

TREATMENT

fundamentals



A therapy **map**
for healthcare
providers and
patients

Greg Lehman
Physiotherapist and Chiropractor

www.greglehman.ca



You are free to use the material in this workbook with your patients provided the source of the material is referenced on the bottom of the sheet.

www.greglehman.ca

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Purpose of this book

This workbook is an introduction to a number of different methods to help with the treatment pain and injuries.

The book should be used with a therapist.

Each page in the book introduces a method to help with pain and injury. Sections of the book are left blank which are to be filled in be either the patient or therapist. These sections are specific to the needs of the person in pain.

Why should you read this book

This workbook is helps prioritize treatment. It helps the therapist and patient find the factors that are contributing to a patients pain. It then helps select interventions that can be helpful and allows the healthcare provider to tailor each intervention to the patient. It provides advice about posture, exercise, beliefs and techniques to get out of pain.

This book is part of a larger course on the simplification of the treatment of pain and injuries entitled **PhysioFundamentals: Reconciling Biomechanics with Pain Science** at www.greglehman.ca or at www.physiofundamentals.com

Open Source this book is a work in progress

Ideally, this book will be updated regularly. If you have ideas on different pages or concepts to be added to the book please feel free to share and I will try to incorporate new and useful information.

Send to greglehmanphysio@gmail.com

Background reading

This book should be part of a comprehensive approach to treating pain and injury. Understanding pain science and the biopsychosocial model of rehabilitation is necessary. Below is a list of great material to learn about pain and injury.

1. Explain Pain: Lorimer Moseley and David Butler
2. Graded Motor Imagery Handbook: Butler, Moseley, Beames
3. Progressive Goal Attainment Program (PGAP) by Michael Sullivan
4. Classification Based - Cognitive Functional Therapy by Peter O'Sullivan
5. Therapeutic Neuroscience Education: Adriaan Louw

Websites for pain

1. noigroup.com (A David Butler production)
2. bodyinmind.org (A Lorimer Moseley joint)
3. bettermovement.org
4. painscience.com (formerly saveyourself.ca)
5. bboyscience.com
6. gradedmotorimagery.com
7. dermoneuromodulation.com

Topics

- A. Evaluation - What are your contributors to your pain?

- B. Sensitivity - a guide to your rehabilitation

- C. Patient Guide Sheets: Movement and Exercise Homework

- D. Patient Advice Handouts: Dispelling misplaced guidance
 - 1. Why its OK to slouch and bend your spine
 - 2. Your body is robust. Stop blaming anatomy for aches and pains

- E. Patient Guide Sheets: Graded Motor Exposure and Goal Setting

Evaluation What are your contributors to your pain?

Part 1 of this book explored how pain and injury is influenced by a number of factors. Many of those are **modifiable** and therefore there are many ways to help with pain. We also learned that pain is more about **sensitivity** than about tissue damage. Again, a great finding because we can change our sensitivity.

It is important to explore what factors might be contributing to your pain. Working with your health care provider is a great way to start to figure this out but you can also do this alone with some reflection.

Below are a number of questions to consider and many you have probably already explored with your health care provider. These questions will get you thinking about the contributors or drivers to your pain. It will also help you think of ways that you can get healthier in all aspects of your life. Remember, pain is about treating the person - you. And you are a complex **Ecosystem** where a number of different factors mix to create your experience of pain. We don't know how pain is exactly influenced by all the different factors but we do know that it is helpful to address many areas of your life. They also inter-relate. When it hurts to move you tend to move less and withdraw from sports and hobbies. This changes your general wellness and can change your mood and social supports. Your life roles change and your sense of self can change. This can be frustrating and demoralizing.

But things can change.

Aggravating Movements

What movements or activities tend to increase your pain?

Are there movements you typically avoid?

What happens when you move into aggravating positions?

Lifestyle Changes

How has your life changed?

What activities are you no longer doing that you would like to?

Is there anything about your lifestyle that you think contributes to your pain?

Stress

Does stress influence your pain?

What stress increased when you first started to have pain?

Can you manage your stress well?

Emotional Health

Are you consistently fatigued?

If you are depressed have you spoken with your doctor about this?

Do you think your pain is unfair?

Beliefs about your pain

Do you feel fragile?

Are you concerned that more activity will cause more damage?

Why do you think you have pain?

Do you fear movement and injury?

Life Balance

Do you have the time in your life to do the things that are important to you?

Do you have support at home from friends or family to help with your pain?

Evaluation Results your contributors to your pain

You will now have explored many areas of your life that can contribute to pain and your overall wellness, both on your own and with your health care provider. In the sections below your therapist should list the most important areas. Not all of the areas will be relevant. For many people just the aggravating movements and lifestyle section might be relevant to your pain. Start with that area.

For therapists: other questionnaires might be useful. If you feel that catastrophizing, fear of movement or other factors are relevant consider using the pain catastrophizing scale, the Fear Avoidance Belief Questionnaire or other outcome measures you are comfortable with.

