

50 Shades of Pain with Dr. Lorimer Moseley

I have for a long time, been reading pain science studies and viewing lectures by Dr. Lorimer Moseley. Dr. Moseley is a clinical scientist investigating pain in humans. He is also professor of Clinical Neurosciences and is the Chair in Physiotherapy, The Sansom Institute for Health Research at the University of South Australia.

In 2008, he was named the outstanding mid-career clinical scientist working in a pain-related field by the International Association for the Study of Pain. In 2012, he was shortlisted for the Australian Science Minister's Prize for Life Sciences.

Some of these quotes are from the lecture by Dr. Moseley called "On pain", this lecture is made possible by Laree Draper (on DVD and digital download). This is truly a amazing resource, and in my opinion it should be in any health professionals collection.

Without further adieu, here are fifty something quotes from Dr. Moseley.

"Pain is an unpleasant conscious experience that emerges from the brain when the sum of all the available information suggests that you need to protect a particular part of your body" Dr. Lorimer Moseley

"Pain is the output. Nociception is one of the inputs. All of the inputs are evaluated when we're talking about pain, I think, according to this question: How dangerous is this? Based on everything I know, which is all of the information available to me right now, how dangerous is this really?" Dr. Lorimer Moseley

"Nociception is clearly not the same as pain" Dr. Lorimer Moseley

"I think it's fair to say at the moment we know inflammatory mediators produced by the immune system modulate nociception. This would be reasonable to say.

When you're sick or have the flu, your old aches and pains might come back. I had a shoulder reconstruction 20 years ago. I know when I'm getting the flu, and I've had the flu three times since then. The first thing to happen is my shoulder scar starts to ache again. We have all of these different systems that are able to modulate nociception." Dr. Lorimer Moseley

“The amount of pain you experience does not necessarily relate to the amount of tissue damage you have sustained” Dr. Lorimer Moseley

"Let's move on to the modulators of pain. The most obvious modulator of pain is nociception— clearly. A lot of people mishear the work I do to mean I don't think pain has anything to do with the tissues. That's not true at all. I clearly think it does." Dr. Lorimer Moseley

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"There's no such thing as a pain stimulus. Nothing has the property of pain. It's an emergent property of the human.

Pain receptor—there's no such thing.

Pain pathway—there's no such thing.

Descending pain control—there's no such thing as that.

There are, however, noxious stimuli nociceptors, nociceptive pathways and descending nociceptive control. Anti-nociception turns the nociception down. Pro-nociception turns the nociception up.

It's very tempting to use these words, and most of the time it doesn't really matter. It's just semantics, but I bet you'll have a patient this week for whom it's more than semantics when you make that mistake." Dr. Lorimer Moseley

“The relationship between pain and the state of the tissues becomes weaker as pain persists” Dr. Lorimer Moseley

"We know sensory stimuli modulate nociception. Nociceptors are free nerve endings that have thermoreceptors, mechanoreceptors and chemoreceptors on them. There are different types of them, but the most common types might have all three—two or all three of those. They're scattered all over the tissues of the body and they're a fantastic first surveillance system" Dr. Lorimer Moseley

"Nociception is also modulated by tissue damage because the inflammatory mediators that are released change the property of the nociceptor. It becomes more excitable. This is called peripheral sensitization. If the nociceptor is active in the presence of a certain chemical environment, the nociceptor can become sensitive to that chemical environment." Dr. Lorimer Moseley

"Thinking that we have a slipped disc has the potential to increase back pain. But what if this piece of knowledge we have stored is inaccurate, just like our notion of a slipped disc? A disc is so firmly attached to its vertebrae that it can never, ever slip. Despite this, we have the language, and the pictures to go with it, and both strongly suggest it can.

When the brain is using this inaccurate information to evaluate how much danger one's back is in, we can predict with confidence that, if all other things were equal, thinking you have a slipped disc and picturing one of those horrible clinical models of a slipped disc will increase your back pain." Dr. Lorimer Moseley

"The evidence that tissue pathology does not explain chronic pain is overwhelming (e.g., in back pain [11], neck pain [12] and knee osteoarthritis [13]).

Yet we continue to avoid the truth that tissue damage, nociception and pain are distinct. I would go so far as to suggest that even the use of these erroneous terms – pain receptors, pain fibers and pain pathways – leaves the patient with chronic pain feeling illegitimate and betrayed, and leaves the rehabilitation team lacking credibility when they look beyond the tissues for a way to change pain." Dr. Lorimer Moseley

"What we know about how pain works is not just relevant to how we teach it to patients, we need to base our clinical decisions on it.

