

Chronic Back Pain: A Guide for Patients and Families

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IMPORTANT NOTES:

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Introduction

Why can't you fix my back pain?

Many people go to their doctor and expect that there is a "fix" for back pain. Why is it so hard to "fix" back pain? Doctors have developed amazing technology that can target cancer cells. Why can't we target pain? The answer may be as simple as medicine's inability to reach the "targets" of cells producing chronic pain. The cells producing pain are not cancerous but are normal, living nerve cells that are overactive or malfunctioning. Destroying these nerve cells is not a good idea because we need these same cells to send "normal" pain, temperature, and touch signals. **The key to understanding chronic pain is to think of chronic pain as coming from an over-active and over-responsive nervous system.**

The Difference between Acute Pain and Chronic Pain:

Most people who develop a new episode of back pain will experience pain relief within six weeks. Studies report that up to 90% of people with acute low back pain get better on their own no matter what they do, or what they don't do, despite what their doctors prescribe or don't prescribe. This leads to all sorts of different treatments that people swear "cured" them of their back pain. **Most of treatments for acute pain are harmless.** These include certain medications, massage, manipulation, and even watchful waiting.

A small but substantial number of people with acute back pain eventually develop chronic back pain. Chronic pain is pain that has lasted longer than three months or pain that has been present for most days over the past 6 months. In either definition, the pain associated with an injury "should have" already "healed". There are a lot of different treatments that are being advertised to people but our recommendation is "Buyer Beware". **Most treatments for chronic pain are not harmless. Chronic back pain is not very responsive to many of the same treatments, medications, procedures, or even surgery that are used for acute pain.**

Some treatments for chronic pain may even be harmful or lead people to become forever dependent upon the medical system for additional treatments or lead to worsening pain.

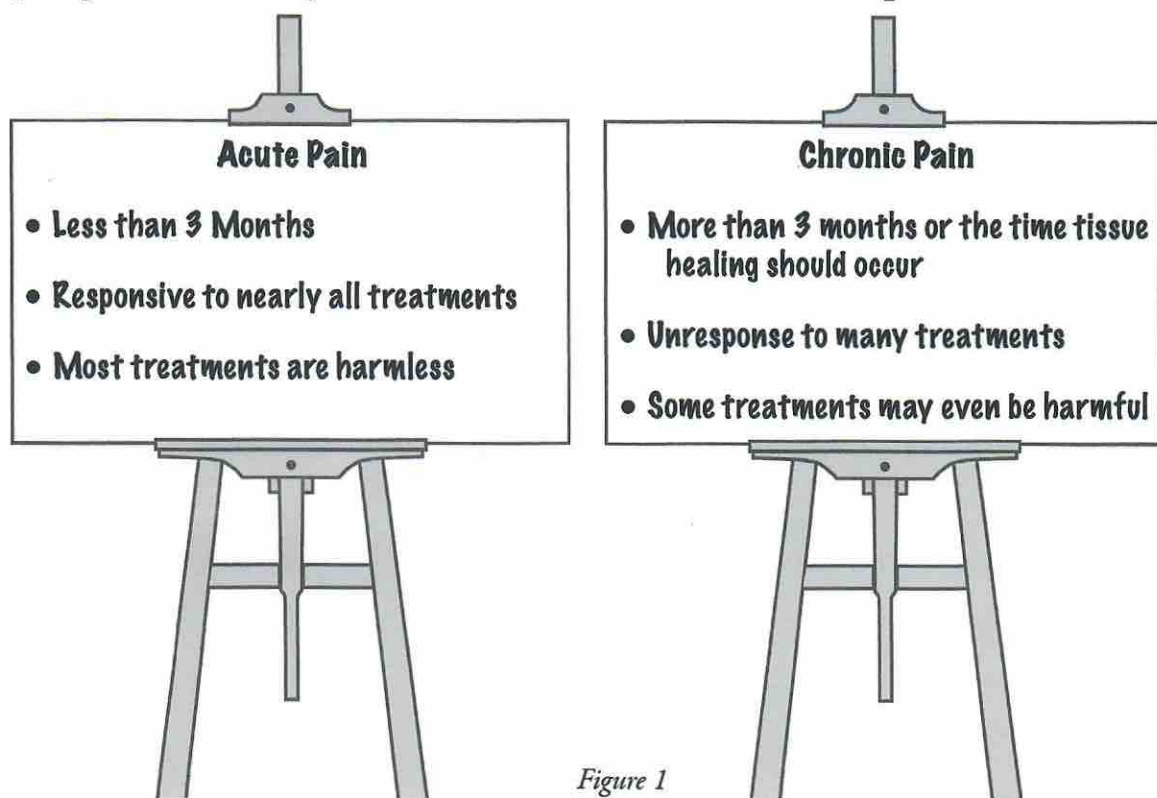


Figure 1

What can my doctor do for my chronic pain?

