



Well that's novel!

Wrapping things up.

Having had a bit of a look at the principles of graded exposure, there usually comes one big question afterwards, where do I start?

The simple answer is: At a level of activity you can perform where you are aware of your pain, but not aggravating it.

Easy, right?

Not always, particularly if you are in a situation where everything you do seems to hurt. The key to beginning a path to recovery is finding the right place to start. Something novel which the body and the brain do not see as threatening, so have no reason to create a pain response. Something which can then be progressed with the aim of making those previously painful movements no longer painful.

As you can imagine, with so many different presentations of pain, and so many different people with so many different experiences, this would vary considerably person to person.

A big part of our job as physiotherapists is helping you figure this out.

Novel Stimulus

Whatever this something is needs to provide the right stimulus, to the body and the brain. Something which helps to elicit a response and activate that neurotag, without having it fire completely. It needs to be something non-threatening and different, a little bit novel (ie. new or unusual) for the brain

A novel stimulus.

Sometimes that *is* quite simple. It might just be that you are unable to walk for long before you're lower back begins to hurt. So using the principle of graded exposure we spoke of yesterday, you may just reduce the distance you are walking, then gradually increase that until your tolerance improves.

But what if you have trouble bending forward and even the slightest bit of movement causes pain?

Then you might get a bit more creative. Often I will find it helpful to remove gravity from the equation, which might include doing an exercise such as this:



Now this is a movement I would tend to give out fairly regularly, particularly for acute lower back pain. What you can see is that we are bending the lower part of the spine like we would when we bend forward, but it's slightly different.

Firstly, the person might be slightly more relaxed (lying down can often be more comfortable than standing up), which already makes it easier, but it has changed the context of the spinal flexion, which makes it less

threatening than bending forward. Sure, they would likely feel some pulling in the lower back, but it might be less painful and may feel more like just some mild discomfort, which hopefully won't cause it to flare-up.

But what if even that is painful? Or you're not able to get into that position?

We may then need to look at continuing to perform the movement in a upright position, but possibly changing the context in a different way.



Both of these images show two different positions, yet they are both using support to gently flex the spine back and forth. The plan might be to then progress onto the first exercise I mentioned. They are also providing support through the bench or the chair, which would both help to reduce the impact of gravity, and provide a context of safety.

It's all about progression.

Another potential treatment option is hydrotherapy. Now this is a word most would have heard, many have probably been involved at some point or another. It literally means water therapy.

Now for those with general painful complaints, there is nothing fancy about hydrotherapy. It's not a magic treatment designed to cure all ills. Those don't exist, despite what you've heard (I'm looking at you current affairs television!). It is simply another way to get someone moving.

I tend to use it as a starting point.

When trying to change the context and maybe remove a bit of gravity from the equation, options are limited. We could always take you up into space and do therapy there, but Medicare won't pay for that.

I've checked.

Or we could get in the water.

What this does is changes the context and the environment in which we perform our movements, as well as take some weight off the tissues. The warm water helps too, just because it feels nice. There are many things you can do in the water, and it's normally easy to take an exercise you may find difficult on dry land and adapt it to suit.

The idea would be to become comfortable with that movement in the water, then gradually try to progress it back onto dry land.

After all, it's all well and good to be able to do the activity in water, but we aren't fish. We have to get out at some point.

If we look at our example of flexing the lower back, the approach might look something like the picture to the right. We might float deeper in the pool and then use the buoyancy of the water to help float out legs up. Or we might use the wall to crawl our legs up. This would cause our lower back to flex slightly, but because the context is completely different, it may be tolerated better.

You could possibly then move shallower and start to do some gentle squats, or focus on rounding the lower back at the bottom of the squat.

Then maybe standing upright and actually bending forward with the support of the water.