Aggravating
Movements

Lifestyle
Changes

Stress

Emotional
Health

Beliefs about
your pain

Life Balance

Evaluation What are your physical impairments and movement habits?

This section is **for the therapist**. It is a summary of the patient's physical function. Psychosocial factors are important but we never avoid the physical. Influencing the physical factors can also influence the emotional and belief processes involved in pain.

In your physical exam, find any large impairments in function, any movement habits that might increase pain, lack of confident, fluid movement (i.e. staying in a protective pattern) and impairments in biomotor abilities (strength, power, endurance, ROM) that don't match the needed function in their sport, hobby or meaningful task. Finding these habits or limits gives us a great place to start in prescribing exercise or movement changes. Remember, the impairments are patient specific. A lack of strength or ROM alone is not enough reason to have pain. Its when this deficit is needed in a specific activity that it might be relevant.

movement and pain couples

What movements have become coupled with pain? If you have found a painful movement does the patient continue to maintain this posture during other tasks.

Therapy Goal: Painful movements are great to find. These can be desensitized a number of ways depending on how sensitive or irritable your nervous system is. Remember, pain does not mean damage. We can work around pain or even poke into pain to ultimately resolve pain.

feared and over protected movements

Do painful movements appear rigid, fearful, lacking in confidence? Describe the subjective quality of movements. Are there fewer spontaneous movements? Does the patient consistently avoid certain movements?

Therapy Goal: feared and painful movements become goals. We can learn that all movements are safe and do not have to be off limits. Treatment can slowly expose you to these movements and desensitize them.

General Impairments

What general impairments are seen around the area of pain? Are there changes in strength or ROM? Does the patient lack options in movement (e.g can only do a single leg squat with knee valgus)?

Therapy Insight: when in pain other body parts might fall into protective behaviours that might contribute to pain. In essence, those limitations in movement can trigger a pain response because they have learned to be associated with pain.

Impairments related to Physical Goals

Do the patient's current abilities match the needed abilities in their sport, hobby or meaningful activity? Has the patient's tolerance to their sport or hobby decreased? Is fear involved with resuming their activity?

Therapy Insight: Rehab exercises don't have to be so boring. Sometimes the sport or hobby you miss can be your rehab. Remember, often nothing is off limits. Its just how hard or how often that can flare you up. Using meaningful activities as rehabilitation can be helpful.

Sensitivity a guide to your rehabilitation

At its simplest good treatment is about two things:

1. **Desensitizing** - any strategy that helps decrease pain
2. **Reloading** - applying stress to the person to cause them to adapt

Desensitizing is done a number of ways and involves treating the whole person. Understanding pain, having hope in your recovery, changing lifestyle habits, managing stress/sleep, setting goals, manual therapy and exercise therapy are all great ways to desensitize.

Reloading goes hand in hand with desensitizing. It involves stressing the person a little more than they are used to. This is typically done with rehabilitation exercises but it doesn't have to be limited to that. Restarting a running program, typing 10 extra minutes a day, spending 3 extra minutes cleaning or performing a slightly painful exercise with vigour are all ways to **challenge your body and ecosystem to adapt**. The key is determining your sensitivity and your meaningful goals.



Below is a simple method of determining sensitivity. Patients can be roughly streamed into a High or Low sensitivity class. There will be overlap.

High Sensitivity

Pain

- pain tends to spread or move across locations
- pain appears to increase severely with little provocation
- pain seems much greater than expected with the degree of tissue damage
- large next day flare ups in pain after mild activity

Movement

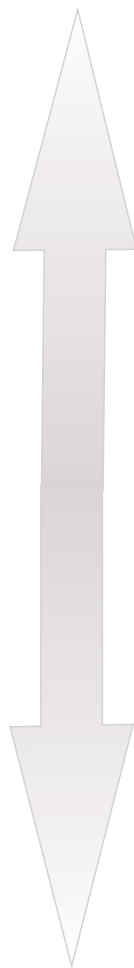
- many movements trigger pain
- movement is guarded and protective
- bracing, grimacing, poor breathing is noted
- a lack of spontaneous and fluid movement is observed

Life roles and meaningful task interruption

- withdrawal from hobbies/sport/work
- low physical activity
- disruption in sense of self

Mood and Beliefs

- fear of reinjury and movement
- low self efficacy, catastrophizing
- poor coping



Low Sensitivity

Pain

- local and discrete anatomically
- pain is consistent with specific tasks
- pain rarely flares up - only with large increases in loading
- pain appears consistent with injury

Movement

- compensations in movement may be observed
- impairments in strength and range of motion can exist
- a possible lack of movement variety
- avoidance of painful movements occurs but not always

Life roles and meaningful task interruption

- maintaining sports, hobbies and work
- pain is present but working around pain

Mood and Beliefs

- fear of reinjury or fear of movement is low
- the pain can be frustrating but coping skills are high (e.g a runner will cross train)
- psychosocial stressors may be present but also existed before the onset of pain

Exercise and movement therapy for pain.

