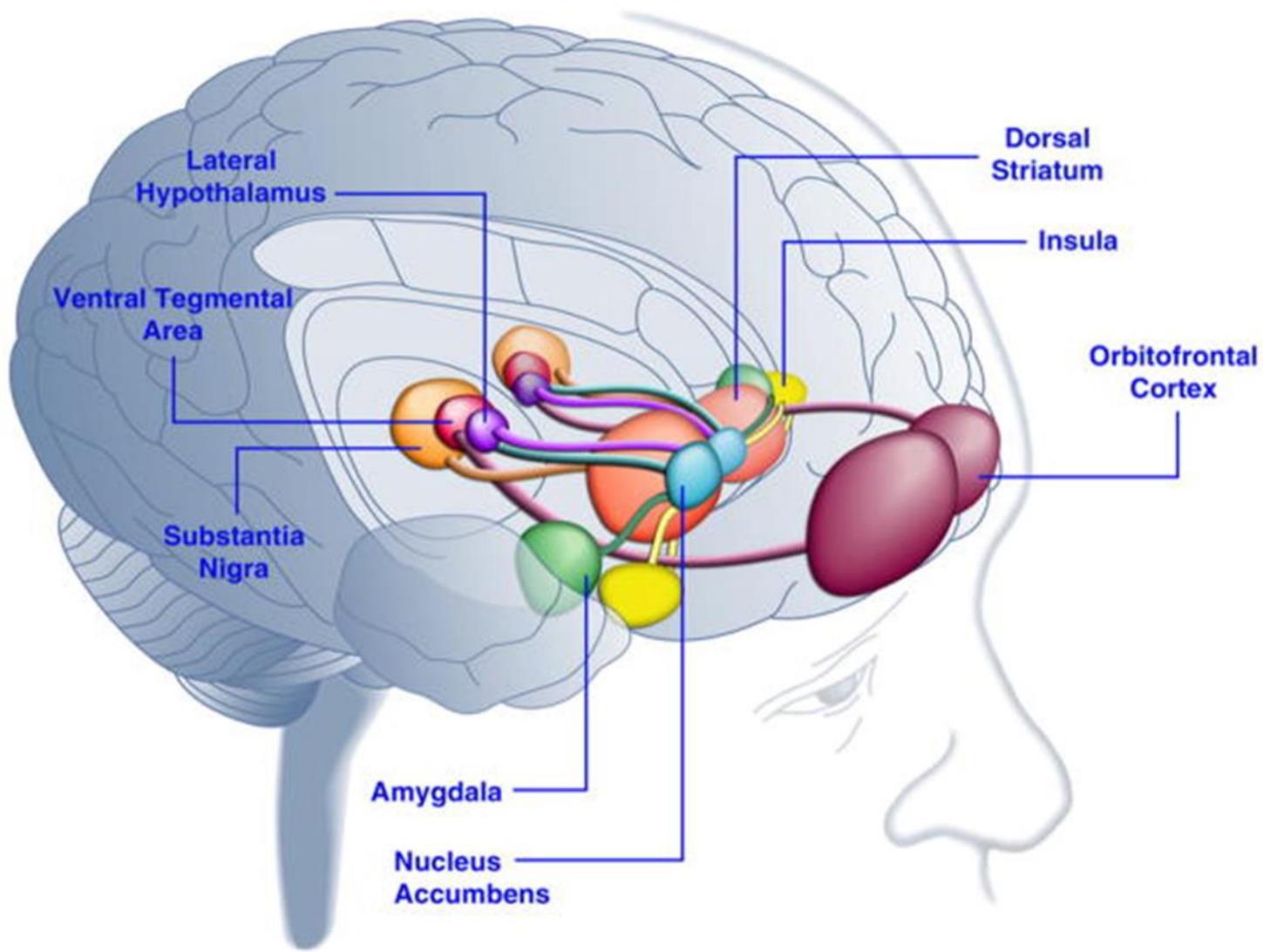
The Mesolimbic Pathway

- Milner's rats in 1954

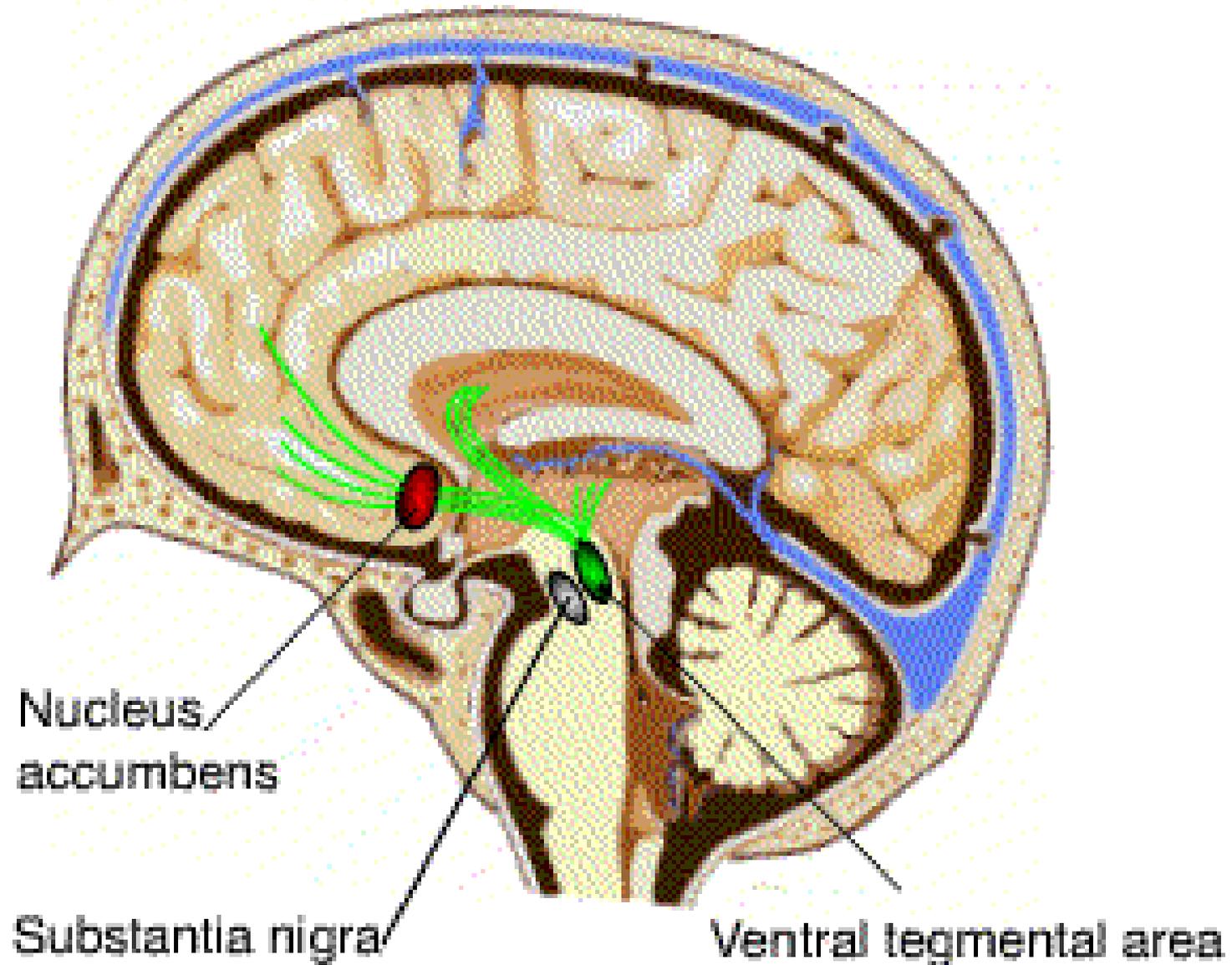


Rat Brain



