why, PAIN?

or How I learnt to Move More and Hurt Less

Danny Clayton

"Behind every beautiful thing, there's been some kind of pain"

Not Dark Yet, Bob Dylan

"Pain and suffering are connected, but they are not the same thing. Pain can exist without suffering; and it is also possible to suffer without pain"

David Gregory Roberts, Shantaram

"This pain, it is a glacier running through you. Carving out deep valleys & creating spectacular landscapes"

Glacier, John Grant

Contents

Introduction

Back pain is the largest reported reason for work absence in the UK, responsible for 15 million lost work days a year. The British Occupational Health Research Foundation estimate that 40% of the population are affected by back pain, and that this translates to £5 billion (or £200 for every employee) in sickness absence costs. In the U.S, the last 5 years has seen a 629% increase in epidural injections & a 423% increase in overall low back expenditure, yet reported pain rates keep rising (1).

It is a condition which is rife in offices across the country, as well as in manual workers. How can a condition affect so many people with so many different daily routines? Why are complaints increasing? What can we do about it?

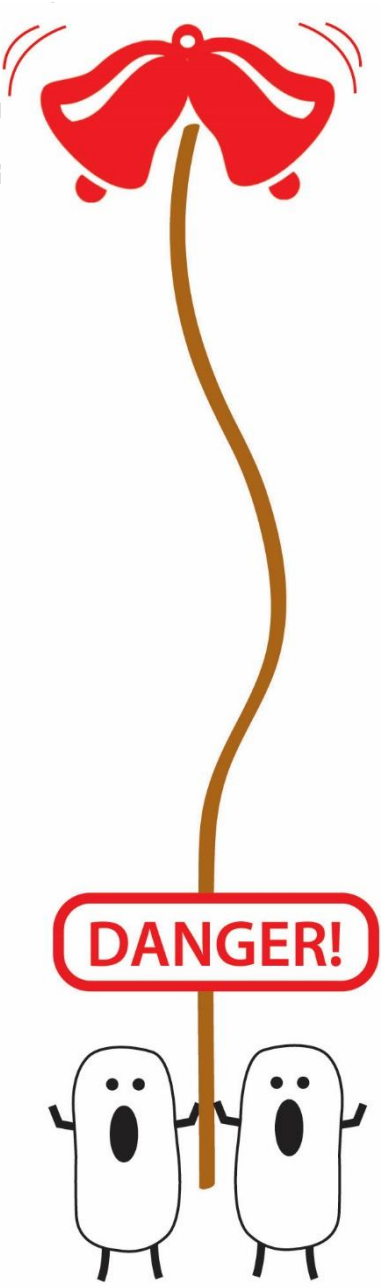
This is aimed primarily at those with back pain, chronic or acute, but most of what follows applies to all musculoskeletal issues. I hope it offers some understanding and sense for those suffering with pain.

What is pain?

"..there is no such thing as a pain receptor…"

Loriumer Moseley, BodyinMind.org

If we don't have pain receptors, what exactly is causing your pain?