Exercise and resuming many life roles is the application of stress to the body. It can function to desensitize and build patients back up. There are different exercises you can do to help change your pain habit. Below is an overview of the different exercise or movement options that can be helpful. Not all are necessary to get out of pain but the ones you do will depend on your presentation and goals.

Exercise has a number of benefits when in pain. We often think that exercise just makes you stronger or more “stable” and this will lead to less pain. While you might certainly get stronger this probably isn’t the reason you get out of pain. The following sections will explore the different types of exercises you can do and the benefits you get out them.

Local Exercise

- stress sensitized/injured tissue
- load to adapt
- high to low sensitivity states
- progress to High Threshold load

Symptom Modification Exercise

- novel, fluid, exploratory and fearless movement
- neurodynamic exercises
- pain uncoupling via movement modifications
- Graded Motor Imagery for highly sensitive patients

Comprehensive Capacity

- general aerobic exercise
- graded motor exposure to important activities
- regional exercise
- sport specific
- comprehensive training for all function



Exercise and movement therapy for pain.

specific exercises

Specific Exercises Category

Remember, the body responds to stress. Some physical stress on painful tissues is good. It teaches them to tolerate that movement and adapt. You might also feel tight, weak or rigid in your movements and simple movements can help change those feelings. Areas around the painful body part might also have changed how they move. This type of exercise does two things:

1. Stresses the painful region to both desensitize and give it confidence again in being used
2. Addresses any physical impairments around the painful body part.

high threshold exercise

And a **bonus effect is on the brain!** Remember, the maps in the brain that change with pain. Focussing on your exercises, and moving in ways that stress those body parts can change your brain. All of this leads to less pain, increased tolerance to movement, increased strength and a more robust ecosystem.

Specific exercises on painful body regions can be used for both High and Low sensitivity areas. A low sensitivity area can be pushed more with higher weights and greater repetitions. This is often what is missing in rehabilitation. The lack of a stimulus to adapt so we can often use very heavy weights, explosive movements or end range challenging movements to catalyse a change.

confrontation exercises

In high sensitivity situations we would use fewer repetitions, often less load but perhaps increase the frequency during the day of stressing the body part. The goal would be to use or **"confront"** the sensitive region, avoid a flare up and ultimately "teach" the ecosystem that it can tolerate those stresses.



novel, fluid, fearless movements

symptom modifying movements

During the physical assessment your therapist would have found movement habits of yours that are contributing to your pain. You might maintain the same posture for extended periods when sitting. Never move your shoulders while standing. Keep your spine rigid when bending forward or always keep a severe arch in your back. Perhaps you hold your breath when bending or don't twist your spine. These are all protective habits that aren't necessary. These habits become coupled with other movements and then become coupled with pain. You have essentially learned to experience pain with certain movements.

This type of exercise or movement retraining tries to give you more options in movements. It breaks up the way you normally move and creates new memories - pain free memories of how to move.

neurodynamic exercise or GMI

Your therapist might also find variations in how you move to decrease pain. For example, if lifting your arm hurts then tilting your neck, shrugging your shoulders or squeezing your knees can change this pain. This is because pain is about sensitivity and habits. These subtle changes that decrease pain significantly can desensitize and further reinforce that damage is not usually the driver of pain. Slowly over time we remove these modifiers and you can ultimately move pain free without thought or correction.

On examination you might have shown signs of some of your nerves having **"altered neurodynamics"**. This means that when those nerves were put under some stretch your therapist was able to create and then modify your pain. Neurodynamic "sliders and tensioner" exercises can be great movements to get you out of your pain habit.

Pain uncoupling movements

Graded Motor Imagery exercises also loosely fall into this category. They don't immediately change symptoms but they are gentle "exercises" designed to desensitize and prepare you for other movements. They are the type of exercises a patient does when all other movements hurt.

One key with these exercises is that you will do them very often. You are learning new memories and just like memorizing a poem high frequency is the key to new learning. You are breaking old habits of painful guarded movements with new fearless confident ones.

general exercise

Comprehensive Capacity

Disuse and disability often follow pain and injury. It is only natural. It hurts to exercise and people often have flare ups of pain after exercising. But **general exercise** (hiking, jogging, elliptical, swimming, yoga, pilates, weight training) that is mostly pain-free and just simply gets your heart rate can help with pain and injuries. Exercise is a key to the drug cabinet in your brain. General exercise leads to descending modulation. This is the mechanism where the brain tells the spinal cord amplifier of the "threat signals" from the body to settle down. It inhibits the input up to the brain. General exercise has been shown to help with all sorts of persistent pain states.

Regional exercise sees the patient training movements, joints and muscles around the painful area. We know that exercise at a distance from the painful site can help so we work to improve the function in related areas.

Regional Exercise and meaningful tasks

Meaningful task exercise helps patients resume what is important to them. Almost any task can be an exercise. A goal of therapy should always be to have meaningful activities incorporated into rehabilitation. For example, runners should be returned to running as soon as possible. Knitters need to knit! Graded motor exposure to meaningful tasks is a great way to design rehabilitation.

