

18 – Pain is Our Alarm System

There are millions of tiny sensors all around your body.¹ They are at the ends of the thousands of nerve cells you have.¹ Some of these sensors respond to mechanical forces such as stretch or touch.² Some of these sensors respond to temperature, both hot and cold.¹ Others respond to chemical changes on the inside or outside of your body.³ For example, some chemical sensors respond to capsaicin,³ the active ingredient in chili peppers,³ and others respond to spider or snake venom.⁴ There are also chemical changes that take place inside your body that chemical sensors respond to, such as inflammation⁵. There are other sensors too like your eyes, your ears, your nose, tongue and so on.

All of the information from all of these sensors gets sent to your central nervous system, so that your brain can figure out what is going on inside and outside your body^{6,7}. The easiest way to think about how this all works is to think of your nerves like musicians with different instruments (the instruments are the sensors), and all of these musicians play their tune so your brain can listen to what's going on in and around your body. So, some play a sound information tune, some play a visual information tune, some play a touch tune, and so on. All of these tunes get put together in your brain so it becomes like an orchestra playing a symphony that your brain is listening to.⁷ To make sure that these tunes come together in harmony, so your brain can make sense of them, your brain needs a conductor for its orchestra. Your brain actually has a number of conductors that work together, and one of these conductors is called your pre-frontal cortex.^{8,9} This particular part of your brain is very sensitive to changes in spinal function and is affected specifically with chiropractic care.^{10,11}

When some parts of the brain get particular messages in a specific pattern – the brain decides for you it should make you feel pain – to warn you that something might not be right – that you may be in danger.¹²⁻¹⁶ A number of parts of your brain are involved in playing this particular pain music, including your prefrontal cortex,¹⁷ and other parts of your brain that are together known as the Pain Matrix.^{18,19} But your brain can play many tunes, not just a pain tune. The brain can also learn new tunes. Your nerve cells talk to each other through little connections called synapses⁵. These synapses can be talking non-stop or totally silent. But how these nerves talk to each other determines what music your brain will hear.

Each synapse is surrounded by an immune cell which can influence the synapse itself as well as about 100,000 surrounding synapses.²⁰ All of these synapses work together in a very complex way which means that all of the different systems in your body can influence the music that your brain will play, such as the pain tune. What we know from decades of pain research is that through this complex interaction, your brain can actually learn to be in pain, particularly if you pay a lot of attention to the pain tune.²¹⁻²³

Sympathetic vs Parasympathetic

Within your entire nervous system you have two important sub-systems that impact the pain tune in a big way.²⁴ The alert & danger system and the calm & healing system. You may have heard of them as the sympathetic system and the parasympathetic system.²⁵ When your alert & danger (sympathetic) system is really active your heart beats faster, your brain mobilizes your bodies energy stores and it prepares your big muscles for a fight or to run away.²⁵ You also become more alert and vigilant and you even sweat more.²⁵

When the alert & danger (sympathetic) system is more settled your calm & healing (parasympathetic) system takes over.²⁵ This allows your brain and body to calm down, to heal tissue cells and digest your food properly.²⁶

When your brain plays the pain tune your alert & danger (sympathetic) system will activate.²⁷ Your muscles will tighten up and blood is diverted away from digestion, reproduction and healing.²⁸ This is great if you have an immediate threat you need to respond to, but this can become a problem if you are in chronic pain, because this means you will have persistent high levels of adrenaline pumping through your body.^{27 29 30} This high level of adrenaline over long periods of time can change your nerves and contribute to amplifying the danger/pain matrix tune in your brain – making the danger pain signals seem greater and making them more constant.³¹

This pain tune, created by your brain is your brain's way of trying to protect you from danger.³² So when your 'alert & danger' (sympathetic) system has been activated your brain primes your big muscles for action.²⁵ For example your hamstrings and quadriceps, your trapezius, biceps and triceps all get ready for you to fight or run away from the situation. This is great if there is a threat you need to fight or run away from – like a saber tooth tiger! But if you are under long-term, modern-day stress, this is no longer so good for you. These big muscles that have been primed, if they don't actually get a work out from fighting or running away, can over time start to feel sore and stiff.³³ What also happens is that when these big muscles get primed for action, the little muscles, for example the small muscles closest to your spine and skull, they go to sleep,³⁴ because there is no use for them if you are trying to avoid the saber tooth tiger.

So, if you are suffering from chronic pain the orchestra in your brain is stuck on one tune – the pain tune.²⁶ It's important then to remember that your brain is capable of playing thousands of other tunes – not just pain - and your brain can be trained out of playing only the pain tune. If you are under chronic stress and in chronic pain, then exercising your big muscles is very important because you need to get them working properly again. It's also very important to go see your chiropractor regularly to keep those small muscles surrounding your spine and skull active and moving well.¹⁰ These small muscles do in fact play a very important role – they tell your brain what your spine is doing, which represents what the core of your body is doing.¹⁰ If that communication between your spinal muscles and your brain becomes distorted, you end up with a communication breakdown between your brain and your body.¹⁰ Not only will your brain not know what is going on in your spine, but if your small paraspinal muscles are not working properly your brain also struggles to 'see' what is going on in the rest of your body, like your arms and legs.¹⁰ This might lead to accidents and the development of more pain and problems.¹⁰

Remember that chiropractic care is already well known in the research literature to help people who suffer with back pain,³⁵⁻³⁸ neck pain³⁹⁻⁴¹ and some types of headaches.⁴²⁻⁴⁴ This is most likely because chiropractic care helps your brain know more accurately what is going on in the spine and body and may help your brain to switch off feelings of pain, when they are no longer needed.¹⁰ Remember also that scientists have shown that chiropractic care changes the function in your prefrontal cortex – one of the brain's orchestra conductors.¹¹ This is also probably why chiropractic care helps people who are suffering with pain – by changing the pain music in the brain itself.¹⁰ Don't forget though that chiropractic care has so much more to offer than just helping you with your chronic pain. Chiropractic care is all about improving the communication between your brain and body so you can function at your optimal potential.¹⁰

However, if you do suffer with chronic pain, do your best to stay positive,⁴⁵ move often,^{46 47} eat well,^{48 49} sleep well,⁵⁰ and go see your family chiropractor^{51 52} to have your brain's conductor fine-tuned too.

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