

UNDERSTANDING PAIN AND PERSISTENT PAIN

There is compelling research that suggests that having a good understanding of pain based on the available science can aid recovery from injuries and persistent (chronic) pain situations.

So how does this work?

First let's consider the difference between pain itself vs the electrical signals (nociception) that injuries create:

The nervous (or neurological) system has fibres all over the body and skin that sense things. But what is it that they sense? In fact, they do not sense or transmit 'pain' directly. They only sense changes in either pressure or temperature ie: from injury, injury-related chemicals and swelling, and changes in body 'wear' (also called degeneration).

These sensory fibres are called *nociceptors*.

(Pronounced: Noh-see-septors – it is easier to pronounce the word PAIN!)

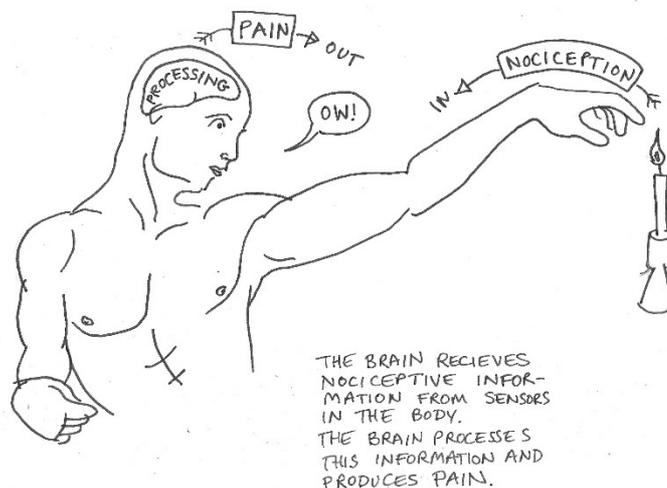
Having sensed these potentially damaging changes in the body tissues, nociceptors create very rapid long-ranging electrical signals that are relayed through the spinal cord to higher brain centres. This electrical signal activity is called NOCICEPTION.

When these messages are received in the brain, various areas in the brain work together like an extraordinarily powerful and complex computer processor (also incredibly quickly) to try to work out many things including how much danger your body tissues are in.

If this process determines that danger is present, the brain then creates a complex variety of responses including the beginning of the healing response. As part of this protective response it can also produce an unpleasant sensory, emotional and psychological experience that is what we perceive as PAIN.

This pain response is the brain's warning to protect us from further injury.

- Nociception is the INPUT part ie: signals to the brain.
- Pain is the OUTPUT part ie: signals to the body and other parts of the brain and nervous system.



NB: As stated, pain is a protective mechanism and so it is a GOOD thing from a human survival perspective. A small number of people have been identified who genetically lack the wiring for pain. These people have multiple deformities due to unprotected injuries that become further damaged.

Damage and pain aren't always related

The very interesting thing that research has discovered consistently is that PAIN can be created by the brain without any NOCICEPTION input at all.

The brain can create a pain response even if it just thinks that there is danger present!

And the amount of pain that the brain creates is not necessarily proportion to the amount of input signalling, depending on many other factors.

Finally, pain can persist long after injury healing is complete and after the tissues have re-adapted if danger or any threat is still perceived for ANY reason.

So, the brain has a 'pain equation' to work out -

**** Pain will be present and persist for as long as the brain perceives that there is more evidence of 'danger' than there is of 'safety' ****

This process is also influenced by individual genetic, psychological and sociological factors, the context of the problem and past experiences. In fact, it is the CONTEXT of an injury that is the best predictor of the degree of pain and the overall outcome rather than the structural changes discovered.

For example, this is one of the biggest reasons why people recover comparatively very well in a 'sporting' context, yet relatively very poorly if in a 'compensation' context. Studies show that if people simply think there is someone to blame for their injury, chronic pain is more likely to result. This pain is similarly very 'REAL'; it is not imagined.

ALSO - most people can think of either personal experiences or stories that illustrate situations where pain was not felt but a significant injury was present. An injury like this was either not associated with fear ie: there was no awareness that it happened, or the situation was such that not having a fear response and not producing pain was a more important priority (eg: for survival) at that time.

Neuropathic (input to) Pain

Neuropathic (Nyoo-row-pathic) pain usually refers to a situation where there is electrical input signaling to a pain response and nerves are considered to be directly involved. This type of pain is more susceptible to amplification, possibly because of direct nerve involvement. Like degeneration and disc injury, we will often see nerve compression on scans with minimal pain and with no pain at all.

Scans don't tell the whole picture

What is seen on x-rays and scans does not correlate with how people feel. This is fully confirmed in research where people with no pain are scanned.