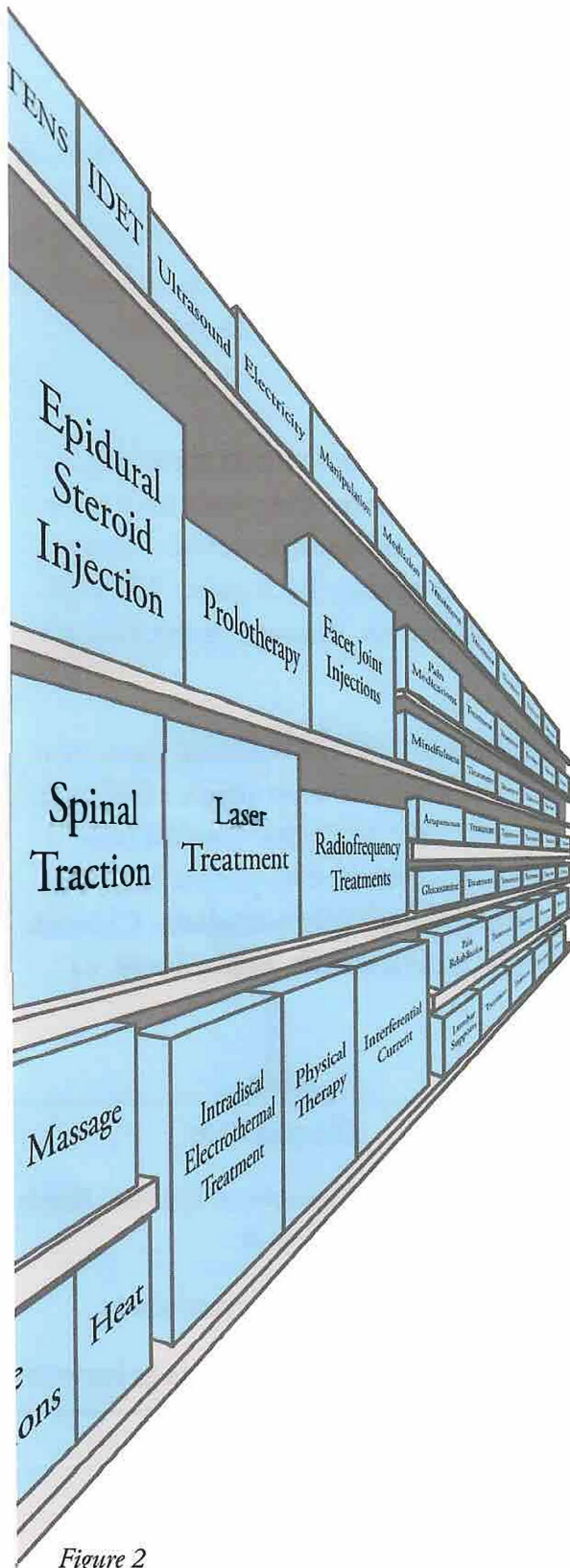


Figure 2

Beware of the things we can do for you. Our interest in satisfying you may lead to overtreatment or complications of overtreatment. This can happen as people ask for pain medications that are good for acute pain but become ineffective or even harmful when used for chronic pain.

Beware that even if you are sure you have a “pinched nerve” and want an MRI to be certain, your MRI abnormalities may not be the real cause of your pain. Beware of having “exploratory” surgery out of desperation or extreme frustration with pain. Some recent studies have shown that patients who are greatly satisfied with their doctors treating their pain actually have worse outcomes as a result of complications from overtreatment.

Chronic pain is very difficult to understand. Most doctors do not explain it well and some patients even get upset thinking that chronic pain “is just in my head.” Don’t be misled into thinking there is a “magic wand” to eliminate pain. **Be especially careful of people who offer a simple explanation, procedure, medication or supplement that promises to get rid of your pain.** If there were a simple, quick fix to your pain, all of the doctors, physical therapists, chiropractors, and massage therapists would clearly follow the same treatment. If you have already tried these different treatments and haven’t noticed much improvement, then a simple explanation or cure to your pain may not be available. No one would withhold a “cure” for your back pain.

OK, what should my doctor do for my chronic pain?

First, your doctor should evaluate you.

Appropriate expectations for medical care if you have chronic back pain are that your doctor will investigate to see if there are any significant disease processes causing your pain. These include some very serious and sometimes fatal or life-changing conditions like cancer, a fracture, infection, or some other sinister disease process. Fortunately, this only occurs in about 5% of people with chronic back pain.

But if there are no obvious findings on your physical examination, x-rays, MRIs, CT scans, or EMG tests, then you should be reassured that all the “bad” things that can cause pain have been eliminated. This should be great news! You should be relieved that you don’t have cancer, fracture, infection, or a “disease” in your spine that can lead to lifelong problems. About 80% of the time, doctors are not able to find a specific structure causing your pain.

Most importantly, we can teach you about your chronic pain.

