

# What Phantom Limb Pain Tells Us About Persistent Pain

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## Pain and Your Brain

Often when people hear about the relationship between the brain and pain, they think it's all in the head – that it's not real. The truth of the matter is that your brain is the boss, but it doesn't account for the whole story of ongoing pain.

Your brain and nervous system weigh up your many life experiences and make a decision about whether you are safe. If those systems get enough evidence that you are not safe, signals will be sent that make you do something different in order to protect the health of your body. Pain is one of those signals, and if it sticks around it becomes a problem.

## All Pain is Real

Understanding more about pain can really help you feel better. But this is a difficult process; it takes time and repetition to really make sense of pain. It is the role of health professionals to explain pain correctly so you understand it. Knowing that pain protects you and understanding how it works is the first step toward recovery.

All pain is real, regardless of what started it or how it has developed. A good way to understand your brain and its role in pain is through a strange phenomenon called “phantom limb pain.” It shows that people can have “real” pain that persists even in a missing body part.

## Phantom Limb Pain

About 60–80% of people that have a limb amputated continue to experience pain in that limb. They have real pain somewhere in a limb that's no longer part of their body. This is no different from any other pain; it's uncomfortable, distressing, and interrupts the person's life. It's often described as a burning, stabbing or cramping.

While phantom limb pain is common, there is some debate about the cause. Most of the scientific studies point to changes in an area of your brain called the "sensory homunculus". You can think of this as a map of your body in your brain.

Persistent pain changes this area of the brain. It reorganises so that the brain mapping of the painful part doesn't match the actual physical body part in the way that it used to. The greater the difference between the mental map and the physical body part, the greater the pain the person experiences.

Researchers know that this re-mapping also happens when you have other types of long-term pain, like low back pain. Your brain is constantly sensing what is happening to your body and modifying itself in response. Such changes can result in increased pain, like in a person with a phantom limb.

Because your brain is capable of change, it can benefit from and adapt to exercise, just like your muscles and heart. Active treatments, like movement and exercise, combined with reassurance and support, work in ways medications cannot. They help train your brain into rethinking your body.

## Re-wiring Your Brain Maps

Knowing about the changes that happen to your brain maps when pain persists is a very powerful thing. Changes to your brain after persistent pain mean your pain is not accurately telling you about your body's health status. You may feel sore but still be safe.

This knowledge by itself probably won't take the pain away, but it helps to understand that brain changes are a primary part of treatment. Your brain and your nervous system have a life-long ability to change. This is called "neuroplasticity."

Our ability to form new connections between neurons or strengthen existing connections is how we learn new skills over a lifetime. It's also how people can re-train the sensitivity of their nervous system to recover from persisting pain.

## Sensory Discrimination Training

One non-pharmaceutical treatment for rewiring your brain is called Sensory Discrimination Training. This involves re-learning to feel and locate sensation accurately in your painful area.

To do this, a therapist touches the skin in the painful area. The patient has to identify the location and type of sensation triggered by the touches. Your therapist gives feedback on your responses and helps you re-learn your sensations. As you become more attuned to your painful body part, you alter the mental body image. Thus, you're improving the match between the mental body image and the physical body part.

This technique is used successfully with amputees to reduce phantom limb pain. It has successfully reduced pain in 64% of people who received it. The training helped the brain to re-map, and the representation of the limb return to normal.

This is exciting news for people with low back pain. They have similar differences in their brain maps, so it's possible that re-training your brain will reduce the pain.

