working minds uk
DOVEY WILDAY CONSULTANCY

Back Pain
A new understanding

Working Minds UK
www.working-minds.org.uk

What Is Pain?

The formal definition of pain developed by the International Association for the Study of Pain states that Pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage”.

This definition outlines that pain is an unpleasant experience with both sensory and emotional aspects, not either or, and that it is associated with perceived or actual damage to the body. Pain can be experienced as a brutal, distressing and, at times, a terrifying feeling that possesses you to desperately want to be rid of it. It can often feel like something important is damaged.

It is generally accepted that there are two different types of pain, acute pain and persistent (or chronic) pain

Acute Pain

Acute pain is pain of recent origin. For example, the sudden pain you feel when you bang your knee or hit your head on a shelf is acute pain. It immediately alerts you to a threat of damage to some part of your body so that you can take appropriate action for healing and enhance your survival. It is a useful alarm signal to tell us there is something wrong in the part of our body that hurts, and that we need to pay attention and do something about it. The important thing to note here is that acute pain is necessary for healing and recovery, when tissues of our body are damaged. It serves a highly useful purpose in telling us to protect an injured area whilst healing occurs, and once healing has occurred, the pain settles and we can return to normal.

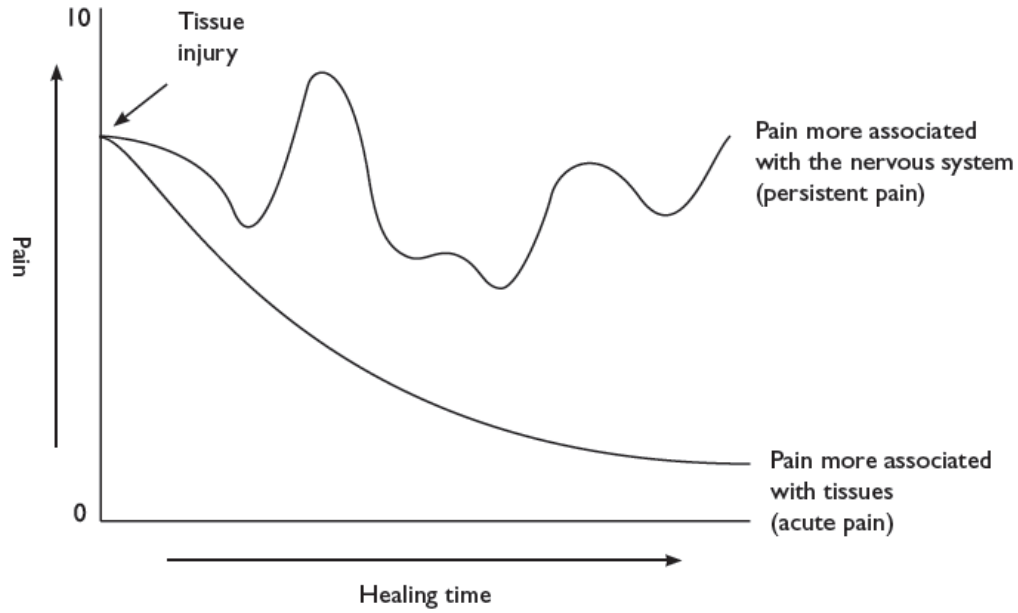
Persistent Pain

Persistent pain, including persistent back pain is biologically very different to acute tissue injury pain. It is generally accepted that any pain that has lasted for more than 3-4 months can be described as persistent or chronic. Persistent pain is no longer useful to us for immediate survival. It is pain that has persisted long after the tissues of the body have healed. It’s important to understand that when pain persists, it is not due to a failed healing process, as any ‘injured’ tissues have healed. The illustration in figure 1 demonstrates that over time pain related to an acute injury will recover gradually over time. However pain associated with persistent pain tends to be up and down with no consistency.

Persistent back pain can really drag you down. It can make you feel fed up, angry, annoyed and frustrated. It can vary from day to day. On some days you might feel like you are over the worst of it, whilst on other days it feels like you can’t even raise yourself out of bed.