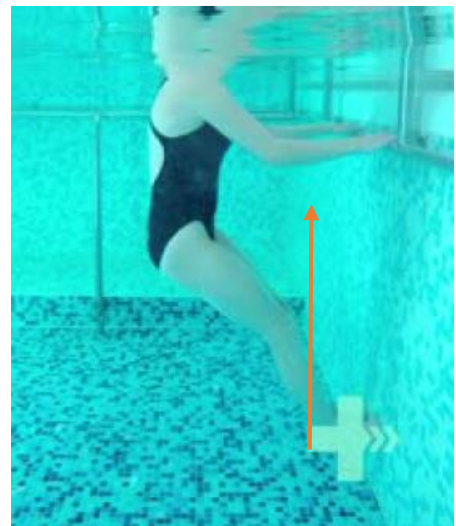
See how these movements are slowly becoming more functional?

Once things became comfortable in the water, we might move out of the water and progress onto some of the exercises I mentioned earlier.

The ultimate goal is to improve your function, improving your body's ability to tolerate these movements, making them less threatening, and hopefully reducing the pain response at the same time. This is important for those who have persistent pain or central sensitisation, but also for those with acute injuries.

If you have ever recovered from an ankle or hamstring injury through gradually increasing your activity, you'll know what I mean. The movements and exercises are different, but the principle is the same. We just need to also take into account the time for tissue healing.

Obviously, this is just a rough example of what you may do, not a recipe for treatment. There are many ways you can change this to suit the individual or the issue in question. Everything needs to be adapted to the individual based on their presentation. Otherwise you could just read this and treat yourself, and I wouldn't have a job.



But most importantly, there always needs to be a plan to progress, otherwise you will plateau and improvement will stagnate. The best thing to do to start with is set some specific goals. With those in mind, it's much easier to then plan towards them. How quickly you do so depends on you, your therapist, what else is going on in your life at the time, and your work schedule.

Most of what we do is novel

A lot of the exercises we give out as health professionals (particularly for lower back pain, but other issues as well) don't work because they specifically strengthen or stretch structures, but because they are novel and gradually expose our body to new and increasing loads.

For acute injuries, they also allow the body to continue moving whilst tissues are healing. I've said that pain and damage aren't always related, but that doesn't mean they aren't often there at the same time.



On the left is an exercise which is commonly given out for lower back pain. I give it our frequently (usually in combination with the knee hug exercise I showed earlier), particularly for acute patients. It's usually done within your tolerances, with a focus on gentle repetition.

It can be quite effective in the right situation.

A lot of the time the theory is because it takes pressure of your discs, which tend not to tolerate bending, thereby allowing them to return to the way they were, a bulge returning to the centre of your discs. Now they probably do to a certain extent, but it's debatable in my mind just how much they have an impact on that. After all, just because you have a central lower back pain does not mean it has anything to do with bulging discs.

How I see it is similar to what I mentioned before.

If you have experienced an onset of lower back pain, possibly from bending over, which movement do you think your nervous system is going to find more threatening? A movement like this, or bending forward in the same fashion in which you experienced pain in the first instance?

What I see this movement doing is allowing you to continue moving the lower back, as well as the joints, ligaments, muscles and nerve tissue in the area, whilst reducing the threat and not eliciting a pain response. As this pain response settles, you can then gradually progress to bending activities with less discomfort and go from there. But it doesn't work for everyone, so sometimes I might then go back to the drawing board and change our approach.

Same goes for core strength exercises.

We know from the literature that lower back pain has very little to do with how strong your core is (1). And that core exercises are no better than general exercise for improving lower back pain (2). So contrary to popular belief, you don't have pain because your core is weak. It's not causative. So why do some people swear by them, particularly in acute back pain?

Probably because they are gentle, non-threatening and don't involve strenuous movements.

What's likely to be more threatening to an acute lower back pain, bending down to touch your toes, or lying on your back, gently moving your limbs whilst keeping the spine in a neutral position?

I see the issue coming when they aren't progressed onto something more active, and the focus stays on trying to get a stronger core. It can only get so strong. Now don't think I'm saying that core strength is useless. Far from it. I think it is important, particularly in the sporting world for performance, but remember I am talking purely about *pain*. So, when the core strength principle is applied to those with ongoing or chronic/persistent pain in an effort to simply *reduce pain*, particularly as the main form of treatment, the outcomes don't tend to be good at all.

