# The 3 Stages of Recovery from Pain

Ever stubbed your toe? Bumped your funny bone? Twisted your ankle? If so, then you know all about the stages of recovery from pain. Read along, and keep your last injury in mind for comparison.

When you experience pain, your nervous system goes through three separate stages. You move through these stages every time you have pain, without exception, as long as you are alive. These stages are:

1. Withdrawal
2. Protection
3. Resolution

Professor Patrick Wall MD* described these stages years ago, and said that there was an instinctive response to help resolve pain. Let's look at them a little closer and see how each of them are different but necessary for recovery:

> ***Withdrawal*** is your nervous system's way of removing itself from the painful stimulus, to reduce any damage it might sustain. Ever close your hand in a door or a drawer? Then you know all about withdrawal – you moved your hand back quickly without thinking about it. This is a reflex action your body has hardwired in to protect you. This is the first stage of response, and it is instinctive – it happens without your conscious awareness.
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> ***Protection*** is your nervous system's way to try to ensure no further painful stress and possible damage occurs. When your hand got pinched, you grabbed and held it with your other hand, right? That's your system's natural protective response, and it is instinctive – it happens without your conscious awareness.
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> ***Resolution*** is your nervous system's way to restore normal mobility and function to the injured part. Resolution restores the blood flow to the injured tissues so healing can take place. When you hurt your hand, and you shook it back and forth to help recover, it's just instinctive – it happens without your conscious awareness.

Most people who have a persistent pain problem are stuck in the protection phase – their system is still trying to protect itself, and it's not able to move toward resolving the problem. When you're stuck in the protection phase you may feel stiffness, coldness, and muscle spasm in the area. You may feel as if the body part does not want to move smoothly.

Practicing corrective movement helps you move out of Protection and toward Resolution, and when you are doing the corrective movement successfully you might feel warmth, a softening, and a relaxing feeling as blood returns to the irritated tissues, mechanical stress in the tissue is reduced, and the system becomes less sensitive. This movement can be prescribed by a health care provider or it can be a natural kind of moving and stretching around to restore mobility and blood flow.

Many people try to fight against the protective response of the body - they try to deliberately change their posture or positioning away from the protective response so they can "look normal" again. Some common protective responses people fight against are a slight shrugging of the shoulder blade to protect the neck and shoulder area or a shift in the low back to the left or right to protect that area. This is usually a mistake - your attempts to force this are not likely to help - use the movement therapy instead. Don't directly fight your body's natural protective responses - help your body move toward resolution and the protective response will naturally reduce. Remember what to look for with successful therapy: a reduction of the protective behavior (less stiffness, loss of motion, coldness, muscle spasm) and a freedom of movement.

*Professor Wall's books are widely available and highly recommended - *The Science of Suffering* is a great book written for a general audience that you might like if you want to know more about these concepts.

**by Jason Silvernail DPT, DSc**

**Watering the Grass: Rest - Build - Strengthen**

Many people seem frustrated that their pain has lasted so long, past the normal body healing time. Often, this is 'mechanical pain' and is related to sensitivity of your nervous system to physical stress. Understanding how to help your nerve tissue recover and tolerate physical stress/load again is a lot like watering your lawn. It's not a question of just waiting for enough time for healing. It's a question of providing the right environment and the right time for it to recover, and then the right stresses to build up its strength. We need to do three things to grow back healthy grass - give it a rest so it can take root, water it consistently to grow it back, and then walk on it carefully to build it back up.

**Stage 1: Rest - Let it Take Root**
To get your grass to grow back, you first need to stop walking on it while it's growing. Depending on how brown it is, you may want to walk on it just a little, or not at all. If you have a volleyball game on it, you can be sure that will REALLY slow down the process. Your nerve tissue is the same way. As it heals, you can load it with exercise, activity, or prolonged postures more successfully. But early in this process, you need to minimize aggravating activities and prolonged positions, in order to maximize your healing. You will notice slowly that you can tolerate more activity and a longer time in different postures, but this ability is a direct result of how often you are doing the movement therapy to "dose" the tissue with blood. This stage ends when you are past the worst of the pain.

