Chronic pain is surprisingly treatable — when patients focus on the brain

An unexpected therapy shows results.

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One-fifth of American adults — 50 million people — suffer from chronic pain, defined as pain experienced most days or every day during the past six months. Conditions include migraines, sciatica and gastrointestinal disorders, as well as shoulder, knee and elbow pain. Back and neck pain, too, affect up to 85 percent of adults at some point in their lives and are among the most common reasons for doctor and hospital visits. Chronic pain results in more than $500 billion each year in direct health-care and disability costs and lost productivity. Roughly half a million Americans have died over the past two decades after overdosing on opioids, commonly taken in a desperate quest for pain relief.

The medical community has traditionally regarded chronic pain in one of two ways. Doctors either consider it a structural problem caused by tissue damage — muscle strain, ruptured disks, an inflamed or torn tendon; or they shrug, saying they can't find anything wrong and suggesting painkillers, physical therapy, rest, or a different diet or lifestyle. Frustrated patients often come away with a highfalutin diagnosis that's little more than a restatement of their initial complaint. In too many cases, surgery is performed, despite dismal success rates of around 25 percent.

I am one of these 50 million sufferers, having endured a lifetime of back, neck, stomach, elbow and sciatic pain, along with periodic headaches. I once attributed these symptoms, which peaked during the stressful, lonely years of graduate school, to what most people assume would be the culprits: overuse, poor posture, aging, a minor car accident. I saw every kind of doctor and tried every alternative treatment. Nothing worked, until I saw the late New York University physician John Sarno, who put me in an eight-week therapy program that finally gave me relief.

The view that chronic pain originates in the brain — that it's fundamentally a psychological phenomenon, and can be eliminated by altering thoughts, beliefs and feelings rather than by changing something in the body or flooding it with chemicals —

has long been controversial and is still largely dismissed as New Age hooey or offensive victim-blaming. But what started out as a hunch by health-care practitioners on the fringe is finally being proved true by science. It's increasingly clear that chronic pain is often "neuroplastic" — generated by the brain in a misbegotten effort to protect us from danger. And that's good news, because what the brain learns, we are discovering, it can unlearn.

The latest evidence comes in a peer-reviewed study just published in the journal JAMA Psychiatry that includes striking results from a randomized controlled trial conducted at the University of Colorado at Boulder. In the study, 151 subjects with persistent back pain were randomly assigned to one of three groups. A third of them were given no treatment other than their usual care (the control group), a third were given a placebo, and a third were given eight one-hour sessions of a new treatment called "pain reprocessing therapy" (PRT). Developed by Alan Gordon, director of the Pain Psychology Center in Los Angeles, the technique teaches patients to reinterpret pain as a neutral sensation coming from the brain rather than as evidence of a dangerous physical condition. As people come to view their pain as uncomfortable but nonthreatening, their brains rewire the neural pathways that were generating the pain signals, and the pain subsides.

Remarkably, 66 percent of the subjects receiving PRT were nearly or fully pain-free after this purely psychological intervention, compared with just 10 percent of the control group. A whopping 98 percent had at least some improvement, and these outcomes were largely maintained a year later. "When our brains are on high alert, we interpret our surroundings through a lens of danger," explains Yoni Ashar, a neuroscience researcher at Weill Cornell Medical College who is the lead author of the new study. "PRT aims to lower the threat level."

A separate study just published by a team of Harvard-affiliated researchers obtained similarly impressive results, finding that a mind-body therapy course was significantly more effective in easing persistent back pain than either a more general stress-reduction program or usual care.

This new research is the latest to validate Sarno's theory that much chronic pain is not structural but is a mind-body phenomenon, and that changing our perceptions — gaining knowledge, altering beliefs, thinking and feeling differently — can dramatically reduce the pain.

This does not mean the pain is imagined or "all in the head." It's a brain response, like blushing, crying or elevated heart rate — all bodily reactions to emotional stimuli. "Pain is an opinion," neuroscientists often say, suggesting not that pain isn't factually present but that all pain is generated by our brains, and is thus reliant on the brain's fallible perception of danger.

Warning us of danger is, of course, the proper role of pain. You wouldn't want to step on a rusty nail and remain oblivious, carrying on with your day. But sometimes our brains

misinterpret threats and overreact by causing or prolonging pain when no danger is present. With chronic pain, our nervous system, triggered by fear, gets stuck in fight-or-flight mode, switching on our body's alarm bells in the form of physical symptoms.