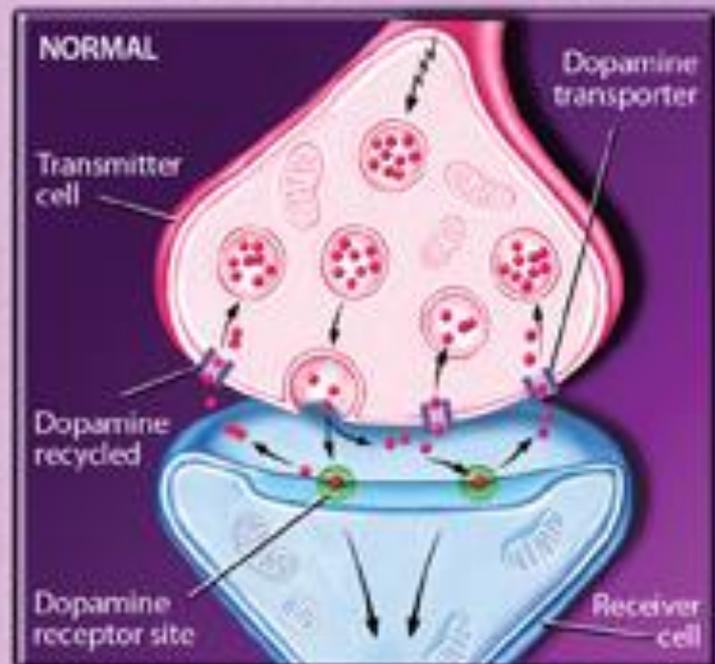
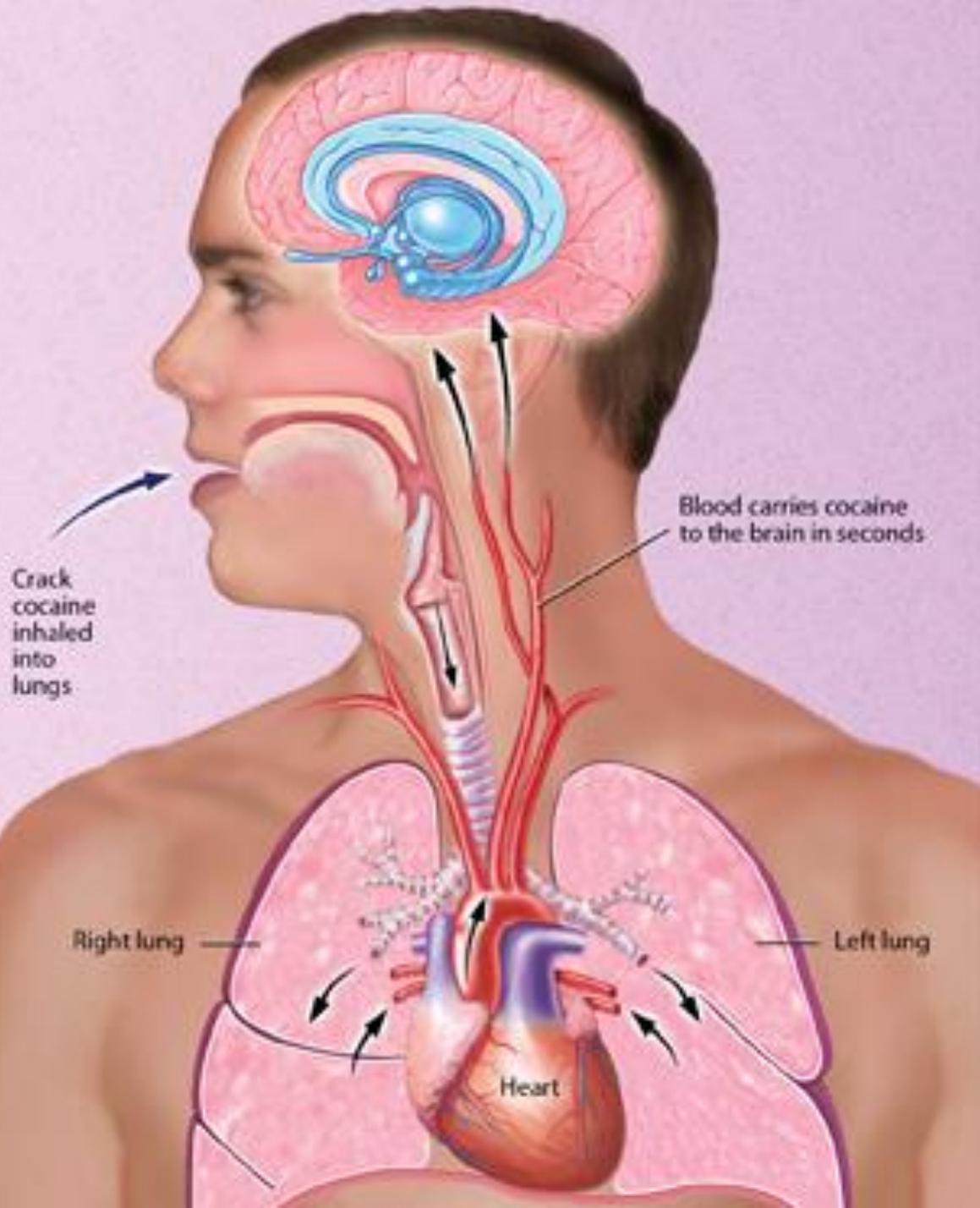


Pleasure Reward Pathway



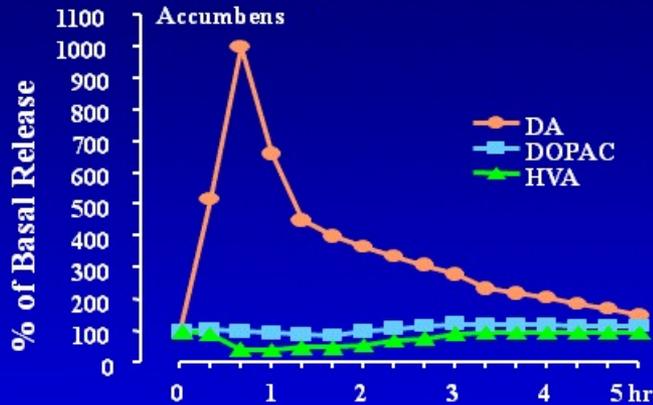
Substance interactions with DA system

- Direct-amphetamine, cocaine, meth
- Indirect-nicotine, Etoh, opiate, thc, caffeine, toluene

