

# Critical thinking on neurotransmitters

[Education](#), [Learning](#)



Fill in the following boxes by identifying and describing the location of the 6 neurotransmitters outlined in the textbook. Describe the effect and function of the neurotransmitter and then discuss possible mental health or behavioral or physical issues that can be associated with too much or too little of the neurotransmitter. Save this document and type directly onto the document. The boxes will expand to accommodate what you write. Submit as an attachment to the appropriate drop box.

## **Identify the Neurotransmitter**

Location of Neurotransmitter

Effect of Neurotransmitter

Function of Neurotransmitter

Possible mental health, emotional, behavioral, or physical issues resulting from too much or too little of the neurotransmitter

Acetylcholine (ACH)

Spinal chord, brain, and peripheral nervous system specifically in organs innervated by the parasympathetic nervous system

It produces excitation in central and autonomic nervous systems. In the rest of the body, its effects are inhibitory.

It stimulates skeletal muscle initiating a cascade of events that results in their contraction. It, however, inhibits the contraction of cardiac muscles. It acts as a neurotransmitter in the autonomic nervous system. In the CNS, it plays a crucial role in cognitive functioning such as learning and memory.

Deficiency of this neurotransmitter in the brain is known to cause Alzheimer's disease, a senile condition characterized by memory loss.

Blockage of ACH receptor sites or of release of ACH from nerve endings results in paralysis. Auto destruction of ACH at neuromuscular junctions causes a condition known as myasthenia gravis.

## **Glutamate**

Brain and spinal chord

It produces excitation.

It also plays a crucial role in learning, memory, cognition, and brain metabolism.

Excess glutamate production is toxic to brain cells and is responsible for Lou Gehrig's disease.

Gamma-amino butyric acid (GABA)

Brain and spinal chord

It's the major inhibitory neurotransmitter in the body.

It mediates the following actions, eating, aggression, and sleeping.

People deficient in this neurotransmitter have chronic anxiety. Its deficiency in certain parts of the brain causes epilepsy, a convulsive disorder.

## **Dopamine (DA)**

Brain

Can elicit excitatory or inhibitory effects depending on the organ.

In the CNS, it plays important roles in voluntary movements, reward, attention, sleep, mood, motivation, cognition, and behavior.

Lack of dopamine is associated with lack of pleasure, loss of interest in life, reduced attention, and motivation. Dopamine deficiency in the motor region

of the brain causes parkinsonism, a condition characterized by uncontrolled muscle tremors. Excessive amounts of this neurotransmitter in the frontal lobes cause schizophrenia, a serious mental condition.

## **Serotonin**

Brain and spinal chord

Has inhibitory effects.

It mediates gut movements and sleep and contributes to feelings of happiness and well-being.

Lack of serotonin is associated with increased appetite for starchy foods, increased anxiety, obsessions, insomnia, compulsions, depression, suicidal ideations, irritable bowel syndrome, migraines, and fibromyalgia.

## **Endorphins**

Brain and spinal chord

It is an inhibitory neurotransmitter except in the hippocampus where it produces excitation.

They suppress pain and mediate pleasurable feelings and appetite.

Deficiency of this neurotransmitter causes increased sensitivity to pain and loss of pleasure.