The Boulder study builds on research that has long identified chronic pain as neuroplastic. One study looked at MRI scans of 98 people with no back pain and found that 64 percent had disk abnormalities. Disks deteriorate throughout our lives, with 90 percent of us showing degeneration by age 60. But, like gray hair or wrinkles, those bodily changes don't necessarily hurt, and too often imaging results are groundlessly assumed to be causal. As one of the largest literature reviews to date put it, the "data do not support a physical injury model of back pain."

Indeed, a large body of literature shows that exposure to stress or adversity, such as trauma, childhood difficulties or job dissatisfaction, predicts chronic symptoms, including back pain, fibromyalgia and irritable bowel syndrome, better than any physical measure. It's long been known that expectations and beliefs about pain can affect how and whether it's experienced, with sham surgeries and other placebos able to trick people into feeling relief, and simulated injuries able to produce pain when people think they're being harmed. If emotional and experiential factors predict chronic pain, that suggests the culprit is not physical, as does the fact that legions of people have resolved their symptoms using psychological interventions alone.

Imaging technology further validates that psychological and emotional factors spur chronic pain. A. Vania Apkarian, who runs a neuroscience pain lab at Northwestern University, predicted with 85 percent accuracy which subjects would develop chronic pain by looking not at their backs but at their brains. His team found that, when pain shifts from acute to chronic, it actually moves to different regions of the brain, regions that — tellingly — are also involved in controlling emotion, memory and learning. Apkarian now views chronic pain as a brain-learning phenomenon linked to "emotion-related" circuitry. Clinicians usually want to treat the site of the pain, he told me. "What we are saying is that's often the wrong thing to do, because that's not where the pain is coming from." Pain researchers find that more than 90 percent of people with lower-back pain recover in just days or weeks. Chronic pain, by contrast, is a whole different animal, and it appears that it's born in the brain.

Fortunately, we now have not only better research than ever showing that much chronic pain is neuroplastic but also more avenues than ever to successfully treat it. (People with persistent pain should consult a doctor to rule out dangerous conditions like a tumor, infection or fracture before concluding that the pain is neuroplastic.) PRT will not be accessible for everyone, but most elements of the therapeutic approach validated by the Boulder study are widely available. The keys to healing neuroplastic pain are genuinely understanding that it's not dangerous, and reducing the fear and other emotions that keep our systems on high alert. How can people incorporate these principles into a regular practice of awareness and calm that retrains their brains to turn off unnecessary pain signals?

Neuroplastic pain treatment has become a rare and exciting example of practitioners and patients coming together to help reduce suffering on a wide scale. They've created vibrant online communities in which patients share and reinforce their healing experiences, often gently guided by clinicians (who have usually experienced chronic pain themselves). They've created podcasts, videos, books, social media groups, and online courses and apps, like "Freedom From Chronic Pain" and "Curable," that offer a primer on how to obtain relief.

While the bulk of research focuses on back pain, there is good reason to believe that many other forms of chronic pain are neuroplastic. (Autoimmune and inflammatory conditions, such as rheumatoid arthritis and lupus, may make up a separate category; they are similar in that they trigger overactive threat responses, but research hasn't clearly shown whether psychological interventions can dial them down.) "I've seen thousands of people heal from dozens of chronic pain conditions with a mind-body approach," says Nicole Sachs, a psychotherapist based in Delaware who specializes in eliminating neuroplastic pain. "One person's back pain is another's sciatica is another's IBS is another's migraines." Her approach includes mindfulness meditation and expressive writing, which research suggests can reduce pain, perhaps because our brains perceive as threatening the surfacing of difficult emotions (a Freudian defense system updated for the age of brain science), which deep journal-writing invites us to unload. Our culture and the health-care field have not caught up. Providers should learn about neuroplastic pain, and medical schools, which now spend an average of just nine hours on pain education, should teach about it. Critically, we must stop viewing emotional or psychological bases for pain as stigmatizing. This long-elusive goal might finally be reached through a broader understanding of the research showing that, in an effort to protect us, our autonomic nervous systems — not some character weakness or a wild imagination — are generating the symptoms.

One of the hardest parts of having chronic pain is the sense that your experiences or feelings are not valid. For too long, patients — especially women — have felt dismissed as neurotic when complaining of serious pain, and it would be a tragic misreading if the evidence on neuroplastic pain were misunderstood as an argument that chronic pain is imagined or the fault of the sufferer. The research shows the opposite: Chronic pain is real and debilitating — and since it's learned by the brain, it's usually reversible.