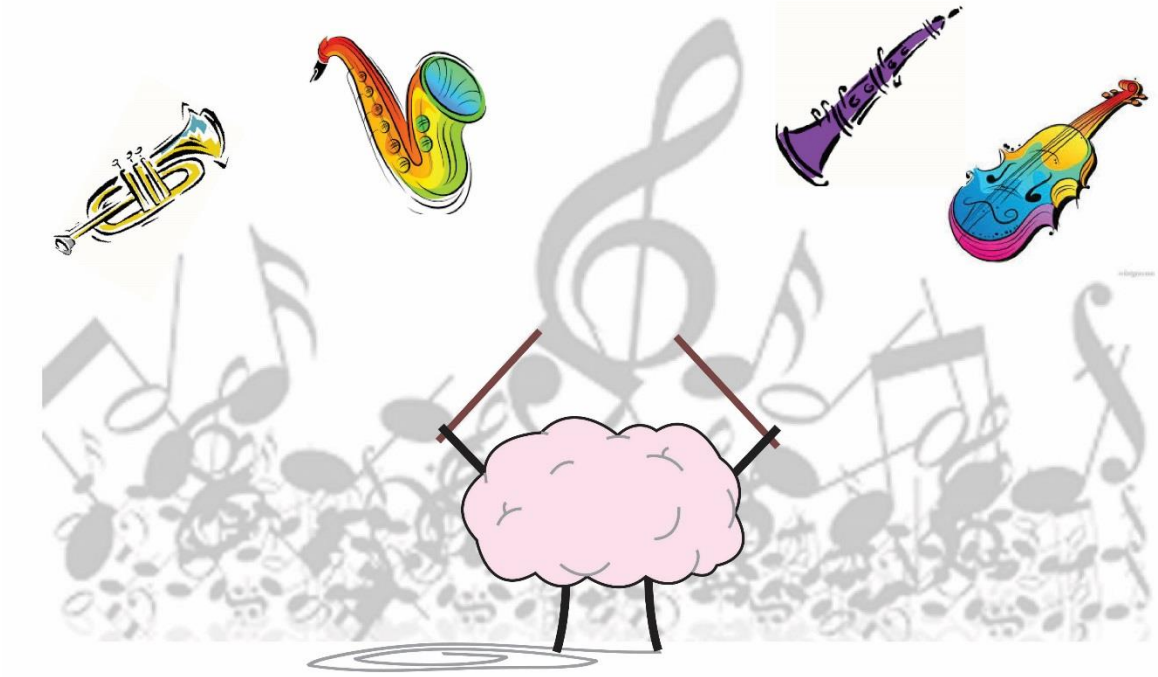


Think of pain as an alarm system. And be thankful that we have one! Congenital analgesia is a condition where pain is not felt; so that appendicitis or gallbladder condition goes undetected until too late.

Our body is full of neurones that respond to various stimuli, be it chemical (e.g. acid), temperature (e.g. fire) or mechanical (e.g. standing on a nail).
If enough of these neurones are stimulated, a message is sent to your spinal cord, which is promptly forwarded to your brain for processing. This is called nociception.
NOTE: there does not need to be 'damage' for a neurone response.

Alarms save lives; you want your smoke alarm to ring when your dinner is burning, but what if your alarm keeps activating when you're making a salad? Is your sensor stuck on High Alert?

In Butler and Moseley's 'Explain Pain' (see further information section), they imagine an "orchestra in the brain" (neurons), which can play thousands of songs, each with different tempos, keys, instruments, and emphases (connections). New songs are invented, old ones revised. Variations and improvisations are common (there are more possible connections between neurons than there are particles in the universe!)



Pain can be thought of as one of the songs possible.

Our orchestra can play a multitude of songs; but some get stuck playing the same song over and over, strengthening the connection…playing the same 'pain' tune on repeat.

Pain can become a dominant factor in life, but it is important to remember that your brain has billions of neurons, and trillions of possible connections (songs), and we can change track.

The Alarm does not need to ring constantly.

Is my pain relevant?

"I would feel the pain, and I would smile, because that pain meant impending freedom"

Aron Ralston, 127 Hours: Between a Rock and a Hard Place

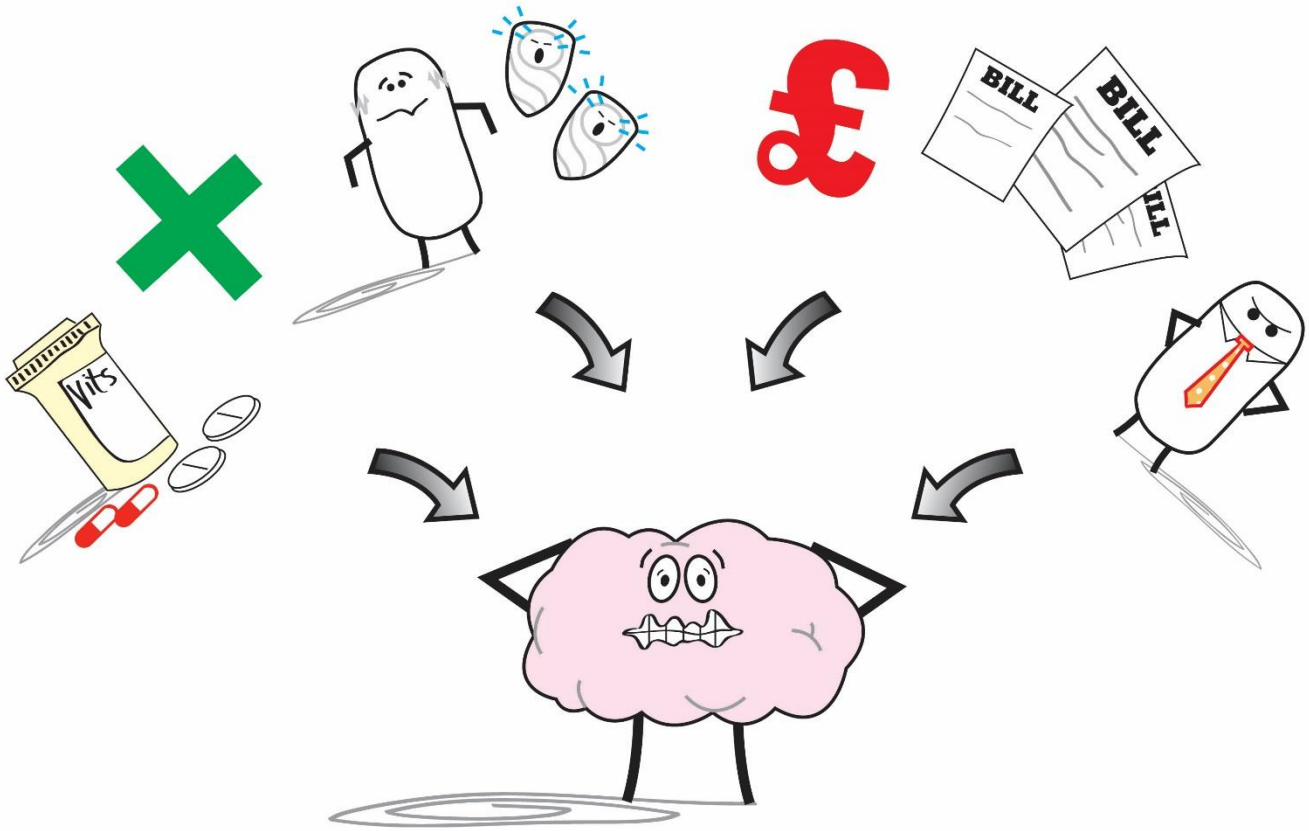
When you feel your pain (or do not feel your pain), and the circumstances thereof, can be as telling as where anatomically you feel your pain.

