

## Low Back Pain Myths

### 1. Only tissue pain is real

Descartes's 17<sup>th</sup> century theory that pain is a hardwired system, also called the specificity theory, has been proven to be wrong over the past 50 years. We now know that pain is a complex multidimensional phenomenon. In 1965 Melzack and Wall published an article proposing the "**Gate Control Theory**". This ground-breaking article proposed that:

- Nerves carry messages from all parts of the body to the spinal cord which is the main pathway for messages to and from our brain.
- In the spinal cord there is a series of gates.
- Pain opens the gates so the brain can receive pain messages.
- If the gates are wide open, a lot of pain messages can get through allowing you to experience a lot of pain.
- Emotions, thoughts and activity of the large A $\beta$  fibres (through touch and movement) can open or close the gates.

This theory led to the realisation that the **three main dimensions of pain** are sensory (the **sensation of pain**), cognitive (the **thoughts about the pain**) and affective (the **feelings about the pain**). Each of these dimensions of pain will to some extent influence the way you experience the pain. Consider the difference between having a bruise caused by a bump (you often can't even remember how you got that bump), and a bruise caused by being hit by a spouse. The amount of tissue damage can be the same but the experience will be totally different. Injuring your back if your mother has had three back operations will be a totally different experience, and more threatening, than it would be for someone with active, healthy parents.

Factors such as culture and previous experiences can influence the experience of pain.

We also now know that the body has very **powerful pain inhibitory systems**. This explains why it is possible for a soldier to run with a broken leg. The brain knows that in that situation it is more important to survive than to feel the pain that would normally warn us of an injury.

We can to some extent influence the "gating system" and thus the amount of pain we feel.

OPEN GATE	CLOSE GATE
Stress, tension, fear, anxiety, worry, depression and anger	Relaxation, meditation
Thinking about your pain	Distraction – TV, radio, music, reading, conversation, social events
Poor posture and maintaining the same position for too long	Good posture and regular movement
Feelings of lack of control	Positive thinking to increase feeling of control and confidence

### Activation of your own Pain Inhibitory Systems:

1. Enjoying yourself - laughter is the best medicine!
2. Relaxation and / or meditations.
3. Distraction for instance reading a good book, spending time with friends, watering the garden – anything you enjoy doing.
4. Exercise! Although exercise should be limited when you are in acute pain, exercise increases the endorphin levels in the blood and helps you fight pain. Regular exercise is the only thing that has been shown to be effective in avoiding the development of low back pain.
5. Passive modalities such as massage, TENS, heat and aromatherapy can also help to improve endorphin levels.

### Key Messages:

1. Our thoughts, emotions, previous experiences and culture can play an important role in the way we perceive pain. Therefore **the amount of pain does not necessarily reflect the amount of damage.**
2. We can **open and close the “gates”** in the spinal cord and influence the amount of pain we experience.
3. **Our bodies have powerful pain inhibitory systems.**

## 2. Abnormal scans validate and explain your pain

In a huge study comparing Magnetic Resonance Imaging (MRI) of patients with and without pain the **amazing** finding was that the asymptomatic population had the same amount of abnormal findings on MRI as the symptomatic population! This, amongst other reasons, led to the development of specific guidelines for the management of low back pain. Worldwide the guidelines agree that special tests such as MRI's and x-rays should only be done on patients with signs of serious pathology. If your doctor does not recommend doing any of these special tests you should feel extremely relieved! It will be saving you and your medical aid a lot of money and he is obviously then happy that, after examination, he found nothing to warrant further investigation.

From the above it should thus be clear that **abnormal findings** on x-rays and MRI are **common** and does not necessarily imply that that is the reason for your back pain. A good clinical evaluation by your physiotherapist or general practitioner is still necessary to assess the extent of your problem and to ascertain if the special test findings (if any were done) correlate with your signs and symptoms.

Disc **degeneration** and / or facet joint degeneration is very common especially in people over the age of 30 and is part of the **natural process** of degeneration (ageing) that takes place in our bodies as we grow older. Strenuous sport activities, heavy physical work and overweight are all factors that can increase the chance of this taking place sooner. The levels that are bio mechanically at a disadvantage in the lower back are L4/5 and L5/S1. They are normally the levels affected by degeneration.

With research they have established that about 85% of patients have non-specific low back pain. This means that the **specific structure** responsible for the pain **cannot be established** with any certainty. Often a combination of structures such as ligaments, discs and muscles contribute to the pain. The majority of low back pain patients develop back pain due to poor posture, inactivity and working in prolonged positions.

#### **Key Messages:**

1. **Abnormal findings** on x-rays and MRI are **common** even in people without back pain.
2. Your **pain** does **not necessarily** come from the **area** that seems **affected** on an x-ray or MRI.
3. **Degeneration** is part of the **normal ageing** process.
4. It is often **impossible** to say which **structure/s is responsible** for your pain.