**Stage 2: Build - Let it Grow**
In addition to resting it, you also need to water it, that's how it gets its nourishment. Your nerve tissue is like that, too – only instead of water, it needs a regular blood supply and reduced mechanical stress in order to recover. Doing the movement therapy you've been practicing is how you both supply the tissue with blood and reduce the mechanical strain on the tissue. You will feel better as a direct result of the frequency that you do this in most cases. Now, if your grass is brown and dying, you don't want to just dump a lot of water on it the first day – that will just get you a lot of mud. You need to start slowly and work yourself up. Some increased pain is expected after you start to do the movement therapy properly. This will go away with continued movement and activity. This stage ends when most of your daily pain is gone.

**Stage 3: Strengthen - Toughen it Up**
After your grass has started to grow back, you need to build up the root structure so that it will be stronger. You do this by slowly walking on it at first and then spending more time on it to allow it to build up. A healthy lawn is one that is strong enough to play games on without getting torn up. Your nerve tissue isn't different - after it grows back in, you need to build up its tolerance by loading it with exercise and physical stress. The more you build up it's tolerance, the less likely it is to get irritated again. This stage ends when you have minimal pain and you can do daily activities and additional things (like work or exercise) with relatively few symptoms.

**How Long Does It Take?**
It's hard to predict the recovery of nerve irritation and nervous system sensitivity. As long as you are following the 3 step plan, you will get much better over time. It's impossible to predict exactly WHEN or HOW MUCH you improve, but if you are doing your part, it's simply a matter of time before things improve.

**Rules for Regrowing Grass**
1. Keep off the grass to let it take root
2. Water it slowly to build it up
3. Toughen it up with activity

**Rules for Healing Nerve Tissue**
1. Avoid aggravating things early
2. Restore it's health with therapy
3. Strengthen it with exercise

**by Jason Silvernail DPT, DSc**

# Understanding Mechanical Pain 1: The Basics

## You're Not Alone

Often people who are in your shoes describe pain as having come out of nowhere, or that the pain has stuck around for far too long, and they usually aren't able to associate the pain with a particular injury or trauma. Or, if there was a distinct injury, the pain stayed around much longer than the time it normally takes to heal. In an attempt to 'find' the pain, you may have had x-rays, MRIs, scans, or other tests that didn't come up with any answers. You may have had care providers who haven't been able to explain to you what was wrong or you may have been prescribed medications that only helped a little or maybe didn't help at all. You may have found that rest doesn't help, that prolonged positions, such as sitting at a desk, driving in a car, or standing for a long time make the pain worse. You may feel stiff and achy, particularly in the morning, and may find that you have to fidget and keep moving to stay comfortable. And when you do move, you may hear crunching or popping noises that may cause you to worry. If any of these things sound familiar, you may have Mechanical Pain.

## How Does Pain Work?

The pain you are experiencing is due to nerve tissue in your body sending your brain a signal and an increased sensitivity in your system to those signals. This ‘danger signal’ is received and your brain makes a decision about whether it will be painful or not based on your current level of sensitivity and the THREAT your brain determines. You see, pain doesn’t come from the body tissues; it comes from your nervous system - and it’s all about how your body interprets a complex web of signals it is receiving. Relieving and reducing your pain is mostly about reducing the signals going up to your brain and reducing the overall sensitivity of the system. We are going to talk about how those signals get generated and what you can do about getting them to slow down, and how to decrease the sensitivity of your system. Doing those things reduces the threat that your nervous system feels and helps reduce your pain.