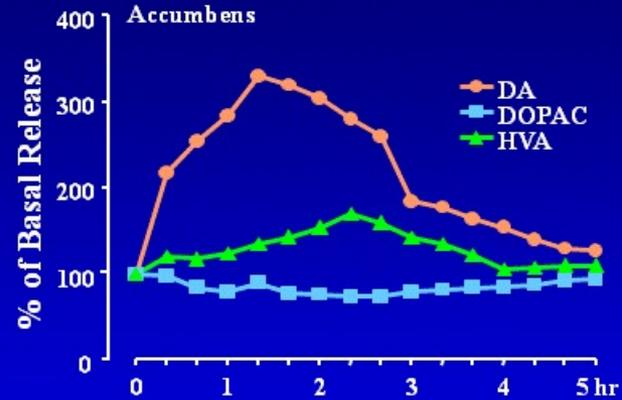


Effects of Drugs on Dopamine Release

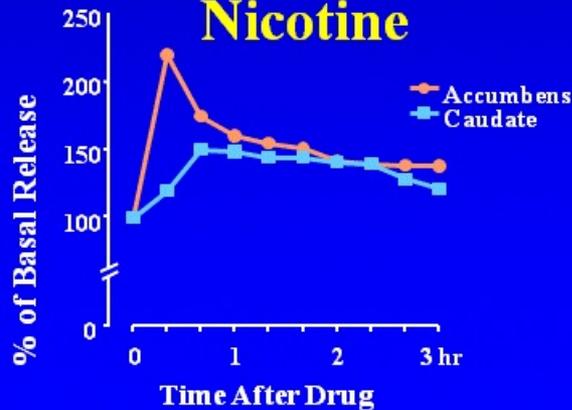
Amphetamine



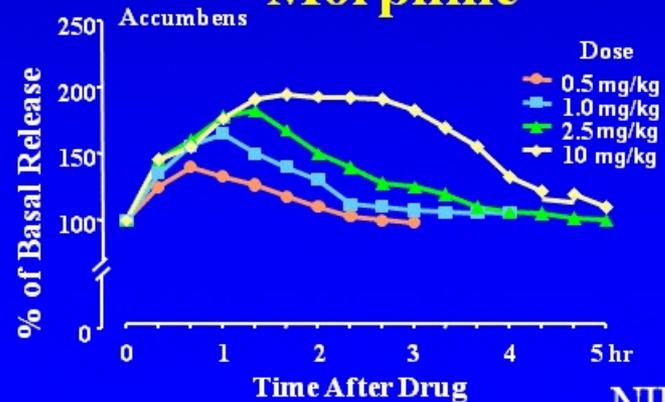
Cocaine



Nicotine



Morphine



Maladaptation of the system

- Behavioral Addiction-gambling, food, pathological internet use
- Substances of Abuse
- They share the same core features emanating from malfunctioning mesocorticolimbic pathways

Maladaptation of the system (cont...)

- Increased extracellular DA in Nac underlies drug addiction
- Chronic changes to supraphysiologic perturbations in DA system make them more responsive to high dopamine concentrations and less responsive to DA concentrations from natural reinforcers

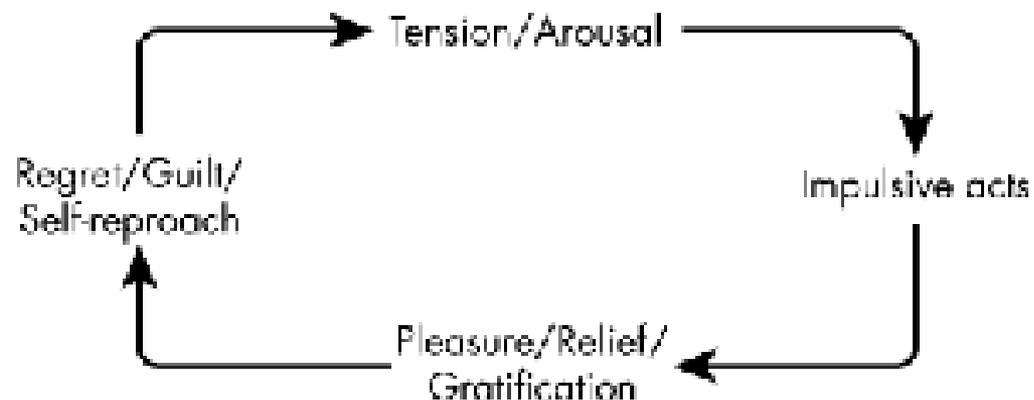
Behavior

- Lose control of substance intake
- Aberrant behavior starts to blossom
- Social function reduces
- Family, personal, work relationships
- Financial patterns change