From Bert Trautmann, who in the 1956 F.A Cup Final broke his neck, yet finished the match, to the many heroic tales of soldiers being shot but being totally unaware until post battle, the stories of 'damage' without pain are endless. NOTE: it works the other way too; we can all have pain which is disproportionate to any 'damage' – think of a paper cut.

Pain – like other senses - is both relative and contextual. Let's look at tickling; fine and funny when tickled by a loved one, but by a complete stranger….

If you break your ankle whilst being chased by a lion, your ankle will not be a limiting factor. Should you outrun said lion, and find a safe place, be sure that the pain of the ankle break will catch you up.

Most of us in the western world do not find ourselves chased by lions – we suffer from very different stresses.



We know that pain tends to correlate with increased stress, anxiety and depression(2); that job dissatisfaction and unwholesome work relationships may be associated with poor outcomes when dealing with chronic pain(3); and even that over-concern from those around us is associated with increased pain and disability(4).

Context

So pain relies on context.

Research shows us that a cut to the finger will be more painful for a professional violinist than for a professional dancer.

When David Beckham broke his metatarsal bone in his foot prior to the 2002 Football World Cup, would his pain have been greater than the exact injury for a guitarist, with no professional reliance on his foot?

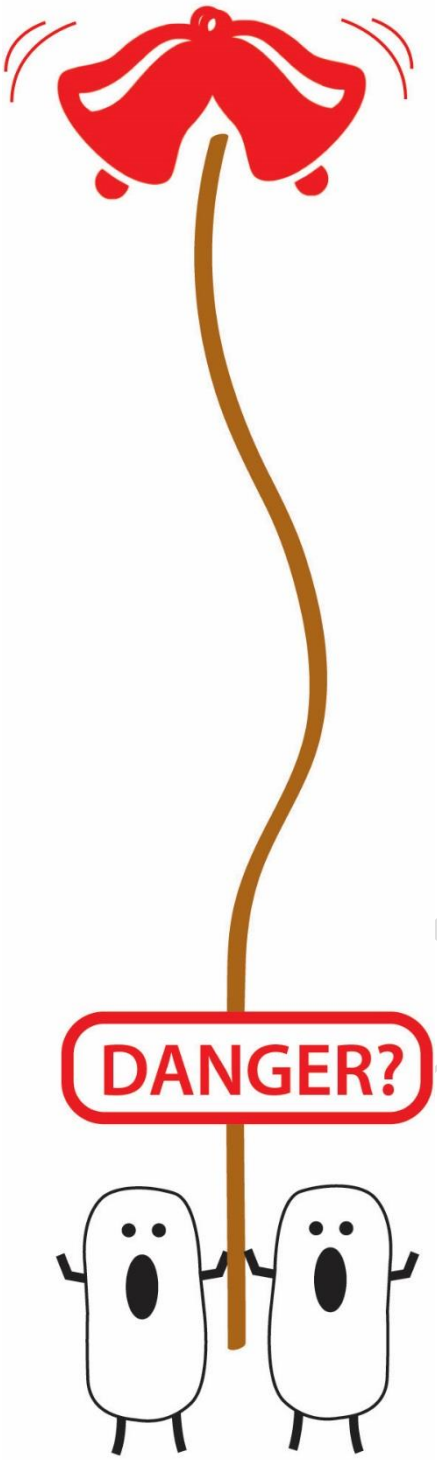
Catastrophizing is a human trait; we see it in marathon runners as they enter the taper period before races, where every little niggle becomes a debilitating dream-ending injury. In a ground-breaking study in 2008, Bialosky et al. managed to successfully manipulate pain in positive and negative directions in both chronic pain patients and healthy volunteers, simply by repeating statements, and they were able to show that these manipulations significantly influence pain levels(5).

