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## *Chronic Pain – Real or Imagined?*

If you delve into the world of workers' compensation, ADA claims or personal injury issues, no doubt you have encountered chronic pain and the role it plays with employees and plaintiffs seeking treatment and damage components to lawsuits. I recently attended a lecture by Dr. X.J. Ethan "Mojo" Moses, the Medical Director for the Colorado Division of Worker's Compensation wherein he discussed how the human brain perceives pain which I found to be not only fascinating, but highly educational.

During his lecture, Dr. Moses discussed two very different scenarios involving the perception of pain. In the first, a construction worker received a 3-1/2 inch nail to his head that had pinned his baseball cap to his skull. He was more concerned with the baseball cap and it not getting ruined than his head and stated to doctors before his surgery that he had spent \$300 to get his free hat and did not want it getting ruined, but that the nail in his skull was not bothering him. The nail had to be surgically removed from his skull.

The second example was of a builder who had jumped on a 15 cm nail. When the nail entered his boot, he screamed in pain and fell over, and as the smallest movement of the nail caused him excruciating pain, he was sedated as the nail was removed. In this second example, however, the nail never actually injured the worker's foot – rather it had only penetrated between his toes and his foot was entirely uninjured.

These examples bring to mind pain reactions I have recently witnessed with my 6-year-old niece. When she falls, she looks to her loving father who quickly comes to her rescue – and sobs, complaining of how much it hurts. But when she falls and believes no one has seen her, she quickly gets up, brushes herself off and continues her play.

So which example of pain is real? According to Dr. Moses and the experts he cites – all of them. A well-known pain management expert, Dr. Howard Schubiner, says in many of his presentations, "The reign of pain lies mainly in the brain." This appears to be true.

For many years doctors believed that the sensation of pain was due to tissue damage stimulating a "nociceptor" (or pain nerve) that travelled up other nerves to the brain where it was perceived as pain in the affected area. In other words, they used to think that all pain was due to physical injury in the body, and that was simply reflected in the brain. According to more advanced science, the reality is much more complex. Those "pain nerves" do exist, but in the brainstem the signal starts to split. One circuit does go to the part of the brain that allows us to localize what part of our body is hurt, but the other circuit goes to the amygdala, commonly known as the "fear center" of the brain. From here it activates several other areas of the brain, including the insular cortex and the cingulate cortex. These parts of the brain are complex, and they are interconnected to emotions, pain sensation, memory, sensory processing, body awareness, risk prediction, decision-making, even empathy. In the end, what that means

is that there is no perception of pain without an emotional response. Our brain must activate pain in order to experience pain. The response is typically fear. Our body does not send pain signals to our brain – it sends signals. Your brain must interpret that signal and determine if that signal is actually a danger or not. You might sense damage to your body, but without fear, it is not really perceived as “pain.”

So, what does this mean in terms of chronic pain? The longer the pain sensation is activated, and the more severe it is, the more likely it will activate the danger alarm system. This pain leads to fear, which leads to more pain (turning the volume up), which increases fear, and so on. Over time, the pain gets worse and spreads to other areas of the body. According to Dr. Moses, depression and anxiety can prime a patient’s danger alarm mechanism. In other words, depression and anxiety can activate a person’s danger alarm system to create pain. In the context of litigation, depression has been associated with a 25% increased risk of occupational injury and other injuries.

How can we break this danger alarm cycle? Dr. Moses advised that education is the best course of action - changing a person’s mind about the source of pain. It is also important to validate the pain. There is no neurologic difference in the brain’s perception between what we call “physical” pain and “non-physiological” pain. Cognitive Behavioral Therapy is another tool to break this cycle – reducing a person’s fear and fear avoidance and increasing activity and emotional processing – returning a person to meaningful work. Finally, early intervention is key. If a patient has had pain for more than 12 weeks, the research is clear that their treatment plan should include psychology. The bottom line: the best approach to reduce chronic pain is to assist patients to access pathways to unlearn their pain.