



Understanding Persistent Pain

HOW TO TURN DOWN THE VOLUME
ON PERSISTENT PAIN

INTRODUCTION

We have learned a lot about pain in the last few years. Some of this knowledge is very new and not commonly known. This booklet introduces some important scientific findings about how pain works. While we won't focus on treatments, we do know that understanding how pain works is helpful for people with pain.

At the end of this booklet there is a list of useful resources for further information. It is also a good idea to visit a health professional who can help you relate this information to your particular situation. You can take some notes or underline things you want to talk about.

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ACUTE OR PERSISTENT PAIN

There is a big difference between 'acute pain' and 'persistent pain,' even though they might feel the same.

Acute pain is short-term and tends to be more associated with damage or possible damage to your body. For example, if you sprain your ankle it is likely you will feel pain associated with the bruising and swelling. This is acute pain. Usually it will settle as your body heals because the affected part no longer needs protecting. Healing usually takes less than three months, even for quite severe injuries.

Persistent pain lasts longer than acute pain and often does *not* indicate ongoing damage, even though it may feel like it. In the past we assumed that this was because we had not healed after an injury, but for most people we now know that this is unlikely. Instead, the **pain is less to do with injury in our bodies and more to do with our central nervous system**. It's like the volume knob on our pain system has been left turned up like a radio stuck on 'loud.' Persistent pain can take over a person's life.

It's really important to understand that you can 'turn the volume down' again, but it often takes effort and time. It won't happen by itself and you need to be patient in working towards it. Therapists can help to guide you in this process, but in the end, you have to take charge yourself.

You may have heard the term 'chronic pain.' A lot of people think this means bad or severe pain, but really, it means pain that keeps on going for longer than we expect it to.

Because of this confusion, health professionals have chosen the word 'persistent' instead. It's not quite as catchy, but it is a more accurate term.



HOW DOES PAIN WORK?

NERVES AND BRAIN INTERACTION

It may seem strange, but pain can be a good thing. When you first injure yourself, *acute* pain can help you change what you are doing so you avoid further damage. Without acute pain, a person might keep running on an injured ankle or keep opening up a healing wound.

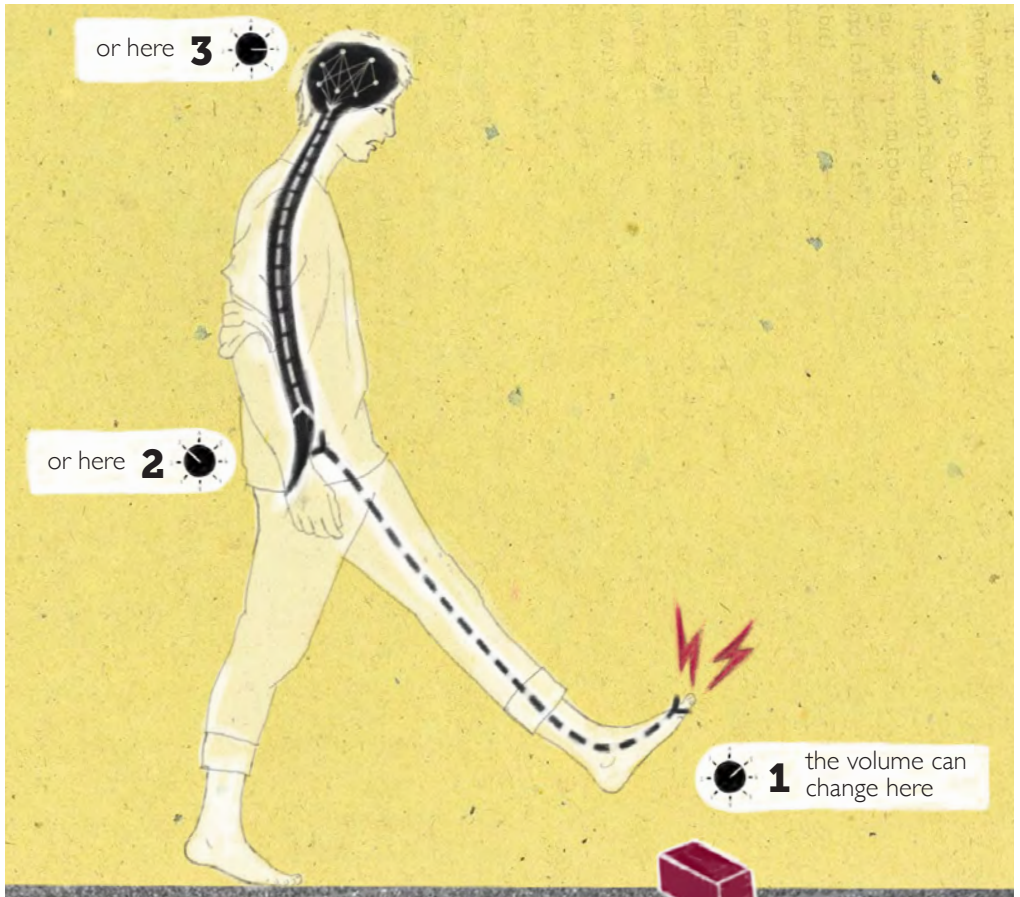
When we injure ourselves (for example, stub a toe), our nerves carry lots of information to the brain to make it take notice. In our body there are millions of nerves and they constantly interact with each other. It's not a one way street - signals go up and down all the time. There's a real buzz of chatter in every direction.

