Chronic Low Back Pain

Introduction

- Chronic low back pain (CLBP) (pain lasting more than 3 months) is the most common reason why people are referred to a pain clinic.
- Low back pain may extent into the buttocks, legs, lower abdomen or groin.
- 80% of people experience back pain at some stage in their lives; it's so common, some experts say it's 'part of being human'.
- 10% of the population have CLBP at any one time (2.3 million Australians right now).
- LBP is usually triggered by an injury, strain or overuse of the back (often at work or sports).

Leg pain (sciatica)

Some patients experience both back pain *and* leg pain—usually radiating down the back of the thigh or calf, or occasionally 'shooting' in a narrow band into the foot.

- Leg pain may be caused by the *facet joints* or the *discs* (this is called 'referred pain').
- In 10% of cases, pain is caused by irritation of the nerves going to the leg by a *protruding disc* in the spine (this is called 'sciatica').

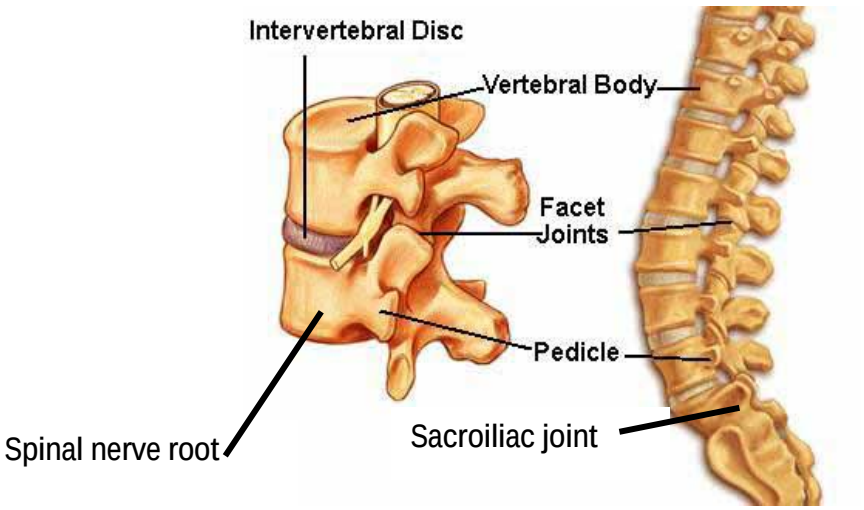

Figure 1. This diagram shows structures in the lower spine which may cause back pain.

Structures of the lower back

- Intervertebral discs: Are like 'shock absorbers' between the bones of the spine (vertebrae). Discs can develop small tears or 'fissures' (like cracks in a tyre) which may become painful. Occasionally, discs develop a protrusion which can irritate the nerves running down the leg, sometimes causing pain, numbness and weakness ('sciatica').

- Facet joints: Small joints on the outside of the spine which can cause LBP most commonly in people over 60—quite rare in younger persons.

- Sacroiliac joints: These are the largest joints in the body which join the pelvis and spine together—may cause back pain felt mainly in the buttocks and back of the thigh.

- Back muscles: Back muscles act like 'scaffolding' to support and stabilise the spinal column. These muscles may develop 'knots' ('trigger points') which cause pain. Muscles in the buttock like the *gluteus or piriformis* may also cause LBP, radiating from the buttock, down the back of the leg (similar to 'sciatica').

- Spinal stenosis: Some older patients experience LBP and aching in the legs when they walk or climb stairs, due to *narrowing* of the holes in the spine through which the nerves run. Aching in the legs starts at a set distance and is relieved by rest or leaning on a shopping trolley in the supermarket when walking (taking the pressure off the lower spine).

- Pars fractures: About 10% of the population are born with an increased risk of developing small fractures in the base of the spine. These are called *pars (stress) fractures* and are more common in younger people with LBP and in cricket fast bowlers.