This means abandoning Rene Descartes famous model of 1654. His drawing depicts a man with his foot in the fire and a "pain receptor" activating an hydraulic system that rings a bell in his head. Of course no one believes we have hydraulics making this happen, but the idea of an electrical circuit turning on the pain centre is still at the heart of many clinical practices across professional and geographic boundaries.

The type of thinking captured in Descartes' model has led to some amazing advances in clinical medicine. But the evidence against it is now almost as compelling as that against the world being flat.

Of course, those sailors who never leave the harbour might hang on to the idea of a flat world. And, in the same way, there are probably clinicians who hang on to the idea of pain equalling tissue damage. I suspect they either don't see complex or chronic pain patients, or, when they do, they presume that those patients are somehow faulty or psychologically fragile, or, tragically, are lying." Dr. Lorimer Moseley

"In this controlled trial involving patients with osteoarthritis of the knee, the outcomes after arthroscopic lavage or arthroscopic débridement were no better than those after a placebo procedure." Dr. Lorimer Moseley

"Inflammation is a primitive form of defence that is essential to the tissue repair process. Think of the swelling, redness and pain after injury as part of your own internal repair system and be grateful for it" Dr. Lorimer Moseley

"Remember, nociception is neither sufficient nor necessary for pain"
Dr. Lorimer Moseley

"Anything that changes your brain's evaluation of danger will change pain"
Dr. Lorimer Moseley

"In all of the brain scans of people in pain, it's a distributed network of brain activation. There's not a single pain center obviously. There are networks or neurotags. The only reason we call it a tag is because it's shorter than signature or representation. That's all it means — a particular network or representation" Dr. Lorimer Moseley

"Change the way we think about chronic pain – Pain in the brain, immune system, endocrine system, feels the same as tissue pain" Dr. Lorimer Moseley

"The more you run the pain neurotag, the better it gets at running. The more you learn it." Dr. Lorimer Moseley

"The longer you have pain, the better your spinal cord gets at producing danger messages to brain, even if there is no danger in the tissue" Dr. Lorimer Moseley

“For many people in persistent pain, this is a critical issue to understand and well worth repeating. In this sensitised state, the brain is being fed information that no longer reflects the true health and abilities of the tissues at the end of the neurones.

Put another way, the brain is being told that there is more danger at the tissues than there actually is. The gain of the system is increased. Brain responses such as movements, thoughts, autonomic and endocrine responses are now based on faulty information about the health of the tissues at the end of the neurone” Dr. Lorimer Moseley

“Another change which is known to occur in the outer brain, the cortex, is 'smudging' - brain areas normally devoted to different body parts or different functions, start to overlap. An associated change then occurs: areas of repeated use get larger. In fact, the more chronic pain becomes, the more advanced the changes in the brain become”

Dr. Lorimer Moseley

"Are we doing any favors with syndrome-ing everything? There's certainly some value in this from a clinical perspective, but do people talk themselves into long term pain by latching onto label thinking "I have [fill in the blank]." Since they have "X" have they been conditioned to think that some magic touch from the ART/Graston person will whisk the evil spirits away? Not saying this is without value, but instead that in chronic repetitive use cases, complete resolution of symptoms must often look beyond the tissues and explore psychosocial elements" Dr. Lorimer Moseley

“Stress can contribute to nerve sensitivity or pain system sensitivity. Stress lives in the brain, and therefore the experience of people with chronic pain often is that their pain increases as they become more stressed” Dr. Lorimer Moseley

"We tend to endorse the complexity of the brain and its fundamental role in what we experience. Unless, of course, we are talking about pain.

Some 25 years ago, Patrick Wall, as frank a communicator as any, lamented the trend towards beating around the bush when it comes to pain: “The labeling of nociceptors as pain fibers was not an admirable simplification, but an unfortunate trivialization under the guise of simplification” [1]. Of course, equating pain to activity in nociceptors is seductive – nociception and pain seem so tightly coupled. However, are nociception and pain really so tightly coupled? This issue was actually settled a couple of decades ago – there is not an isomorphic relationship between pain and nociception, nor between pain and tissue damage [2].

A very large amount of research has explored the multifactorial nature of pain (see [3] for a clinically review).

