MODULE 1- Funny Things About Pain

Why Do We Get Pain?

Following a new injury, pain has an important protective function. Pain is an effective and essential part of life. It protects you and alerts you to danger. It makes you move differently and behave differently, which makes pain vital for healing.

Pain occurs when your body's nervous system alerts the brain to actual or potential tissue damage. The nervous system can be thought of as an alarm system. The alarms send messages to the brain, and then your brain creates pain perception and responds to try and stop the pain.

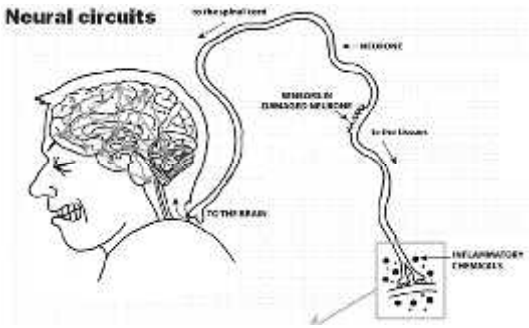
Pain can be thought of as a response to danger messages sent to the brain by the nervous system. The pain response makes us move or behave differently to try to help an injury to heal.

What Happens When You Have An Injury?

Let's say that you have torn a muscle in your back.

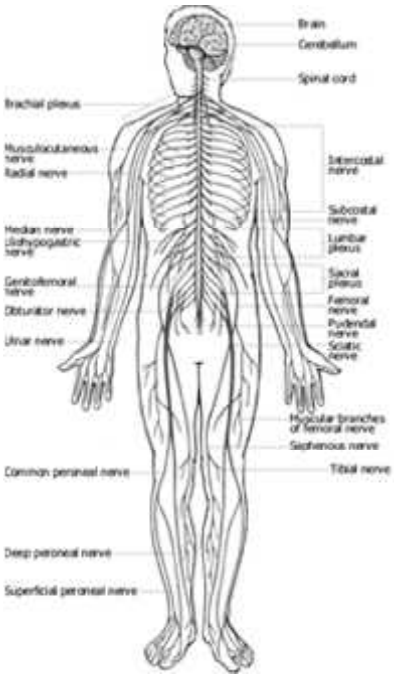
The muscle tear results in a process called inflammation, which is the body's response to injury. Damaged muscle fibres release chemicals which assist the torn muscle to heal.

Inflammation produces increased amounts of blood and fluid around the injury, which is why the torn muscle may be hot and swollen.



(Butler and Moseley NOI Group Publications 2003)

Surrounding the torn muscle are small sensory nerves which contain receptors. The job of these receptors is to detect changes in the body's tissues. These receptors are sensitive to heat, chemicals and movement. So any change in temperature, movement or chemicals will activate the receptors in the nerves. The receptors then generate an electrical signal which travels through the nerves, up your spinal cord and to your brain. This signal can be thought of as a "danger signal".



Once this danger signal reaches your brain, your brain interprets, and decides if pain will be produced. Pain is only produced when these electrical signals reach your brain, and if your brain interprets that there is a danger to your tissues.

Now that there is pain, your brain makes you do something about it. This may be to rest the muscle, put an ice pack on it, or take a pain killer. Pain makes you change your activity based on the signals sent to it by your nervous system.

We will explain this further throughout this book.

It is important to understand that injured tissues have a reasonably defined healing time.

Muscle - couple of weeks; Ligament and disc - couple of months; Bone 3-6 months. This will vary due to associated disease processes, how the tissue is used or not used and the things people do in life.

Inflammation will eventually subside, but sometimes pain can continue.

So, there are other reasons besides inflammation and tissue injury why you still have pain. The nervous system changes and the alarm system that alerts your brain to a problem in the tissues go off the rails. This is an abnormal process that can cause ongoing pain.