Comprehensive capacity training is about maximizing the function at every joint and related movement system. It may not be important for pain relief but is more relevant at advanced stages of rehabilitation for athletes. At its simplest, comprehensive capacity means that training should be the most out of every joint and activity. We train through multiply planes of movement, at various speeds, under different loads and in different contexts.

There are no Bad Exercises...mostly



Now this is a tough concept to grasp as most people in pain or with injuries are warned about moving certain ways or avoiding certain activities. Avoidance is good when there is an initial acute injury - like the first few days after a torn ligament, muscle or broken bone. If you get a cut you put a bandaid on for a week or so. But you don't leave that band aid on for months. The same thing with injuries and pain. A torn hamstring muscle requires a few days of rest but soon the best way to promote healing is to begin stressing it. The stress on a tissue causes it to adapt. We are just cautious in **how much** and **how often** we put stress on the tissue

Persistent pain is the same thing. When you have had pain for more than 6-12 weeks you are healing and most likely do not have tissue damage...yet you still have pain. Gently starting to stress your body, your tissues, your sensitive nervous system, your thoughts about your pain and your entire **ecosystem** helps you adapt. You slowly begin to do more and your pain slowly begins to subside.

When a therapist puts a limit on what you can do or tells you that you have specific rules on how to sit, how to bend and a huge list of "don'ts" its natural to lose confidence in the strength and resiliency of your body.

But when you make the shift in thinking that your pain is due more to sensitivity and protective responses are not about damage to a weakened structure then you can start doing more with less pain. You can start stressing your body to adapt and ultimately learn that you are strong.

Treatment and exercise teach the body that it is Strong but Sensitive.

Temporary Limits There are no absolutes. Sometimes there are temporary limits on what you can do and the body is in need of protection. An example, is an acute flare up in achilles tendon pain in a runner. For a short period of time we would avoid stretching, hill work and speed work. Maybe even a temporary heel lift would be used. But all these modifications are band-aids and are short lived. Below is a list of your temporary modifications in movement, exercise and daily living relevant to you.

Patient Guidesheet: Calming the Sensitive Nervous System



Following your assessment your healthcare provider may have found some neurodynamic tests that increased and subsequently decreased your pain. These give us some insight into the sensitivity of certain movements. If applicable you should start doing some of these movements. They are a specific type of **Symptom Modification Exercise**. You need a nervous system to feel pain. If you have muscle damage that damage will not hurt unless you have also somehow irritated the nerves around that muscle. And remember, your brain has to also view the information that those nerves are sending as threatening and ultimately you experience pain.

The peripheral nerves in the body can become sensitized, irritated and contribute to you feeling pain. Two common examples of this are Sciatica (i.e. the sciatic nerve gets irritated) and carpal tunnel syndrome (i.e. the median nerve in the forearm gets irritated).

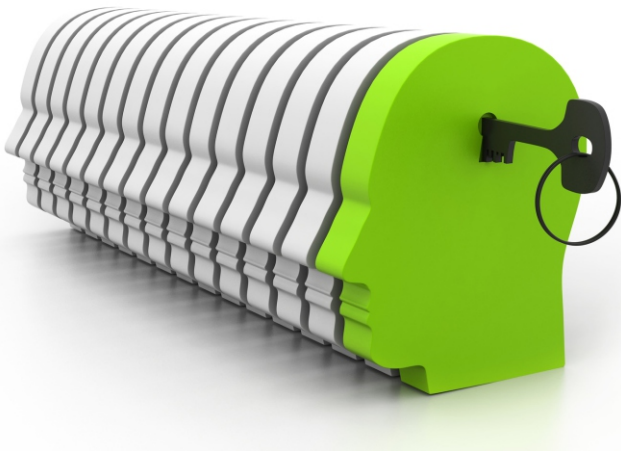
Often people think that Sciatica only occurs when a disc in the back is pressing on the nerve, however, the nerve itself can get irritated, stay irritated and you can feel pain anywhere that it sends its branches. People might feel ankle pain that seems like they sprained their ankle but they never had ankle trauma. This can be an example of a branch of the sciatic nerve becoming irritated.

To calm down this irritation we use movement. Specific movements that are designed to get the nerves of the body sliding and moving through the muscles and joints of the body. These movements are painfree and you should not feel worse after performing them.

Tips on performing Neurodynamic exercises

1. You might perform as many as 10 per hour for 3-4 days
2. Perform both the left and right side of the body
3. Perform slowly and tune in to how you feel
4. Slight discomfort is allowed but do not push through pain
5. If your pain gets worse the next day then you need to do less or do something different

When it hurts to move - an introduction to **Graded Motor Imagery**



Sometimes almost all movements hurt. Body parts can become extremely sensitive and it is difficult to do anything without flare-ups of pain. For these cases **Graded Motor Imagery** is a helpful treatment technique. The best training in this process is with the Neuro Orthopaedic Institute (noigroup.com) and the GMI can be found at gradedmotorimagery.com. GMI consists of three steps 1. Left-right judgements 2. Imagined movements and 3. Mirror training. The purpose of GMI is to sneak under the pain radar.