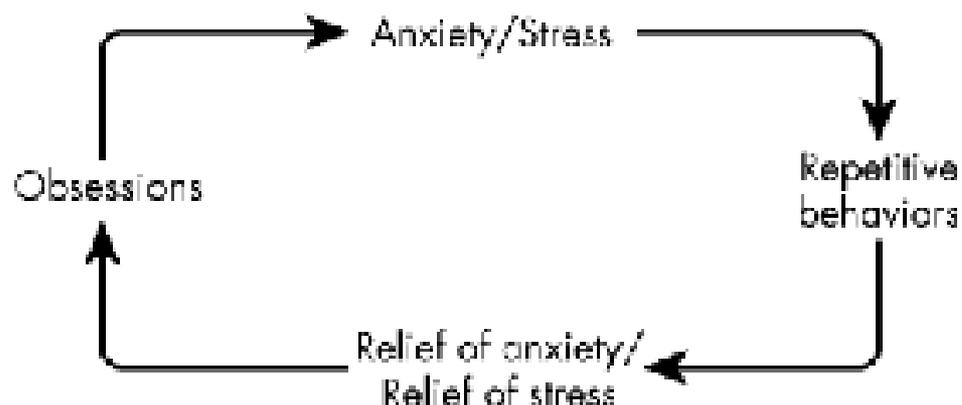
Maladaptive patterns of addiction

- Use changes essence and spirals into uncontrolled use in a 3 stage cycle:
 1. Binge/intoxication
 2. Withdrawal/ negative emotional state
 3. Preoccupation/anticipation
- Shift from impulsive to compulsive behavior occurs as disease advances

