

# Introduction to Anxiety Disorders

Anxiety is the most common mental disorder in the United States, affecting 19.1% or 40 million adults over the age of 18 (Anxiety & Depression Association of America [ADAA], 2022). Anxiety occurs when the amygdala senses trouble. This “trouble” appears as a real or imagined threat, activating neurotransmitters, flooding the body with stress hormones, and activating the fight-or-flight response.

While a state of arousal is normal in the presence of a perceived threat, when symptoms of anxiety persist in the absence of threatening stimuli or become overwhelming to the point of impacting an individual's daily functioning, an anxiety disorder may develop.

## Classification Guide

Which publication is the authoritative guide to the classification of mental health disorders?

- Prescriber's Digital Reference (PDR)
- Diagnostic and Statistical Manual for Mental Health (DSM-5-TR)
- International Classification of Diseases (ICD-10)
- Nursing Diagnosis Handbook (NDH)

The Diagnostic and Statistical Manual for Mental Health (DSM-5-TR) is the authoritative publication on mental health disorders (American Psychiatric Association [APA], 2022). This manual outlines the criteria that must be present for each mental health disorder to be diagnosed.

The PDR is a manual that provides information on medications. The ICD-10 is a series of codes for classifying conditions and billing insurance. The Nursing Diagnosis Handbook contains diagnoses not specific to mental health issues.

## Fight-or-Flight Response

Which excitatory neurotransmitter activates the fight-or-flight response in a client experiencing anxiety?

- Adrenaline
- Corticotropin-releasing hormone
- Cortisol
- Glutamate

Adrenaline is a neurotransmitter involved in the fight-or-flight response. Stress triggers adrenaline release, which leads to clinical manifestations associated with anxiety.

Corticotropin-releasing hormone release contributes to anxiety but not fight or flight response. Cortisol is a stress hormone, and glutamate is released during exercise, excitement, and sex, producing euphoric effects.

Complete the following sentence by choosing from the list of options.

**Gamma-aminobutyric acid** is the major inhibitory neurotransmitter that helps regulate **dopamine** levels.

Gamma-aminobutyric acid (GABA) is the major inhibitory neurotransmitter in the brain that helps regulate dopamine levels (not cortisol or glutamate). Alterations can lead to stress and anxiety.

Adrenaline and acetylcholine are excitatory neurotransmitters, not inhibitory.

# NEUROTRANSMITTERS

<b>ADRENALINE</b> fight or flight produced in stressful situations. Increases heart rate and blood flow, leading to physical boost and heightened awareness.	<b>GABA</b> calming Calms firing nerves in the central nervous system. High levels improve focus, low levels cause anxiety. Also contributes to motor control and vision.
<b>NORADRENALINE</b> concentration affects attention and responding actions in the brain. Contracts blood vessels, increasing blood flow.	<b>ACETYLCHOLINE</b> learning Involved in thought, learning and memory. Activates muscle action in the body. Also associated with attention and awakening.
<b>DOPAMINE</b> pleasure feelings of pleasure, also addiction, movement and motivation. People repeat behaviors that lead to dopamine release.	<b>GLUTAMATE</b> memory Most common neurotransmitter. Involved in learning and memory, regulates development and creation of nerve contacts.
<b>SEROTONIN</b> mood contributes to well-being and happiness. Helps sleep cycle and digestive system regulation. Affected by exercise and light exposure.	<b>ENDORPHINS</b> euphoria Released during exercise, excitement and sex, producing well-being and euphoria, reducing pain

## Neurotransmitters

**Adrenaline** - fight or flight - produced in stressful situations. Increases heart rate and blood flow, leading to physical boost and heightened awareness.

**Noradrenaline** - concentration - affects attention and responding actions in the brain. Contracts blood vessels, increasing blood flow.

**Dopamine** - pleasure - feelings of pleasure, also addiction, movement and motivation. People repeat behaviors that lead to dopamine release.

**Serotonin** - mood - contributes to well-being and happiness. Helps sleep cycle and digestive system regulation. Affected by exercise and light exposure.

**Gaba** - calming - calms firing nerves in the central nervous system. High levels improve focus, low levels cause anxiety. Also contributes to motor control and vision.

**Acetylcholine** - learning - involved in thought, learning and memory. Activates muscle action in the body. Also associated with attention and awakening.

**Glutamate** - memory - most common neurotransmitter. Involved in learning and memory, regulates development and creation of nerve contacts.

**Endorphins** - euphoria - released during exercise, excitement and sex, producing well-being and euphoria, reducing pain.

## Pathophysiology of Anxiety Disorders

Clients with anxiety disorders, compared to those without anxiety disorders, display significantly decreased spontaneous brain activities in the right putamen, the right orbital inferior frontal gyrus, and the right temporal pole (Wang et al., 2022). These areas in the brain are associated with emotional processing. Activation of the limbic system also occurs in response to stress, which can lead to anxiety (when the amygdala triggers the fight-or-flight response).

