

How They Work: An Intro to Nerve Function

The peripheral nervous system is a complicated thing...but the way it works is actually pretty straightforward. We'll break down the way your nerves do their jobs, so you can better understand what's happening when peripheral neuropathy takes its toll.

[Nerves can be some pretty complicated little things](#)...but when it comes to the way they work, they're actually refreshingly straightforward. While we're still learning quite a lot about the nervous system, there does exist a pretty keen understanding as to how it goes about doing its job. And its job is a pretty impressive one, as your nervous system is essentially in charge of everything the human body does and experiences.

Bump your foot against the door jamb, and it's your sensory nerves that communicate the feeling up to your brain. Similarly, cold air against bare skin (or any other change in temperature) is going to be relayed to your brain by the sensory nerves. Your motor nerves do the super important work of enabling you to move your limbs, helping your muscles contract to lift that arm of yours when you've decided it's time to do so. Finally, the autonomic nerves are in charge of regulating the different *automatic* things your body does, without your conscious thought – breathing, heart rate, and so forth.

So how do they actually accomplish of this?

The Ever-Important “Action

Potential”

To put it very simply: **Your nerves work by sending signals throughout your body.** The process goes both ways, but it always starts and ends with the *central nervous system* (which is located in your brain and your spine).

Your central nervous system uses the peripheral nervous system to either send or receive signals throughout the body. This means that your central nervous system sends a signal out when it wants to make something happen...or that it *receives* an incoming signal when your body needs to process some type of information or stimulus.

More specifically, when you want to move your arm, your brain sends a signal down the motor motor nerve fibers that run all the way to the muscle in charge of that arm’s movement. When your eyes see this article, they’re sending the signal to your brain, which presents you with the information in the form of the words you’re reading.

Before these signals reach their destination, they’re called **action potential**. Action potential is a pretty nifty thing, as it gets changed from a chemical signal, to an electrical one, and then back again.

From Axon to Synapse to Axon Again

Once your body decides to send out a signal, it originates as action potential, an electrical signal produced by the central nerve body. This signal then gets sent from the central body along down the axon that extends out from the nerve. The axons, you’ll recall, travel from the brain or spine *all the way out* to the part of the body that a particular nerve is in charge of.

Sometimes, the signal’s destination is so far away that multiple axons have to be used in order for it to get to where

it's going. In either case – whether going from one axon to the next or actually reaching its final destination – the action potential must cross a **synapse**. These are little spaces between your nerve endings that the signal jumps across. As it reaches the synapse, the action potential causes the release of something called a **neurotransmitter**, which is a chemical messenger that aids in the sending of nerve impulses.

As the neurotransmitter crosses the synapse, it bonds with receptors on the other side. These receptors then turn this chemical compound *back* into an electrical signal, which then continues on down the axon. This process basically repeats itself until the action potential has made its way all the way to its eventual destination.

Peripheral Neuropathy: The Great Interruptor

Peripheral neuropathy, understandably enough, mostly does its damage by interrupting the normal function of your peripheral nervous system. This means that, in one way or another, your nerve fibers aren't being allowed to do their jobs the way they normally would be.

This can happen in a variety of different ways, and depending on the specific type of damage being inflicted on your nervous system, different symptoms will present themselves.

Demyelinating Peripheral Neuropathy

Certain kinds of peripheral neuropathy are said to be **demyelinating**. This means that they actually cause nerve damage by eating away at the myelin sheath surrounding your thicker nerve fibers, slowing down their conductivity and making them vulnerable to further damage.

If the myelin sheath gets completely taken out, the neuropathy becomes **axonal**, which is more serious. Axonal neuropathy

directly impairs the way your nerve endings work.

Motor Nerve Neuropathy

When motor nerves become damaged, your movement tends to be impaired. This might start with something like slight unsteadiness, but can eventually turn into full-blown balance problems. Trouble with activities like going upstairs or picking up small objects can also be an early indicator.



Sensory Nerve Neuropathy

Sensory nerves respond to damage in one of two different ways. **Positive symptoms** mean that your sensory nerves are overacting, and will send signals that aren't appropriate. This can mean overreacting to normal stimulation, or it can mean reacting to input that isn't even there, to begin with. **Negative symptoms** mean that your nerves are either not sending enough information, or aren't sending any at all. This can result in loss of sensation or even complete numbness in parts of the body.

Autonomic Neuropathy

Your autonomic nerves respond in a much more dangerous way to damage, as this disrupts involuntary body functions that can have serious consequences. Problems with gastrointestinal motility can lead to secondary digestive issues. Improper blood flow can cause stroke. Autonomic neuropathy is no joke, but it's also much more rare than sensory and motor nerve damage.

The Domino Effect of Neuropathy Symptoms

Despite how complicated the nerves themselves can be, the way nerves function is refreshingly straightforward. The

informational relay that your nerves undertake throughout the day is responsible for helping your body do its thing, in literally every possible way. Neurons use axons to send a signal from one part of the body to another...simple as that!

Of course, it goes without saying that when one thing goes wrong with the peripheral nervous system, other problems tend to follow closely behind. This is why it's best to get a handle on peripheral neuropathy sooner, rather than later. Learning more about the peripheral nervous system certainly helps when it comes to gaining a better understanding as to how peripheral neuropathy impacts your body, which leads to ways in which you can help yourself recover from within.

Studies show that [educated patients](#) have better outcomes.