To begin the process of changing pain neurotags in the brain. In persistent pain states cortical body maps in the brain are changed and the ability to determine left from right is altered. Beginning with these tests of **laterality judgement** starts to change those body maps. This is then followed with **imagined movements**. Imagining movements helps activate parts of the movement neurosignature that is often painful. However, since the movement is imagined it may not also activate the pain neurotag. Although, in some patients pain can occur with only imagined movements.

Imagery can also be used with less sensitive patients when their movements are being progressed in terms of intensity or what they consider fearful. Imagining forward bending while having the spine bent in a sidelying position is a good way to prepare the body and nervous system for the more challenging and fearful regular bending.

After imagined movements patients are progressed to **mirror training**. Mirror training has the painfree arm or leg perform movements in a mirror and when the patient looks at the mirror it looks like the painful limb is moving. This is the last step in retraining the brain. This **desensitizing** process can then be followed by actual movements.

Patient Guidesheet: Confrontation Training - Poking the Bear for pain relief



If you always avoid even the slightest pain then disability and sensitivity can increase. At times, doing activities that hurt slightly can be beneficial. Again, when we shift our mindset that pain is more about sensitivity than damage then we can understand why doing something that hurts a little bit is not harming our body. The condition is that we do not completely ignore pain. We recognize that it is the brain perceiving a threat...we do not push so much into pain that there is a large windup or flare up of pain the next day. But "poking the bear" slightly and learning that this does not lead to more pain can teach our ecosystem to desensitize. It learns to tolerate these activities again.

In some specific cases, pushing into pain might even be necessary. With many tendinopathies our exercises should be progressed until they are slightly uncomfortable. We also know that with tendon pain we can persist in playing sports or activities while in pain (provided there is minimal next day flare-ups).

Poking into pain is a way to keep nudging up our pain threshold line. If we always avoid this line then we can increase our sensitivity.

Patient Guidesheet: High Threshold Training - heavier and dynamic loading to catalyze a change



Many aches and pains can tend to linger after good rehabilitation. The pain itself is mild but often annoying and only comes after certain sports or activities.

A possible reason for lingering dysfunction is a lack of a sufficient stimulus to cause **adaptation**. This is quite common with persistent, nagging, tendinopathies. This pain is often of very low sensitivity. This low sensitivity allows the tissue to be aggressively stressed with either heavy weights or more explosive, stretch-shortening like treatment. Exercise might also need to be taken to more end ranges of movement and loaded as well.

The therapist should try to find movements or ranges of movement that are painful. Exercise treatment then involves stressing the movements with heavier loads and dynamic activities. Daily loading might also be required. This type of treatment can also fit well with "Confrontation Exercises" where we are trying to poke the bear slightly.

Patient Guidesheet: Comprehensive Capacity - maximizing all your options



Perfect form is often taught in lifting, squatting and the execution of exercises. Exercises are often done straight up and down or just front and back. Essentially, in 2-D. Little variation in technique is permitted. But we live in 3 dimensions and physically we are designed to move in almost infinite ways yet our exercises often lack this novelty and variety.

This component of exercise training asks for variety and exploring all the ways that the body can move. For example, instead of doing a single leg squat where the hips are perfectly level and the knee tracks over the 2nd toe to try to modify the exercise. Drop the hips down and then pop them back up. Drop one hip way out to the side and then regain equilibrium. Swing your other leg back and forth behind you. Do this fast, do this slow. Drive your knee inwards and then pull it back to start. Let your knee fall far over your toe and then “windshield wiper” back and forth.

Perform these variations for many body parts. Choose exercises not just because an assessment says one area might be weak **but because you want to maximize all functions at every joint.**

This process is called **Comprehensive Capacity**. It works the totality of the body and develops the capacity in all ways that the body can move.

Patient Guidesheet: - Meaningful task exercise - the importance of resuming hobbies, life roles and sports



Performing a sport, hobby or activities of daily living can be great rehabilitation. We often think we need to perform certain exercises before we return to a sport. But depending on the sport the sport itself can become rehabilitation. The rule of thumb is whether the sport itself can be broken into less demanding tasks. If the sport consists of complex, demanding tasks then the athlete must be able to do the components of the sport first. However, if the sport is simple and can not be broken into more simple physical tasks then that sport can now be used as rehabilitation.

For example, running is a sport that an injured runner can use as rehab. The act of running, possibly with modifications to technique, terrain, distance and speed is an excellent means of putting load on the body and asking the body to adapt. We merely quantify the stress placed on the athlete. A more complex return to sport might be golf. Immediately returning to play 18 holes and hitting the full bag of clubs might be too much initially. With a return to golf we could start with putting, chipping, slow motion driver swings, only playing 3 holes or only playing from 100 yards in etc. Exercise wise, we could break the golf swing into components and slowly start to train these movements.