SO –

people can feel lots of pain and have very little to see on examination and on scans / other investigations,

AND ALTERNATIVELY –

people can have little or no pain and have much to see that looks damaged or worn out on scans,
AND-

There is everything in between as well!!

THEREFORE-

It is VERY important to look at the whole situation and not just worry about the scan.

IN FACT-

If you worry excessively about the scan YOUR PAIN WILL LIKELY BE WORSE!! And now you know why ...

*** because FEAR / CONCERN / CONFUSION influences PAIN more than anything else ***

The body is usually an AMAZING healing and adapting machine, but this works best if the body and the brain are working together. The great majority of injuries heal very well and the very great majority of degenerative, 'wearing out' conditions either DON'T result in pain or only produce pain for short periods of time while the body and the brain re-adapt to the changed situation.

ALL degenerative structural changes can be observed in people with LITTLE or NO symptoms

There is no evidence that the discovery of degeneration has any positive connection to future pain outcomes. Degenerative changes are normal changes that we all have as we grow older. The vast majority of such changes cause NO symptoms or minor symptoms, so it is not a DISEASE at all by definition despite very commonly being described scarily as 'degenerative disease' by health experts.

So be very wary if you are told otherwise as this information will probably just worry you needlessly and then it is quite likely that your pain will be worse.

It is interesting that despite advances in technology, therapy options and surgical innovations in the past two to three decades, persistent spinal and other musculoskeletal pain has increased substantially in the same period, especially in Western Society and this is across all age groups. This implies that we have a problem with our current approach.

How is this all happening? - The brain's hand on the pain dial.

Positive information and a positive context can facilitate a PLACEBO effect. Most people know placebo as a "sugar tablet" and know that this can produce a positive response despite being inert ie: having no active ingredients. Placebo studies have shown that this is not just a psychological effect but results in actual physiological changes which can be measured!

BUT – placebo has an evil twin brother called ***NOCEBO !!*** ie: the opposite occurs.

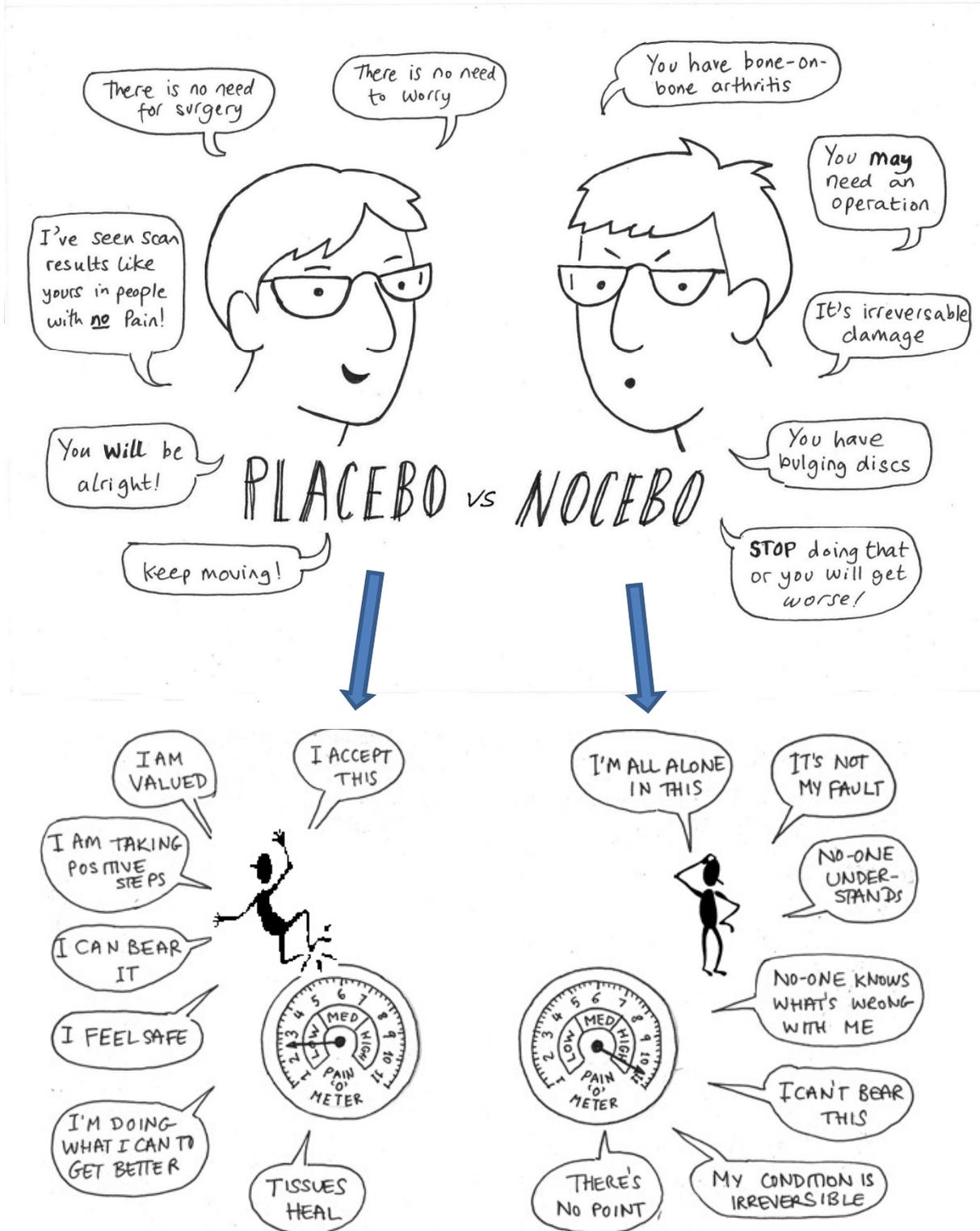
A negative context or negative information can create the opposite psychological / physiological response which can result in alteration to neurotransmitters (nervous system chemicals), changes in the immune system, increased inflammation, AND PAIN.

