

# UNDERSTANDING THE NEUROBIOLOGY OF AUD

To understand alcohol use disorder (AUD),  
we must look to the brain.

AUD is a chronic, relapsing brain-based treatable medical condition shaped by a variety of factors that are<sup>1,2</sup>:

BIOLOGICAL

PSYCHOLOGICAL

SOCIAL

Yet AUD is often misunderstood as<sup>3</sup>:

- Not serious enough to require treatment
- A problem that will resolve over time

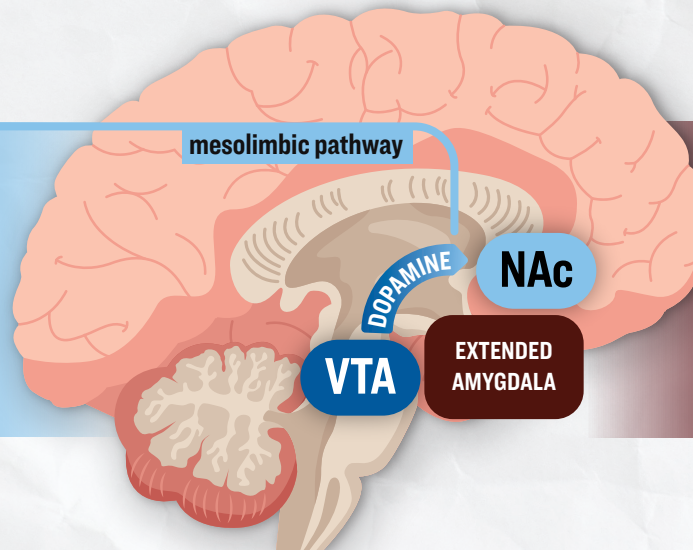
These perceptions do not reflect the underlying neurobiology of AUD.



AUD is often seen as a personal failing. Bringing neurobiology into your conversations with patients gives you a way to reframe AUD—*not as a moral failure but as a disorder of brain circuitry.*<sup>4</sup>

Reward and relief are early drivers of the processes that can lead to AUD.<sup>5-7</sup>

↑ Alcohol increases dopamine release in the mesolimbic pathway, producing a reward-associated signal that reinforces drinking.



↓ Alcohol can temporarily relieve distress by modifying GABA and glutamate signaling, dampening activity in stress-related regions such as the extended amygdala.

GABA=gamma-aminobutyric acid.  
NAc=nucleus accumbens.  
VTA=ventral tegmental area.

# Repeated alcohol use disrupts more signaling molecules than just dopamine, a common misconception<sup>2,8-10</sup>



SIGNALING MOLECULE

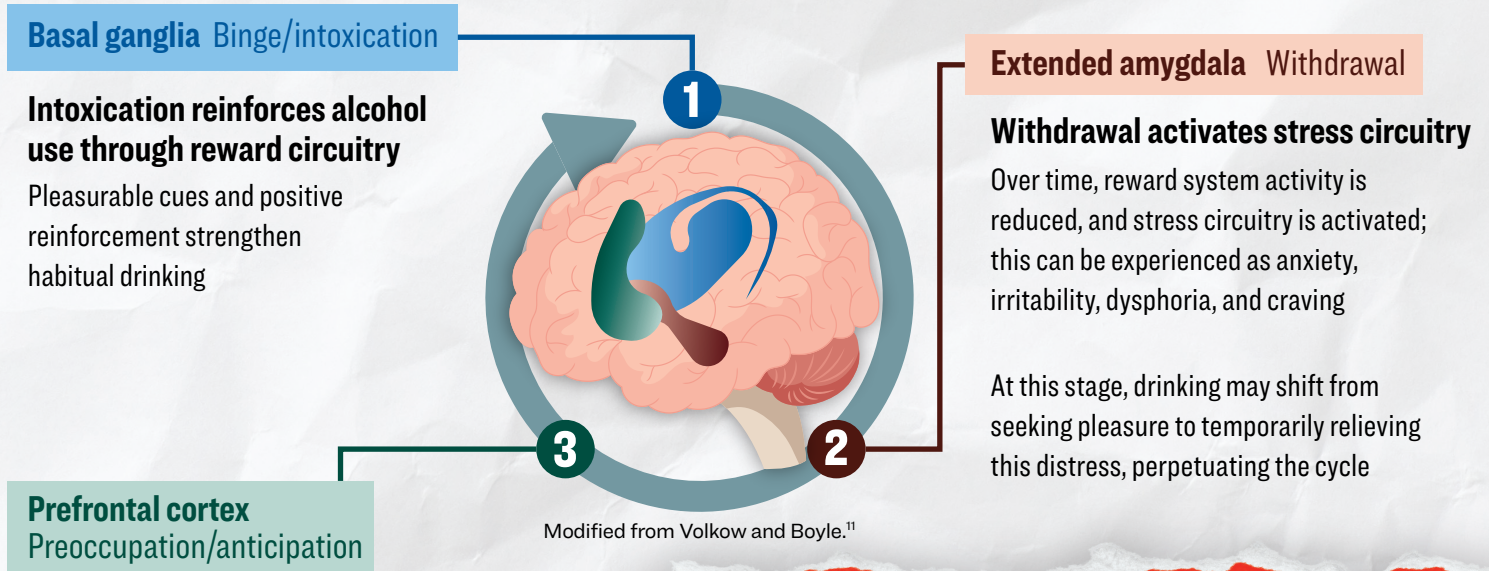
NEUROBIOLOGICAL PROCESSES AFFECTED

Serotonin	Dopamine	GABA	Glutamate	Acetylcholine	Endogenous opioid peptides
Mood regulation	Motivation and reward	Tolerance, dependence, and withdrawal	Tolerance and withdrawal	Motivation and reward (indirect)	Motivation and reward (indirect)

Chronic alcohol use alters neuronal networks *that regulate reward, motivation, decision-making, and emotion processing.*<sup>11</sup>

**AUD progressively changes the brain in ways that make alcohol use increasingly harder to control.**<sup>12</sup>

AUD can be understood as a 3-stage cycle<sup>1,6,11</sup>:



**AUD changes the brain in ways that perpetuate alcohol use and *increase susceptibility to relapse despite negative consequences.***<sup>1</sup>



**The neurobiology of AUD demonstrates that  
*it is not a moral failing,  
but a brain-based disorder.***

Consider being the change catalyst for your patients. Approach alcohol use conversations with empathy and help them see the whole picture.

**Find more resources on AUD at the  
LILLY MEDICAL WEBSITE**



## References

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