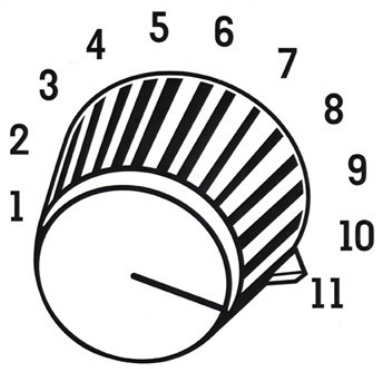
It doesn't follow a consistent pattern like acute pain does, and will feel like it will never go away.

Figure 1: Acute and Persistent Pain Patterns over time



Whilst it is easy to predict when your recovery will be complete with acute back pain, this is not the case with persistent back pain.

It is still a common feature of our healthcare system, that when pain becomes persistent, some health professional's still hunt around looking for the damaged tissue, long after healing has occurred. But we now know that persisting pain has more to do with biological changes in our nervous system, and how we respond to those changes, and what we think about our pain, than actual on-going injury or damage in our body. These biological changes, our psychological response to them and the social context in which we exist can turn up the volume in our nervous system, like an amplifier pumping out loud music. As long as these changes continue, the pain persists



Pain is now understood to be the consequence of many factors. This helps us to understand pain better, as it takes into account the many dimensions of our life that can influence pain including biological, psychological and social factors (often referred to as the bio psychosocial approach). This is helpful when we look at ways to help manage pain that persists.

To understand pain better we first need to understand how we process information on a moment-by-moment basis to enable us to function. We are complex beings and much has been learnt recently about how human beings develop and process information generally. It is these recent developments and new understandings of human brain processing that have further enhanced our understanding of pain.

Understanding how we function and process information

A basic assumption in information processing was that we interact with our world in a very logical and unbiased way. It was believed that data was gathered accurately, processed rationally and that our conclusions would flow in an accurate empirically grounded manner. We now know that the brain processes data very differently from this- often using lots of short cuts based on the unique individual learning that we have each experienced.

We now know that all data that comes into the brain enters via the back part of the brain which is our unconscious processing, data comes into the brain from our internal sensors to give us information about what is going on internally and our external sensors (eyes, ears, smell, taste, touch etc.) to inform us as to what is happening around us.

The brain then filters all of this new data through our archives of previous learning and based on an assessment of all of this data passes forward to the conscious arena only in the region of 20-30%. As such we receive data based on what our brain has decided is relevant for us to know based on our previous learning.

The main function of our brain is for our survival and it has a very complex protective survival system. Our protective system needs to enable us to identify danger both internally and externally. We have a good understanding of the system that is in place for our protection from external danger. This is called our fight/flight/freeze mechanism. This system is switched into play when the brain receives data that it believes is related to previous danger or if the data is new to us and we have no sound data stored to tell us it is safe. In both circumstances the brain will

turn on our fight/flight/freeze response to enable us to respond to the danger in a way that will heighten our chance of survival. We then have our immune system which will check changes in internal processes and set of changes internally should it detect it is under attack. We then come to our internal pain protection system. This comes into play when data is received from sensors in our body that detect changes in pressure, temperature and chemical balance. This information is weighed up alongside previous learning and the brain decides how dangerous the situation is for us and how it should respond. Do we need protecting? If the brain decides that we do then it will send messages of pain, so that we slow down and protect what it believes to be a vulnerable body area.

All of these systems can fire off in error; the brain can make erroneous decisions. We know this to be true of our fight/flight/freeze system and when it is in error (that is it switches on when we are not in danger) we call this anxiety. So too can the pain system be switched on when we do not need protecting and this is the case in persistent pain.

With our flight/fight/freeze system- if we cope with the erroneous switch on as if we were indeed in actual danger (i.e. we flight or overcompensate when we feel anxious) we inadvertently reinforce the continued error and the brain learns that we are safe because we have protected ourselves from what was dangerous and it will continue to see the trigger as a continued threat.

The same is true with persistent pain. If we treat on-going pain as a sign to protect ourselves then we inadvertently maintain the brain in a belief that there is indeed damage and a need for continued protection and so pain.