For many with chronic pain, you are in much more control of your pain than doctors are. Be aware that the way you view your chronic back pain is extremely important. If you are fearful of movement or think the worst of your back pain, you **will not** do well. This is why **teaching you about your chronic pain is one of the most important thing doctors can do for you.**

Don’t think of back pain as a “debilitating” disease. Start thinking of your chronic pain as signals in your nervous system that have come from two important changes. **The first change is that you have muscles that are telling you they are stiff, weak, and need more endurance.** Most people with chronic pain are no longer in “the best shape of their lives.” An injury may have occurred while you were in good shape, but after the acute injury has had time to heal, most have noticed weight gain, stiffness, lost strength, and poor endurance. Getting back to the same level of fitness may or may not be possible depending on how much effort **you** put into your overall fitness.

The second change is that you have an over-active or over-responsive nervous system that “amplifies” normal “achey” muscle signals. Blocking and even reading these pain signals is beyond the technology that we currently have in medicine. If you start thinking of your pain from these two changes, you will slowly understand that a complete elimination or silencing of your pain signal may not be possible. You may need to focus on a more practical solution, such as **managing your pain.** This is why physical exercise can be helpful in making muscles more fit and mental exercises can be helpful in decreasing pain. People who successfully manage their pain are able to get back into age-appropriate work and recreational activities.

Part 1: Faulty nerve sensors

Can we replace these sensors?

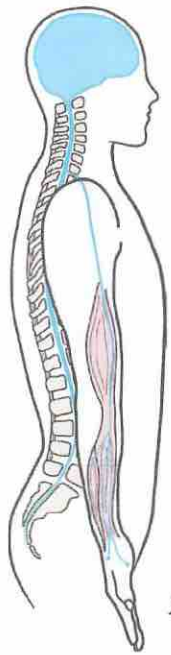
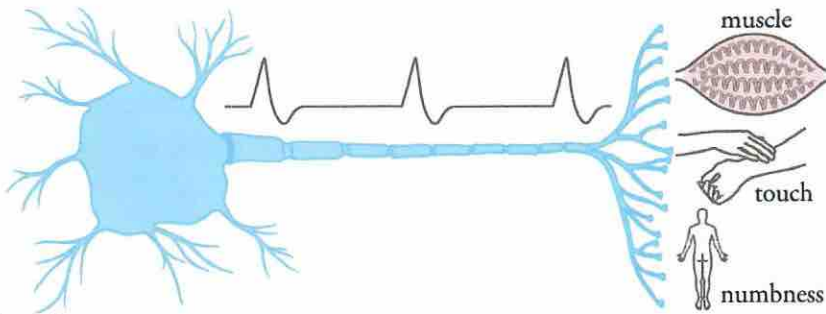


Figure 3

The human body is not so easily fixed as a car. If an old part is worn or broken on a car, then it can be easily diagnosed, replaced, and completely fixed for the life of the vehicle. The complexity of our living muscle, nerve, spinal cord, and brain cells do not work this simply. We cannot replace these microscopic nerve sensors. Pain is transmitted by nerve fibers that are too tiny and numerous to see. This network of the smallest nerve fibers form to make peripheral nerves that can be felt in some areas like around the elbow.



These nerves then combine to form even bigger spinal nerves or nerve roots that exit our vertebral bodies and spinal cord. Only these larger nerves are the ones that doctors can see on an MRI.

There are sensors in the muscles too?

A better view of how a human being can stand and move our bodies is that our nervous system is connected to all sorts of muscles that must activate and respond instantaneously to keep our bodies from losing balance or performing a specific task. These sensors instantaneously feed back information about our muscles response and are modified by our central nervous system to compensate if more effort as needed. In a chronic pain patient, we believe that the microscopic pain sensors become **over-excited** and send back **incorrect information** about pain, temperature, vibration, or touch. These improper signals may actually be telling you that your muscles are hurting because of not having enough stretchiness (flexibility), not being able to generate as much force (strength), or not being able to contract for so long (endurance).

So, you need to ask yourself if you believe your muscles are flexible enough, strong enough, or have enough endurance to perform the desired activity. If you don't think your muscles possess reasonable stretchiness or flexibility, strength, and endurance you will need to work on this yourself. Despite

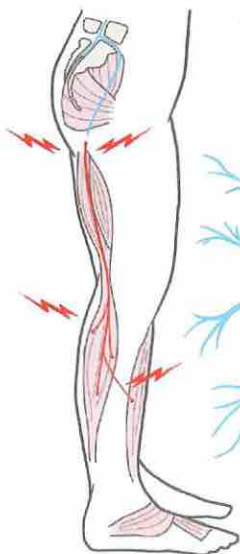
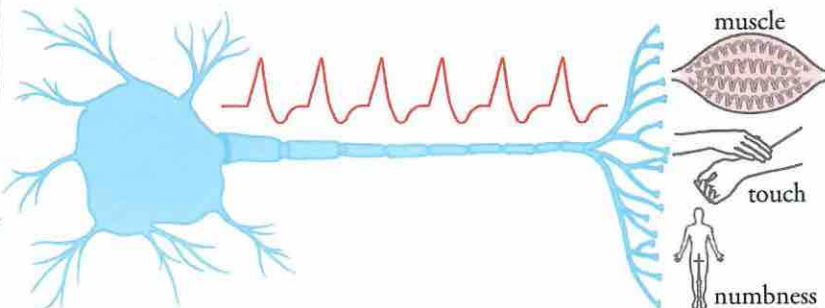


