



Prof. Phil Fischer, Professor of Pediatrics, Mayo Clinic, USA, Consultant Pediatrician, Chair of Adolescent Medicine, and Associate Dean of Education Medical Students, Sheikh Shakhbout Medical City, Abu Dhabi, UAE- Paediatric pain:

"Pain is good... when it helpfully warns us to take action to prevent tissue damage.

Pain is bad... when there is no treatable structural body problem on which to act.

Pain is miserable.... Whether warning us of danger or just messing with our minds, pain is miserable.

And, to remove any doubt, pain is real. Whether the pain is warning about physical danger or just being a physical bother itself, pain is real. I've never seen the wind, but it is real, and I see its effects. Similarly, I'll never feel my patients' exact pain, but their pain is real, and I can see its effects.

So, how can I as a pediatrician who sees lots of hurting teenagers understand pain? How can we as human beings understand pain?

I think it helps to consider pain in the same good-bad way I explained – but with different words, because it is distractingly discouraging to patients to hear that pain is good, that it has value.

Pain that is communicating the presence of a dangerous anatomical or organic or inflammatory problem is what I might call "structural pain." The terrible feeling of cracked edges of ribs rubbing on each other when I laughed after a fall warned me to hold still so my fractures could heal. The severe headache of a swollen mass in the head prompts a visit to a neurosurgeon who can remove the brain tumor. The pain of a swollen appendix is so unusual for a patient that he or she goes to a doctor to get the appendix removed. These are examples of structural pain, pain that prompts action before the ribs slip farther out of place or the brain tumor spreads or the appendix ruptures.

Doctors are pretty good at figuring out structurally based pain. They talk to patients, do physical exams, and , if needed, do blood tests or x-rays or biopsies. While evaluating and



treating the structural problem, acute pain medications can help dull the pain, even as the pain served its purpose and the danger of further damage is being mitigated.

For our few minutes together today, though, we are more concerned with chronic pain, with pain that persists even when all the doctor visits and blood tests and x-rays and biopsies show no evidence of a structural problem affecting the nerve endings.

This pain is still miserable and it is still real – even if no one can see it or find a structural source of the pain. This situation shouldn't surprise us at all. In fact, a third of doctor visits turn out to be for bodily function problems, not for structural disorders. And, most chronic pain is a problem of function.

Structure or function. Hardware or software. Phone or app. Some pain is of structural origin, and some pain is because of dysfunction of the nervous system.

Sometimes functional pain (the chronic pain for which no test reveals a cause) started with a structural problem – but then the nerves kept communicating pain messages even after the ribs healed or the tumor was treated or the appendix was removed or the COVID resolved. Sometimes functional pain starts with stressful life events that were temporarily overwhelming – but the pain persisted even after the stress was resolved. And, sometimes pain just happens.

How does this make sense?

Nerves send pain messages to the brain either when the nerve endings are structurally stimulated or when the nerves themselves are functionally impaired. But, the nerve messages then travel through the spinal cord and subconscious parts of the brain to finally arrive with painful misery in the conscious parts of the brain. Structural or functional in origin, the brain still senses bad nerve messages.

Usually, our brains filter out messages that don't really matter to us. If I hold still, I don't feel my collar on my neck or my sleeve on my wrist. The nerves work, but my subconscious brain filters out the distracting "collar on neck" and "sleeve on wrist" messages. If I had to consciously register all those minor sensations all day long, I'd probably go crazy!

And, that's what happens to some of my patients.

Especially after physical injury or illness but also sometimes after major emotional life events or even randomly, the sensory nervous system stays hyper-aware, wanting to catch the next similar sensation before danger results. The nervous system, centrally in the brain, is sensitized in what seems to have been a protective mechanism to notice every little sensation.

Thus, some of my patients do feel their socks on their ankles and their food moving through their intestines. And, their brains register these sensations as "danger, pathology, bad." They see doctor after doctor and do test after test – all in a futile attempt to find the structural cause of their pain, the structural cause that doesn't exist for them.



So, what can I as a pediatrician do for my adolescent patients with chronic pain? What should all doctors do to fulfill patients' rights to appropriate care?

I, and all doctors, must pull together the best of medical science to make sure I am not missing an undiagnosed structural cause of pain. Recently, we cared for a patient with chest pain – with negative tests elsewhere for two months until we finally saw the patient and diagnosed a hidden leukemia.

At the same time, though, I must realize that most chronic pain is functional in origin rather than structural. I need to diagnose the pain properly as functional. I need to explain "central sensitization" to my patients, the notion that pain is registered centrally in the brain when the subconscious mind fails to filter out unnecessary pain and danger messages. I can tell my patients about scientific data showing how neurotransmitter chemical levels are altered with this sort of nervous system dysfunction, with central sensitization.

And, fortunately, I have the privilege of treating my patients – and of seeing most all of them recover and return to fully normal life activities.

I can empower my patients with an understanding of their functional pain. I can let them know that their pain doesn't oblige them to respond any more than a prank "stop ahead" sign requires cars to stop. I offer them the freedom to gradually increase their activities, the activities that their body didn't want to do when it thought the pain was dangerous. I let my patients know that the body will regain function as they get regular meals, have adequate good sleep every night, and get daily aerobic exercise. And, I can use medications, if needed — products like amitriptyline and gabapentin and selective serotonin reuptake inhibitors.

But, recovery from chronic pain is not easy, and it should not be a solo endeavor. We can mobilize a team of caring family and friends. Physical therapists and personal trainers can help patients get back into action. Cognitive behavioral therapy is of proven effectiveness, and most of my chronic pain patients count on their psychologist more than me as they learn and implement pain management strategies. We can "extinguish pain behaviors" such as limping or moaning or even talking about pain – since all those activities build the "nerve memory" of pain and foster ongoing non-productive central sensitization.

Yes, in theory, some pain is good. Most pain is bad. And all pain is miserable. With good scientific understanding and with a good treatment plan, however, most all pain can be conquered!"