

**Substance Use Disorders:
brains, behavior, and
diagnosis**

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1

Disclosures

Speaker: Jessica Gregg has nothing to disclose

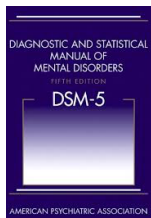
2

Objectives

1. Understand the diagnostic criteria for substance use disorders
2. Review (some of) the neurobiology of addiction

3

3



DSM 5

Diagnostic and Statistical Manual
of Mental Disorders

11 criteria

Craving/Compulsion/Consequences/Loss of
Control

4



DSM 5: Substance Use Disorder

- Taking in larger amounts or for longer than intended
- Unsuccessful efforts to cut down
- Spending a lot of time obtaining the substance
- Craving or a strong desire to use the substance

5



DSM 5: Substance Use Disorder

- Continued use despite recurring social or interpersonal problems due to use
- Important activities given up or reduced
- Recurrent use in physically hazardous situations
- Persistent / Recurrent physical or psychological difficulties from use
- Recurrent use resulting in a failure to fulfill major role obligations

6



DSM 5: Substance Use Disorder

- Tolerance*
- Withdrawal*

7

Substance Use Disorder

2—3	4—5	6+
mild disorder	moderate disorder	severe disorder

8

The diagram consists of two large circles. The left circle is dark grey and contains the text "Substance Use Disorder". Below it is the word "Diagnosis". The right circle is red and contains the text "Addict". Below it is the text "Label/Accusation". At the bottom of the diagram, it says "The words we use to describe our patients affects the care they get". In the bottom left corner, there is a small text credit: "Kelly JF Int J Drug Policy 2010".

9

The infographic is titled "Recovery Dialects" with the subtitle "The words we use matter." It is divided into two columns: "Positive" and "Negative".

Positive	Negative
Person who uses substances	Substance Abuser
Recurrence of Use	Relapse
Pharmacotherapy	Medication-Assisted Treatment
Accidental Drug Poisoning	Overdose
Person with a Substance Use Disorder	Addict
	Alcoholic
	Opioid Addict

While some negative language is okay to use in mutual aid meetings, its use should be avoided in public, when advocating and in journalism.

SOURCE: Ashford, R. D., Brown, A. M., & Curtis, B. (2018). Substance use, recovery, and linguistics: The impact of word choice on explicit and implicit bias. *Drug and Alcohol Dependence*, 189, 131–138.