Hobbies and work tasks are done in similar ways. If a patient has trouble sitting and typing for 8 hours, we break that work up into smaller chunks of 10-30 minutes. Again, we slowly ease into these activities.

Meaningful task exercise, along with other exercises, is part of activity **Goal setting and Graded Motor Exposure.**

Patient Guidesheet: Treatment Summary

Contributors to Pain

Lifestyle/stress/beliefs treatment plan

Application of Stress to Promote Adaptation

Specific Exercises

Symptom Modifying Exercise

Comprehensive Capacity Exercise & GME

Future Progression

Patient Advice Handouts: Dispelling bad advice



The following section explores a number of areas related to pain and injury. It aims to inform and give sound advice best on the best available evidence.

Some of what you read may sound like the exact opposite of what you've heard before. Topics include:

1. Why its OK to slouch when you sit and bendover
2. Your body is robust. Stop blaming anatomy for aches and pains

why **its OK to slouch** when you sit or bend over

I'm sure you have heard it before. Don't slouch. Don't bend your back. Don't do sit ups. Sit up straight. Don't look down at your book or your tablet.

Most of this advice is wrong. There is nothing inherently dangerous about sitting with your spine bent and being slouched in a chair. There is nothing dangerous to the spine about bending your neck all the way forward. There is no risk to sitting with your legs crossed or with kids sitting in a "W" sit position.

During activities of daily living (sitting, standing, walking, bending) there is not a lot of stress on the body. The body has a huge margin of safety. Nothing is going to break if you sit in a chair for 60 minutes with your back slightly rounded.

I know you might say that if you sit with your back flexed all day then you can have a lot of back pain later. This without a doubt happens. But its not that there is a better way for you to sit in the same position that would have avoided that pain.

The problem with posture is that we often lack variety.

If you sit all day in the same position, regardless of the type of position, you might very well have some discomfort. But there is a good chance that this discomfort won't be any less than if you were to sit tall, with your abs tight and your head directly over your shoulders. Holding this position all day can be just as stressful and uncomfortable.

The same holds true for many movements. If you have to bend over to pick up your shoe its OK to **not** bend at your knees or your hips. There is not a lot of stress in this position and the spine is robust, strong and built to tolerate these movements. However, if you have to lift a thousand pairs of shoes then you might certainly get a backache if you are not accustomed to doing this. But this might happen regardless of how you bend or don't bend your spine.

Healthy sitting involves multiple positions

This means getting up for frequent breaks. Sitting with your feet on your desk. Using different chairs or even working on the floor. It means crossing your legs. It means leaning back in your seat. It even involves sitting up straight. **Options are Key.**

When might you want to avoid certain postures

Sometimes it hurts to flex the spine. In these people pain has become a habit and surprisingly so has the act of always flexing the spine. So even though spine bending hurts they often still adopt a bent posture. If you are one of these people than you need more movement options and for a short while need to avoid flexing your back. Not forever, though. Your spine isn't weak and incapable of flexing. It just needs a short break while you develop new habits and it gets a chance to become less sensitive

stop blaming your body - your anatomy doesn't dictate pain

Many of the following ideas have been driven by well-intentioned and often very good therapists but unfortunately has little scientific evidence to support them. It is important to know that these ideas are false because believing these falsehoods can often set people up to have more pain. **Pain is often amplified by faulty beliefs.** For example, if you've been told your spine is unstable it can set the belief that your back is weak and in need of protecting. Remember one way that the brain protects you is by producing pain so pain might occur more readily when we view our body as weak and unstable. Instead we need to view the body as strong and capable of adapting but often sensitive. Its this sensitivity related to the faulty opinion that the body needs protection that can perpetuate pain.

The most common body myths about pain

1. *Your flat feet, knock knees, leg length differences and scoliotic spine are causing the pain*

This one is prevalent. But the research is just not there for most painful conditions. For the scientists out there, there is a very small, probably clinically insignificant, difference in foot flatness for one type of running injury but for the most part our anatomical peculiarities are not related to pain. Why? Because you adapt to them. If you have these differences, and everyone does, you have probably always had it and you have adapted to it. These peculiarities don't put any greater stress on the body. The only stress is the grief it causes when you view these normal variants as pathologies.

2. *Your joints are stuck, out of alignment and need fixing*

Whole professions are based on this faulty belief. But in the 100 years of studying this no research has ever documented a joint that was stuck or that the body can come out of alignment. No technique has ever been shown to realign joints either. Sometimes the techniques that try are very helpful for pain but this doesn't mean that you were ever re-aligned. This is important to know because if we believe we are in need of fixing or "realigning" we view the body as fragile and something that "goes out". Its not. **The body is robust.** It is strong and capable. Often times it is just very sensitive and uses protective mechanisms that hurt. Believing these falsehoods can create that sense of fragility and the need for over-protection.

3. *You are tight, don't stretch and therefore have pain.*

Big Falsehood. The preponderance of research has not been able to show that stretching helps prevent pain. Nor does it link inflexibility with causing pain. It might work the other way around, in that when you have pain you tend to move more guardedly and you might fear movement and therefore move less. But we don't get pain because we don't stretch. However, if you love stretching then you can probably go ahead and do it. It can even help pain sometimes but not because you became more flexible.