Pin-pointing the cause of your back pain

Because there are so many structures in the lower back, it's often difficult to pinpoint which ones (discs, facet joints, muscles, ligaments) are causing the pain (see below).

Red flags: We're always on the lookout for rare but serious conditions causing LBP that should not be missed, called 'red flags'. These include *fractures* of the vertebrae with osteoporosis, *infections* of the discs and bones, *tumours* (e.g. breast or prostate cancer), *arthritic conditions* or *major nerve compression*.

The good news is….
Over 95% of people with low back pain do not have a serious condition causing their pain (red flags), such as a fracture, tumour, infection or nerve compression.

Back pain signals are generated in the brain after just few weeks

People who experience back pain for more than a few weeks undergo changes (seen on brain scans) in the parts of the brain 'controlling' their lower back. After a few weeks, most of the pain signals aren't coming from the back anymore, but are produced by these areas of the brain! This amazing discovery was made only a few years ago and is one of reasons back pain is difficult to diagnose and treat.

Patient Information

Our *spinal cord* also has a built-in pain signal 'amplifier'—if you've had back pain for more than a few weeks, the pain signals are 'amplified' in the spinal cord and continue to fire-off, even though the back has 'healed'.

In other words, the 'pain alarm' keeps on ringing even though there's no ongoing 'damage' in your back.

This is called pain *sensitization.*

The 'cause' of your back pain: Don't get hung up on the diagnosis!

We're all keen to find out what is *causing* our chronic back pain; which disc, joint or nerve is involved? This is because many of us (including health care professionals) have a *structural or mechanical* way of thinking about pain. Pain doesn't really work that way because pain signals are produced and amplified in the brain and spinal cord.

In 80% of cases, no clear cause is found for a person's back pain.

That's why most people are given the diagnosis of ***'non-specific'*** chronic low back pain. This isn't bad news because in most cases, we don't need to know the exact 'cause' of the pain to manage it effectively.

It might surprise you to know that even now, in the 21st century, there's no 'gold standard' test, x-ray or scan that reliably pinpoints the cause of a person's back pain.

Some people show a lot of changes (degeneration) on their spinal x-rays but only report minor back pain; others have 'perfect' looking x-rays and complain of lots of pain. Both situations are totally acceptable.

Remember, you can't see pain on an x-ray or MRI scan.

- The main reason doctors order x-rays or MRIs of the spine is to rule out red flags—rare but serious conditions such as nerve compression, fractures, tumours or infections.
- MRIs, CT scans and bone scans provide information about the *structure* of the bones, tissues and nerves in the spine but are not *diagnostic* on their own.
- Apart from *sciatica*, x-rays and scans are not usually needed to diagnose or treat LBP.

Frightening words

Many patients are concerned by the words used in their x-ray reports, such as '*bulges', 'protrusions', 'degeneration', 'nerve entrapment' and 'slippage'.*

However these are just technical words used by x-ray specialists in their reports to other doctors and are not as disastrous as they sound.

Don't get worried by your x-ray report—discuss it with your doctor.

Be aware that *jargon* used by health care professionals such as, '*degeneration of the spine', 'disability', 'slipped discs' and 'bone-on-bone*', sounds a lot worse that what's actually happening in your back!

MANAGEMENT OF LOW BACK PAIN

Time for some honesty

You may have noticed we talk about *pain 'management'* and not so much about pain *'cure'*. Realistically, a 'cure' for low back pain is *the exception rather than the rule* (probably less than 20% of cases). That doesn't mean we can't do anything to help you, but we want to give you *realistic* expectations and accurate information.

Many patients go from doctor to doctor, physiotherapist to chiropractor, herbalist to surgeon, looking for that elusive cure. This can be disheartening, exhausting and expensive.