How does your pain effect your life? Does you back feel worse on the day of an important meeting? Do you constantly worry about permanent damage? Have you been 'diagnosed' using harmful, or helpful words?

Memory Prediction

"Neurons that fire together, wire together"

Donald Hebb, 1949



The brain is the control centre for pain. This is different from saying that it is "all in your head". Pain is a very real and unique experience.

It is in the brain where it is decided whether or not something is a threat, and whether action is needed. Your brain uses all available senses, plus the ability to use prior experience to predict the future, assessing potential danger…and damage!

This is one of the amazing things that separates us from the animal kingdom! However, what happens when this system is over sensitive, such as in sufferers of chronic pain?

Have you stopped gardening because it hurt last time?
Will it hurt next time?
Does gardening hurt?
Does the *memory* of gardening hurt?

The Response to Pain

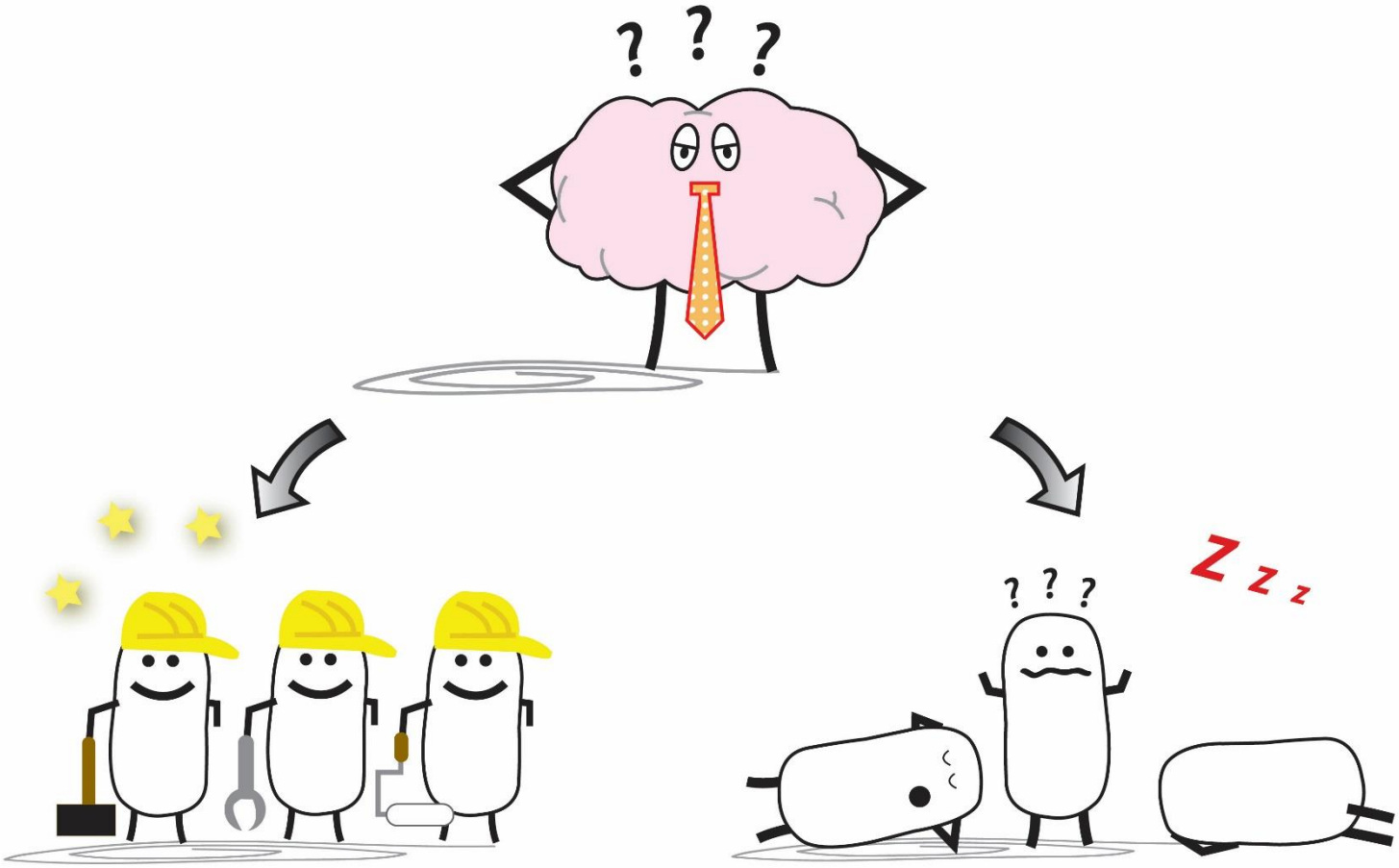
Pain is produced by the brain to protect. The brain is also responsible for priming the body to escape the perceived threat, by activating muscles. Generally speaking, when these muscles are over activated, such as in chronic pain or stressful situations, they become tired, or stiff, or weak.