How does this affect our understanding of Pain?

We no longer think of pain as a measure of tissue damage- but a complex and highly sophisticated protective mechanism.

Our body contains specialised nerves that detect potentially dangerous changes in temperature, chemical balance or pressures. These danger detectors (nociceptors) send alerts to the brain. They cannot actually send pain to the brain because all pain is made by the brain.

Pain is the result of the brain evaluating information which includes the danger data from the danger protection system but also from other data such as other incoming sensory data (hearing, sight, smell etc.), our

expectations, previous exposure, cultural and social norms, our beliefs, as well as our current emotional state.

The brain produces pain. Where in the body the brain produces pain is a best guess scenario based on all of the evidence it has to hand including current incoming data as well as previously stored data.

It is pain that tells us not to do things such as walk on an injured foot or use an injured hand, it also signals for us to do things such as seek out medical opinion, see a physio or to rest.

We know that pain can be turned on or tuned up by anything that provides the brain with credible evidence that the body is in danger or needs protecting.

So is pain all in my head?

No! We cannot say that pain is all in the brain, it is a complex process that relies on data from danger detectors (acting as the eyes and ears of the brain) that are located though-out almost all of the body tissues as well as other data about the current situation and that we have stored in our memories in our brain.

When there is sudden change in tissue environment, these detectors are our first line of defense, alerting the brain to mobilise inflammatory mechanisms that increase blood flow and cause the release of healing molecules from nearby issues thus mobilising the repair process.

Your pressure danger detectors will pick up a pinch to the skin, the build up of lactic acid at the end of a sprint of exercise will be picked up by the chemical detectors.

Danger messages travel via danger transmission neurons that run up the spinal cord to the brain. The brain governs the sensitivity of these neurons.

If the brain evaluates all its information and deems that the situation is one of true danger it will make the danger transmission system much more sensitive (descending facilitation) or if it concludes things are not really dangerous then it will decrease the sensitivity of the danger transmission system (descending inhibition).

Many regions of the brain are involved in danger evaluation and the process is amazingly complex.

To understand in simpler terms we know that any credible evidence that the brain has that the body is in danger and that protection would be

helpful will turn up the pain experience. Any credible evidence that the brain has to say that the body is safe will decrease the likelihood and intensity of pain.

Self-perpetuating pain

This is where our understanding of pain itself becomes part of a vicious cycle. We know that as pain persists the nociception system becomes more sensitive. What this means is that the spinal cord sends danger messages to the brain at a rate that overestimates the true danger level. This is a normal adaption to persistent firing of spinal nociceptors. Because pain is (wrongly) interpreted to be a measure of tissue damage, the brain has no option but to presume that the tissues are becoming more damaged. So when pain persists, we automatically assume that tissue damage persists.

On the basis of what we now know about the changing nervous system, this presumption is often wrong. The piece of knowledge that's turning up the pain in the brain is actually being reinforced by itself!

(Lorimer Mosely: **Explainer: what is pain and what is happening when we feel it?** November 18, 2015 theconversation.com)