UNFORTUNATELY, the current orthopaedic medical system contains quite a lot of NOCEBO information. 'Expert' opinion may, and often does, contain scientifically questionable conclusions and speculations which are perceived as factual by patients. This can then feed into the 'DANGER' / PROTECTIVE part of the brain's pain equation unnecessarily. Speculation and inaccuracy is not uncommon – please consider how many different body focussed diagnoses are offered to people in chronic pain. They can't all be correct, can they?

** In reality, in the vast majority of cases, the human body is a WONDERFUL adapting and healing

machine **

BUT I REPEAT, for this to happen optimally, THE MIND AND THE BODY HAVE TO BE WORKING TOGETHER AS A TEAM.



PAIN SENSITISATION & NEUROPLASTICITY

UNFORTUNATELY, the longer and more persistent the PAIN is, the better your brain is at creating and amplifying the pain experience for you. This is like a broken central heating thermostat system that keeps warming up the house because it is not reading the temperature properly. It is called SENSITISATION.



This eventually changes and becomes an imprecise process which explains why the pain often seems to change, 'spread' and 'amplify'.

NB: This pain can also be remarkably resistant to almost all forms of management, even very strong painkillers including morphine. Pain is surprisingly common after surgery that is considered structurally successful and was intended to manage the pain in the first place.

BUT, the best way this horrible process can be turned around safely is to first fully understand how pain is processed and then be guided through a rehabilitation program progressively, with perspective and confidence that no harm is being done, and to 'NORMALISE' your activity as much as possible.

*** It is extremely important to be able to understand that even though it hurts, there is NO HARM ***

The process of NEUROPLASTICITY describes the way in which the brain's neural connections and pathways can be altered throughout life as an effect of environmental (the 'CONTEXT') & behavioural factors, thinking & emotions, as well as by changes resulting from bodily injury. This can occur in a negative way (this is called 'maladaptive neuroplasticity') and is then able to result in persistent sensitised pain. Importantly it can also be facilitated to occur in a positive direction ('adaptive neuroplasticity') and reverse the situation. This process reduces and de-sensitises pain back to normal protective levels. This re-adaptive process is based on a solid foundation of PAIN LITERACY (knowing pain).

**KNOW
PAIN.
KNOW
GAIN.**

(PS: unfortunately for many this could also be "*Know pain OR no gain!*")

References & Resources

There are a huge number of available scientific language references for the information provided here – these are available on request.

Some useful patient resources and links to explore this area further are available on my website www.painliteracy.com.au and directly via www.kalfried.com.au/for-patients.php.

Another metaphorical explanation of pain biology processes including sensitisation is available via <http://kalfried.com.au/Burning.php>



I am offering a specific four-point plan using the key parts of what I have found to be most necessary for a pain re-adaptation program to be safe and successful. This is explained via <http://kalfried.com.au/kals-plan.php>

- **K**ONSTRUKT A FOUNDATION OF PAIN LITERACY
- **A**NALYSE WHAT IS HELPFUL & WHAT IS UNHELPFUL
- **L**EARN THAT PERCEIVED HARM IS NOT ACTUAL HARM
- **S**TART TO MOVE AGAIN CONFIDENTLY