Even when the threat – or perceived threat – has passed, fear or apprehension can limit the muscles returning back to their normal state (think of Whiplash).

Long-term pain can alter movement patterns creating different secondary muscular issues and co-morbidities such as stress, anxiety, and even depression.

These can create a vicious circle, as we will see a little later.

Imagine your brain as the boss of a company (your body). One department (muscle group) is productive, hardworking and reliable. Its opposite department (or muscle group) is lazy, demotivated and unreliable. Where will the boss send important jobs? What will happen to the two departments?



Now think of what we blame for our pain…

The truth about…

Muscles

Due to excellent blood supply, muscles are great **self-healers**. However, our muscles are full of the sensors mentioned in the 'What is Pain' section, so are usually a **contributing factor** in your pain. Although actually quite hard to injure, they can become **weak and unhealthy** if left unused, or repeatedly used in ways they are not suited.

Muscle 'spasms' are an example of the brain sending out a self-preservation message, in the **process of protection** against threat or potential damage – **irrespective of the actual level of threat** or damage.

Joints

Lots of people suffer from 'joint' pain. Our joints come in varying **shapes and sizes**, but they are all lined with sensors looking out for danger. Nearly all of us have worn joints – it is a **natural caressing of time**. Worn joints do not correlate with painful joints.

Joints **crave movement**; the brain interprets our joints movements to place itself in space (proprioception) – this movement also distributes the key **fluid** within the joint socket, allowing fluid motion and avoiding unhelpful diagnosis such as '**freezing/locking/grinding'**.

Bones

There are **206 bones** in the body. Bones are naturally **strong and resilient**; they are **living, self-healing** structures. They are encompassed in an added protective layer of incredibly sensitive sheath (periosteum) which is full of **danger sensors**.

Broken bones heal, often **stronger** than pre-break – and more often than not **within 6 weeks.**

Nerves

Nerve pain can be frightening and confusing. There are hundreds of metres of nerves in the body – many of which (peripheral nerves) **connect the brain** and spinal cord **to the muscles, joints and outside world.** Nerves are much thicker than you would thick – some are as **thick** as a pencil – and are **strong** and ligamentous, but again, full of danger sensors on the lookout for threat.

Nerves, like joints, go through a natural **change with age**.

Nerves slide as we **move**; if you have altered movement patterns, or new movement patterns, these movements may lead to nerve pain.

If a nerve is injured the brain can recruit **more sensors**, making the area more sensitive, creating more sensitivity.

Discs

'Discs' sit between the bony parts of your spine – the vertebrae – as part of your spinal cords defence. The most common fear with back pain relates to discs, and there are some pretty strong – and, again, unhelpful - adjectives associated with the injury;

"slipped" "herniated" "bulging" "ruptured"

The discs are surrounded by lots of **strong** ligament and muscle – they are not the delicate structure we naturally **fear** them to be.

Both the disc and the surrounding tissues are highly innervated with sensors. In fact the surrounding tissues have **more** sensors than the disc itself – think of it as your bodies last defence Alarm System, protecting your most important possessions (spinal cord).

Discs age, they can bulge, they sometimes herniate, but **never slip**. They heal slowly, but naturally – even a bulge!

Core Stability

"We need to work on your core stability"

Extremely frequently heard, however there is **little evidence** that sufferers of back pain have a **delayed onset of core muscle activation**(6); there is no evidence that any apparent delay found is **important to the causation** of their pain; or that core stability training **improves** any timing issues anyway(7).

So, actually, the link between the core and pain is pretty, umm, unstable…

Scans

Some results from scans to ponder;

% of Neck Disc Bulges Seen on MRI Scans in 1,211 **Pain Free Subjects**

30-40 year olds – **85% had Disc Bulge** **(8)**

% of "abnormal" findings on Lumbar Spine (lower back) MRI & CT images in **Pain Free subjects**

30-40 year olds - **40% had Disc Bulge** **(9)**

% of "abnormal" findings seen on knee MRI scans in those **without pain**

All ages - **Cartilage damage 75%** **(10)**

Scans alone mean little without context.

Cultural Epidemic?

Non-specific lower back pain is the most common cause of disability today, but was it always so? Did our ancestors suffer as we do? Do we as a species suffer together, or is there a difference in the west compared to the east? On the surface, these are strange questions, but research suggests that back pain is twice as common in the developed world compared to less developed nations (11). How can that be?

A "normal", healthy, fit back needs to flexible, strong and durable. One of the major causes of muscle wastage is inactivity – for example sitting in a chair for prolonged periods. Imagine the person that drives for 2 hours to the office; sits for 8-10 hours at their desk; drives 2 hours home and is then tired and demotivated to exercise, so sits on the sofa for a couple of hours. Sound familiar?