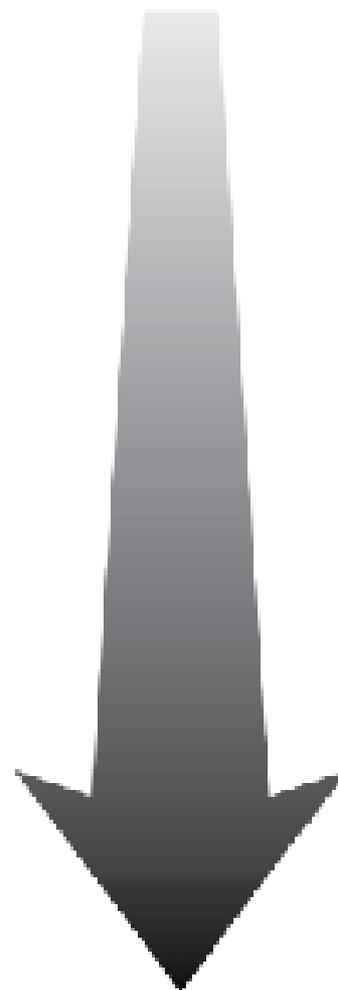
Impulse control disorders



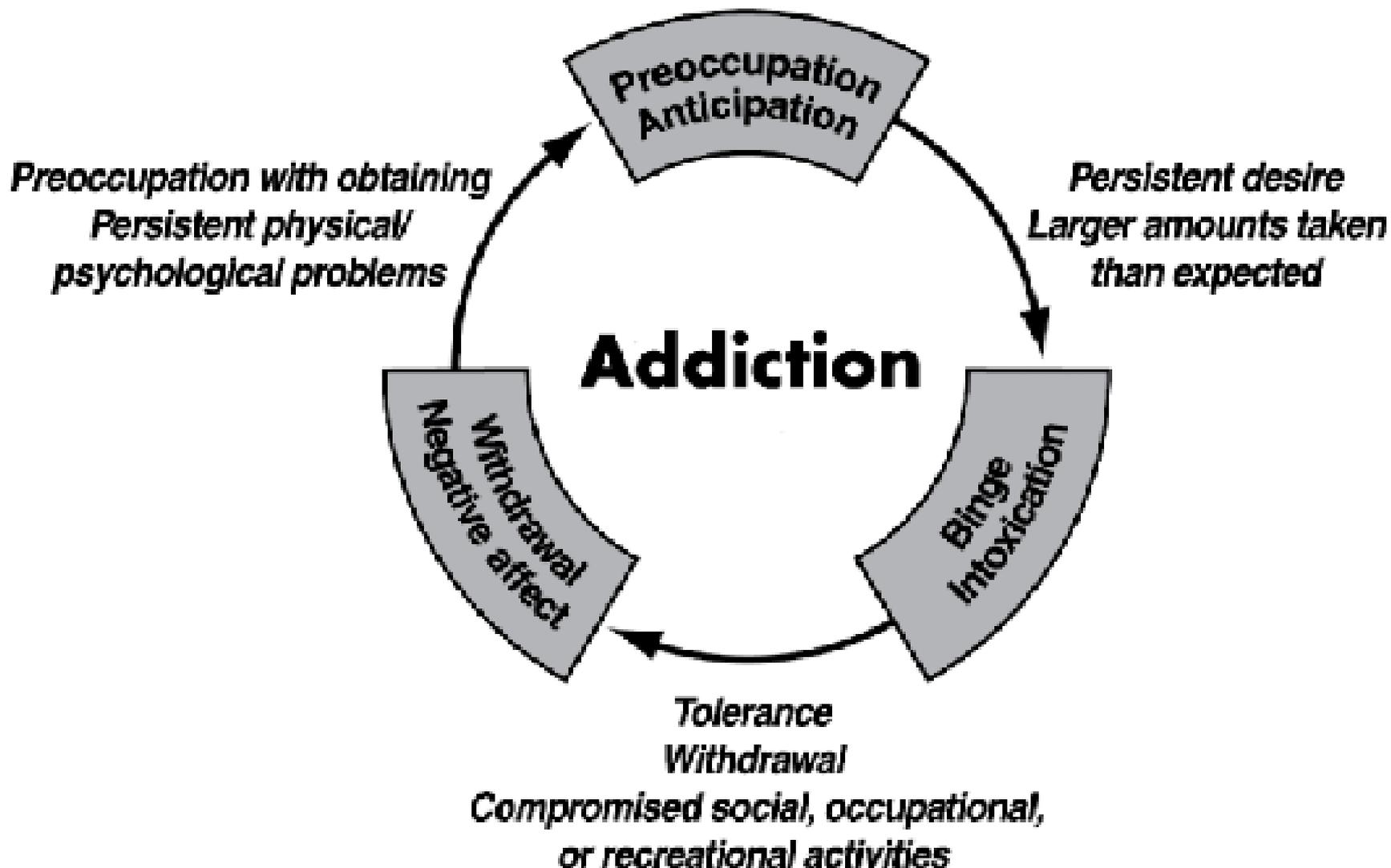
Compulsive disorders



Positive reinforcement



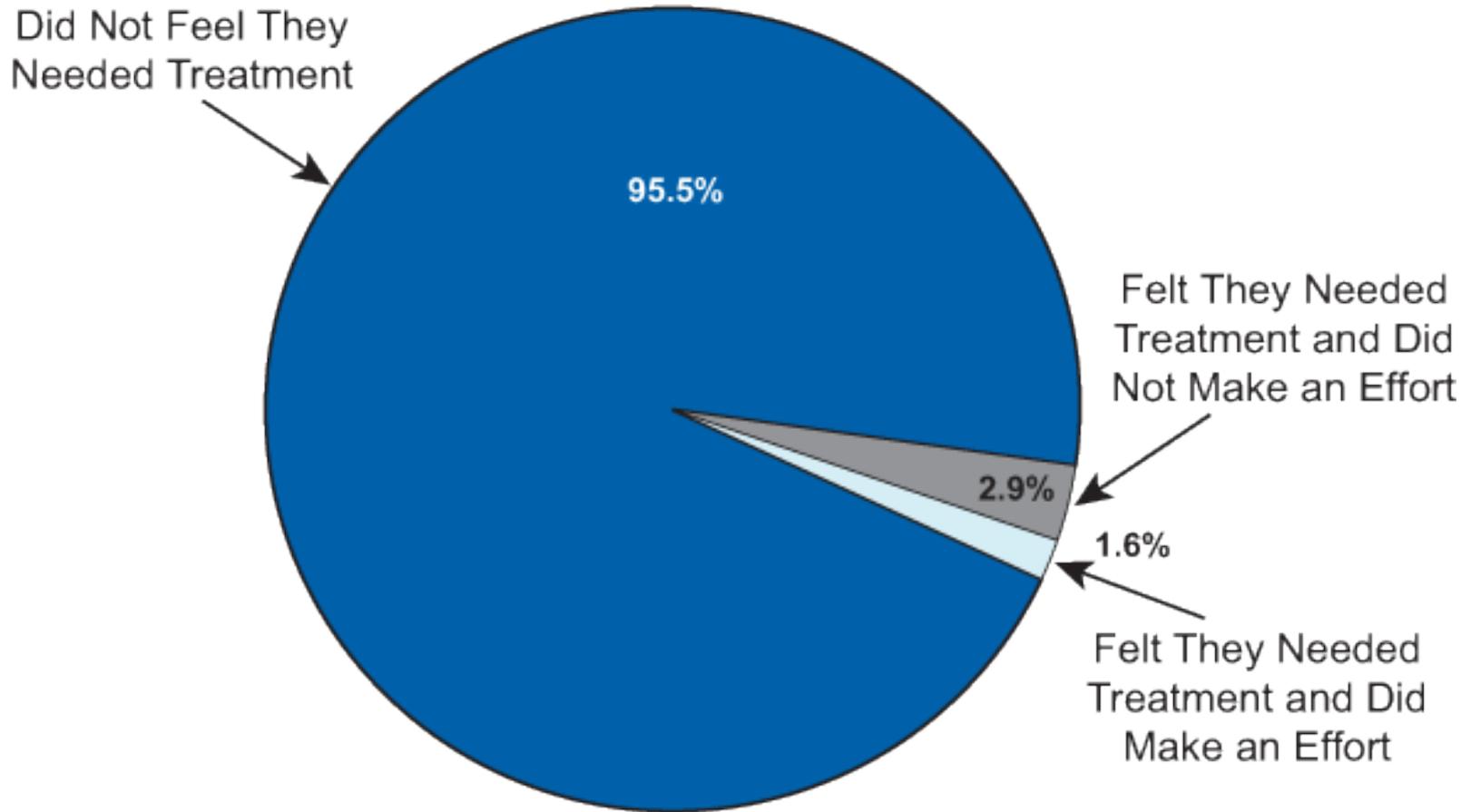
Negative reinforcement



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Treatment

- A patient needs to be treated according to their current state
- A patient does not have to be ready to quit in order to start treatment