There are two ways to stimulate the nerve tissue in the body to produce danger signals: chemically and mechanically. We are going to talk about nerve tissue because it is the communication network of the body. Muscles, joints, bone, tendons, and ligaments don’t send signals to your brain the way nerves do, they have nerve tissue all around them that is responsible for this communication. Your nerves are always sending up danger signals to help keep you safe, and they usually don’t indicate any tissue damage has been done. When more danger signals arrive over a short period of time, or if your system is more sensitive than normal, you are more likely to have a pain response.

So really there’s no such thing as “bone pain” or “muscle pain”, there is only pain from stimulation of nerve tissue in the bone or muscle or whatever body part we’re talking about. When you have pain in your skin from a cut, it isn’t your skin itself that hurts, but the nerve tissue that lives in the skin that is talking to you. A cut creates chemical irritation of the nerves inside the skin from the natural inflammatory process and mechanical irritation of those nerves from local swelling. These nerves send your body danger signals to help protect you. Let’s talk about chemical and mechanical stimulation that can produce danger signals.

1. Chemical irritation is part of the inflammation process, and it’s the first way to stimulate nerve tissue. If you’ve ever had sunburn, a sprained ankle, or a cut on your finger, you know what chemical pain feels like. The pain is more or less constant no matter what position you are in, and you can relieve it with ice and with anti-inflammatory medications. People with this chemical pain usually respond well to anti-inflammatory medications and some rest – the body clears the chemicals irritating the tissue with time as part of the healing process.

2. Mechanical strain is the second way to stimulate nerve tissue – it is pressure or tension in the nerve tissue. Mechanical pain changes with position and movement, worsens with prolonged positions, and doesn’t respond very well to anti-inflammatory medications and time or rest.

## Won’t an X-ray or MRI show this mechanical pain?

No. Mechanical pain is a problem with the way the tissue FEELS, not the way it LOOKS. It is not a structural problem (like a broken bone), it is a functional problem. If someone took your picture right now, they could tell you how you look, not how you feel. Scans you may have had may have been normal or showed normal aging changes. In medical studies, people with no pain have been found to have

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advanced arthritis in their joints, torn cartilage, and even herniated disks in the spine – so in the absence of a major injury like a broken bone the scans aren't that important to helping diagnose and treat your pain. What you have is chronically irritated tissue and a overall sensitive system, not broken or damaged tissue.

**OK, I've Got Mechanical Pain. What Can I Do to Help It?**

Well, as we said before, anti-inflammatory medications aren't usually very helpful – this is tension and pressure, not inflammation. The solution for mechanical pain is movement; movement that relieves the tension in the system and reduces its sensitivity. No amount of medication or rest or time will help the problem. But if you're reading this, you probably already know that part.

Here's something else you should know. When nerve tissue is under this strain, the small blood vessels that deliver blood to it are pinched. This reduces the blood flow to the tissue in addition to increasing the tension. Resolving this pain involves reducing the strain and restoring the normal blood flow. Without a regular blood supply, the tissue will remain irritated and painful. One way to think of mechanical pain is to think of someone twisting your finger – this is what the tension in your tissue is like. What we have to do is "untwist" it.

**Is This Like a Pinched Nerve? Not Really....**

Well, mechanical pain is tension in nerve tissue. So, in one way, all mechanical pain is kind of like a pinched nerve. Usually, when people talk about pinched nerves they talk about one specific nerve that has been compressed – this nerve loses its ability to send signals well and there might be numbness, burning, weakness, or a loss of the normal "reflex hammer" response. While this does sometimes happen, most mechanical pain is not focused on one nerve; it is more widespread in the tissue in general. When the compression is focused to one particular spot, it's usually easier to diagnose with a physical examination or testing. It also tends to be easier to treat. Unfortunately, most mechanical pain isn't like this. It isn't a big major nerve getting pinched - it's small nerves that live throughout our tissue like a spider web getting pinched and under tension.