Anxiety disorders have many causes, including neurohormonal imbalances, post-traumatic stress syndrome (PTSD), or head injuries.

Neurohormonal imbalances include the following:

- **Norepinephrine (noradrenaline):** This neurotransmitter is involved in the fight-or-flight response. Stressors trigger an increase in norepinephrine, which leads to the physical manifestations associated with anxiety, including tachycardia, increased blood pressure, tremors, and diaphoresis.
- **Serotonin (5-HT):** This neurotransmitter modulates several anxiety-related factors, including releasing norepinephrine and corticotropin-releasing hormones.
- **Corticotropin-releasing hormone:** Through the mechanism of the hypothalamic-pituitary-adrenal axis, this hormone is released, contributing to anxiety.

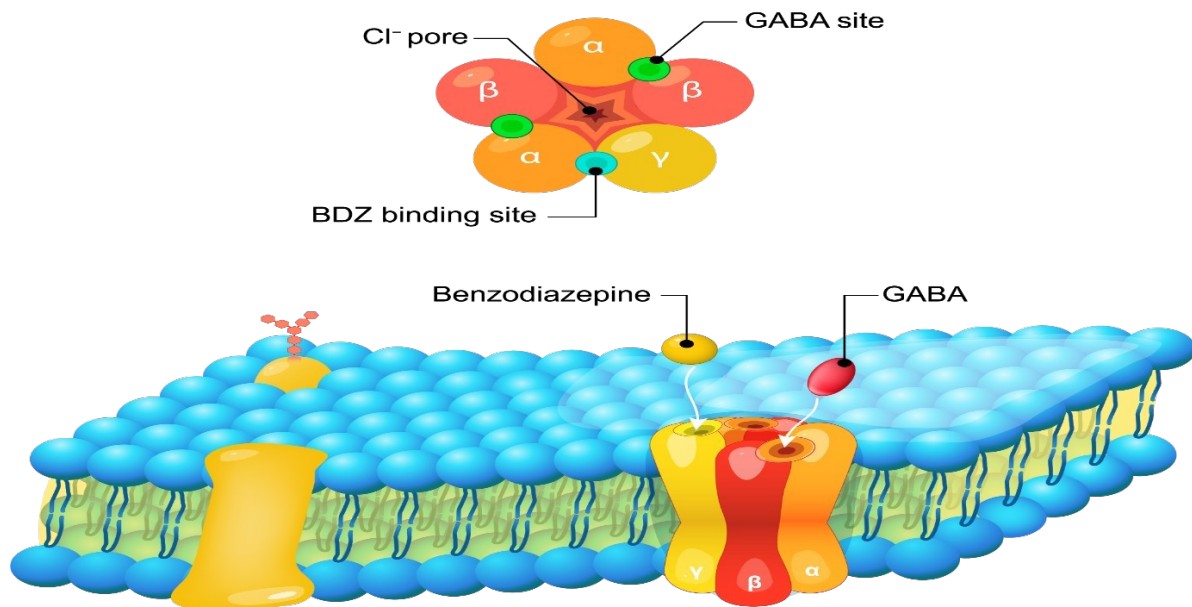
## Normal Physiology of Gamma-Aminobutyric Acid

**Gamma-aminobutyric acid (GABA)** is the major inhibitory neurotransmitter that regulates serotonin, norepinephrine, and dopamine levels. GABA receptors located in the neural synapses of the central nervous system (CNS) play a key role in neuronal firing (e.g., seizure disorders), regulating emotion, and controlling cognition, pain, sleep, and motor function. GABA decreases neuroexcitability across the brain. When triggers increase the utilization of GABA, GABA levels decrease, causing anxiolysis and anxiety. The role of GABA has long been regarded as central to the regulation of anxiety, and this neurotransmitter is the target of benzodiazepines used to treat anxiety disorders.

When alterations affect GABA, serotonin also acts as an inhibitory neurotransmitter (found in the raphe nuclei). Alterations in serotonin will affect the serotonin-reuptake transporter and the post-synaptic serotonin receptors. This alteration results in the client experiencing an increased sensitivity to stress, leading to anxiety.

Reductions of glutamate activity in the hippocampus can also contribute to increased stress and anxiety. Glutamate regulation is important for memory, cognition, and mood regulation.

## GABA<sub>A</sub> receptor



## Role of Gamma-Aminobutyric Acid

Complete the following sentence by choosing from the list of options.

The role of gamma-aminobutyric acid (GABA) is regarded as central to the regulation of , and this neurotransmitter is the target of  medication therapy used to treat anxiety disorders.

The role of gamma-aminobutyric acid (GABA) is central to the regulation of anxiety (not bipolar or depression), and this neurotransmitter is the target of benzodiazepine (not antidepressant or mood stabilizer) medication therapy used to treat anxiety disorders.

Drugs that modulate GABA receptors include benzodiazepines, barbiturates, neuroactive steroids, intravenous and inhalational anesthetics, and ethanol.

## Types of Anxiety Disorders

There are various types of anxiety disorders, including the following: