The
Mystery
of Pain

by Douglas Nelson

The dominant theory about pain that has been in existence for many decades comes from René Descartes, who likened pain to a rope pulling on a bell. Trigger a pain event in the periphery (such as a muscle) and a message is sent (via the nociceptors) to the pain center in the brain, which reacts strongly to warn you to change course or adapt behavior. Like so many things, it seems cut and dried—until further investigation starts revealing an amazingly complex system fraught with multiple ways the system can go awry.

Pain's message
First, we’ll address the idea of the nociceptors being pain receptors. There are people who are born with the inability to feel pain. This is a terrible condition called congenital analgesia. Imagine drinking a cup of tea so hot your mouth is severely burned, yet you cannot feel it and continue to drink (and burn) the inside of your mouth. Most people who have this condition do not live beyond 20 years or so.

What is absolutely amazing about congenital analgesics is their nociceptors are perfectly normal—but if nociceptors are pain receptors, this cannot be. What scientists presently know is nociceptors do transmit noxious stimuli to the brain, but it is the brain that decides whether to interpret those stimuli as painful.

Clearly, in people who are congenitally analgesic, we see how vital to survival the perception of pain can be. Pain is a warning sign, a message to us that something is wrong and we should respond to it.

Here again, this model doesn’t really apply to all kinds of pain. If I step on a sharp object, the pain alerts me to pull my foot away as fast as possible. What if my leg has been amputated at the knee and I still have pain between my toes? Of what is the pain warning me? For the person who has fibromyalgia, of what is the pain warning her? What purpose could the pain serve when the danger is long since past? For the person whose doctor informs him cancer has spread all throughout his body and it is far too late for treatment, where was the warning sign of pain?
"That which holds us back is not what we do not know, but what we think we know."

—Albert Einstein
Therefore, the simple idea that pain warns us of impending damage is true, in some cases, but not in others. Some distinction of types of pain must be made.

**Acute vs. chronic pain**

Enter the concept of acute pain vs. chronic pain. This has nothing to do with time.

In acute pain, the experience of pain is proportional to the potential damage. The rock I was stepping on was slightly sharp; I feel a slight amount of pain and casually lift my foot. The stove is really hot; I pull my hand away immediately. In these cases, pain equals damage.

Chronic pain is very different; in this case, pain does not equal damage. With chronic pain, the messenger is the problem. The neural impulses that create the pain experience continue, even if the precipitating event that started it all is no longer present. True, time can often be linked with chronicity, for the simple reason the longer the pain experience continues, the more likely the brain is to adapt or rewire the circuits of the pain.

The ability to rewire circuits is yet another

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**STORIES IN COMMON**

**HOW TO HELP CLIENTS UNDERSTAND THE CONTEXT OF PAIN**

If pain is about perception, who gets to make that decision? The assignment of meaning seems to be the job of a part of the brain called the amygdala.

In seminars, I will often walk over to a participant and pinch him and begin to make some point about pain and meaning. The student will recoil a bit, but his brain knows this crazy lecturer must be making some sort of point—and he waits to hear what I am going to say. Imagine his experience if I am 30 feet across the room, and he feels the same pinching feeling without me being right there. He would be up out of that chair so fast it would defy gravity! The sensation is the same, but in the first case, the brain understood the meaning of the experience. In the second case, there is no meaning to the event, which is terrifying.

The application of this is vast, but here is a great clinical application. When someone comes to see me for frozen shoulder, she often feels like Job; out of nowhere this pain came, unconnected to anything she thinks she has done. When one person (a very bright man who was a lawyer, accountant and professor) came to see me a couple months ago, he described himself as a very interesting and unusual case. After about three sentences, I stopped him from continuing to describe his symptoms, and I then described his multiple symptoms in great detail, to his astonishment. What was the purpose? He then had a context to his pain, a meaning to his symptoms. Showing him other people have had the same experience was enormously comforting to him. When people understand the context of pain and have a sense of a timeline for when it might end, it makes the sensation much less scary, as fear worsens pain.

**PAIN AND MEMORY**

What about the reverse? Instead of context and future events, how about memories and past events? Pain and memory have a very interesting relationship. First, the part of the brain linked to the amygdala (the meaning center) is the hippocampus, the center of memory. This only makes sense; if you walk near a tree that has poison ivy, you need to remember which tree it is. The brain encodes the pain with the memory, for the sake of survival.

Moreover, researchers in 2003 were able to remove two proteins, which also are neurotransmitters, from the bloodstream. The net effect of this was to eliminate chronic pain. Imagine the applications; pharmaceutical companies must be drooling! So, why have you never heard of a medication that would effect neurotransmitter removal? Because in an effort to conserve energy, most neurotransmitters in the body do more than one thing: The neurotransmitters that influence pain also influence memory. You do not hurt; however, you do not remember where you live. Not good.

Pain and memory are certainly linked in ways we never imagined. Does this shed any light on the number of times you may have massaged someone who was in pain—and suddenly a memory connected to the pain comes to her?

—Douglas Nelson
absolutely new concept to pain research and for that matter, brain research. Have you ever heard such phrases as, “The neural circuits of the brain are fixed” and “That which is destroyed can never be regained”? These ideas came from the famous, early-20th-century neuroanatomist Ramón y Cayal and were repeated for many decades.

What we now know is the brain can rewire the circuits, for better or for worse. Those of us in the bodywork field should be proud one of the pioneers in the practical application of this paradigm was Moshe Feldenkrais, who asserted the ability for the brain to rewire in his book, *A Case of Nora*. How did Feldenkrais come to this idea? Was it a flash of insight or inspiration? No, he actually arrived at these ideas by reading the foremost neural researchers of his day. He then put the principles into action.

In the vernacular of neuroscientists, “That which fires together wires together.” In learning a new skill, this can be a great thing. In chronic pain, this can be devastating. In chronic pain, the whole neural matrix fires together with increasing efficiency, so the initial stimulus doesn’t even have to be present for the system to work. It can even involve areas that had nothing to do with the original trauma. How cruel is that?

Part of the change that happens in the brain is at the central nervous system (CNS), which, after receiving nociceptive input from the periphery, streams input back down the system to put everything on hyper alert. From your early study of neural receptors, you may remember there are receptors that monitor touch receptors, thermal sensations and chemical receptors. When the CNS gets lit up (central sensitization), even the thermal receptors perceive any sensation as noxious.

Have you ever had a client say she sat in a restaurant and had air-conditioning blowing across her neck, which caused a stiff neck for days? Cold air should make you feel cold, not feel pain. But with central sensitization, neural job descriptions get rewritten and more neural receptors are recruited to monitor pain, which creates more pain, which creates central sensitization—a vicious cycle.

**Pain is perception**

You may notice I keep referring to the experience of pain. If pain is not just noxious input, what is it? Pain is perception, the meaning of sets of stimuli by the brain. This is at the heart of the current understanding of pain research.

Here is an example: If I ask you to describe what the physical sensations of excitement and anticipation are, what would you say? If I then asked you to describe the physical sensations associated with fear, how different would those be? I would wager your brain has little difficulty discerning one from the other in real life. The difference is your brain assigns meaning to the stimuli and declares it to be anticipation. It could have just as easily assigned it to fear. The end result, and the brain and body’s response, is wildly different. The cardinal principle—pain is perception.

If pain is perception, where on an MRI would you see this? This is the bane of every health-care provider. Nowhere on any image or screen can you see pain. You can see pathology, you can see distortion, but you cannot see pain. The axiom for pain specialists is, “The person is in exactly as much pain as he says he is.” You cannot prove a person is in pain; neither can you disprove it.

In 2003 I went to a conference of the creme de la creme of pain researchers. With all the money and resources available to them in their research, do you know how they measured pain? On a scale of 1 to 10, with 10 being the worst pain imaginable. That’s right, the good old Verbal Rating Scale (VRS). There is no gold standard for pain, no amazing test, just the person’s perception of the experience.

**Physical vs. emotional pain**

There is some difference between physical pain and emotional pain, as far as the brain is concerned. If you look at the brain scans of two people, one in physical pain and the other in emotional distress, the scans look identical. Since the brain processes both physical and emotional pain in the same place, scientists now believe a spillover effect is reasonable, that gross physical pain can stir emotions, while emotional distress spawns physical symptoms. This may seem obvious, but the application is enlightening for clients.

For example, many times a whiplash victim has lamented to me that ever since the accident he has
been an emotional wreck. Since the damage to the car was negligible, people doubted the reality of the pain. Since he was emotionally volatile, even the client began to wonder if the problem was in his head. The visible sense of relief (accompanied often by tears) is remarkable when I relay that the problem is in the brain, but not how he thinks. Pain gives rise to emotional experiences; studies show when the pain is removed, the emotional distress disappears.

A new frontier
The study of pain is the new frontier of medicine, and the applications to massage therapy are vast and imminently practical. The more we know, the more knowledgeably we can guide the people who grace our treatment tables through the maze from pain to recovery, or at the least, better management through greater knowledge. They deserve nothing less.

FOOTNOTES
6. Ferguson, L.W., Gerwin, R., Clinical Mastery in the Treatment of Myofascial Pain, Lippincott Williams & Williams, pp 64, 2005.

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