



## Talking Pain – An Introduction

This week is National Pain Week, a week organized by Chronic Pain Australia in order to increase the awareness of dealing with pain and “reduce the social and other barriers to living with chronic pain”<sup>(1)</sup>.

In Australia, pain is perhaps the most common reason people seek medical help<sup>(2)</sup>. Despite this, it would have to be amongst the most poorly understood areas of healthcare. One in five Australians lives with chronic pain, with this rising to one in three people over the age of 65<sup>(2)</sup>. The cost this has on the healthcare system in Australia is staggering.

Due to the fact this is pain week, I wanted to put together some information about pain which I could put out there for people to increase their general knowledge. After all, the better you understand it, the better you can manage it.

While there is obviously a focus on chronic pain over the course of this week, I wanted to talk about pain in general, how it relates to both the acute and chronic scenarios, and how it affects *all* of us.

Today will mostly be an introduction, and is the first of a number of articles I will be putting up this week. Naturally, this is quite a large topic, of which I will only be able to scratch the surface, so please don't think this is the be-all and end-all of knowledge on pain. It won't be a how-to guide to get rid of pain, more a foundation of knowledge as a starting point to help you do so. Hopefully it will get you thinking, and hopefully it will raise more questions. If it does, feel free to ask.

Knowledge is power, after all.

I do need to apologise in advance, because it may at times get a little bit dry (today in particular), but I will try and make it as interesting as possible, so bear with me. Today I'm going to go into a little bit of background to set the scene. Hopefully it will get more interesting (and relevant to you, the reader) as the week goes on. Lets all enjoy some pain...

### **What is pain?**

Innocent enough question, I'll admit, but a rather complex one nonetheless.

We don't really have very good language to describe pain with. If I was to ask you, as I do for my patients, what their pain feels like, I will get many, many different responses.

It's a burning feeling. Sharp, dull, aching, pinching, throbbing. It is like an electric pain. Shooting, splitting, stabbing.

All words you have probably used to describe pain. All metaphors, because pain feels *like* many things, but there isn't one word to describe what pain feels like.

It's also a very individual experience. Two people with seemingly the same general presentation, can describe their pain very differently, feel different levels of pain and be affected in different ways.

So the question 'What is Pain?' is not so simple as it first seems

If we look to *define* pain, we generally look to the International Association for the Study of Pain (IASP), who's definition is most widely used.

**“an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”<sup>(3)</sup>**

There are a few points from this definition which will guide what I talk about for the rest of the week, and we will look at them in more detail, but first, because I'm somewhat of a nerd when it comes to history, let's look into the background of our understanding of pain...

### Good old René

Along time ago (in a galaxy far, far away), there lived a man named René Descartes.

René was a French philosopher, mathematician, scientist and all-round smart guy. It was he who first proposed a change to the way we view pain. Prior to his 1664 work *Treatise of Man*, there were a number of theories of pain being caused by everything from the heart to fluid imbalance in the body.

During the middle ages in particular, pain was a spiritual, mystical experience and treated with great superstition by many. Descartes theorized that the body was more similar to a machine, and pain was a disturbance passed down along nerve fibers until the it reached the brain<sup>(4,5)</sup>. This made the pain a more physical, mechanical sensation meaning that a cure could be found from close examination of the body.



Descartes Pain Pathway<sup>(5)</sup>

The picture on the left is how Descartes envisaged the pain pathway working. Essentially, “particles of heat (A) activate a spot of skin (B) attached by a fine thread to a valve in the brain where this activity opens the valve, allowing the animal spirits to flow from a cavity into the muscles causing them to flinch from the stimulus, turn the head and eyes toward the affected body part, and move the hand and turn the body protectively”<sup>(5)</sup>.

Makes sense in theory, and at the time was quite a leap forward, but as we'll find out, it was ultimately more complex than that.

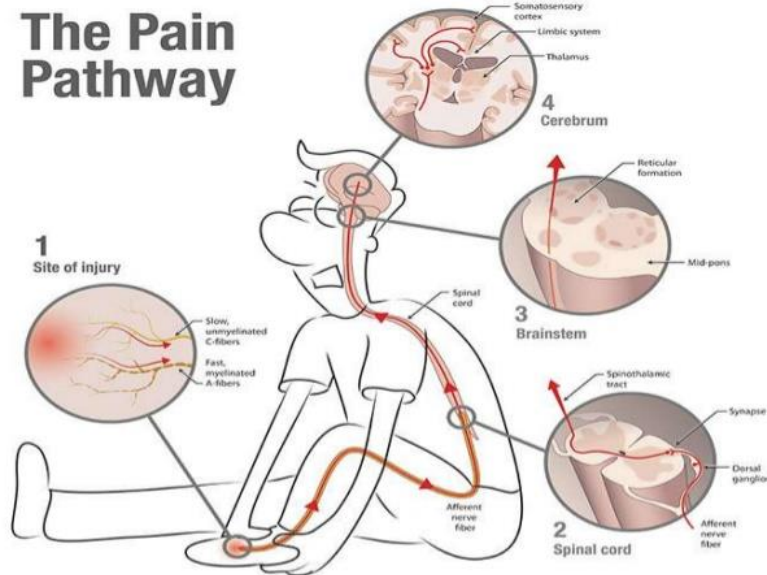
### How has this changed?

Descartes' theory is what we would call 'mind-body dualism', which essentially means that the mind and body are distinct and separable. Research since then has told us this is not the case. We now know that the central nervous system (the brain and spinal cord), along with the peripheral nerves, are central to

the function of our body (and indeed the basis for our consciousness and sense of self, but that's a very big topic for a different time).

Essentially, we can't have pain and sensation in the body without the mind.

And so the pain pathway looks something a bit more like this:



The Pain Pathway Simplified<sup>(6)</sup>

I like this picture because it is one of the more simple representations of the pain pathway we can get without oversimplifying it.

So what happens?

When our friend here lays a solid left boot into a stationary piece of furniture, it causes a reaction in the tissues.

This reaction is picked up by nociceptors, which are nerve endings in the tissues, and come as myelinated A-delta fibres and unmyelinated C-fibres (think of myelin as insulation, helping for better and faster conduction of

signals). The lightning quick A-fibres will take this message straight to your brain.

They don't carry a pain signal, they just carry a signal that *something* has happened.

While this is happening, the C-fibres are bringing up the rear with their message. The same message. They hit the spinal cord, where they connect with spinal nociceptors who take that message (or relay baton, if that helps with creating an image) and carry it up to the brainstem, which in turn relays it to the brain.

Now this happens in an instant, and as yet, there hasn't been any pain experienced.

Once this signal reaches the brain, the information is interpreted, and a pain experience is produced (or not) dependent on how that information is interpreted.

Now as I said, this is very much a simplification of what is a complex and emergent process. An emergent process is where a number of simple things come together to create a more complex behavior. Hopefully this should begin to make sense as I expand on this topic over the week.

Tomorrow, we'll have a bit more of an in depth look at the nervous system, followed by the brain.

## References

1. National Pain Week, 2017, *Our Philosophy*, Chronic Pain Australia, <http://www.nationalpainweek.org.au/>
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