Figure 4

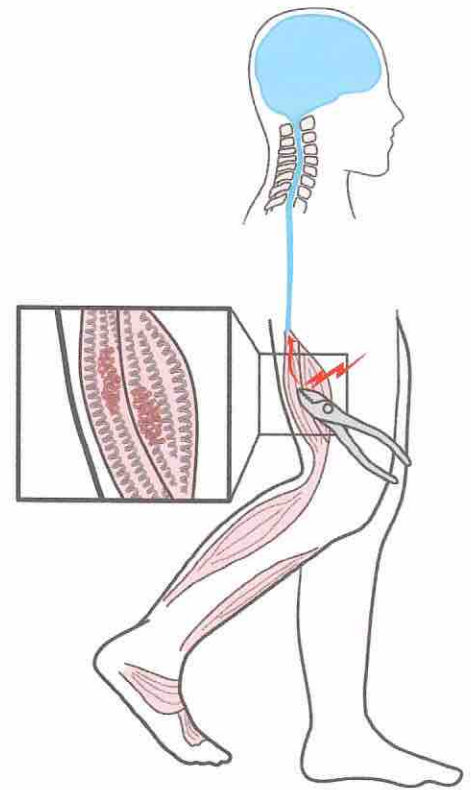
what you may have heard on late night television or internet advertisements there is no reliable method of building muscles by ingesting muscle powders, supplements or using electrical stimulation devices to passively "grow" muscles or replace muscles.



This is why at least some form of consistent recreational physical activities to maintain your desired activity level is an essential component of chronic pain management. **There is no shortcut to exercise.**

Did you know that a “pinched” muscle can actually mimic a pinched nerve? The muscles are the farthest extension of the entire nervous system. All of our body’s movements are dependent upon muscles activating in a certain manner. A “pinched” muscle is often overlooked by many doctors when they tell patients they have “sciatica,” a loosely-used term for pain radiating from the back down the leg. Of course the first thing doctors think about for causing sciatica is a pinched nerve. However, a pinched muscle from any of the deep buttock and back muscles can also produce the pain and tingling that people feel all the way down their leg. This is frequently called referred pain. The best example of referred pain occurs during a heart attack. First responders often ask questions about the location of an individual’s pain. Some individuals report chest pain that is felt in their elbow, jaw, or shoulder and not just in the chest. Our brain is much more frequently called upon to respond to muscle changes or pain associated with jaw, elbow, or shoulder movements so that part of the brain is also stimulated to respond to pain signals that originate from the heart muscle starving of oxygen or nutrients.

Localized “pinching” sensations in the back or buttock are thought to come from muscle fibers that activate in exactly in the direction that you need them to pull. This explains pain that occurs with simple mechanical activities such as bending or twisting your spine. MRIs are also not helpful in locating these painful muscles. Painful muscles and non-painful muscles appear exactly the same on MRIs. An appropriate physical examination by your physician or physical therapist can determine if your muscles are too stiff, weak, and a possible cause of your pain. People can describe this pain as being sharp, dull, aching, and sometimes even constant if these “core” muscles are continually activated and painful with common activities including just sitting or barely weight-shifting and moving your spine.



*Figure 5:
Localized “pinching” sensations
can come from muscles.*

What happens with a skeletal muscle is starved of oxygen or nutrients? Frequently the muscles make lactic acid which further starves muscles of vital oxygen and nutrients. Muscles then develop localized trigger points that can be felt just under the skin and fatty tissues. Some people are even sensitive enough that they feel these areas “swell” or enlarge temporarily. Some become increasingly alarmed about these findings when they really should just think of these trigger points as occurring because the muscle that doesn’t have sufficient flexibility, strength, or endurance to perform their required work. Any change or problem with a particular muscle’s flexibility, strength, or endurance can cause pain receptors to start firing and signal to the spinal cord that something is wrong. The best way to minimize these signals is to improve your overall flexibility, strength, and endurance through a consistent and rigorous exercise program. This is how muscles repair and rebuild themselves.

