

Why Test?

Neurotransmitter testing can provide pertinent information on neurotransmitter levels. The nervous system is a coordinator of all body functions; imbalances in the nervous system can alter endocrine (hormone) function.

What Parameters are Tested?

The Nutrition and Health Center uses the NeuroScreen Essential neurotransmitter test. This test includes screening the following parameters via a urine sample:

- **Epinephrine** - also known as adrenaline, is an excitatory neurotransmitter and hormone essential for lipolysis, which is a process in which the body metabolizes fat. As a neurotransmitter, epinephrine regulates attentiveness and mental focus. Fear or anger can cause heightened secretion of epinephrine which can result in increased heart rate and the hydrolysis of glycogen to glucose. This reaction, referred to as the "fight or flight" response, prepares the body for strenuous activity.
- **Norepinephrine** - is an excitatory neurotransmitter that is important for attention and focus. Norepinephrine is synthesized from dopamine by means of the enzyme dopamine beta-hydroxylase, with oxygen, copper, and vitamin C as co-factors. The noradrenergic system is most active when an individual is awake, which is important for focused attention. Elevated norepinephrine activity seems to be a contributor to anxiousness. Also, brain norepinephrine turnover is increased in conditions of stress.
- **Dopamine** - is an excitatory and inhibitory neurotransmitter, depending on the dopaminergic receptor it binds to. It is derived from the amino acid tyrosine. Dopamine is the precursor to norepinephrine and epinephrine, which are all catecholamines. The function of dopamine is diverse but plays a large role in the pleasure/reward pathway (addiction and thrills), memory, and motor control. Common symptoms with low dopamine levels are loss of motor control, addictions, cravings, compulsions, and loss of satisfaction. When dopamine levels are elevated symptoms may manifest in the form of anxiety or hyperactivity.
- **Serotonin** - is an inhibitory neurotransmitter synthesized by enzymes that act on tryptophan and/or 5-HTP. Serotonin is stored in presynaptic vesicles and released to transmit electrochemical signals across the synapse. Extensive research has been conducted surrounding serotonin and acts as a target for symptoms like low mood, compulsions, anxiousness, and headaches.
- **GABA** - is a true neurotransmitter and is the major inhibitory neurotransmitter of the brain, occurring in 30-40% of all synapses. GABA is second only to glutamate, the brain's major excitatory neurotransmitter. The GABA concentration in the brain is 200-1000 times greater than that of the monoamines or acetylcholine. The primary function of GABA is to prevent overstimulation.
- **Glutamate** - is the major excitatory neurotransmitter in the brain which is necessary for memory and learning. In fact, it is believed that 70% of the fast excitatory CNS synapses utilize glutamate as a transmitter. Excitatory neurotransmitters increase the activity of signal-receiving neurons and play a major role in controlling brain function. An event or process that dramatically increases the activity of glutamate often induces the death of neurons. Such a scenario is believed to take place in e.g. ischemia, trauma, hypoxia, hypoglycemia, and hepatic encephalopathy. More mild but chronic malfunctioning of glutamatergic systems may be involved in many neurodegenerative diseases such as Huntington's disease, Parkinson's disease, Alzheimer's disease, vascular dementia, amyotrophic lateral sclerosis, AIDS-neurodegeneration, Tourette's syndrome, and Korsakoff syndrome. It is unlikely that a disturbance of glutamate homeostasis is the sole initiator of these neurodegenerative diseases, but rather that excitotoxicity plays a pivotal executive role in events triggered by other processes such as energy deficits that facilitate the neurotoxic potential of endogenous glutamate.
- **Beta-phenylethylamine (PEA)** - is an excitatory neurotransmitter derived from the amino acid phenylalanine. Studies have found that PEA promotes energy and elevates mood. PEA also functions as a synaptic neuromodulator inhibiting the reuptake of dopamine and norepinephrine. Studies have discovered that patients with depression have decreased PEA levels while increased levels have been found in patients with psychopathic symptoms. It has also been implicated in headaches and the antidepressant effects of exercise.