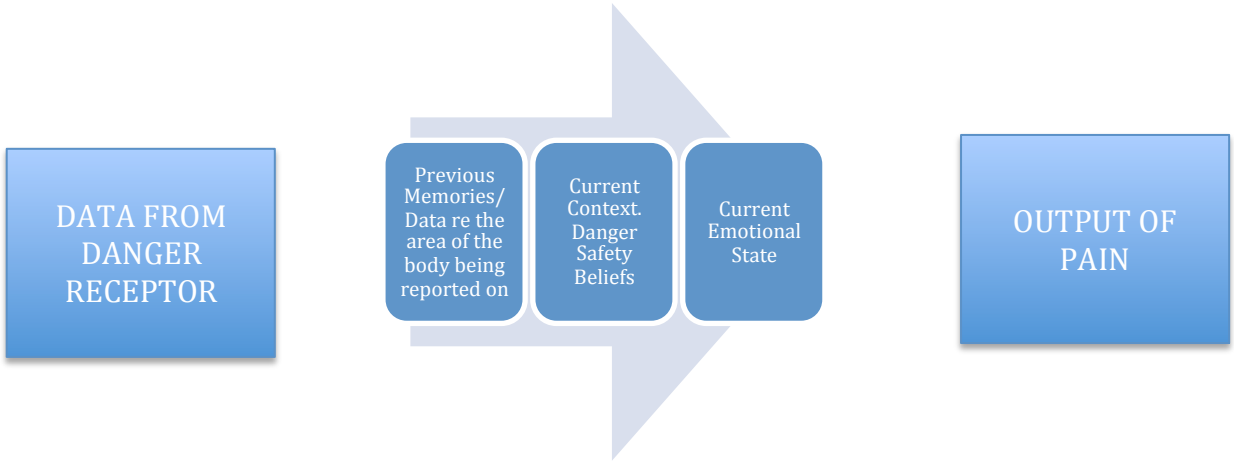
The Pain Process

CHANGES DETECTED BY THE DANGER DETECTORS (NOCICEPTORS)

MESSAGE SENT TO THE BRAIN VIA THE DANGER TRANSMISSION NEURONES

BRAIN MAKES SENSE OF THIS DATA ALONGSIDE OTHER DATA STORED IN THE BRAIN TO DECIDE…..

'HOW DANGEROUS IS THIS?'



EXPERIENCE OF PAIN

BELIEF THAT PAIN = DAMAGE

HEIGHTENED DAMAGE BELIEFS

HEIGHTENED DANGER PERCEPTION IN BRAIN

INCREASED SENSITIVITY IN DANGER TRANSMISSION SYSTEMS

MORE PAIN

OVER-PROTECTION
& CONTINUED BELIEF IN DAMAGE

How can this help us reduce our pain experience?

For the brain to reduce pain, it needs to have reduced credible evidence of danger and increased credible evidence of safety.

We know that local anesthetic can turn off danger detectors (for example for use in surgery). We also know that we can simulate the body's own danger reduction mechanisms.

We can reduce the experience of pain by anything associated with safety.

1. Understanding Pain

Understanding that pain is a complex mechanism that can be over-protective and cause pain and swelling in the absence of harm rather than the old beliefs that pain always means harm. When we change the meaning of our pain, this in turn changes the way we manage our pain. We will be more inclined to move more freely and increase our activity levels if we understand pain as on over-sensitivity of our protective system rather than pain = harm and damage.

As we reduce overly protective behaviours the brain can learn that no harm occurs and that less protection is necessary, thus reducing the need for pain and inflammation to slow us down. Thus turning down our pain.

2. Exercise & Active Coping

By gradually increasing our activity the brain can gather new data that our body is safer than it first thought- gathering safety data like this means that the brain will begin to turn down the sensitivity of the danger system and we will experience less pain. This process will generally lead to an initial low-level increase in pain but as you continue your gradual stepped up activity it begins to relearn.

If we increase our activity too quickly this heightens the brains danger protection system and protective measures such as pain and inflammation are likely to increase to a very heightened level to stop you. This then forces protective behaviours such as resting and provides no new information of safety- this in turn keeps the brains evidence of danger heightened and turns up the sensitivity of the system causing pain to persist. This is often termed 'boom and bust behaviour'.

3. Safe people and places

When the brain is gathering all of the data incoming from the danger sensors alongside the data it has stored it is assessing the danger for you. This will take into account the environment that you are in and the

support/access to protection you have around you. If the brain assesses evidence of a safe environment and external support it is more likely assess us as in less danger and so send less protection in the form of pain and inflammation.

4. Distraction

A very effective way to reduce pain is to make something else seem more important to the brain – this is called distraction. Only being unconscious or dead provide greater pain relief than distraction.

As we have explained in persistent pain the sensitivity of the danger system (the biological structures) increases so the relationship between pain and the true need for protection becomes distorted: we become over-protected by pain.

This is one significant reason there is no quick fix for nearly all persistent pains. Recovery requires a journey of patience, persistence, courage and good coaching. The best interventions focus on slowly training our body and brain to be less protective