10

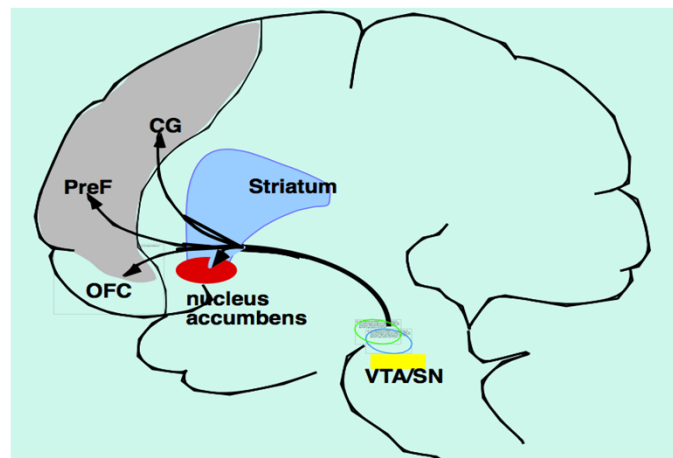
Objectives

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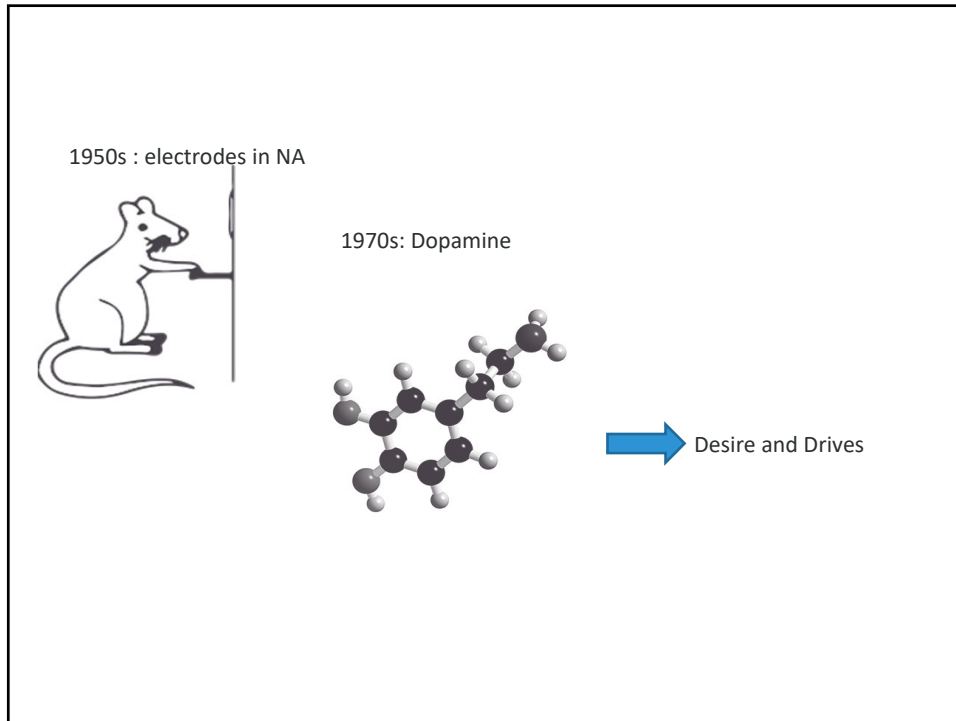
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11

Mesolimbic Dopamine System



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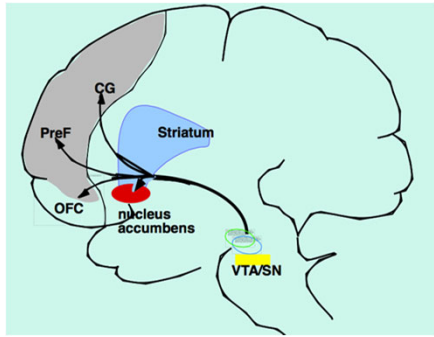
The use of dopamine neurons to shape responses to rewards is seen in simple organisms like worms and flies.

It evolved millions of years ago.

Dopaminergic impulses tell organisms to move toward reward (warmth, food, moisture)

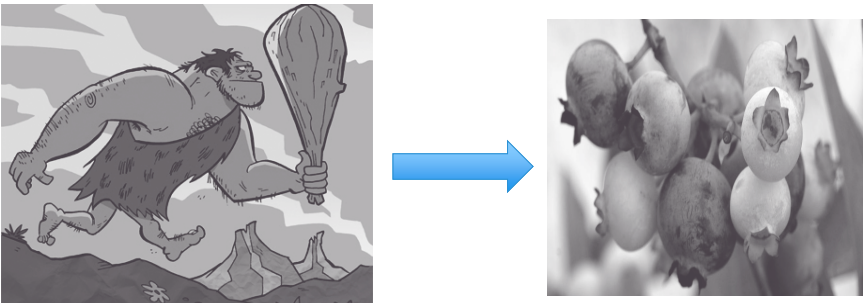
A black and white photograph of several earthworms in soil is positioned on the left side of the slide. To the right of the photograph, there are three paragraphs of text explaining the role of dopamine in simple organisms.