Modulators broadly fit into one of three categories: prioritization, meaning and transmission/processing. Prioritization depends on the survival value of a nociceptive stimulus. Observational data abound; for example, the extensive work with military and civilian injuries – the soldier feels little pain until he is safe behind lines [4]. Experimental data have corroborated this – noxious stimuli do not hurt in cases of extreme air hunger [5] – and the pain threshold is higher after a bout of startlingly loud noises [6]." Dr. Lorimer Moseley

"Movement established and re-established fine functional motor and sensory representation in the brain" Dr. Lorimer Moseley

"The biology of pain is never really straightforward, even when it appears to be" Dr. Lorimer Moseley

"Hopefully your brain will play your pain-in-your-leg tune if the danger is in your leg, but we know there are situations where the brain will play pain-in-your-leg tune, when there is danger in your back"

"If your brain concludes that your muscles are in danger (which would seem logical) and you should do something (which also seems logical) then it will hurt. The solution? Move. Just move. Any kind of movement. Random movements are best" Dr. Lorimer Moseley

"When you massage skin, you are moving tissues and also sending useful impulses to the brain. So, movement and touch are useful ways to refresh your 'virtual' and actual body" Dr. Lorimer Moseley

"Joints adore movement and regular compression, which are essential for their health. Movement distributes the slippery synovial fluid, and cartilage loves the pumping compression. The brain eagerly welcomes the sensory inputs from the joints as it wants to know what is happening so it can construct the best responses for you" Dr. Lorimer Moseley

"Let's think about the no pain, no gain road. People talk about pushing through the pain barriers. We don't support this, although for some people there is no harm in vigorous exercise as long as they understand any pain that is provoked. For example, some discomfort as you rehabilitate stiff joints and tight muscles is probably necessary. But pain is a bit like love, joy or jealousy - have you ever heard of anyone pushing through the love or joy or jealousy barrier? Maybe we should say, 'know pain, or no gain'." Dr. Lorimer Moseley

"We can't have pain pathways, we can't have pain receptors. Pain doesn't exist until it emerges into consciousness" Dr. Lorimer Moseley

"Pain, however, is an emergent experience. It emerges from the human.

The language I use is that pain emerges from the brain. That's not actually correct, because if you got a brain and you put it on a pillow, pain can't happen, right? This might seem stupid, but I have been criticized — by people I respect — as being neuroeccentric, because the brain itself can't make pain.

It's the human. However, for the sake of the argument, it's a lot easier in dealing with patients and in normal conversation to say pain is an emergent property of the brain—remembering the caveat behind it." Dr. Lorimer Moseley

"Is adrenaline a small triangular molecule?" No, this is not an x-ray or anything. This is just a drawing. If it's very active in the presence of adrenaline, it makes adrenoreceptors and it inserts those adrenoreceptors onto the cell wall. That nociceptor, as long as it's manufacturing adrenoreceptors, will be sensitive to adrenaline. Let's say the original thermal stimulus is gone or the original heat stimulus is gone or the mechanical stimulus is gone, but there is a whole lot of adrenaline released into the system.

That adrenaline is enough to activate the nociceptor. We have a very clear mechanism by which people's pain gets worse when they're stressed out, for example, or when they're angry. Being able to explain that will take two minutes. It can be very de- threatening to people who can now make sense of an experience Rene Descartes could not have made sense of." Dr. Lorimer Moseley

"What is pain? Is it simply a symptom of tissue damage or is it something more complex? One way to approach this second question is to determine whether it's possible to have one without the other – tissue damage without pain or pain without tissue damage. And you can answer that one yourself – ever noticed a bruise that you have absolutely no recollection of getting?

If you answered yes, then you have sustained tissue damage without pain. Ever taken a shower at the end of a long day in the sun and found the normally pleasantly warm water, painfully hot? That's not the shower injuring you - it's just activating sensitised receptors in your skin." Dr. Lorimer Moseley

"Pain is usually triggered by messages that are sent from the tissues of the body when those tissues are presented with something potentially dangerous. The neurones that carry those messages are called nociceptors, or danger receptors. We call the system that detects and transmits noxious events "nociception". Critically, nociception is neither sufficient nor necessary for pain. But most of the time, pain is associated with some nociception. Dr. Lorimer Moseley

"The exact amount or type of pain depends on many things. One way to understand this is to consider that once a danger message arrives at the brain, it has to answer a very important question: "How dangerous is this really?" In order to respond, the brain draws on every piece of credible information – previous exposure, cultural influences, knowledge, other sensory cues – the list is endless" Dr. Lorimer Moseley

"A disc is so firmly attached to its vertebrae that it can never, ever slip" Dr. Lorimer Moseley