

Treatment of chronic low back pain can reverse abnormal brain activity and function

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It likely comes as no surprise that low back pain is the most common form of chronic pain among adults. Lesser known is the fact that those with chronic pain also experience cognitive impairments and reduced gray matter in parts of the brain associated with pain processing and the emotional components of pain, like depression and anxiety.

In a longitudinal study published this week in the [Journal of Neuroscience](#), a group of pain researchers from McGill University and the McGill University Health Centre (MUHC) posed a fundamental question: If you can alleviate [chronic low back pain](#), can you reverse these changes in the brain?

The answer is, Yes.

The team began by recruiting, through the Orthopedic Spine Clinic and the Alan Edwards Pain Management Unit at the MUHC, patients who have had low back pain for more than six months and who planned on undergoing treatment – either spinal injections or spinal surgery – to alleviate their pain. MRI scans were conducted on each subject before and six months after their procedures. The scans measured the cortical thickness of the brain and brain activity when the subjects were asked to perform a simple cognitive task.

"When they came back in, we wanted to know whether their pain had lessened and whether their daily lives had improved," said the study's senior author, Laura S. Stone from McGill's Alan Edwards Centre for

Research on Pain. "We wanted to see if any of the pain-related abnormalities found initially in the brain had at least slowed down or been partially reversed."

Not only did the team observe recovery in the anatomical function of the brain, but also in its ability to function. After the subjects were treated, researchers found increased cortical thickness in specific areas of the brain that were related to both pain reduction and physical disability. And the abnormal brain activity observed initially during an attention-demanding cognitive task was found to have normalized after treatment.

While more research would be needed to confirm whether [chronic pain](#) actually causes these changes in the brain, Stone hypothesizes that chronic [low back pain](#), at the very least, maintains these differences.

"If you can make the pain go away with effective treatment," she added, "you can reverse these abnormal changes in the brain."

Provided by McGill University

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