THE BRAIN PRODUCES PAIN

Then there's your brain - the biggest bunch of nerve cells in the body. The brain is *really* important when it comes to understanding pain. It may surprise you to learn that **all pain, no matter where or how it is felt, is produced by the brain.** When you injure yourself, the nerves in your body can only tell your brain that 'something has happened.' It is your brain (and not your toe) that interprets this and says to you 'hey, this hurts!'

Before your brain tells you 'here is pain,' it must first combine a heap of information, and then try to make a sensible interpretation of it all. Your nerves just say to your brain 'danger – something is happening to your toe.' Your brain then weighs up many aspects of your immediate environment as well as other life factors such as what you do for a job, your personal or cultural beliefs, whether you've injured your toe in the past or what you are planning to do in the future! Only after sorting through all of this, will it tell you whether your toe hurts or not. It does this incredibly quickly and *well before* we are aware of anything.

You'll see why all this is important for you as we move further into this booklet.



Think of the brain as a parent refereeing arguments between young kids. As a parent you receive information all the time: 'Mummy, he snatched from me ... no I didn't ... but it's mine ... my tummy hurts ... are we there yet ... but it's not fair!' Obviously you don't respond to everything in the same way. The constant chatter needs to be interpreted based on the child's tone of voice, their personality, their environment, the words they use, your parenting style and how busy you are at the time. Sometimes you'll interpret a toddler's cry as just 'whinging.' Sometimes you'll interpret their cry as 'pain.' In a similar way, the brain interprets the 'chatter' from your nerves and other factors in your life to decide whether or not you will feel pain.

WHY PAIN REMAINS

NERVES CAN GET SENSITIVE

When a person first hurts themselves, it is normal to experience soreness both near the area of injury and in other areas around the actual injury site. For example, after stubbing your toe, you may feel pains spreading over the rest of your foot or even up your calf, well beyond any areas that were damaged.

In this scenario, the volume around that area is *temporarily* turned up. This is absolutely normal and helpful *at first*. This increased pain can remind us to slow down and avoid doing more injury as we heal. Usually, this pain settles down rapidly as we get back to normal habits and activities.

In some situations, pain can hang around for longer than is helpful. Remember we call this persistent pain and it is often related to extra sensitivity. The 'buzz of chatter' amongst our nervous system starts to set up self-reinforcing 'feedback loops.'

Nerves do a lot more than just send messages around the body. **All of the nerves in our body, including the spinal cord and brain, change in response to what we do and the world around us.** Importantly, nerves continuously change how 'sensitive' they are in response to what is going on around them, like turning the volume up or down on a radio. Sometimes this can lead to big changes in pain levels without immediately obvious reasons.