In contrast, standing or squat sitting – as in the east - requires more muscle recruitment helping maintain strength and control; things your back craves.

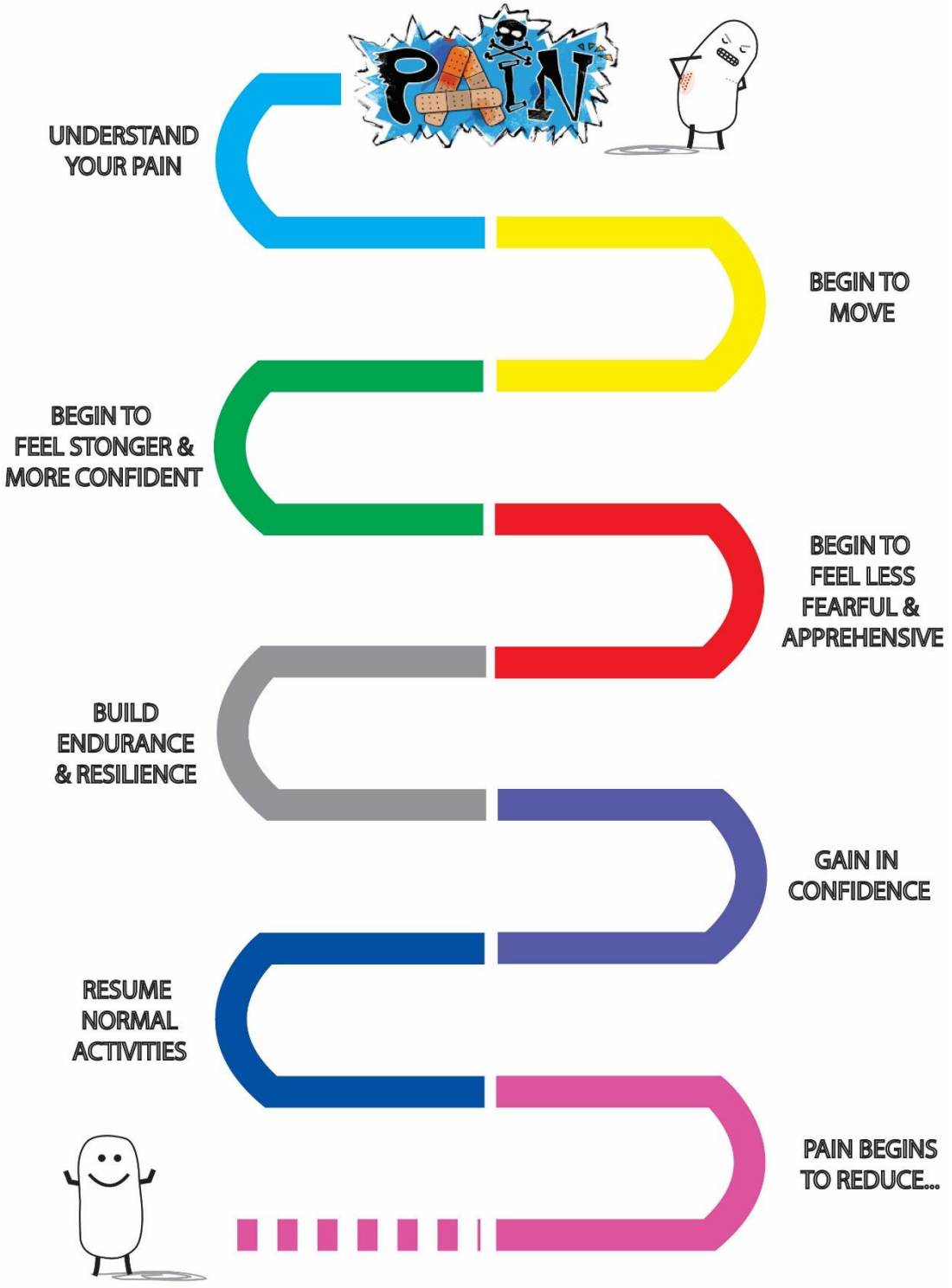
Back pain can become self-limiting. Your back hurts, so you rest, so muscles waste, you move differently, and so your back hurts…

We can break that cycle.

Breaking the cycle

"Nothing changes, if nothing changes"

Tony Robbins



Movement

"A ship in harbour is safe — but that is not what ships are built for"

John A. Shedd

Imagine a drug found to reduce knee pain in arthritis sufferers by 47%; to reduce progression of dementia and alzheimer's by 50%; reduce progression of diabetes by 58%; reduce chance of death by 23%; and is the No.1 treatment for fatigue….(12)

We can utilise the brains drug cabinet – a cabinet full of hormones that mimic the effects of morphine; opioids, endorphins, serotonin. These 'happy hormones' are very effective for pain management, and easily (and cheaply!) utilised by doing what your body craves; moving (13).

