
Back pain management programme

Explaining pain

The nervous system

The nervous system consists of the brain, the spinal cord and the peripheral nerves. These peripheral nerves are like the branches of a tree stretching out all over the body. They send instructions from the brain and receive messages from the environment.

The 'sensory' nerves are made up of chains of many bundles of fibres, which run from the head to the bottom of the body. They cover the skin, muscles and ligaments of the limbs, torso and spine and the organs of the body. They sense changes in the environment and in our own bodies and they transmit information about temperature, touch/pressure, chemical stimulus and pain. This information is transmitted by electrical impulses in the nerves and chemical signals in the spaces between interconnecting nerves.

Historically, doctors believed the brain was a control centre, observing all the incoming information and responding to, but not being able to **affect**, what was felt. However, we now know that the brain and nervous system are much more integrated. Perhaps a better way to view the nerves is as 'tentacles' of the brain.

What is pain?

Pain has been defined as: "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (International Association for the Study of Pain, 1979).

How do we respond to pain?

The important bit to note here is '**potential**' tissue damage. In mechanical pain, actual tissue damage doesn't have to occur for pain signals to be made. Pain is used in this way as an early warning system to **prevent** injury. For example, if you stretch your finger back too far and hold it, pain will be present long before any damage is done to the joints and ligaments.

Theory one – a stimulus/response model

In a simple injury such as a cut, the initial injury causes **fast nerve fibres** to send lots of impulses to the brain to tell it that tissue has been damaged. As the healing process starts, **slower nerves**, which are triggered by the chemicals of healing, are activated to tell the brain that healing is in action.

This prompts the brain to take action to protect the vulnerable area. As the tissue gets stronger, the pain signal should slowly fade until the area is fully healed.

But this theory is too simple for most painful conditions.

Theory two – the ‘pain gate’ model

The theory suggests there is a **‘gate’** in the spinal cord, which can be opened, closed or left ajar to signify different degrees of pain.

This 'gate' can control how much pain your brain is aware of. It is designed to be able to block pain from an injury if the pain will affect you badly. This mechanism has evolved in mammals (and humans) so that the onset of pain is delayed when it is advantageous.

For example, an animal with a leg damaged during an attack by a predator may still be able to run away and hence survive if the pain is not felt. Only after the animal escapes will the injury start to hurt.

The healing process and pain

This gate model also accounts for the opposite effect, that is, an elevated awareness of pain. For example: after an ankle sprain the whole leg will be very sensitive for a short period of time during the first stage of healing (the **inflammatory stage**). This has the advantage of encouraging you to protect the injury.

The very sensitive stage wears off rapidly (within 48hours) as the second stage of healing begins. It is important to understand that this second stage, called the **regeneration stage**, relies on a gradual, but steady return to normal activities.

Misunderstanding your pain

Misunderstanding the meaning of the pain, over caution, delaying your return to normal activities or premature overstressing of the injury, can all prolong the very sensitive period in an initial injury. This inappropriately widens the 'gate' and 'up-regulates' the nervous system, causing hypersensitivity, and hence increasing the perception of pain.

Negative emotions such as fear, anxiety and depression, can sometimes cause this 'gate' to be propped open. But positive emotions such as happiness, interest, excitement, can close the gate.

So what goes wrong in chronic pain?

In most people, once the initial injury has healed, the pain signal starts to fade and eventually goes away completely. In some people, however, the pain signal 'forgets' to decrease, even after the injury is fully healed.

In these cases, the 'up-regulated' nervous system has 'learnt' the pain. The signal effectively becomes stuck and the gate is left permanently open. The pain signal is no longer a useful signal to prevent injury or to encourage us to protect an area as it heals.

In addition, the 'open gate' may mean that even normally pain free sensations such as a stretch may be perceived as painful.

This means that injury isn't the problem; the problem is the pain.

This is often made worse as people will try to protect painful joints and muscles by not using them. If people are in constant pain their muscles de-condition due to decreased activity levels. This leads to weakness, tightness and loss of stamina, which can further lower the pain thresholds.

The problem is further complicated by 'true' injuries, which of course can also exist hand in hand with a chronic pain problem. New problems, as a result of poor back care, bad posture or accidents crop up throughout life. It is important to remember that injuries heal.

Theory three – 'the constantly learning' nervous system

This theory recognised the nervous system as a living 'plastic' system, constantly learning and adapting to events. In effect you **are** your nervous system. We cannot pluck out elements of a pain problem and treat them in isolation; we must look at the whole person. Your background, beliefs, past experiences (good and bad), physical health, relationships and work happiness etc can all affect the way you view, respond, interact with and experience your pain. A chronic pain problem can have a devastating affect on all areas of a person's life. In effect, many people find that their pain becomes their main focus. They become trapped in a pain 'bubble'

Managing your pain

Our approach to chronic pain does not treat pain as a physical problem. This has been shown to be unsuccessful, but instead, we teach you how to manage the problem. We are not trying to 'cure' the pain but hopefully to burst the bubble and put the pain back in its place. As a result of managing the pain better, improving your fitness and taking back control of your life, you will find that your pain levels can improve. More importantly have minimal impact on your life.