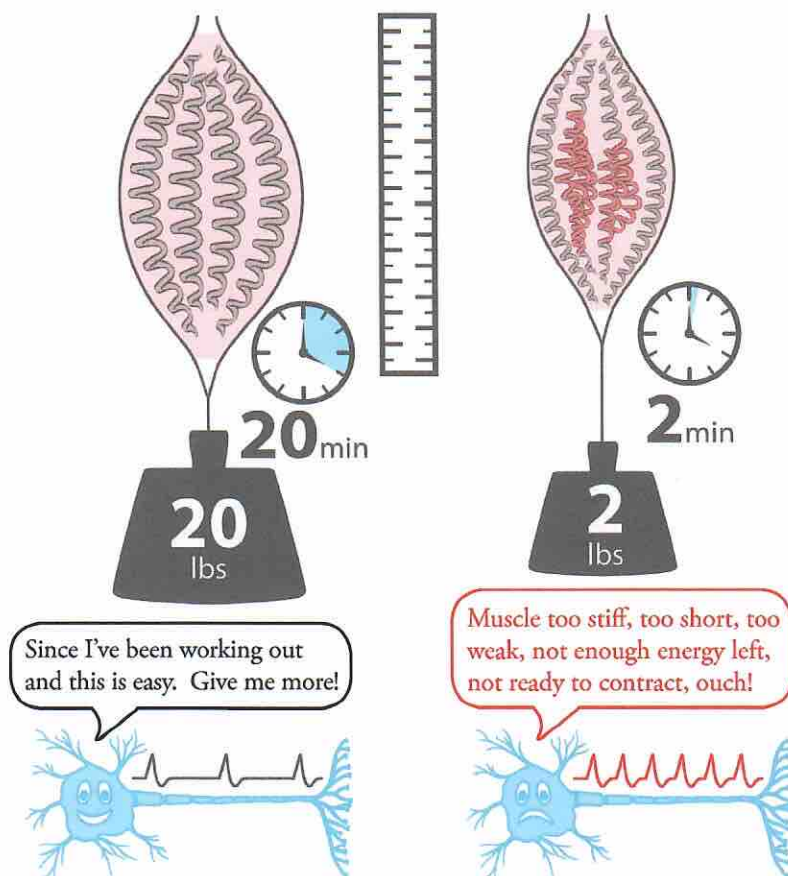


Figure 6

First, muscles must have enough flexibility or “stretchiness.” One way to think of muscles and tendons is to compare them with rubber bands. When we are young, muscles and tendons have natural elastic properties. That’s why children and teenagers frequently do not have chronic pain. As we get older, we lose these elastic properties and lose some flexibility. The stretching exercises taught in physical education classes are intended to encourage a lifelong habit of stretching and maintaining flexibility. This also explains why people who have had poor flexibility all their lives or who do not exercise are especially at risk for developing back pain. Inevitably neglecting a consistent stretching programs can put contribute to the natural stiffness and aging process that muscles undergo. When a short, tightened muscle is stretched, pain receptors within the muscles naturally respond to alert the spinal cord. Some experts believe that these sensors are calibrated incorrectly or responding to faulty information and therefore cause chronic pain.

The easiest test to see if your flexibility is a big component of your back or buttock pain is simply to sit in a chair and cross one leg over the other and bend your trunk forward. If this reproduces some of your pain, there is a high likelihood that improving your muscle inflexibility may decrease your pain.

Do this on with your other leg and see if there is a difference. If there is a noticeable difference from side to side, that means the muscles on your painful side are substantially shorter than the muscles on your non-painful side. If you hurt on both sides, or even your “good” side, this indicates improving your flexibility may reduce your pain.

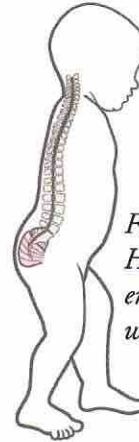
Next, muscles must have enough strength to be able to generate enough force to control our joints while we walk. Our gluteal (buttock) muscles must generate enough force to control our pelvis while standing on one leg. This concept is something we all learned when we were a year old and learned to walk. We figured out that if we can stabilize our hip, we can put all of our weight over that one leg. If we stabilized the other hip, we could take another step. By repeating this process, we learned how to walk.

Another important thing to remember is that our muscles are accustomed to moving only our current weight. If you gain an extra 50 lbs, those buttock muscles have a much harder job to control your hip and are more prone to being strained or injured with sudden or unexpected activity. Even slight gains in weight may lead muscles that were previously barely able to compensate without back pain to become painful. Knee pain, foot pain, and even neck pain is not uncommon even as people gain weight. Going up stairs requires your muscles to propel your entire body weight vertically and increases the demand on other joints and muscles. Many patients also have knee pain along with their back pain and also develop plantar fasciitis as they gain weight and become progressively less active. This results on increasing pressure needed for the plantar fascia to continue working. Keep an eye on your weight and do what you can to maintain a healthy weight and a regular exercise program.