4. *Your x-rays show that you have degeneration*

Welcome to the club. Everyone's x-ray shows this. If you have wrinkles or if you are losing your hair then this is degeneration. Does your face and head hurt? Of course not. Degeneration is like wrinkles on the inside. **It is a normal condition that is poorly related to pain.** You don't expect to have the same face and body that you had at 20 years of age so why should you expect your bones and joints to look the same. This is a very important falsehood to correct because we know that if you believe the idea that your body is "degenerating" then you will naturally fall into behaviours that try to protect you. These "protections" are lack of use, hypervigilance and increased sensitivity. All things that increase pain. The body adapts until it dies. Continuing to stress joints, even those with "degeneration" is what keeps people healthy and improves those joints.

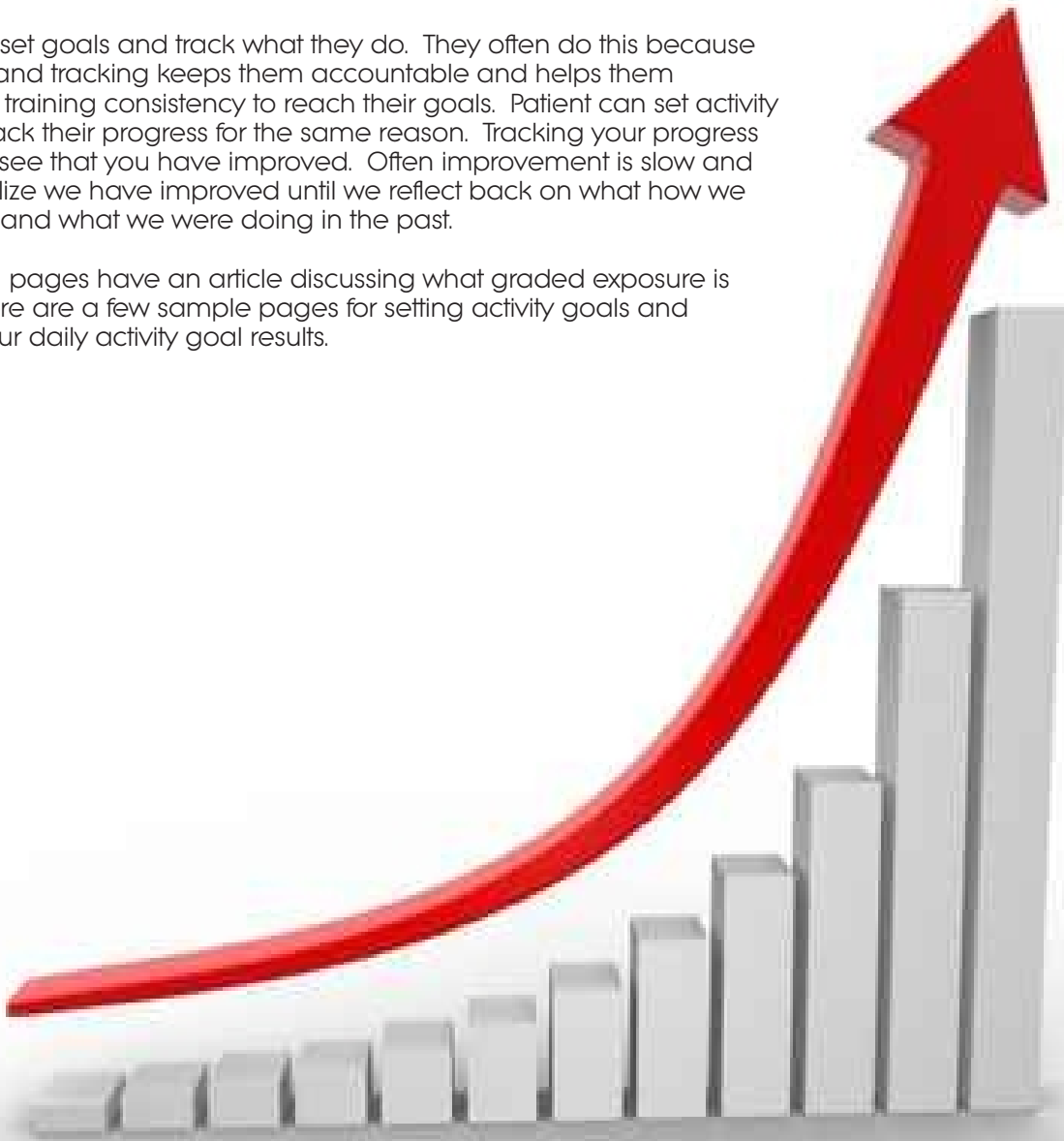
Patient Guide Sheets: goal setting and graded exposure helps with **Pain**

Goal Setting and Exposure

Elite athletes set goals and track what they do. They often do this because goal setting and tracking keeps them accountable and helps them maintain the training consistency to reach their goals. Patient can set activity goals and track their progress for the same reason. Tracking your progress helps you to see that you have improved. Often improvement is slow and we don't realize we have improved until we reflect back on what how we were feeling and what we were doing in the past.