14



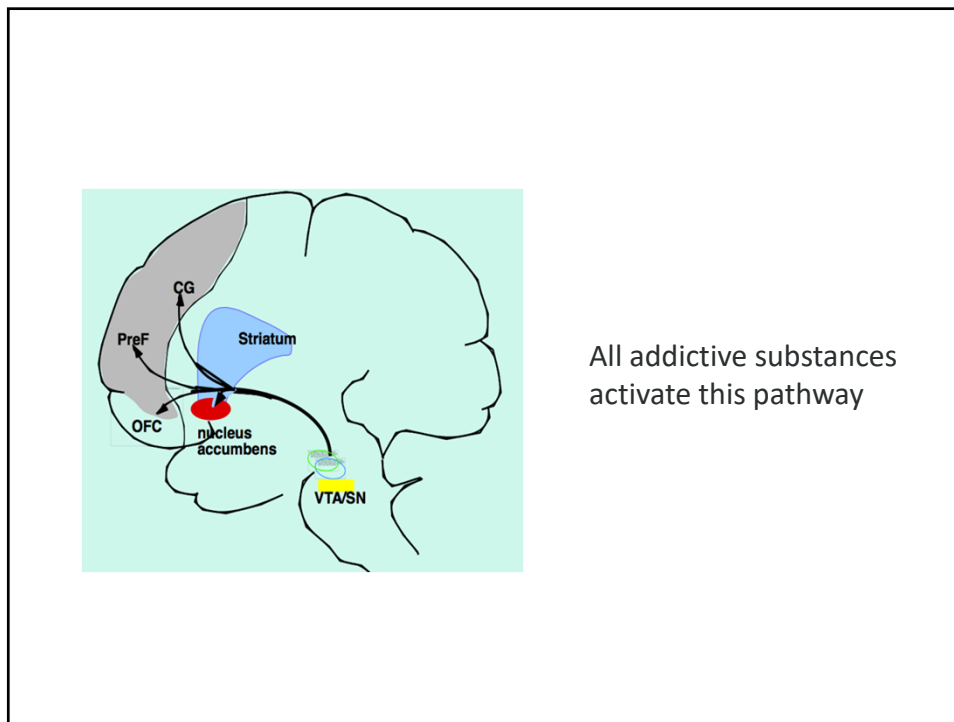
- In humans, those dopaminergic impulses travel through the NAC
- Mediate responses to food, sex, social interactions
- DA projections from VTA to NA release DA and tell the NA to go for it!
- Connects with memory and emotional centers

15



1. Hungry cavewoman eats berry. It is sweet and pleasurable and she doesn't starve.
2. Brain pays close attention so she can repeat the action
3. Sees the berry bush again, remembers the berry, craves the berry, eats it.
4. Lives

16

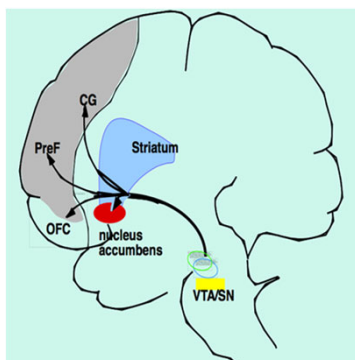


17

- Over time, people, places, things associated with drug use can activate the pathway and trigger cravings
- Even when images associated with drug use are shown too rapidly to be “seen” they still trigger cravings
- Repeated activation of this pathway triggers further changes that “hard wire” habits

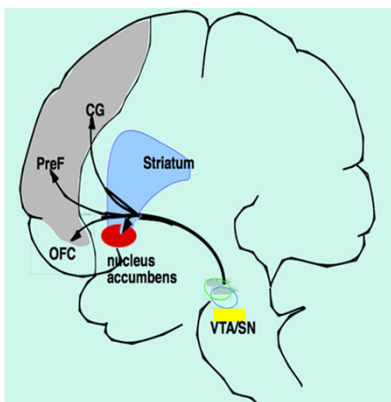
18

Dysregulation



- Repeated activation of the pathway also leads to dysregulation: impaired ability of the front of the brain to regulate what is going on in the older regions of the brain.
- Prefrontal cortex helps determine the risks and benefits of behaviors and make rational choices.