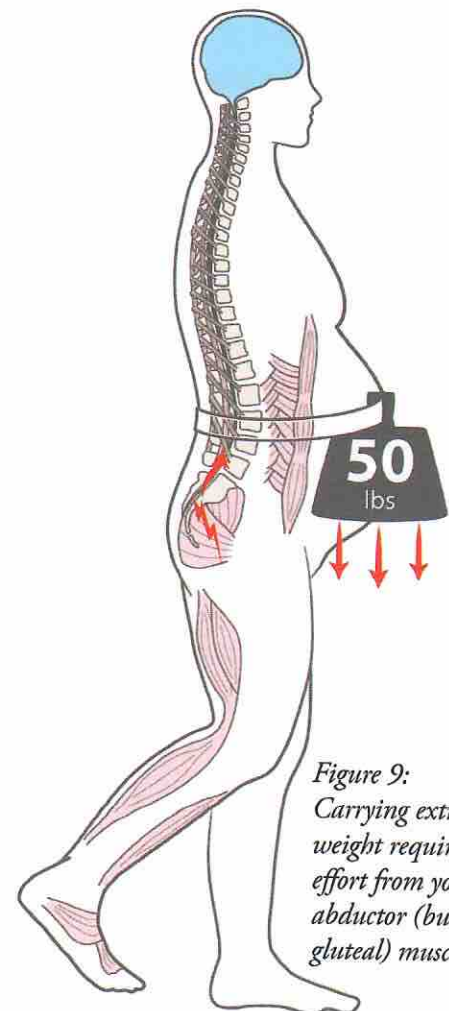
It is also helpful to consider horsepower to weight ratio, factors important for airplanes to take off properly or sports cars to accelerate quickly. Weight itself is not necessarily a factor if you have enough power to move it. Some professional athletes or football players can weigh over 300 lbs. However, their muscle power is more than enough to allow them to work at a high level. People who have heavy work demands need to make sure their muscles are operating at 100% efficiency. We do not know at this time what the ideal horsepower to weight ratio in human beings needs to be to combat back pain. However, a person who weighs 250 pounds needs stronger muscles to function than a person who weighs 150 pounds. Increasing muscle power is especially important for easing back pain, and especially important if your muscles must carry additional body weight. Studies have actually confirmed that overweight or obese adults who exercise feel less pain with their day to day activities.¹



*Figure 7:
Back and buttock
pain with sitting
forward may mean
tight muscles.*



*Figure 8:
Hip abductor strength and
endurance are essential to
walking and standing.*



*Figure 9:
Carrying extra
weight requires more
effort from your hip
abductor (buttock or
gluteal) muscles.*

Third, muscles must have sufficient enough endurance, or the ability to be contract repeatedly over a period of time. Standing for 15 seconds activates the same muscles as standing for two hours. So if you can stand for 15 seconds, you have sufficient strength. If there is no way you can stand comfortably for two hours, then the only difference is explained by endurance. Your muscles may have enough endurance to activate for 15 seconds but not for 2 hours. Usually if a person does not have even enough flexibility or strength to start activity, then having endurance to continue the activity is even less likely. A regular cardiovascular or aerobic exercise program is essential. As we age, our endurance can diminish. This may explain why many Olympic athletes are rarely able to perform at age 40 at the same level as when they were at age 20. What was an easy workout when we were 20 years old becomes much more difficult at age 40 especially if we have not maintained the same exercise program over the intervening 20 years. It is also common that as people become busy with taking care of kids, work, and busy schedules that naturally we have less time to exercise. It doesn't matter whether a person walks, runs, swims, or bicycles; what matters is a consistent record of activity. Your muscles only understand recent activity. This is like a "bank" of energy that your muscles need to use whenever you move your body. A heavier body requires you to make more withdrawals. You can't keep borrowing from this bank without contributing to on a regular basis.

Many people with chronic back pain tell us that they are already doing exercise. In that case, what your back pain is telling you is that your exercise program is still not sufficient to control your body's muscles and current weight requirements. We recommend you increase your exercise regimen even more for another 6-12 weeks and see if your new exercise program allows your muscles to function with less pain. If you still have pain then, you'll likely need to do even more exercise. Talking with a physical therapist or physician at that time may be a reasonable plan.

We've discussed several possible reasons why inflexible, weak, or easily fatigue-able muscles could be causing some of your chronic back pain. Do you have pain over those particular muscle groups? The typical muscle groups that cause pain are the gluteals, lumbar paraspinals, quadratus lumborum and spinal multifidi muscles.