This does not mean a membership to an expensive gym and hours a day of intense exercise! Set yourself simple goals; walking the dog, or taking the stairs. Everything should be graded – pacing is key, gradually build the foundations. Exercises that aggravate your pain should be managed, working *up to* your pain, and not *through* it. Pain relief (paracetamol, ice packs) can be used sensibly to enable this.

Try some of these movements, whilst appreciating that the 'Road to Recovery' is rarely linear. Expect bumps along the way, but remember that pain rarely means damage, and to stay focussed and positive.

We are far more capable than we realise.

Standing Up

Simple, right? But think of how long we spend sat down in our modern lifestyles. As discussed on Page 21, it is easy to imagine sitting for 12-14 hours a day. Try keeping a "Sitting Diary" to log the hours spent sat down. You may be shocked.

If you are a desk worker, have you considered a Standing Desk?

Walking

Sitting for long periods of time can put twice as much pressure on the spine as standing. It can reduce blood flow to muscles and joints, which can lead to stiffness and de-toned muscles. If you don't use them, you lose them!

Being upright needs more muscle recruitment; walking requires more still.

Start gently, walking for a few minutes more than normal, and build gradually. Take the stairs where possible. Research shows that as little as 6 minutes walking a day as part of "*A six-week walk training program was as effective as six weeks of specific strengthening exercises program for the low back.*" (14)

For videos of the below exercises, please visit

www.DC-InjuryClinic.co.uk/Videos

Lumbar Rotation

Lie on your back, with hips and knees bent at 90°

Keeping shoulders on the floor, gently rotate knees towards the floor. Repeat for 1 minute. DO NOT EXPECT KNEES TO TOUCH GROUND.

Glute & Hamstring Bridge

Glute Bridge: Lie on your back with your knees bent, feet flat on the floor. Raise hips until your shoulders, hips and knees form a straight line. Hold this position for as long as you can, up to 25 seconds.

For a Hamstring Bridge, inch your toes 6 inches away from your bum, and repeat above.

Door Squats

With feet either side of an open door, hold both door handles. Slowly lower your bum to the ground – AS FAR AS POSSIBLE WITHIN PAIN TOLERANCE – and stand up pushing hips forward. Repeat for 1 minute at a time.

Remember

Pain is **not the same** as damage

There are **no quick fixes**

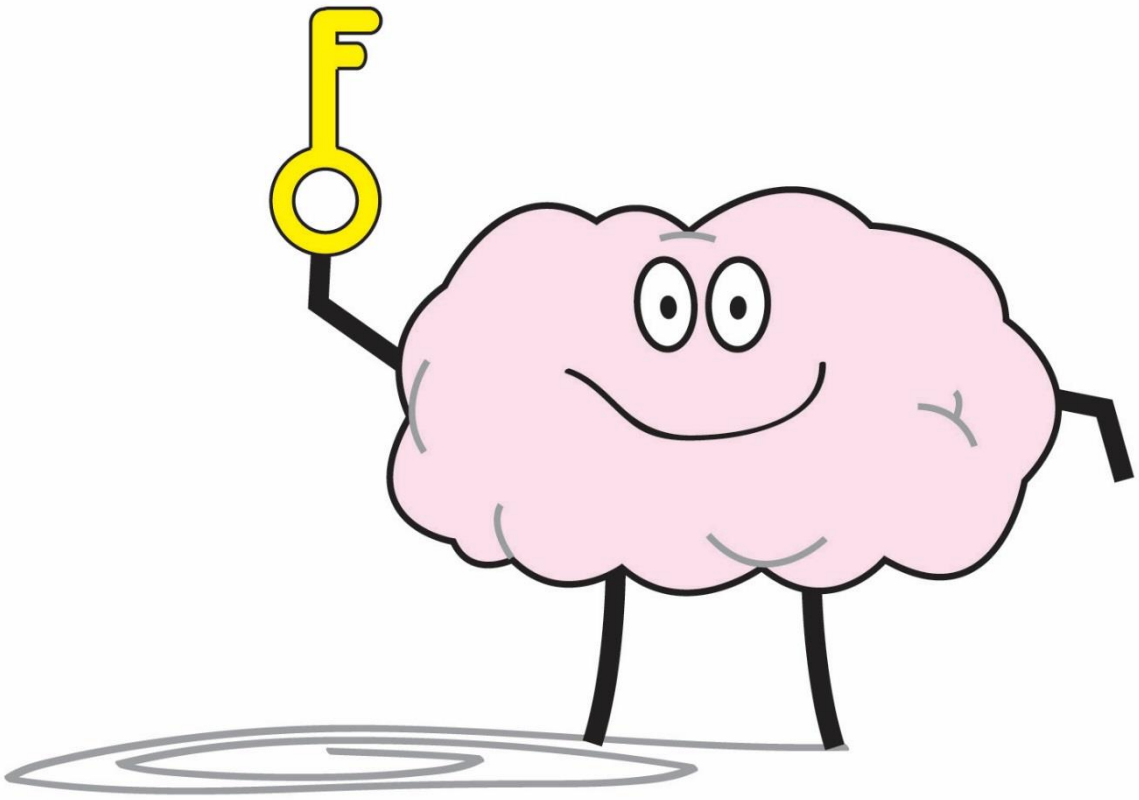
It may **not be a smooth journey** to recovery