WHY PAIN REMAINS

MYTH: PERSISTENT PAIN EQUALS ONGOING DAMAGE

It often feels like persistent pain is due to ongoing or recurrent damage to your body. However, pain that remains after three months often has more to do with changes in the nervous system. A lot of persistent pain could be described as 'unhelpful changes in the nervous system.' The original injury will have healed as much as it can and although you may still be getting some signals from stiff joints or poor muscle control, the biggest problem is often the 'increased volume.' This may come as a surprise to many, yet the research tells us this quite clearly. The nervous system becomes more sensitive.

While persistent pain may feel a lot like acute pain, it tends to act differently. Your nervous system responds to normal messages such as touch, cold or movement as if they are dangerous. The volume stays turned up long after the injury has healed. A little bit of this 'input' can lead to a lot of pain. Something that might not have hurt starts to, or something that might have hurt just a bit, starts to hurt a whole lot. These are all signs that the problem is changing from one of physical injury to that of a 'turned up' nervous system.

Bob hurt his back and it hurt to bend. He was told that bending was bad for his back. Eight months later, Bob still walks stiffly and slowly and moves in strange ways to avoid bending.

The interesting thing is that Bob's back has healed. His brain is stuck in an unhelpful movement pattern that says 'it's not safe to bend.'

It'll take time and determination yet by practicing normal movements, Bob can retrain his body and brain to allow him to bend normally again.

CHANGES IN THE BRAIN

PATTERNS FORMED BY THE BRAIN

When the nervous system is sensitised, it is common to experience pain with everyday movements such as walking, bending or twisting. In some cases, even just thinking about a particular movement or activity can trigger pain. Why does this happen and what causes these changes?

The brain is made up of different parts, each with different main functions. The parts are amazingly interconnected and work as a team. Even seemingly unrelated parts such as those related to smell, movement or feeling emotions can form connections. For example, many people know about the power of smell or music to evoke memories. If you regularly walk past the local bakery while listening to music, your favourite songs might become associated with the smell of fresh bread. If this becomes a really strong association, just hearing The Beatles may make you desperate for a fresh croissant!

It is said that at the end of her famous career in ballet, Margot Fonteyn's arthritic feet hurt when she just *looked* at her shoes.

In the same way, when a person repeats a particular movement or activity on a regular basis, the brain creates a pattern of nerve connections. If a movement is painful for long enough the brain will strengthen the connection between movement and pain. It's like your brain has joined the dots between, say, the normal sensations coming from your back, the movement of bending, the memory of injury and the experience of pain. This unhelpful pattern can then become sensitised or 'turned up.' Once sensitised, just preparing to do that movement may be enough to cause the pattern to kick in and for you to feel pain. **The body has healed as much as it's going to, but the movement still hurts.**



Jane hurt her back nearly a year ago. It was excruciating at the time and led to her quitting her job and social netball team. Since then the pain has never really gone away. Recently, the pain has started to move and spread up her back and into her neck. It's hard to pin down what makes it worse. All sorts of everyday movements are painful. It's almost like it has a mind of its own. Sometimes Jane feels pain when only touched lightly. Her back is worse when the weather is cold. Sometimes just *thinking* about bending or putting out the washing can make her feel worse! Her back has healed, but now she has a 'volume control' problem.

WHOLE-OF-LIFE FACTORS AFFECT PAIN

So far we have talked a lot about nerves and the brain, but every system that keeps our bodies running can get involved in producing and responding to pain. The way a person experiences pain is influenced by a lot of factors. We are social, spiritual, physical and mental beings. Persistent pain is a whole-of-life problem, so effective management needs to take a whole-of-life approach. Put simply, the way we experience pain is highly influenced by our overall well-being.

Most of us can recognise stressful or emotional situations that have affected our pain. It might have been tiredness following too little sleep, an argument with our spouse or kids, a rough day at work, anxiety about paying overdue bills or grief over the death of a friend. Our thoughts, beliefs and environment can also make us susceptible to a turned-up nervous system and therefore more prone to persistent pain. Although we know clearly that pain is *not* a 'conscious decision', we also know that our conscious decisions and actions can make a huge impact on our pain.