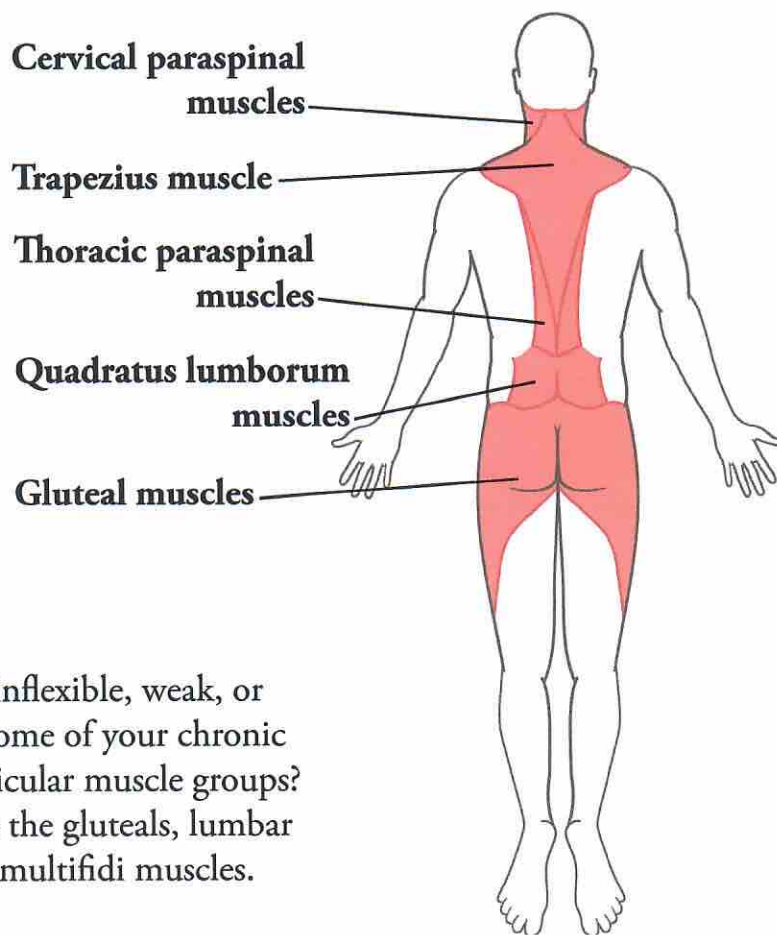
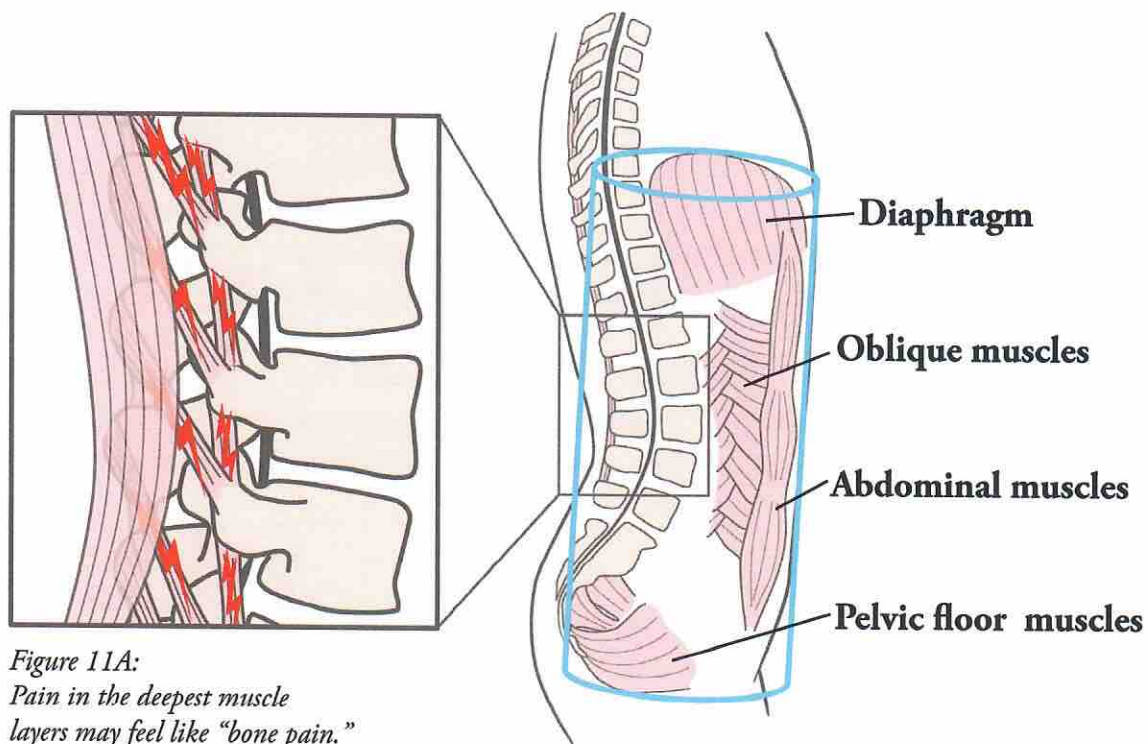


Figure 10:
Common areas where muscles attach to the spine and extremities

Sometimes people don't believe that their pain can be coming from their muscles because it is so "deep." Many muscles are quite deep and because they attach to bones, their pain can feel like pain "coming from deep within the bone." Of course you may be able to feel a tender muscle if it is very close to the skin. We do have muscles in the back which most of the time you may be able to feel. Some people feel that this area even "swells" or spasms with increases in pain. We also have some muscles that are much deeper and many people feel that this is "in the bone." If an appropriate x-ray or MRI have been done and there are no worrisome findings in the bone like a fracture or tumor, you may rest assured that although this pain feels like "it's in the bone" it really is nothing to be worried about. If activities such as bending or twisting make the pain much more intense and you have had an MRI that only shows disc bulges, you should start thinking of the pain as coming from these deep muscles and not as the disc "bulge" damaging the nerve root.



*Figure 11A:
Pain in the deepest muscle
layers may feel like "bone pain."*

*Figure 11B:
If even one of these muscle groups
is not contracting properly, your
muscle "cylinder" won't be able
to help protect your spine and
abdominal contents as you move
and lift.*

Part II

It doesn't feel like it's only a muscle.

My pain feels much more intense and I have a high pain tolerance!