**The Spider Web and Movement That Helps**

Most people with mechanical pain problems have tension in the tissue that is not focused on one nerve, but is more widespread. The nerve tissue branches throughout the body like a spider web, sending and receiving signals from place to place in your body. Picture a spider web for a moment. If you pull on one strand, what happens? The whole web moves. The tension is distributed throughout the system. That's why it's sometimes hard to find the movement needed to restore the blood supply and ease the tension. You may have tried stretching and exercising in the past and found they didn't help – the spider web nature of the nervous tissue makes finding the right movements very hard sometimes.

The movement that helps your pain is the movement that eases the strain and restores the blood supply. Sometimes this movement can be introduced by your healthcare provider with manual therapy techniques – sort of an "outside in" approach. But this is only a jump start to the system – you have to learn to untwist yourself from the "inside out" if you are going to feel better in the long term. Your health care provider might prescribe or choreograph specific exercises that can help, or you may have been shown other kinds of movement therapy designed to reduce the tension.

**Pain Is Like Thirst**

When your body is thirsty, your mouth feels dry and you know exactly what to do. You give your body what it needs. Thirst is your body's request for water. Once you give your body what it asks for, the thirst goes away. You drink when you're thirsty, and sometimes you drink a few times a day because you know that's what your body needs. You don't need to be told how much to drink, you let your body tell you that. The same thing is true of your pain and movement. Y*ou should see the pain as your body's request for movement.* When you have pain, you should do the movement therapy until you feel you've done enough - and also you should do the therapy a few times a day just because you know your body needs it. Don't save up the pain during the day, thinking that "I'll just do my exercises at night." You wouldn't save up your thirst throughout the day and then drink a big jug of water at night to make up for it. Doing the therapy is just the same.

**Continued in Mechanical Pain 2**

**by Jason Silvernail DPT, DSc**

**Understanding Mechanical Pain 2: Threat, Sensitivity and Building a Plan**

**What did you learn in part 1?**

Pain doesn't have much to do with your scans and tests
Pain is about how YOU FEEL, not how the SCAN LOOKS
Small nerves are spread throughout your body tissues and they report danger when irritated
Pain is about threat and is determined mostly by two things
Danger signals from nerves that are spread through your body like a spider web
The sensitivity of your nervous system
There are two kinds of danger signals: chemical irritation and mechanical irritation
Most of these danger signals aren't indicators of damage to your body
Movement to relieve mechanical irritation is sometimes hard to figure out

**OK, I understand the two kinds of danger signals. What's this about threat and sensitivity?**

Danger signals are an important part of understanding pain, but that's only part of the story. Both the threat judgment your brain makes and the sensitivity of your system can affect your pain.

**Understanding Threat**

When you have a pain response, it's because your system has decided that there is a situation that requires ACTION on your part to avoid danger. This judgment is made deep inside your brain and it is something you often don't have much control over. We will talk later about how to reduce this threat.

**Understanding Sensitivity**

As your body receives an increased number of danger signals, and it feels threatened, the system gets more sensitive to danger. Why would this happen? It's a learning process your brain and body have to better protect you. This sensitivity happens in the nerve tissue that's spread throughout your body, in your spinal cord, and in some of the danger signal processing areas in your brain. This is a biological response your body builds up - often without your knowledge. But anything that can be sensitized can be *de-sensitized*!

**An Example of Threat and Sensitivity**

Imagine you are at home, in the middle of the day. The house is full of guests at a party you are hosting and there are a lot of people there talking, laughing and listening to music. Everyone is there to see you and have fun. You feel well-rested and healthy, and you get regular exercise. Imagine just at this moment, your friend jumps out of the closet near you wearing a scary mask and yells "Boo!" Would you be scared? Probably not. Why? Well the party is loud, so his yelling doesn't seem very loud. It's light outside, you are surrounded by friends, and you have no reason to think anything scary is going to happen. Your system is not sensitive, and your friend's behavior isn't threatening. So you're not scared.