Research points to a number of factors that influence persistent pain such as:

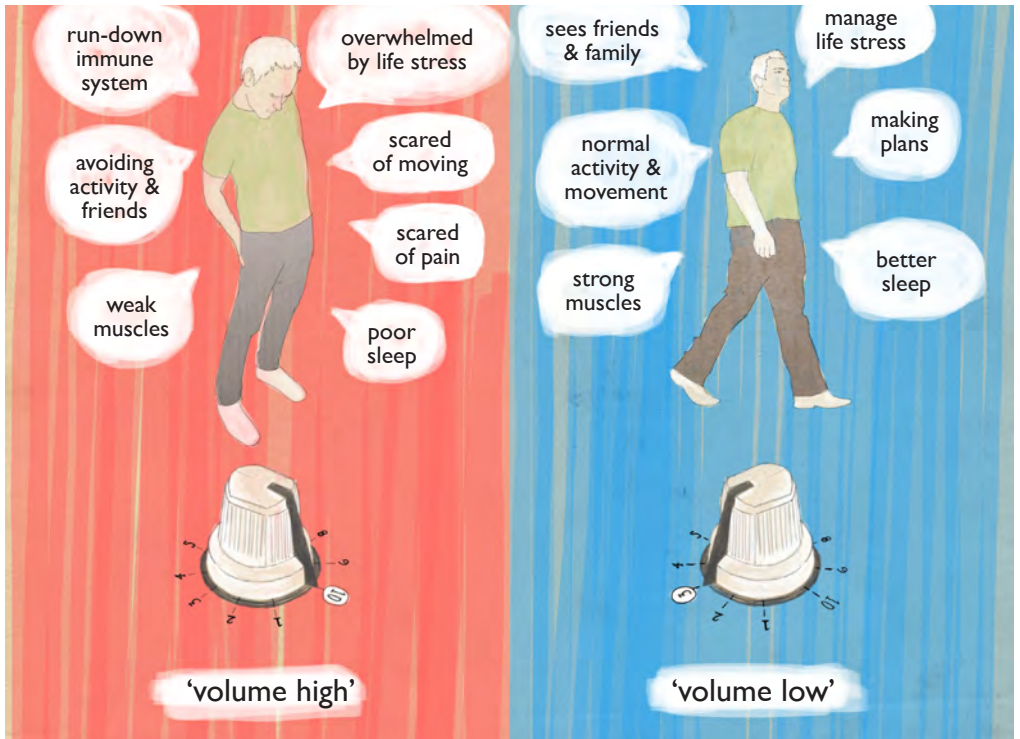
- how scared, stressed or worried a person is at the time of injury;
- what the injury means to a person; what they believe has happened to them;
- how long a person avoids their normal activities;
- a person's family history.

In other words, **personal beliefs and environmental factors can make a big difference to how we experience pain and how likely it is that pain will persist.**

THE LINK BETWEEN EMOTIONS AND PAIN

Remember how we described nerves as electrical-chemical computers that send messages up and down the body? When the body is injured, it releases chemicals that kick start messages in the nerves. The natural chemicals connected with tiredness, stress, anxiety or depression are very similar to the chemicals used to communicate danger or damage. In a sensitised (turned up) nervous system, chemicals released by low moods and associated feelings can 'turn up the volume' even more and make our pain worse.

Thankfully it works the other way too. The natural chemicals associated with



happiness, fun or satisfaction act to turn the volume down. This is a powerful system which some people have likened to a “medicine cabinet in the brain.” By doing things which are enjoyable and meaningful you can start to harness this.

THE DOWNWARD SPIRAL

The interconnection of all these factors can start a vicious cycle. Pain can cause low moods and low moods can increase experiences of pain. Pain can lead to avoiding movement and activity, leading to weakness, stiffness and tiredness, which lead to increased pain. There’s no more damage in the body, but because of this vicious cycle, your pain and ability to cope and stay active all get worse over time.

