

PRT RESEARCH

The neuroscience underpinnings of PRT

To understand how PRT works, it is first necessary to have a lay person's knowledge of recent advances in neuroscience. In the 21st century, advances in fMRI technology enabled scientists to view brain activity as opposed to merely offering static images of the brain. Advanced imaging techniques demonstrated that most forms of chronic pain are not caused by physical problems in the body, but rather learned neural pathways in the brain and the misfiring of pain circuits. In fact, they discovered that chronic pain is processed in a completely different part of the brain than acute pain. This type of chronic pain is called neuroplastic.

Three important studies demonstrated that chronic pain can be caused by non-structural factors:

The Norwegian–Lithuanian study was the first controlled study to examine the association between rear-end collisions and the development of chronic neck pain and headaches. Following the sudden occurrence in Norway of a devastating “epidemic” in which 70 000 people, from a population of 4.5 million, claimed to have been disabled by whiplash, Harald Schrader and his Norwegian colleagues wanted to learn more about the course of whiplash uncomplicated by the availability of insurance and fashionable beliefs that whiplash causes disabling symptoms.

They wondered, *“Will the lack of awareness around whiplash decrease the likelihood of suffering from the injury?”* They decided to do a study in Lithuania where there is no concept of whiplash. Over 200 Lithuanian collision victims were interviewed. Not a single collision victim reported persistent head and/or neck pain attributed to their collision.

The German placebo car crash study asked, *“Is chronic whiplash the result of physical injury?”* 51 participants experienced a simulated crash. Three days later, 20% of them had neck pain that they attributed to the crash. One month later, 10% of them still suffered from symptoms. Even though there was no way that they suffered an actual injury from the simulated crash, they developed pain.

The New England Journal of Medicine published a study on **Magnetic Resonance Imaging of the Lumbar Spine in People without Back Pain**. The authors of that article found that out of 98 people with no back pain 64% had disc bulges, protrusions, herniations, or disc degeneration. These structural changes were a normal part of aging and usually unrelated to pain. In other words, it was impossible to predict if a patient had chronic pain solely on the basis of their MRI results.

A Swiss study in the Journal of Clinical Medicine confirmed these findings after recruiting chronic back pain patients and seeing no relationship between structural issues like disc, degeneration, bulges, and pain symptoms. Neurologists have noted that some patients with multiple abnormalities on their imaging were not in pain, while others complained of severe pain even though their imaging was relatively normal.

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