Analgesics (pain relievers)

- Opioids: morphine-based pain relievers are **not effective** in most people with CLBP.
  - Oxycodone, Tapentadol, Norspan patch, hydromorphone, methadone, codeine.
  - Only effective in 1 in 5 people.
  - *Older patients* (> 60 years of age) with arthritis in their spine causing back pain **may benefit** from a small dose of opioid.
  - **Side effects** in most people (1 in 3).
    - Sleepiness, slowed breathing, nausea, constipation.
    - **Increased** in pain sensitivity.
    - Hormone deficiency (low testosterone in men), osteoporosis (brittle bones).
    - Drug dependency, addiction, death in overdose.
- **Tramadol**: may be effective in back pain—taken either *regularly* (slow-release form) or *'as required.'*
- **Paracetamol**: may be effective—consider taking 'regular' doses.
- **Non-steroidal anti-inflammatory drugs**: (e.g. Celecoxib, Naproxen, Ibuprofen) are very effective pain relievers, but *should only be used for few days at a time* for acute pain 'flare-ups'. Taking them *all the time* increases your risk of high blood pressure, heart and kidney problems, strokes and stomach ulcers. Topical gels (e.g. Voltaren gel) may provide a limited degree of pain relief.
- **Duloxetine**: (Cymbalta™) is an antidepressant with good pain-relieving effects for back pain.
- **Pregabalin or gabapentin** are nerve pain medications—sometimes helpful in patients with 'sciatica' (pain in the leg due to a 'trapped nerve' in the back).

Patient Information

Physical therapies: Stay active: A vital part of management.

- Physiotherapy (PT) is a vital part of effective back pain management. A lot of what pain specialists do is to provide pain relief so you're able to work with your physiotherapist.
- The main aim of PT for back pain is to improve your *function* and to prevent your pain and disability from getting worse.
- Physical activity of any kind sends 'good messages' to the brain, signalling that 'you're OK'— the brain concludes; 'you're able move around, so your spine can't be all that bad'!
- Out of Africa: We evolved over thousands of years to walk for days through the grasslands of Africa. So whenever we reproduce this (simply walking or other physical activities) the brain thinks 'everything's OK'—this in turn makes it *harder* for the pain alarm to be set off.
- I'm scared to move: Some patients are frightened of physiotherapy (and movement in general, such as lifting, bending, walking) because it 'hurts too much' or it 'might make my back worse' (or cause more 'damage'). We call this *fear-avoidance*—it's a kind of pain phobia and can be quite disabling.
- With *fear avoidance*, we focus constantly on 'what could go wrong with my back if I do anything' (this is called *catastrophizing*) and a vicious cycle of pain, fear and avoidance is set up leading to more and more disability. However, physiotherapists and psychologists have effective ways of helping with this problem.

Physiotherapy and gentle activities such as walking or swimming are very *unlikely* to 'damage' to your back, even if you experience some pain at the time.
Remember to stay as active as possible.

- Exercise: Walking, stretches, swimming or water-walking (hydrotherapy) are best.
- Spinal core stability: 'Core muscles' of the abdominal wall and the back support and stabilize the spinal column. Strengthening these muscles may reduce back pain and improving mobility.
- Spinal manipulation: Is not that helpful for CLBP but it may help with *acute* back pain or pain 'flare-ups'.
- Pilates and stretches: Can be helpful.
- Massage: May reduce muscle tension and discomfort in the back, but it's usually a temporary measure (hours-to-days).
- Trigger point release: Loosening-up painful 'knots' (trigger points) in the muscles of the back and neck may be helpful in some cases.
- Heat therapy (heat wraps): Effective for treating flare-ups of *acute* back pain.

- Spinal corsets and back braces: Are *not* helpful in the treatment of CLBP and may actually make the situation worse by reducing spinal flexibility.

- Acupuncture: 'The jury is still out'. There's a big 'placebo' effect, but it may be helpful for back pain in some cases. As a general rule, if five sessions of acupuncture don't do anything, then it's unlikely more will work-save your money.