We need to build **endurance and resilience**

We need to **build confidence**

It may **not be painless**, but **that's ok**

You are **more capable than you realise**



N.I.C.E Guidelines (15)

The National Institute for Health and Care Excellence (NICE) provides national guidance and advice to improve health and social care

Their advice for **"Non-specific low back pain and sciatica management"** includes;

Do;

Consider a **group exercise** programme for people with a specific episode or flare-up of non-specific low back pain with or without sciatica. Take people's **specific needs, preferences and capabilities** into account when choosing the type of exercise.

Consider **manipulation, mobilisation or soft tissue techniques** (for example, **massage**) for managing non-specific low back pain with or without sciatica, but only as part of multi-modal treatment packages.

Consider a combined **physical and psychological** programme (preferably in a group context, that takes into account a person's **specific** needs and capabilities) for people with persistent non-specific low back pain

Do not;

…offer **belts or corsets** for managing non-specific low back pain.

…offer **foot orthotics** for managing non-specific low back.

…offer **traction** for managing non-specific low back pain.

…offer **acupuncture** for managing non-specific low back pain.

…offer **ultrasound** for managing non-specific low back pain.

…routinely offer **opioids** for managing acute non-specific low back pain.

…offer **spinal injections** for managing non-specific low back pain.

About the author

Danny Clayton is a practicing Advanced Sports Therapist at DC Injury Clinic in Swindon, England. Clinical interests include chronic pain, running injuries and pain science.

Danny runs a Pain Science Workshop in businesses aimed at reducing work place pain and absence. Please contact Dan@Dc-InjuryClinic.co.u.uk for more information.

Danny also runs Strength and Conditioning for Runners Workshops, combining his main interests with the aim of reducing running injury occurrence.

Previously a semi-professional footballer, Danny has worked at all levels of sport, and is now an average runner in his spare time!

See Danny's blog at DC-InjuryClinic.co.uk/blog

Further Information

Books

Explain Pain

By David Butler and Lorimer Moseley

Why Zebras don't get Ulcers

By Robert M. Sapolsky

Mind over Mood: Change how you feel by changing how you think

By D. Greenberger and C. Padesky

On Intelligence

By Jeff Hawkins

The Man Who Mistook His Wife For A Hat

By Oliver Sacks

Videos

TEDx Adelaide - Lorimer Moseley - Why Things Hurt

http://tedxtalks.ted.com/video/TEDx-Adelaide-Lorimer-Moseley-W

23 and 1/2 Hours

https://www.youtube.com/watch?v=3F5Sly9JQao

Understanding Pain: Brainman stops his opioids

https://www.youtube.com/watch?v=MI1myFQPdCE

Understanding Pain: Brainman chooses

https://www.youtube.com/watch?v=jlwn9rC3rOI

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CHRONIC LOW BACK PAIN

— TAKING BACK CONTROL - A Biopsychosocial Approach —

Up to 80% of people will experience low back pain at some point in their lives. (1)

In 85% of cases, no specific cause can be defined, despite careful investigation. (2)

PAIN is a complex, multi-factorial experience, unique to each INDIVIDUAL

CHRONIC LOW BACK PAIN can be influenced by....

Psychological Factors

Fear-avoidance of activities such as bending can increase pain-related disability (3)

Increased pain tends to correlate with increased depression, anxienty and stress (4)

Social Factors

Job dissatisfaction & unwholesome work relationships may be associated with poorer outcomes (5)

Over-concern from family members is associated with increased pain and disability (6)

Lifestyle Factors

Sedentary lifestyles tend to correlate with higher levels of pain and disability (7)

Poor general health is associated with poorer outcomes in Lower Back Pain (8)

WE CAN HELP ...

"... the **correct dosage** of multimuscle, dynamic exercises can act to **promote movement** variability ... ... exercises involving the use of different movement strategies could be effective in helping people to obtain exercise induced benefits while **avoiding injury and pain reaggravation** ..." (9)

UNDERSTAND your pain → Start MOVING → Feel STRONGER → Have more CONTROL → Feel more CONFIDENT → Return to NORMAL activities → Pain starts to REDUCE

Injury & Rehabilitation Specialist

www.DC-InjuryClinic.co.uk

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