

# Prominent areas and structures in the brain associated with addiction

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## Background

When a person becomes addicted to a substance, the brain begins to change. Many studies found that the brains of those addicted to a substance are different than those who are not, especially in areas correlated with self-control.

## Research Question

What are the prominent area and structures in the brain associated with addiction?

## Methods

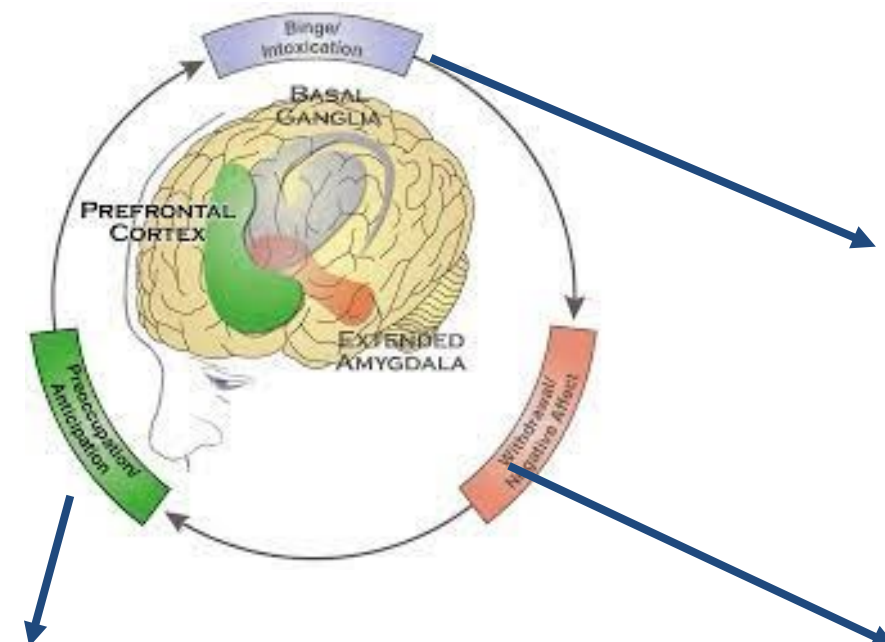
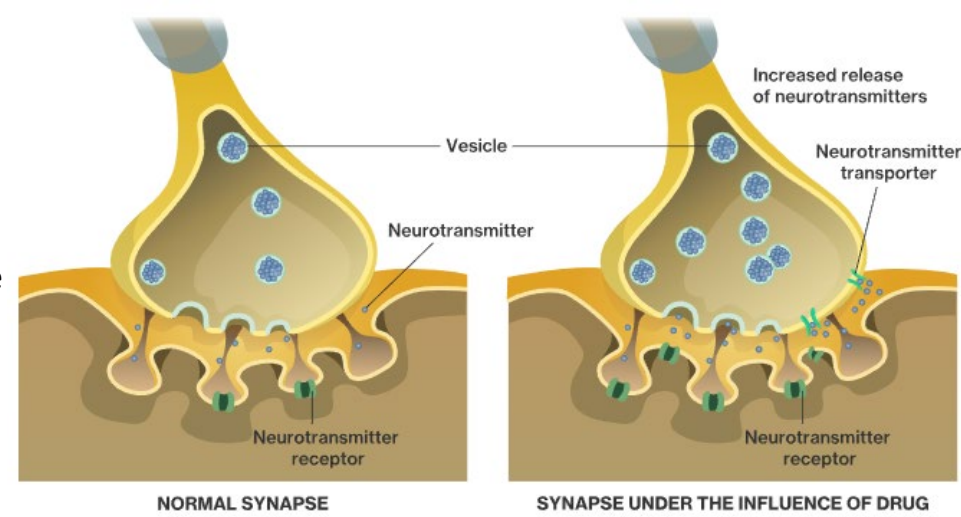
I started with researching general brain structures behind addiction. I then moved on to more specific topics based on what I found.

## References



## Findings

Drugs interfere with the way neurons send, receive and process signals. Some drugs can activate these neurons due to the fact that they have chemical structures that mimic neurotransmitters, allowing them to attach and activate the neurons. Certain drugs can bind to specific receptors that exits the neuron, so that it fires more action potential causing an additional release of neurotransmitters.



**Basal Ganglia-**  
Function- Plays an important role in positive forms of motivation (dopamine) and are involved in the creation of habits and routines. It also is apart of the brain's "reward circuit".

In relation to addiction- Drugs over-activate, producing the euphoria of a drug high. This produces a pleasurable surge of dopamine. The repeated exposure causes the reward circuit to become desensitized its sensitivity to the drug, making it hard to feel pleasure from anything but the drug.

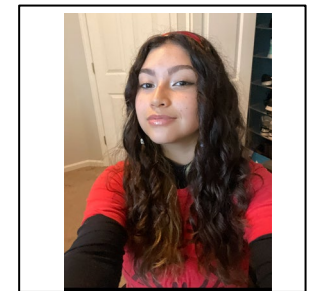
**Extended Amygdala-**  
Function- Plays a role in stressful feelings such as anxiety, irritability, and unease. These are characterized symptoms of withdrawal after the drug high fades.

In relation to addiction- The reward circuit becomes sensitive with increased drug use causing the user to feel more anxiety, irritability, and unease. This motivates the user to seek out the drug again and eventually use the drug to get temporary relief from the discomfort rather than the high.

**Prefrontal Cortex-**  
Function- Plays a role in the ability to think, plan, solve problems, and make decisions, and exert self control over impulses. This is also the last portion of the brain to develop, making teens more vulnerable.

In relation to addiction- The shifting balance between this part of the reward circuits and the circuits of the basal ganglia and amygdala make a person seek the drug compulsively with reduced impulse control.

## Reflections



- West Ashley High School
- 11th Grade
- During one of the meetings, we had activity where we played family feud. We got to work together and have friendly competition while also learning about college.
- Asking your mentors and learning from them will be your best friend. They will help guide you and are experts in the topic.

## Mentorship

- Brittney Browning
- Anna Sofia Crews
- My favorite advice from my mentor was about the path she took and the steps leading her to where she is now.

## Acknowledgements

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