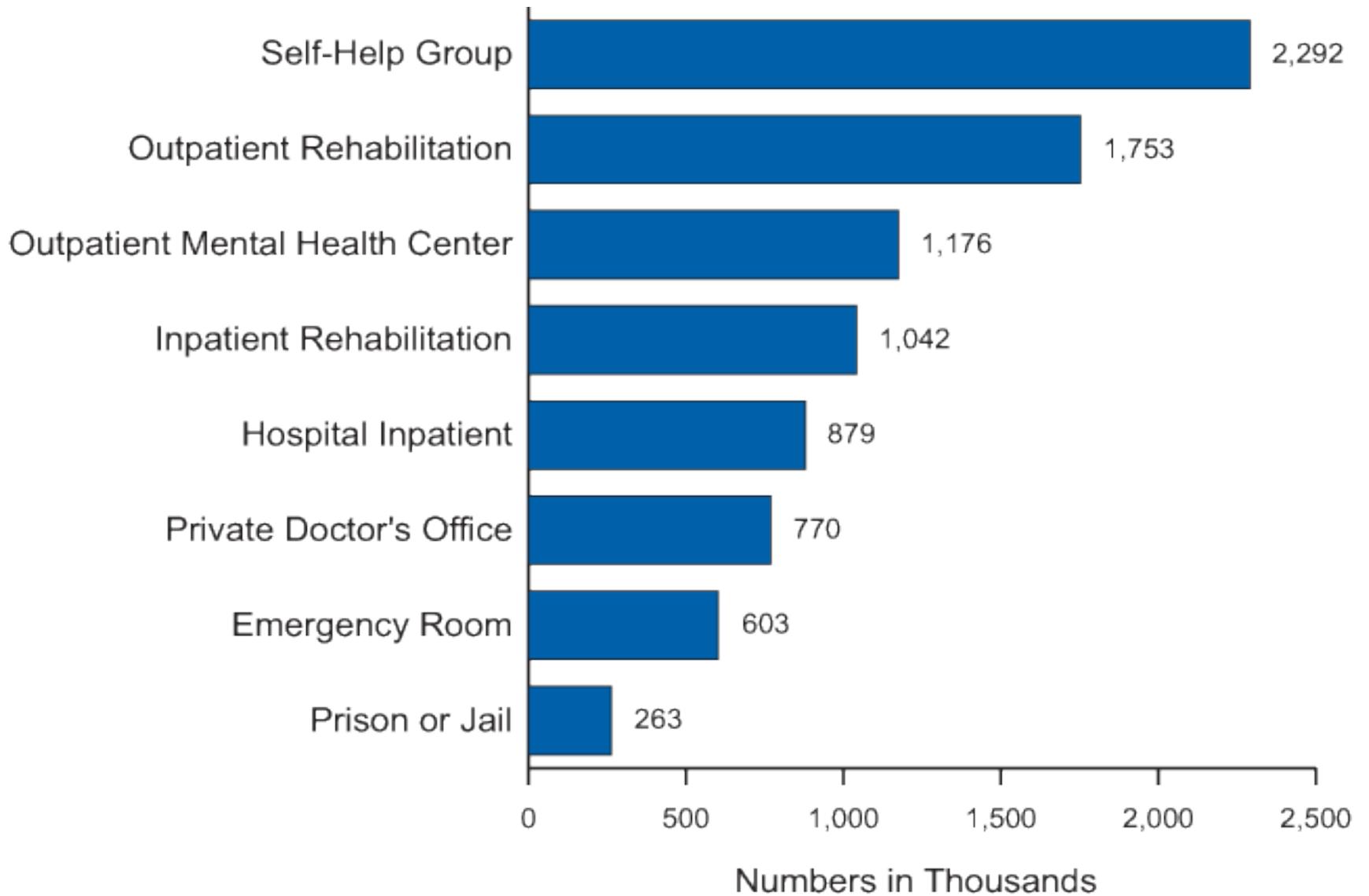
20.2 Million Needing But Not Receiving Treatment for Illicit Drug or Alcohol Use