The following pages have an article discussing what graded exposure is and then there are a few sample pages for setting activity goals and recording your daily activity goal results.

Good luck!



Graded Exposure helps with Pain

The following article is by Todd Hargrove at bettermovement.org

Graded exposure is a key concept in understanding how to reduce pain caused by movement. It's a very common sense idea, and one that most people kind of know at some level, because there is profound truth to it. But it's also an idea that most people will probably fail to put into practice in a systematic way. Here's a brief discussion of what it is, why it works and how to do it.

What is graded exposure?

Graded exposure is a process by which you slowly and progressively expose yourself to some form of stress, in order to make you less sensitive to that form of stress. In the context of movement, it means the progressive introduction of threatening movements, in the right dosage and timing, in a way that makes them less painful. This might happen in one of two ways – through causing a change in the body, or a change in the way the nervous system perceives threats to the body.

Tissue adaptation – make your body stronger

There is some physiological truth to the idea that what doesn't kill you makes you stronger. According to the SAID principle, the body will adapt to get better at withstanding specific forms of stress, provided they are experienced to a sufficient degree. For example, when the muscles are stressed enough by lifting weight, this causes micro damage that stimulates changes in muscle physiology. These changes will make the muscles stronger and less likely to get damaged by the same weight in the future. With this principle in mind, you can get stronger and stronger by progressively overloading your muscles over time. The trick is to expose yourself to stress in a graded manner – enough to stimulate adaptation, but not enough to cause injury or prevent healing.



The same principle can be applied to rehab injuries, especially overuse injuries like tendonosis. The difference is that in this context, getting the right timing and dosage is much more difficult, because the likelihood of injury or incomplete recovery is greatly increased. This makes it harder to find the "sweet spot" where you apply enough stress to cause adaptation, but not enough to cause or worsen injury. A careful and systematic approach is required.

For example, if you are currently experiencing pain in your foot after running a mile, you could try running just short of a mile, and then slowly inching your way upwards in distance, making sure that you are not making the pain worse. If you succeed, this might be a sign that you are applying enough stress to the tissues to get them to beneficially adapt, but not enough to cause injury or prevent them from healing. Most clients find this strategy fairly easy to understand, if not to apply.

The more complicated explanation for why graded exposure might reduce pain associated with a particular movement is that it makes the nervous system less threatened by the movement, even though the tissues are not really adapting in any meaningful way.

Nervous system adaptation – disassociate pain and movement

We experience pain in relation to movement when the nervous system perceives that the movement is threatening to the body. Like other perceptions, the perception of threat is an interpretation that is subject to change based on a wide variety of information. A program for graded exposure can offer the nervous system new information about a movement that might cause a change in perception. If you can find a way to perform a currently painful movement at a low enough intensity that it does not hurt, you are sending the nervous system feedback that the movement is safe. If you do this repeatedly, perhaps the nervous system will start to disassociate the movement from the pain. This is the same rationale underlying many treatments for anxiety and phobias.

Here's an analogy to illustrate. If a child wanted to convince his overprotective mother that it was safe to play at the playground, he would first need to show her that he can play without getting hurt. A good strategy would be to start slowly with the safest activities, and then move to more dangerous ones, all the while showing Mom he is safe from injury or threat. Hopefully Mom will eventually chill out. You can go through a similar process of graded exposure to show your nervous system that a particular movement is safe. If running three miles causes panic, try running just one and see if that is acceptable. Then slowly inch the mileage upward and monitor the response.

Summary: graded exposure sends good news

A major goal of any program for movement health should be to send as much "good news" to the nervous system as possible about the state of the body, and its ability to withstand the stress of movement. Whether this is done by making the body stronger, or making the nervous system less concerned about the strength of the body is sometimes irrelevant. Either way, the formula for movement success is the same. Start moving how you want to move, make sure you're not in pain during the process, and then move a little more next time. That's graded exposure, and it's how we get better at anything. Like many other ways to improve health, it's simple but not easy.

Patient Guide Sheets: goal setting work sheets

In the space below write your weekly goals in terms of physical activity. Include housework, meaningful tasks, hobbies, sports and exercises. In the right hand column right if you met the goal and how it felt



Activity Goals

Examples

1. Walk the dog 3x/day for 5 minutes
2. Perform gentle spine movements for 30 seconds 5 x/day
3. Spend 10 straight minutes on the floor playing with the kids
4. Visualize my back bending pain free for 30 seconds and then doing 2 back bends

Comments

Example Comments

1. Completed with ease
2. Able but did it only 4 times - pain did not increase
3. Started to get sore around 5 minutes - had to stop but no worse the next day
4. No problem. Was able to bend my spine with ease

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Activity Goals

Comments

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Activity Goals

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