# Nervous System: Facts, Function & Diseases

The nervous system is a complex collection of nerves and specialized cells known as neurons that transmit signals between different parts of the body. It is essentially the body's electrical wiring.

Structurally, the nervous system has two components: the central nervous system and the peripheral nervous system. According to the [National Institutes of Health](http://www.nlm.nih.gov/medlineplus/neurologicdiseases.html), the central nervous system is made up of [the brain](https://www.livescience.com/29365-human-brain.html), spinal cord and nerves. The peripheral nervous system consists of sensory neurons, ganglia (clusters of neurons) and nerves that connect to one another and to the central nervous system.

Functionally, the nervous system has two main subdivisions: the somatic, or voluntary, component; and the autonomic, or involuntary, component. The autonomic nervous system regulates certain body processes, such as blood pressure and the rate of breathing, that work without conscious effort, according to [Merck Manuals](http://www.merckmanuals.com/home/brain_spinal_cord_and_nerve_disorders/autonomic_nervous_system_disorders/overview_of_the_autonomic_nervous_system.html?qt=nervous%2520system&alt=sh). The somatic system consists of nerves that connect the brain and spinal cord with muscles and sensory receptors in the skin.

**Description of the nervous system**

Nerves are cylindrical bundles of fibers that start at the brain and central cord and branch out to every other part of the body, according to the University of Michigan Medical School.

[Neurons](https://www.livescience.com/18749-human-brain-cell-number.html) send signals to other cells through thin fibers called axons, which cause chemicals known as neurotransmitters to be released at junctions called synapses, the NIH noted. There are over 100 trillion neural connections in the average human brain, though the number and location can vary. For example, a new study published January 2018 in the journal Proceedings of the National Academy of Sciences found that out of the 160 participants studied, the brains of [highly creative people have more connections among three specific regions of the brain than less creative thinkers](https://www.livescience.com/61428-brain-connections-creativity.html).

"You have these three different systems that are all located in different parts of the brain, but they are all co-activated at once," said lead study author Roger Beaty, a postdoctoral fellow studying cognitive neuroscience at Harvard University. "People who are better able to co-activate them [came] up with more-creative responses."

A synapse gives a command to the cell and the entire communication process typically takes only a fraction of a millisecond. Signals travel along an alpha motor neuron in the spinal cord 268 mph (431 km/h); the fastest transmission in the human body, according to [Discover magazine](http://discovermagazine.com/2011/mar/10-numbers-the-nervous-system).

Sensory neurons react to physical stimuli such as light, sound and touch and send feedback to the central nervous system about the body's surrounding environment, according to the [American Psychological Association](http://www.apa.org/). Motor neurons, located in the central nervous system or in peripheral ganglia, transmit signals to activate the muscles or glands. [[Here's What You'd Look Like as Just a Nervous System](https://www.livescience.com/61599-dissected-nervous-system-photo.html)]

Glial cells, derived from the Greek word for "glue," are specialized cells that support, protect or nourish nerve cells, according to the [Oregon Institute of Health and Science University](http://www.ohsu.edu/blogs/brain/tag/neuroscience-2/).

The brain's connections and thinking ability grew over thousands of years of evolution. For example, a virus bound its genetic code to the genome of four-limbed animals, and the code can still be found in humans' brains today, according to two papers published in the January 2018 journal [Cell](http://www.cell.com/cell/fulltext/S0092-8674%2817%2931502-7). This code packages up genetic information and sends it from nerve cells to other nearby nerve cells, a very important process in the brain. [[An Ancient Virus May Be Responsible for Human Consciousness](https://www.livescience.com/61627-ancient-virus-brain.html)