- TENS machine: Is a simple electrical stimulator (the size of a transistor radio) applied to the back, which produces an 'electrical buzzing sensation' in the skin which turns-off the pain signal. It's the same effect as 'rubbing' your arm when you're hurt. TENS sometimes helps, is drug free, low risk and relatively cheap.

Procedures (spinal injections)

- Effectiveness: Unfortunately, there's no *magic* procedure or injection for back pain. We say a *50% (or greater) reduction in your pain for at least 3 months* is a successful result after a back pain procedure.

- Facet joint injections (FJIs): These are the most common spinal injections performed in Australia. A small amount of steroid (cortisone) and local anaesthetic is injected under x-ray into the facet joints. FJIs are effective in about *1 in 10 patients* with low back pain. They may be worth trying at least once if you are over 60 years of age and your doctor advises it, but if the FJIs don't work the first time, *don't* keep on having repeat injections in the hope they may work later.

- Facet joint (medial branch) neurotomies: This involves cauterizing or freezing the small nerves that go to the facet joints (performed under local anaesthetic with an x-ray machine). Neurotomies are effective in about *1 in 5 patients*.

- Spinal epidural steroid injections: A small amount of steroid (cortisone) and local anaesthetic is injected around a nerve going to the leg, near a protruding spinal disc. This reduces leg pain in *1 in 3 patients*. Epidurals often work well for a few days or weeks but may then wear-off.

Epidural steroid (cortisone) injections *do not* reduce back pain

- Sacroiliac joint steroid injections: May be helpful in patients with arthritic conditions like ankylosing spondylitis.

- Trigger point injections: Placing a fine needle or injecting local anaesthetic into a tight muscle 'knot' (trigger point) may reduce back pain in some cases. It's not well studied, but is relatively low risk and inexpensive.

- Spinal operations (fusions, laminectomies): Surgery should always be a last resort—all good spinal surgeons will tell you this. For *leg pain* due to a disc compressing a spinal nerve (sciatica), or *spinal stenosis* (see above), surgery may be helpful. For the treatment of back pain alone, the success rate is much lower. The use of implantable *artificial discs* is controversial. You should discuss these issues with your surgeon.

WARNING

Surgery *is required urgently* if you develops weakness or severe numbness in your leg(s), or you lose control of bladder or bowel function. If this happens, you need to go to the *nearest emergency department immediately* (*not* to your GP).

- Spinal cord stimulators are an implantable TENS machine. Wires are placed into the epidural space of the spine and electrical impulses are sent from a pacemaker implanted under the skin. These impulses block the pain signals emerging from the back. There is evidence that spinal cord stimulators may help in a select group of patients with back pain.

Clinical psychology and behavioural pain management

- Stressing the stress: The main factor that predicts a person's risk of developing *chronic back pain*, is not what the MRI scan shows or what the doctor says—it's the amount of *stress* a person is dealing with in their life at the time. This includes depression, anxiety, financial or family stresses and work issues.

The more stress you have to deal with, the greater the risk that your back pain may not improve.

- Clinical psychology: Techniques such as *Cognitive Behavioural Therapy (CBT)* and *Mindfulness-Based Stress Reduction* are very effective components of a pain management programme.

Is it all in my head?

When we talk about 'stress and back pain', it doesn't mean we think your pain isn't 'real', 'it's all in your head', you're 'weak', 'crazy' or 'malingering—it simply highlights the scientific fact that *stress increases pain*.

Pain management programmes

Are courses run by a healthcare team that provide providing physical and behavioural therapies, as well as education and lifestyle tips to help manage chronic pain.

There is *very good scientific evidence* that pain management programmes improve *function* and *quality of life* in people with low back pain. Sometimes the pain also improves, but not always. People often say, "my back pain hasn't improved all that much, but I'm functioning and coping with it much better" (such as using less medications, or returning to part-time work or sports).

Conclusion

Pain management is a long-term project with few quick fixes, but it can be very effective in improving pain, quality of life and physical function, especially if the person-in-pain is actively involved in their own care.