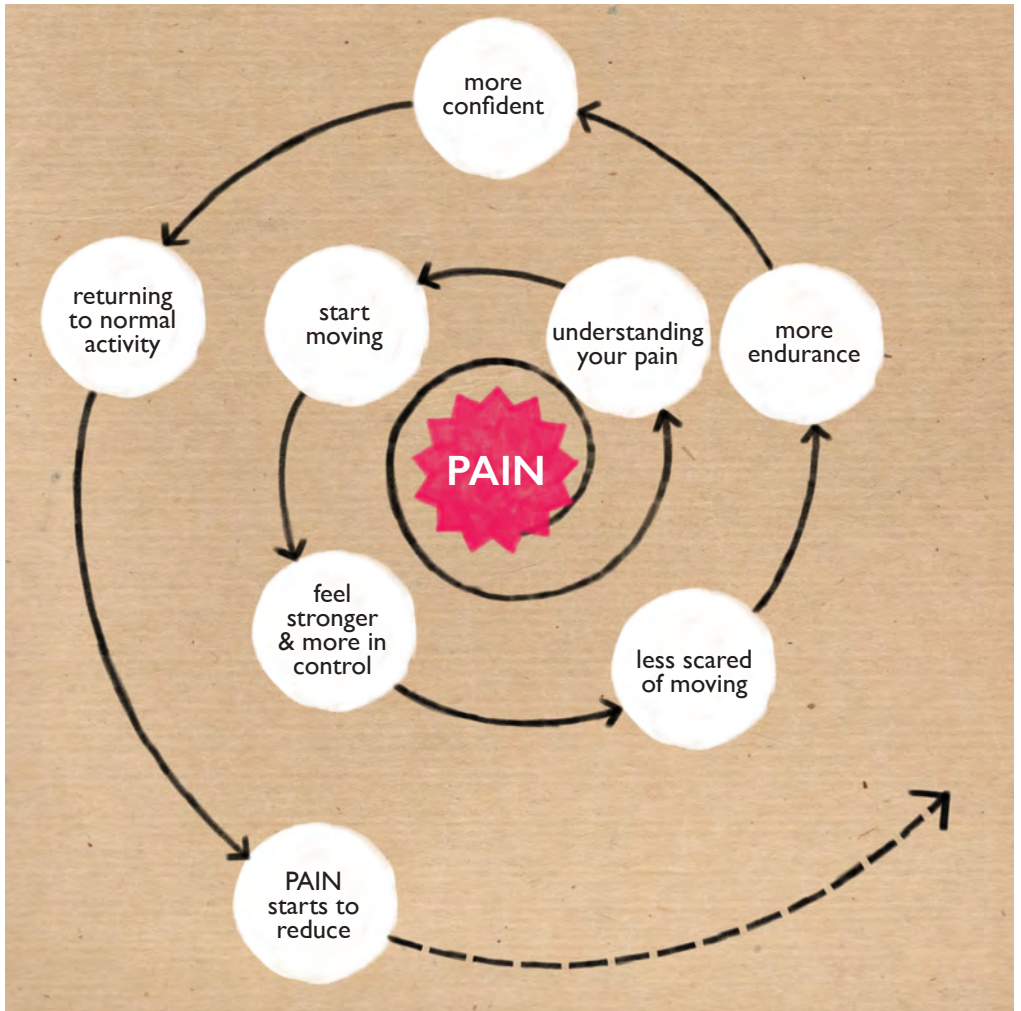
But there is good news! Once you understand and accept this, there are lots of things you can do to turn the pain volume down again and start living a full life. A good starting point is to stop thinking ‘my body is damaged and needs fixing’ and instead, seek a whole-of-life solution to manage your pain.

THE UPWARD SPIRAL

Now that you better understand pain, you can start to turn the pain volume down and regain control of your life. It often takes time and effort but it is possible!