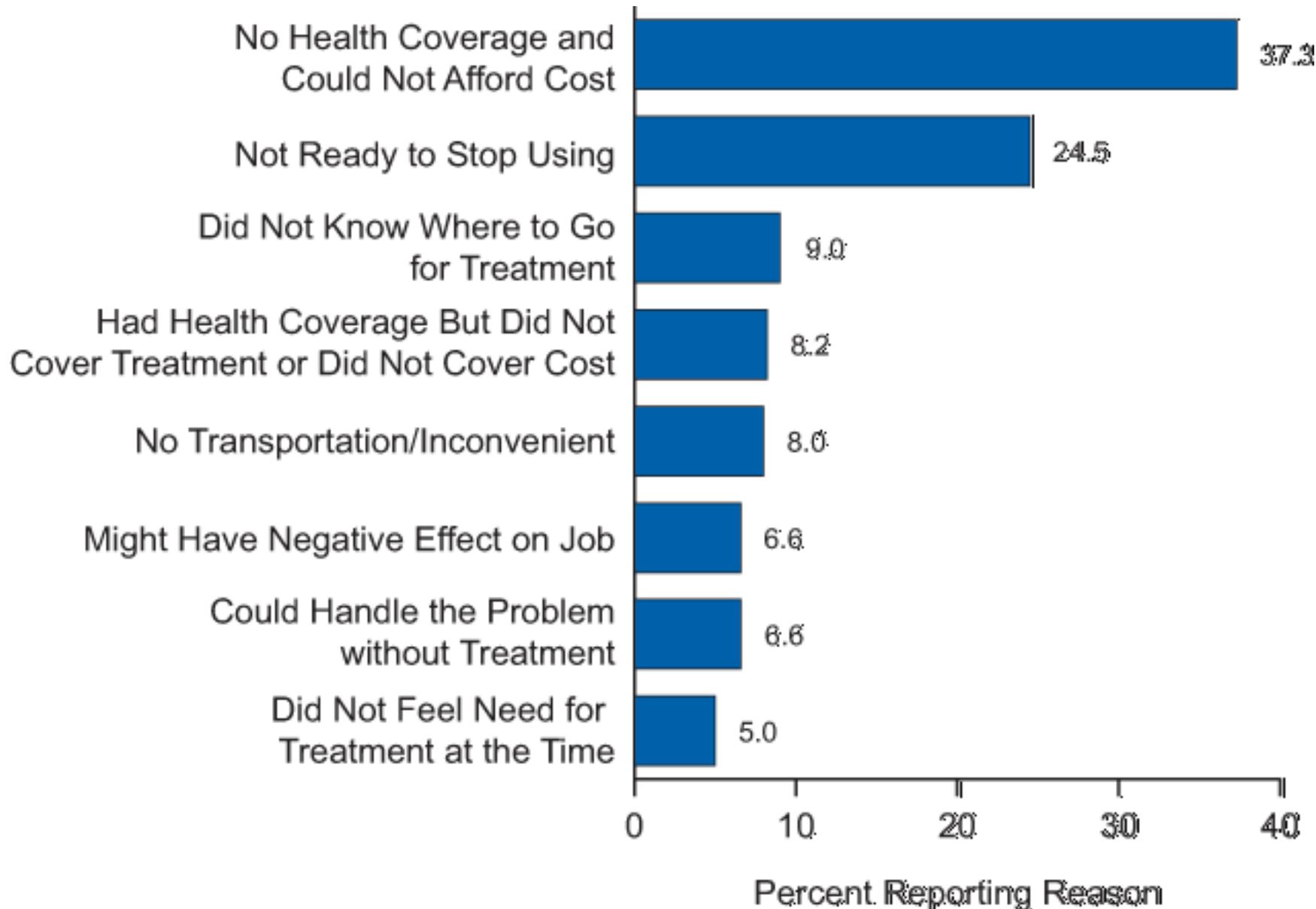
Treatment

- Interdisciplinary treatment is the best approach
- Modality needs to be paired to patient's style
- Treatment length is patient specific

Treatment

- Intoxication
- Detoxification and Withdrawal
- Early remission
- Sustained remission





Therapeutic modalities

- Brief interventions
- CBT
- MI
- MET
- AA, NA, GA, TSF, self help resources
- CRA
- Hypnosis, Acupuncture, Spiritual Based Group

Pharmacotherapeutic options

- Methadone, Suboxone, Vivitrol
- Disulfiram, Naltrexone, Acamprosate
- NRT, Wellbutrin, Chantix
- Topiramate, Gabapentin, Baclofen, Zofran
- Narcan rescue kits

Co morbid conditions

- You have to treat the underlying condition

Examples:

- Dual diagnosis
- Cognitive distortions
- Chronic pain
- OSA
- Sexual dysfunction

Summary

- Basic reward pathway
- Maladaptive Nature of Disease
- Changes involved in Addiction progression
- Recognition addiction emanates from diseased neuronal tissue
- Treatment needs to be patient specific