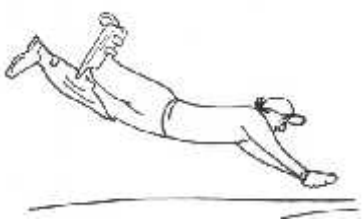
To the right is a picture of how your nerves connect to all tissues throughout your body and then connect to your spinal cord which runs up to your brain.

Pain Is Variable

There are many examples of pain being variable. Sometimes a minor injury can be extremely painful (such as a paper cut) and sometimes there can be minimal pain from a serious injury.

Can you remember when a footballer was being hailed as a courageous hero after continuing to play in the grand final following a serious injury? Why didn't he stop playing? Did he feel the pain of the injury?

Why do cricket players who drop a catch always look at, shake and rub their hands, but when they take a spectacular diving catch they leap back to their feet to celebrate?



Also, there are many stories in war time when a soldier has been shot and seriously injured, but continues to fight. Only later when the battle is over and he is back at headquarters does he become aware of his injuries.

Considering this, it becomes evident that the severity of an injury is not directly related to the level of pain that is felt. If it were so, then we would not have these heroic stories.

There are many reasons why the amount of pain is different to the level of physical injury. Your ability to understand these reasons will help you with your own pain and injury.

Pain Can Last A Long Time After An Injury

Sometimes, after the inflammation has settled and the injury has healed, pain can continue.

As you remember, a change in the tissues is detected by a receptor, which then creates an electrical or "danger" signal up the nerve, through the spinal cord to the brain. The brain then produces pain if it concludes that the body is in danger and that something needs to be done about it.

Even when healing has occurred, if the receptors keep being set off by changes in temperature, movement or chemicals, danger messages can continue to be sent to the brain which may result in pain.

It is important to realise that pain is not produced at the site of the injury, but is produced when these electrical signals reach the brain.

A major reason why pain can persist is because the nervous system continues to send electrical "danger" signals to the brain. The brain then concludes that there is still a problem in the tissues where the injury occurred.

This nervous system dysfunction that occurs will be explained in Module 2

Pain Helps To Protect Us

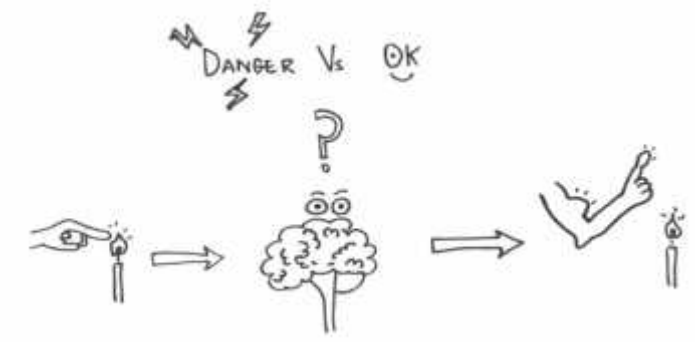
As we said earlier, pain has an important protective function after a new injury. The pain produced by your brain alerts you to a problem in the tissues so you can do something about it.

In this way, when you touch something hot, you will take your hand off it. If you didn't feel pain, you wouldn't move your hand, and would end up with a severe burn.

Pain protects us from serious injury by making us do something to remove ourselves from harm. This protective mechanism describes what is classed as acute pain. Acute pain is a helpful, protective system to prevent further injury.

One of the problems of chronic pain is that this protective mechanism continues even after the injury may have healed.

The protective response to pain often prevents you from strengthening your old injury, which is what it will need to do to get better.



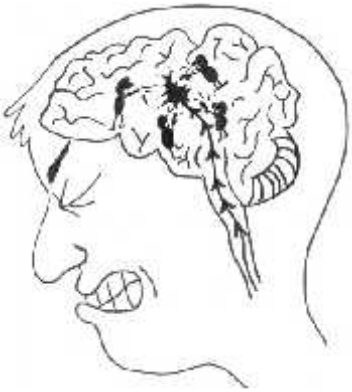
Why Would Pain Continue After An Injury Has Healed?