### **3. Activities such as bending will injure my back and aggravate the problem.**

Acute pain is normally the way our bodies respond to an injury or strain. The pain will limit our movement to aid the healing process. **Acute inflammation** will **subside in 10 to 14 days** and that is the time that we need to be more careful in how we do certain things, for instance bending. Once the inflammation has settled down our muscles, joints, discs and ligaments actually need movement to improve the circulation to these structures.

Vertebral discs (the cushions between vertebrae) have a cartilage like outer ring and a soft jelly centre. The **disc** has poor blood supply and receives it's **nutrition** through **osmoses**. This means that it needs the pump action provided by **movement for good nutrition**. The joint cartilage receives it's nutrition in exactly the same way. Muscles have good blood supply but with inflammation a lot of waste products build up in the muscle and can contribute to pain. The best way to **get rid** of the **waste products** is to **improve the circulation** to the muscles. Therefore, again we need **movement!** The anti-

inflammatory drugs the doctor prescribes initially, will aid the process and certain physiotherapy modalities are also aimed at improving circulation. Once the medication is finished, however, regular movement will aid the healing process.

**Our backs were specifically designed for movement.** Once the initial inflammation has subsided, research has shown that returning to normal activities is the best way to get rid of your pain. **Maintaining positions** for long periods has more of a **detrimental** effect than movement. Sitting, standing and lying down for long periods will decrease the circulation and slow down the healing process. This explains why, in the initial phase, you may have more pain in the early morning, on rising.

Bending is a natural movement for our backs. The discs of the lower back were not designed to bend and turn at the same time especially under load. It is therefore important to pick up something without adding rotation to the action. Your physiotherapist will assist in teaching you the correct way of doing things.

#### Key Messages:

1. **Inflammation will subside** in 10 to 14 days.
2. **Movement** is important for **nutrition and circulation**.
3. **Movement aids healing**.
4. **Our backs were specifically designed for movement**.
5. **Prolonged positions** are **detrimental** to joints, ligaments, muscle and disc and will **slow down healing**.

#### 4. Let pain be your guide – Rest when it hurts.

Research has shown unequivocally that **rest is not beneficial** for persons with non-specific low back pain. The best way to recover from an episode of pain is to **resume normal day to day activities** as soon as possible. As explained before, movement is essential for good circulation and recovery. Thus the sooner you start moving the sooner your body can start recovering.

Initially **some movements may hurt**. For the first 10 – 14 days you can be a bit more careful with those specific movements. After 14 days when the most of the inflammation should have resolved you can gradually return to normal activity.

The physiotherapist may have started you on breathing and stabilising exercises quite soon. These are very gentle exercises that will assist circulation and help support the back.

In the first information session it was explained how emotions and thoughts can influence pain. It should therefore be remembered that a **lot of factors will contribute to the pain**. Some **pain after activities** can be expected especially in the beginning. This

is **normal** and nothing to worry about. Research has shown that most pain will resolve in the first two months in at least 66% of patients. Some patients can have pain and limitations of activities for up to a year without anything seriously wrong with their backs!

#### **Key Messages:**

1. **Bed rest is not beneficial.**
2. **Different factors** can **contribute to the pain.**
3. **Some pain after activities is normal** even for as long as a year after an injury!

#### **5. Pain is a warning that something is seriously wrong.**

The natural history of non-specific low back pain is to resolve itself in 80 to 90 per cent of people. As the natural healing process takes place, the pain should gradually disappear. A small percentage of people (7 – 15%) may have on-going pain. Once the **pain persists** for longer than the normal healing time (normally after three months) it is known as **chronic pain**.

For a long time very costly and mostly unnecessary tests have been done on these patients in an attempt to identify the cause of pain. With research it has been proven that the **problem** lies in a **sensitised nervous system** and not in any specific structure.

When an injury occurs the inflammatory agents will trigger the c fibres (nerves that warn the body of change) in the area of injury. They go to the dorsal horn in the spinal cord where there is a series of “gates” (see above point 1) and from there to different regions of the brain. Depending on **different factors**, such as the amount of damage, thoughts and emotions, the **brain will decide how to react to the messages**. If the gates are open it will react by experiencing a lot of pain and if the gates are closed it will feel only a little pain. “We believe that all pain experiences are normal and are an excellent though unpleasant response to what your body judges to be a threatening situation. We believe that even if problems do exist in your joints, muscles, ligaments, nerves, immune system or anywhere else, it won’t hurt if your brain thinks you are not in danger.” Butler & Moseley (2004).