The first step is to understand that your pain is not causing damage. Our physical well-being, cultural beliefs, social environment, health beliefs and mental health all contribute to our experience of pain. We know that pain is not a 'conscious decision,' but when we consciously begin to address these factors, we can start to turn the volume down. When a person starts to make positive changes in their life, 'happy chemicals' such as endorphins are released. One small gain leads to another. **With increased activity and increased confidence, people experience less pain, which in turn, leads to further positive changes.** Examples of activities that release feel-good chemicals are appropriate exercise, doing things that you enjoy, helping others or working towards goals which are meaningful to you.

Sometimes it is helpful to seek the guidance of a health professional to help you make these changes. Different professionals may help in different ways. For example, if poor relationships or stress have contributed to your pain, then seeking assistance from a counsellor or psychologist may be helpful. If you have been too frightened to move or have become very weak because of the pain, then a physiotherapist with persistent pain experience can assist you.



1) INCREASING GENERAL ACTIVITY

People with persistent pain often struggle to stay fit and active. It is common for people with pain to do less over time. This can lead to muscle weakness, stiffness and low moods. This then leads to more pain.

By gradually increasing activity you can reverse this negative cycle of inactivity and pain. When you do a bit more activity on a regular basis, your body releases feel-good chemicals which can improve your mood. Muscle strength and endurance increases. Thinking improves as blood flow to the brain increases. This can lead to increased confidence to do a bit more again. In this way, a negative cycle can be reversed through small, positive daily changes.

When you first increase your activity, it is likely you will still feel pain. That's okay. Remember that pain is not the same as damage. A gradual increase in activity helps you to feel in control of your pain, as well as increase your fitness and sense of well-being. With practice, you can start to move normally again, with less and less pain.



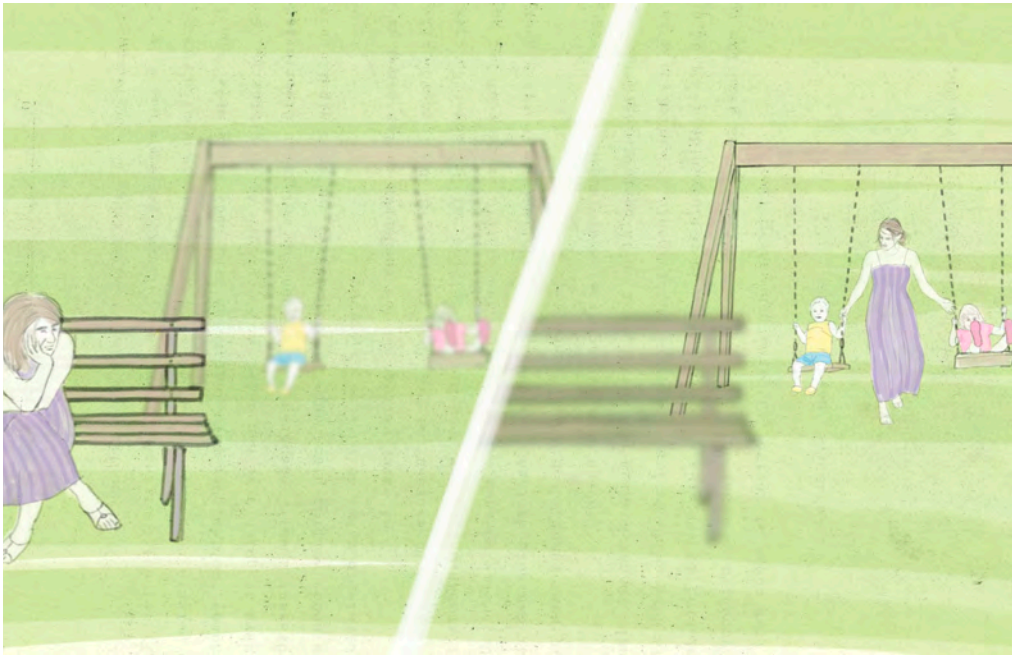
PRACTICAL TIPS TO TURN THE VOLUME DOWN

2) WORKING TOWARDS PERSONAL GOALS

Another way to turn the volume down is to **start focussing on personal goals instead of on how to 'fix' the pain**. When people work towards goals that are important to them, they find that their pain leaves centre stage. Working towards goals may not take the pain away, but can help you to increase in confidence and enjoy life more.