19



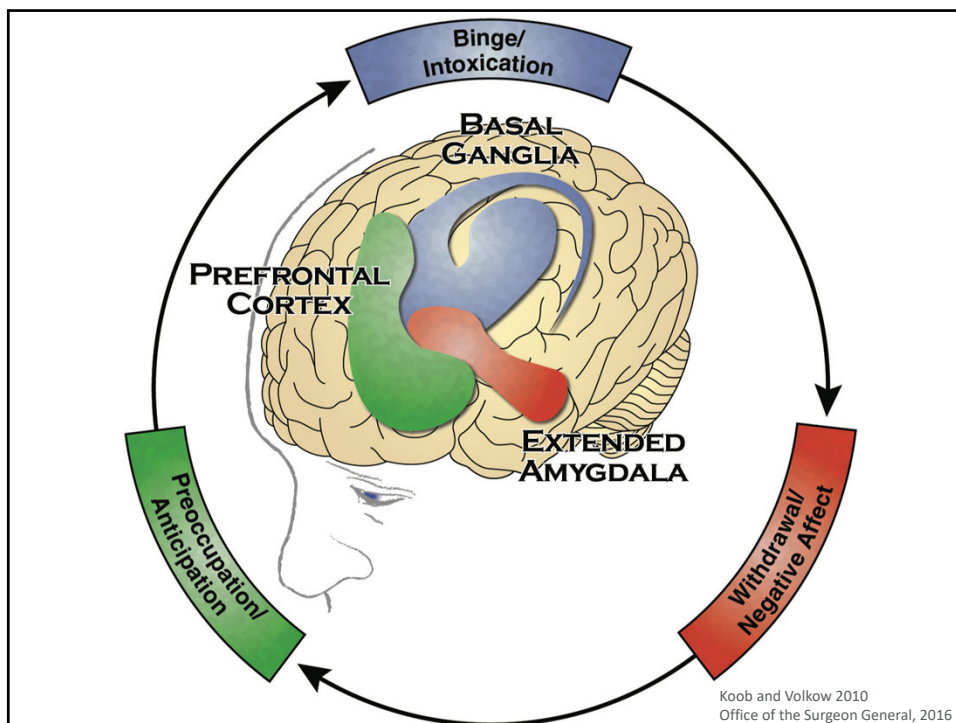
- Prefrontal cortex is newer and more complicated. It needs a little time to weigh in.
- Repeated activation of the VTA to NAC track slowly strengthens those connections. Habits get hard wired, fast and automatic. Prefrontal cortex can't keep up.

20



Like stepping on brakes of car barreling down a hill only to discover that brakes have been disconnected.

21



22

Withdrawal/Negative Affect:

1. Fewer dopamine receptors →
 - a. Less sensitivity in reward system to addictive substances → tolerance
 - b. Less sensitivity in reward system to natural reinforcers → feel generally lousy
2. Release of hormones like NE, CRF, and dynorphin → withdrawal

23

Preoccupation/Anticipation

Downregulated dopamine receptors + increased NE, CRF, dynorphin + increased glutamate →

changes in frontal cortex →

Increase craving and decreased ability to regulate impulses →

both impulsive and compulsive substance seeking

24



- Medications to decrease craving and attenuate withdrawal symptoms
- Behavioral interventions that entrain different habits
- Little pleasures like family, friends, jobs well done, tasks accomplished, regulates DA levels and allows reinforcement of positive behaviors, different habits

25

This ECHO clinic

- Discuss medications that help with craving and withdrawal and help people pause and engage in activities that provide meaning
- Discuss importance of Peers for connection
- Learn about evidence-based behavioral interventions
- Discuss harm reduction as a life-saving intervention and treatment

26



Thank You