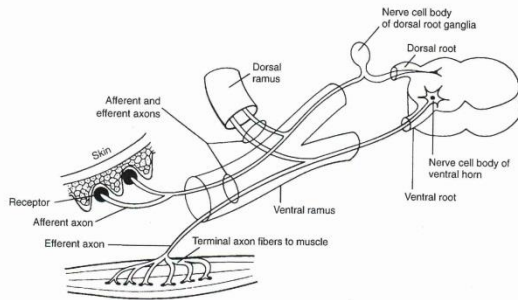


Figure 2-2. Afferent and efferent courses of axon cylinders related to the nerve root, spinal nerve, and ramus.

## Messages from body tissue to dorsal horn

When the spinal cord gets bombarded by pain messages after an injury this can lower the threshold of the cell membranes. If the **“gates”** remain **open** because of, for instance, unnecessary **worry or low mood**, more pain messages go to the dorsal horn in the spinal cord. The dorsal horn (or gate) will, over time, undergo change and allow even more messages to go to the brain. In time it can even allow **normal messages to be interpreted as pain**. The pain system (nociceptive system) is now like a keyboard that has become stuck. Instead of signalling an x only when you type x, it will give you xxxx. At the same time as the sensitivity to input increases, our natural pain inhibitory system loses some of its ability to fight pain. The brain will start to overreact to any input. The nociceptive system has become dysfunctional. In these circumstances **pain no longer means harm**.

### Key Messages:

1. The **brain decides how it will react** to messages depending on circumstances.
2. The **amount of pain** experienced is normally **equal to the threat** value of an experience and not the amount of tissue damage.
3. In chronic pain the **pain system** becomes **sensitised and dysfunctional**.
4. The pain **inhibitory system** becomes **less effective**
5. **Pain does not equal harm**.

### 6. I have a “slipped disc” / I have put my back out.

As was explained in a previous section, in 85% of cases the specific cause for low back pain cannot be established. Furthermore abnormal findings on x-ray or MRI do not necessarily reflect the origin of the pain.

The lumbar **discs are cushions** between the vertebrae and assist in shock absorption and movement. It has an **outer layer that is cartilage** like and a **softer jelly like centre**. With ageing small cracks can develop in the cartilage and the soft centre can push through the outer layers. This can cause swelling and inflammation resulting in pain. The **disc is adhered to the vertebrae** and will not separate from the vertebrae even in

severe injury such as car accidents. The **disc can therefore not “slip” out** – this is just a term used for swelling of the disc.

If the disc has a lot of cracks in the outer layer (often from prolonged sitting and bending) bending and turning especially under load can suddenly cause a lot of swelling and even pressure on the nerve. Fortunately this does not happen often and in most cases the swelling and pain will resolve over the following six weeks. This is referred to as **disc protrusion**. On MRI it has been shown that these **protrusions can be totally absorbed** by the body leaving you with a slightly narrowed disc space on x-ray. It is important to remember that disc narrowing is as common amongst pain free individuals as in people with low back pain.

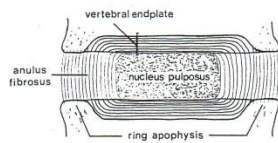


Fig. 2.4 Detailed structure of the vertebral end-plate. The collagen fibres of the inner two-thirds of the annulus fibrosus sweep around into the vertebral end-plate, forming its fibrocartilaginous component. The peripheral fibres of the annulus are anchored into the bone of the ring apophysis.

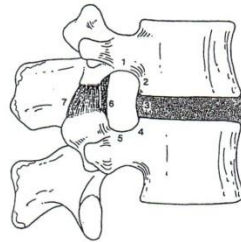


Fig. 5.4 Lateral view of the boundaries of an intervertebral foramen. 1 — Pedicle. 2 — Back of vertebral body. 3 — Intervertebral disc. 4 — Back of vertebral body. 5 — Pedicle. 6 — Ligamentum flavum. 7 — Zygapophysial joint.

### Disc adhered to vertebrae    Vertebrae fit snugly together

The **vertebrae** of the back are like its building blocks. They **fit tightly into each** other like a jig-saw puzzle. The only way one vertebra can move on the other is when a fracture is present or in severe degeneration (people over the age of 60). The spine can appear out of line because of muscle spasm. This should return to normal once the pain is better.

If our **backs crack** when we move it in a certain way or stretch it, it **does not mean** that it has been **put in place** again. It is suspected that the crack is due to joint fluid being moved from one place in a joint to another. The joint fluid is under negative pressure and the crack is a result of it being forced from one side to another. There are a number of theories about why this can ease pain; unfortunately we don't really understand the rationale behind this. Continuous “cracking” of the back is not advisable. The physiotherapist will give you **exercises** that will **strengthen** the weaker muscles and **lengthen** any shortened muscles. In this way your muscles will be able to give your **back enough support** with day to day activities and sport.

### Key Messages:

1. **Discs cannot slip out**
2. **Disc swelling** or protrusion will normally be **absorbed again** by the body
3. **The back cannot go “out”.**
4. **Exercises** will strengthen the back so that the **muscles provide** enough support.