When setting goals, think about something you would like to be able to do. It needs to be realistic and important to you. A realistic goal might be to walk to the shops and back within three months, or finish washing the dishes without sitting down. An unrealistic goal might be running in a marathon in three months' time.





Jill wanted to spend more time with her kids but didn't know if she could. So she started by going to the park with them and sitting on the bench while they played. A week or so later she started walking around chatting to them as they were on the swings and the next week she gave them a push or two. She was a bit sore after that but knew that she hadn't done any damage. So the next week she pushed them again and didn't have any problems afterwards. A while later Jill started teaching them a bit of soccer and now she's wondering if she might start to kick it around a bit herself...

Jill's doing more. She has better control over her pain. And her kids love it.

PRACTICAL TIPS TO TURN THE VOLUME DOWN

3) THINKING DIFFERENTLY ABOUT PAIN

The way you think about pain is very important. Remember that all pain, no matter where it is felt, is produced by the brain. The research shows that if you understand your pain more, then you can feel more in control, make better decisions and experience less pain.

The good news is that by having just read and understood this booklet you have made a step in the right direction. You have taken the first step to turning down the volume on your persistent pain.



POINTS TO REMEMBER

- Persistent pain is different to acute pain. Persistent pain is not a trustworthy indicator of damage.
- Persistent pain involves the nervous system and an 'increased volume.'
- This doesn't mean that pain is a conscious decision, but we do know that conscious decisions and thoughts can turn the volume up or down.
- The brain is interconnected and forms patterns. Sometimes the brain connects pain with movement so that it hurts to move or even think about moving.
- Whole-of-life factors such as emotions, beliefs and environment affect pain and need to be addressed to turn down the volume effectively.
- "Unhappy" chemicals are released when people are tired, stressed, anxious or depressed. These chemicals are similar to 'danger' and 'damage' messages and they influence the sensitivity of the nervous system.
- You can regain control and begin the positive cycle by increasing activity, working towards personal goals and thinking differently about your pain.
- A health professional trained in persistent pain management can be helpful as you work through these changes to turn down the volume on your pain.

REFERENCES

- Christiansen S, Oettingen G, Dahme B, Klinger R (2010) A short goal-pursuit intervention to improve physical capacity: A randomized clinical trial in chronic back pain patients. *Pain* 149:444–452
- Hay EM, Mullis R, Lewis M, Vohora K, Main CJ, Watson P, Dziedzic K S, Sim J, Minns Lowe C, Croft PR (2005) Comparison of physical treatments versus a brief pain management programme for back pain in primary care: a randomised clinical trial in physiotherapy practice. *Lancet* 365: 2024–30
- Johnson RE, Jones GT, Wiles NJ, Chaddock C, Potter RG, Roberts C, Symmons DPM, Watson PJ, Torgerson DJ, Macfarlane GJ (2007) Active Exercise, Education, and Cognitive Behavioral Therapy for Persistent Disabling Low Back Pain A Randomized Controlled Trial. *SPINE* 32(15):1578–1585
- Latremoliere A and Woolf CJ (2009) Central Sensitization: A Generator of Pain Hypersensitivity by Central Neural Plasticity. *Journal of Pain* ; 10(9): 895–926
- Moseley GL (2003) A pain neuromatrix approach to patients with chronic pain. *Manual Therapy* 8(3):130–140
- Moseley GL (2004) Widespread brain activity during an abdominal task markedly reduced after pain physiology education: fMRI evaluation of a single patient with chronic low back pain. *Australian Journal of Physiotherapy* 51: 49–52
- O’Sullivan P (2011) It’s time for change with the management of non-specific chronic low back pain. *Br J Sports Med* (2011)
- Wand BM, Parkitny L , O’Connell N, Luomajoki H, McAuley J, Thacker M, Moseley GL (2011) Cortical changes in chronic low back pain: Current state of the art and implications for clinical practice., *Manual Therapy* 16:15-20
- Woolf CJ (2007) Central Sensitization. Uncovering the Relation between Pain and Plasticity. *Anaesthesiology* 106:864–7

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