Chronic pain is classified as pain that lasts longer than expected for a given injury. Chronic pain is not as helpful as acute pain, because if the injury has healed, there should be no reason for there to be pain. The healed injury should not need pain to protect it.

However, because your nerves and brain continue to create pain, you will continue to do something in response to the pain. This may be to continue to rest the previously injured muscle, or continue to take pain killers.

Chronic pain is not helpful as it makes you over protective of the old injury. This may stop you from exercising and strengthening the muscle which is what it actually needs to get stronger.

Chronic pain is therefore a problem itself. It is most commonly due to problems in the nervous system that carries those electrical danger signals from the injured area to your brain.



Acute and Chronic Pain Summary

Acute pain and chronic pain are very different processes. Because of this, the management of acute and chronic pain are different. It is important that you understand how they are different and the different ways which they are managed.

Acute Pain

Characteristics

- Occurs in the first 6 weeks after an injury
- Is a sign that tissue damage, or a new injury, has occurred
- Gradually improves over time
- Is designed to protect your body from further injury and to allow the injury to heal itself.

Treatment

- Passive treatment such as medication, ice, heat, supportive devices and braces, crutches, braces, splints
- Directed purely at the injured body part
- Hands on treatment such as massage or “Hands on” Physiotherapy

This type of treatment is appropriate for the first six weeks following an injury. If pain lasts for longer than six weeks, it is unlikely that more of this passive style of treatment will have any more benefit. After six weeks, the injury progresses towards the chronic phase.

Chronic Pain

Characteristics

- Pain which lasts more than 3 months after an injury.
- Pain which continues after the injury has healed
- Is not directly related to
    - the severity of the injury
    - the rate of healing of the injury
- Is a more disabling form of pain
- Fluctuates over time
- Is often associated with
    - Generalised weakness and deconditioning
    - Loss of fitness
    - Reduced ability to return to work
    - Development of psychological complications such as depression and anxiety.
- Changes in the nervous system occurs which maintains pain

Treatment

- Active treatment such as
    - Exercise (Cardiovascular, Core stability, General reconditioning)
    - Education - understanding your condition
- Integrated treatment – a number of professionals working together with you including your doctor, a psychologist and a physiotherapist
- Case manager may be involved
- Individualised - directed by your specific goals and requirements

The Chronic Pain Cycle

If you continue to have pain after an injury, you will usually end up being over protective of the old injury due to the pain. This seems sensible, because normally, pain means that there is something going wrong and we need to be protective of it.

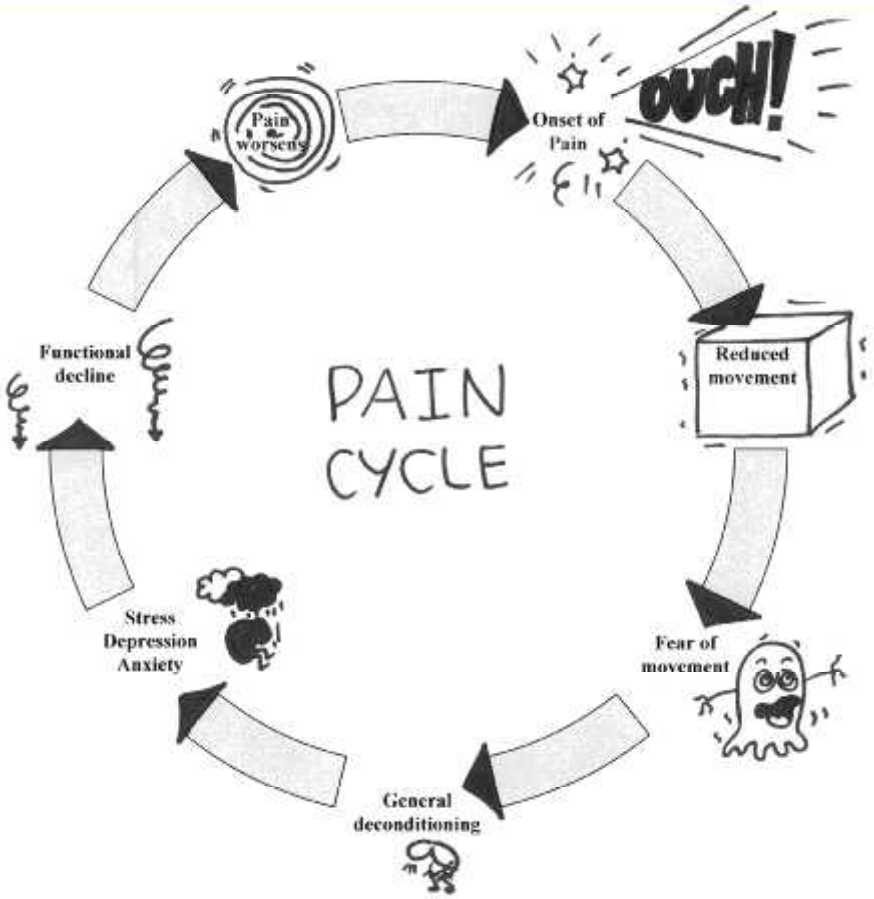
As we now know, pain can continue after an injury has healed. This chronic pain is an outcome of problems in the nervous system which continues to send electrical danger signals to the brain.

