

Nervous system

The nervous system helps all the parts of the body to communicate with each other. It also reacts to changes both outside and inside the body. The nervous system uses both electrical and chemical means to send and receive messages.

Neurones are the building blocks

The basic building block of the nervous system is a nerve cell, or neurone. Neurones are shaped differently depending on where they are in the body and what role they play. All neurones have finger-like projections called dendrites and a long fibre called an axon.

In many cases, the axon is coated by a specialised membrane called a myelin sheath. The axon feathers out and has a number of bumps on it. Each bump sits near to a dendrite from another neurone. The space between the bump and the dendrite is called a synapse. Messages jump the synapse from one neurone to the next, using special chemicals called neurotransmitters.

Unlike other cells in the body, neurones aren't easily replaced if they die or are damaged by infection or injury.

Central nervous system

The brain and the spinal cord make up the central nervous system. They are wrapped in a thin lining called meninges and bathed with cerebrospinal fluid (CSF).

The brain

The brain is the powerhouse of the body, even though it only makes up two per cent of the body's weight. This soft, jelly-like organ has countless billions of neural cross-connections. The brain oversees the workings of the body, while its higher functions give us consciousness and personality.

The spinal cord

The spinal cord is connected to the brain and runs the length of the body. It is protected by the bones of the spine (vertebrae). Nerves branch off from the spinal cord into the arms, legs and torso.

The peripheral nervous system

Nerves connect the brain and spinal cord to the peripheral nervous system, which is what nerve tissue outside of the central nervous system is called. It is made up of two main parts: the autonomic and the somatic nervous systems.

The autonomic nervous system

The autonomic nervous system is part of the peripheral nervous system. One of its main roles is to regulate glands and organs without any effort from our conscious minds.

The autonomic nervous system is made up of two parts: the sympathetic and the parasympathetic. These systems act on the body in opposite ways. Together, they coordinate a multitude of adjustments required for our changing personal needs as we move through our environment. For example, the size of our pupils is adjusted automatically to allow the correct amount of light into our eyes for optimum vision, our sweat glands are turned on when we get too hot and our salivary glands produce saliva when we eat food (or even think about it!).

The somatic nervous system

The somatic nervous system is also a part of the peripheral nervous system. One of its roles is to relay information from the eyes, ears, skin and muscle to the central nervous system (brain and spinal cord). It also obeys commands from the central nervous system and makes muscles contract or relax, allowing us to move.

Problems of the nervous system

Some common problems of the nervous system include:

- **Epilepsy** – storms of abnormal electrical activity in the brain causing seizures
- **Meningitis** – inflammation of the membrane covering the brain
- **Multiple sclerosis** – the myelin sheaths protecting the electrical cables of the central nervous system are attacked
- **Parkinson's disease** – death of neurones in a part of the brain called the midbrain. Symptoms include shaking and problems with movement
- **Sciatica** – pressure on a nerve caused by a slipped disc in the spine or arthritis of the spine and, sometimes, other factors
- **Shingles** – infection of sensory nerves caused by the varicella-zoster virus
- **Stroke** – a lack of blood to part of the brain.

Where to get help

- Your doctor

Things to remember

- The nervous system uses electrical and chemical means to help all parts of the body to communicate with each other.
- The brain and spinal cord make up the central nervous system.
- Nerves everywhere else in the body are part of the peripheral nervous system.

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