

# Anatomy of The Spine

## The Brain and Spinal Cord

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The spinal cord connects the brain and brainstem with the body. The brain has an intricate network of between 10 billion and 100 billion nerve cells called neurons. Many of the neurons in the brain have a direct or indirect connection to the nerves of the spinal cord. Although most of the nerve cells never actually connect with one another they communicate electrochemically across small gaps between nerves referred to as synapses. **It is estimated that the brain may have as many as 20 quadrillion (20,000,000,000,000,000) of these nerve connections (synapses).** This network of biological communication is more advanced than the most sophisticated computer today.

The brain and spinal cord regulates every bodily function. The nervous system enables us to perceive with our senses, interact emotionally and physically with the world as well as understand, and imagine.

Messages travel along the nerves of the spinal cord and spinal nerves as electrical impulses. **They can travel at speeds of up to 240 miles per hour.** The central nervous system is connected to every part of the body through 43 pairs of nerves, 12 pairs of these nerves go to and from the brain with 31 pairs going from the spinal cord to each side of the body, both right and left. There are approximately 45 miles of nerves running through our bodies.

Humans are born with all or most of the nerve cells that they will ever possess. Unlike most other cells within the body, a nerve cell typically does not replicate although, outside the brain and spinal cord there is a greater capacity for repair.

The spinal cord conveys nerve impulses from the brain to other parts of the body. It also serves to relay messages from the body back to the brain.