CONCEPT: DRUG EFFECTS ON THE BODY

The Pleasure and Reward Circuit

◆ Evolution has developed the brain to prioritize and _____ actions that lead to rewards (pleasure/satisfaction).

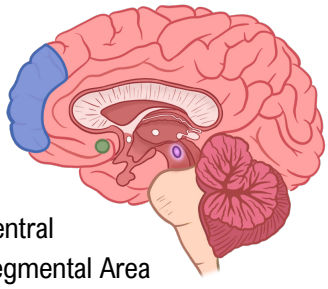
- The pleasure and reward circuit of the brain reinforces behaviors associated with rewards.

◆ This reinforcement process has ___ main phases.

- Dopamine Release ➡ Reward ➡ Habit Formation

1 Dopamine Release

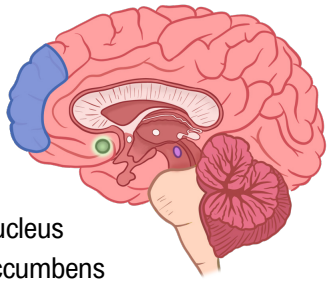
Neurons in the VTA produce and release _____.



Ventral Tegmental Area

2 Reward

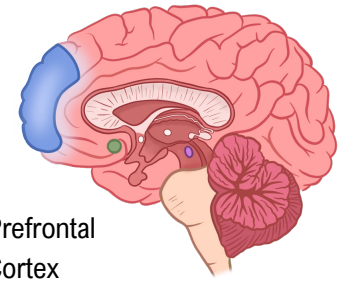
NAc creates _____ of pleasure and satisfaction.



Nucleus Accumbens

3 Habit Formation

Thinking, motivation, and _____ are affected.



Prefrontal Cortex

◆ Habit formation (reinforcement) acts as a foundation for _____.

EXAMPLE

Which of the following statements is true about the pleasure and reward circuit of the brain?

a) It is activated when a person eats food that contains dopamine.

b) Activates with a behavior or substance causing the neurons in the VTA to release dopamine.

c) Dopamine is released when a stressor affects a person and activates their stress response.

d) After the release of dopamine from VTA, NAc helps the brain memorize the action that led to the reward.

e) Neurons in the NAc release dopamine which leads to feelings of pleasure and satisfaction.

CONCEPT: DRUG EFFECTS ON THE BODY

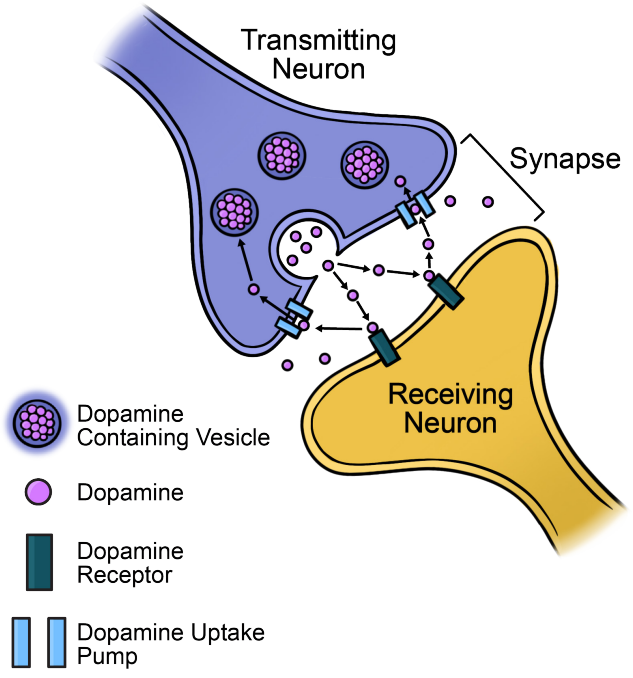
How Drugs Affect the Brain

◆ Neurotransmitters, such as dopamine, are chemical _____ – transmit signals between nerve cells (neurons).

- Generated signals impact emotions when they attach to their _____.
- Addictive substances _____ with the process of neurotransmission.

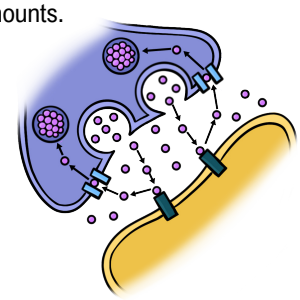
Dopamine Neurotransmission and the Effect of Drugs

Typical Dopamine Function



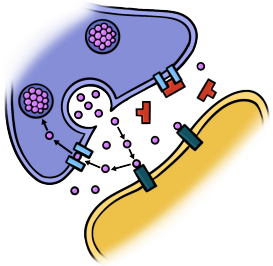
Increased Dopamine Release

- Methamphetamine causes the release of dopamine in _____ amounts.



Dopamine Reuptake Inhibition

- Cocaine _____ the reuptake of dopamine.



EXAMPLE

Which of the following is true about the effect of drugs on the brain?

a) An addictive drug increases the energy intake of the neurons causing them to become dependent on it.

b) Drugs interfere with neurotransmission by sending dopamine to the wrong receptor.

c) Drugs can produce feelings of pleasure by stimulating pituitary glands to release more dopamine.

d) Some drugs can interfere with pleasure and reward circuit by inhibiting dopamine uptake pumps.

CONCEPT: DRUG EFFECTS ON THE BODY

Factors Affecting Drug Action

◆ Dosage, physical factors, and the route of administration are the most important factors.

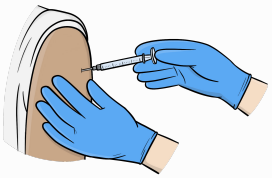
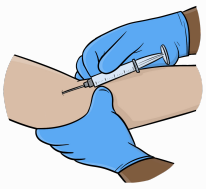
Factors Affecting Drug Action

1 Dosage: A drug can have _____ effects depending on how much of it is taken.

2 Physical Factors: Can affect how the body reacts to the drug.

Weight	Body Composition	Body Biochemistry
▸ ____ body weight = ____ effect.	▸ Affects drug concentration in blood. - e.g., ___ BAC in women.	▸ _____ of metabolism of a drug.

3 Route of Administration: Determines how _____ a drug acts.

Ingestion	Snorting	Intramuscular Injection	Intravenous Injection	Inhaling
				
~ 30 min	_____ min	3 – 5 min	15 – 30 sec	_____ sec

EXAMPLE

Ella has been prescribed cannabis by her doctor for chemotherapy-induced nausea and vomiting. What mode of administration will provide her the fastest relief after a treatment session?

a) Smoking dried cannabis flowers.

b) Eating a chewable cannabis candy.

c) Snorting powdered cannabis leaves.

d) Taking liquid cannabis extract with juice.

PRACTICE

Which of the following statements is incorrect?

a) Individuals with higher weight may require a larger drug dose than lower weight individuals.

b) Cocaine can inhibit the reuptake of dopamine causing it to stay longer in the synapse.

c) Inhaled nicotine vapors will give a higher concentration in the blood than chewable nicotine products.

d) Addictive substances act on the pleasure and reward circuit of the brain causing dependence.