Now imagine you are at home alone, in the middle of the night. The house is completely empty, dark, and quiet. You are in the same room, watching a scary movie that freaks you out a little. Before the movie, you saw a news program about a crazy person hiding in people's houses and attacking them. You haven't been sleeping well, and feel tired often. Things haven't been going well for you and feel a bit sad about it. It feels like it's been months since you got regular exercise. And now that same friend, in the same mask, jumps out of the same closet and yells 'Boo!" at just the same volume. Would you be scared? Of course! Notice the danger signal hasn't changed - same friend, same mask, same yell. But you responded differently. Because the context has changed, your body's perception of the threat and the sensitivity of your system has lead to a different feeling. Your system is sensitive, and your friend's behavior is threatening, so you get scared. It's a natural protective response.

Pain is just like this - different contexts, levels of threat, and sensitivity change how your body interprets danger signals. The more threat something has, the more sensitive your system, the greater the pain response.

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**How Do I Reduce Threat?**

1. Understand your problem in detail. Reducing uncertainty helps calm your body's biological response and is an important part of recovery. Many aspects of these problems are unknown - and that's okay too. Medical science is learning more about pain every day.
2. Make a plan with your provider. What are your treatment options and different approaches that can help? What is likely to happen in the future?
3. Gain experience with less pain and better function through progress in rehabilitation. This requires an active, exercise and movement-based approach to getting better. Treatments that are passive - where the provider does something TO you without a lot of participation or effort from you - are less likely to help.

**How Do I Reduce My Nerve Sensitivity?**

1. Get enough sleep. Medical studies show almost everyone should be getting at least 7-8 hours of sleep a night as adults. The US National Sleep Foundation and other groups have information on sleep needs by age group.
2. Improve your sleep quality. Quality matters for sleep - The US National Sleep Foundation has resources on improving your sleep quality that can help, and your provider can assist also.
3. Get regular aerobic exercise. Try to move towards 150 minutes of moderate to vigorous exercise per week - start slow with an achievable goal and slowly work yourself up. Your healthcare provider can assist you and so can a good personal trainer.
4. Do strength training 2-3 times per week. You can use weights, machine exercises, elastic bands, or your bodyweight to build strength. Your healthcare provider can assist you and don't underestimate the value of a good personal trainer also.
5. If you are depressed, get treatment - it works and will help your pain as well. Your healthcare provider can refer you to an expert or can discuss your options with you. Medications and counseling therapy are both good options.
6. Find ways to manage your stress and learn to relax - a sport or hobby you like, exercising, talk therapy, deep breathing exercises, meditation, or just doing something fun - all of these can help.

**Building a Plan with Your Healthcare Provider**

Often it feels like there are a lot of different approaches to address mechanical pain problems. Your healthcare provider may have more experience or training in some approaches than others, and you may be more or less interested in some specific ones. The key is to find an approach that works for you and has a good track record for success with other patients in medical studies - so you don't end up wasting time on things that are popular with some people but aren't likely to help. Therapy is almost like a buffet - with so many options, how do you choose?

Think of a buffet as having two kinds of food: main dishes and side dishes. Main dishes are something everyone should have, and are all most people need. The side dishes are something you can have if you like, but they aren't critical, and most of the time you can skip the sides unless you really want them. Often your healthcare provider's skill with some side dishes might convince you to give that a try - that's great! But remember it's the main dish that makes a meal.

**The Therapy Buffet - Main Dishes**

Education about the problem, active exercise therapy, staying physically active, reducing threat and sensitivity with good sleep quality, regular exercise, treatment for depression if you have it, and stress management.

T**he Therapy Buffet - Side Dishes**

Manual therapy like spinal manipulation and massage, pain medications, needling treatments like dry needling or acupuncture, hot and cold packs, lasers and ultrasound therapy, kinesiology taping, electric stimulation treatment, and injections of steroids or other medications.

Once you have your treatment plan and you are reducing threat and sensitivity, you are well on your way to feeling better.

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