So how does this all relate to everything we have spoken about this week?

As always, it comes down to the nervous system.

By progressively loading the body through a series of exercises that are both relevant and non-threatening, we are able to help the tissues, and in particular the nervous system (because remember, the peripheral nerves are physical tissue in the body), adapt to that load or movement without causing activation of the pain response.

Simple!

It's just the individual approach which sometimes isn't. Sometimes it means a little bit of trial and error to find the best place to start, along with a little creativity. It's not usually a smooth, linear process either, especially for those with chronic pain. Sometimes we go a bit far, and pain does increase, but if we recognise it and adjust it we can keep moving forward. The more positive progress we have, the more of an impact it has not only on the tissues, but the brain. Continued ability to perform certain movements *without* activating the pain neurotag is hopefully going to remove the association between it and the movement, remove the threat and ***provide evidence to the brain that the activity or movement is safe.***

If the brain feels safe, then there is no need for a protective response.

Wrapping it all up.

So that brings us to the end of the week and the end of putting up with me bang on about pain (for the time being!). Hopefully it's provided a few little insights for you, whether you are in pain or not, and has given you a little bit more knowledge about your body.

That being the case, it would be useful to look back at the main points from everything we've spoken about this week. In summary:

1. Pain is a combination of complex experiences, not a single sensation produced by a single stimulus;
2. Nociception (warning signals from body tissues) is neither necessary nor sufficient to produce pain. In other words, pain can occur in the absence of tissue damage;
3. The nervous system (including the peripheral and central nervous system) is crucial to the production of pain, and signals travel in both directions along its course. Neural health is important in maintaining function;

4. All pain is neurogenic (arising from the nervous system);
5. A pain experience may involve a composite of sensory, motor, autonomic, endocrine, immune, cognitive, affective and behavioural components. The brain will draw on many areas to determine the appropriate response to a given stimulus;
6. In longer term pain conditions, the central nervous system can become so sensitised that it produces pain without any danger signals from the tissues;
7. Context and meaning are extremely important in determining the eventual pain output. Changing the context can change the experience;
8. A pain experience may be induced or amplified by both actual and potential threats;
9. Just because we can see things which appear abnormal on imaging, it does not necessarily mean they are contributing to the pain experience. Often treating the pain and symptoms is more effective than trying to diagnose a specific issue to be fixed;
10. Gradually exposing your body to increasing stimulus in a steady and controlled way can help to improve tolerance and function;
11. Sometimes you need to get a bit creative! It can be good to look outside the box a bit to find where to start. If you are trying things that cause you pain, or have done so in the past, don't throw them out. Think about ways to adapt them to make them effective;
12. Pain is a perception, so if you feel pain, then you have pain. The only one who can tell that for certain is you. The next step is to determine *why*;
13. Just because pain is a construct of the brain and the nervous system, it doesn't mean you can just think away your pain! It happens on a subconscious level which you have little conscious control over. Understanding that and removing the fear of pain is obviously very important, but it is only a piece of the puzzle. Providing evidence of safety to the brain is important. You can't just tell it, you have to show it!

As I said at the start, these articles have only been an overview of the volumes of information relating to pain. There are entire books on, and people have devoted their entire careers to, understanding the topics I've tried to cover in each article!

Hopefully what this has done is give you something to think about, and a starting point from which you can find out more.

Feel free to talk to us about anything you've read, we're always happy to talk! If you want me to expand on anything in particular, I am more than happy to do so, either in person or through further articles.

It's always good to ask questions.

Importantly, the approach which works for one person will be different for the next, and just because that person seems to have a similar pain to you, doesn't mean they will respond the same. If you are someone who suffers from chronic or persistent pain, an approach which involves a number of different therapists from different disciplines is also of great benefit to make significant progress.

Discussion is important and we **must always ask why**.

And above all else, look at the bigger picture, and look at your body as a whole. After all, ***our nervous system is us***. Everything around that (the tissues and skin), is a just vessel through which it sustains itself and interacts with the world.

References

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