Chronic pain will make us respond as if there is a new injury that needs to be protected.

What then happens is that you may become too hesitant to strengthen the torn muscle, go back to work or resume your normal activities. This will result in the old injury remaining weak. The problem now is that because it is weak, it is more likely to be injured again.

Also, because you are not getting back to normal, you can begin to become anxious, agitated and depressed about your pain and lack of progress.

We call this the chronic pain cycle.



Deconditioning

When you have experienced an injury that has persisted and you have stopped doing activities such as work and exercise, the body generally becomes less fit. The tissues are not as strong as they were previously and therefore cannot cope as well as they once could. This can be true of all the tissues, not just the ones that have gone through the injury and repair process.

Recovering From Chronic Pain

To get better you need to break the chronic pain cycle.

This involves going against your instinct to be protective of the old injury due to your pain.

As we know in chronic pain, the amount of pain is not directly related to the amount of tissue damage. This is because of the changes in the nervous system that happens in chronic pain.

So even if you do some exercise and you do feel some pain, this pain is not harmful to your tissues. Therefore it is safe to exercise to gradually improve the strength of the injured body part.

Recovery will depend on your understanding of pain, and confidence to exercise despite some pain to regain your strength. The key is understanding the processes that are happening in your body, so you can decide what to do about them.

Example: Bungee Jumping

Imagine turning up for your first ever bungee jump. Think about if they simply tied a rope to your leg and said jump! Chances are you'd look at them like they are crazy. What would actually happen is that the instructors would talk to you about how high you are, how much you weigh, how long the cord is, the tension on the cord and about how safe it is despite it seeming to be dangerous activity.

Once you understand how it works and if it is safe, you will be much more likely to go ahead with it!

Exercising, doing the housework or going back to your old job with pain may seem like a crazy thing to do. But if you understand the reasons behind it, and why it is safe, you will be more likely to go ahead with it and proceed (just like bungy jumping!).

Key Points - Module 1

Pain is produced by the brain when it receives an electrical danger signal from the nerves somewhere in your body.

When we feel pain, we respond and do something about it. This may be to lie down, take a pain killer or stop what you are doing

Inflammation is the body's response to injury.

Acute pain is helpful as it protects us from further injury.

Chronic pain occurs when you still have pain even after the injury has healed.

Chronic pain is caused by problems in the nerves which carry the electrical signals from the body's tissues to the brain.

Chronic pain will cause you to be overprotective of the old injury. This can lead to the chronic pain cycle.

When you have chronic pain, you are not damaging yourself by exercising or being active. This is because the initial injury has healed, but there is a problem in the nerves which carry the electrical signals to your brain

Recovery involves breaking the chronic pain cycle, and being confident to exercise and resume activity despite the presence of some pain.