The other part of chronic pain is that these signals become “amplified” and then your central nervous system latches onto this signal or recognizes this signal as an intensely painful signal so that even harmless stimuli become amplified and are interpreted to be much more intense pain signals. Doctors commonly hear that chronic pain patients have a “high” pain tolerance. This central sensitization process explains exactly what our patients have been telling us. We understand that you have been doing your best to ignore these extremely “loud” pain signals. The best explanation is that that your typically “achey or sore muscle” pain that others would rate only as a 1 or 2 out of 10 pain intensity has become amplified to an intolerable 8, 9, or 10 out of 10 pain signal while performing common daily activities such as standing, doing dishes, or walking.

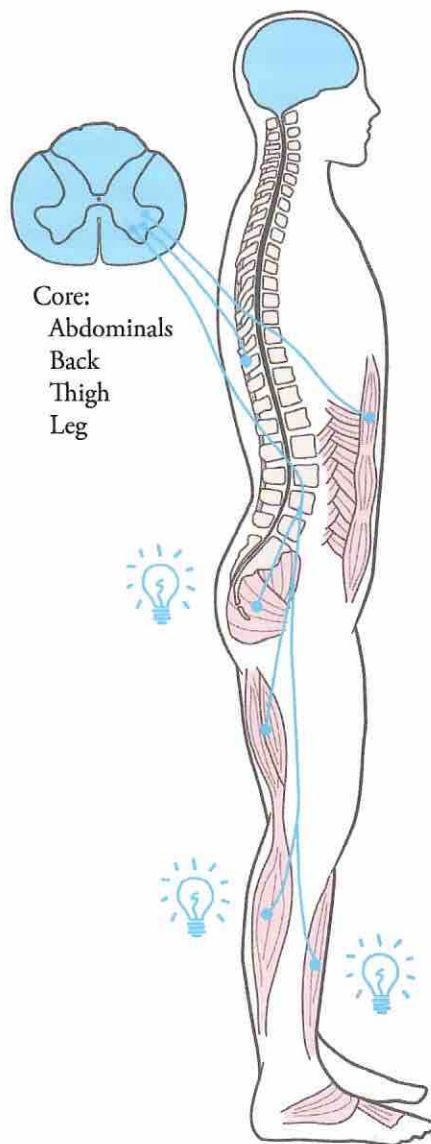


Figure 12:
Normal spinal nerve cells
controlling movement.

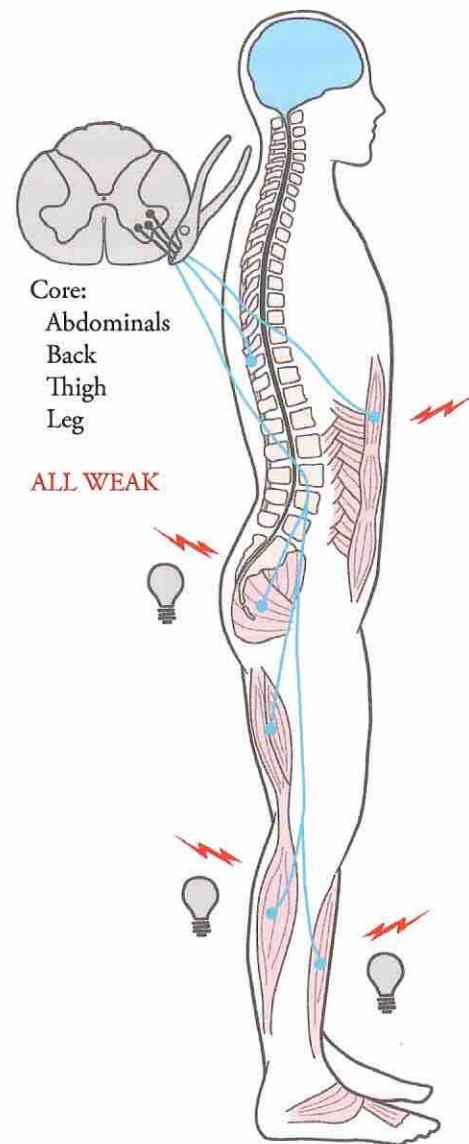


Figure 13:
Effect of a “pinched”
spinal nerve = all these
muscles would be weak.

Therefore the best medical understanding for chronic pain is that **the entire system of microscopic pain sensors and the central nervous system has become “short-circuited”** amplifying even **normal achey muscle pain signals.**

I don't understand...It sure feels like a "pinched" nerve...

Not everything that feels like a "pinched" nerve is actually due to a nerve being compressed. It can be useful to think of these peripheral nerves from your spine to be like wires transmitting electricity to a light bulb. If an electrical wire were cut or compressed, you would expect that the light bulb that it's attached to wouldn't shine as brightly is the same for "pinched nerves." When "pinched" nerves occur, people complain of shooting pain down the leg or pain, or abnormal sensations below the knees and into the foot and ankle. By checking ankle strength, toe strength, reflexes, and nerve tension signs, your doctor can determine whether you have a "pinched nerve" or not. A pinched nerve will usually result in weakness in the ankle and foot muscles that gets much worse with standing or sitting with your knee extended.

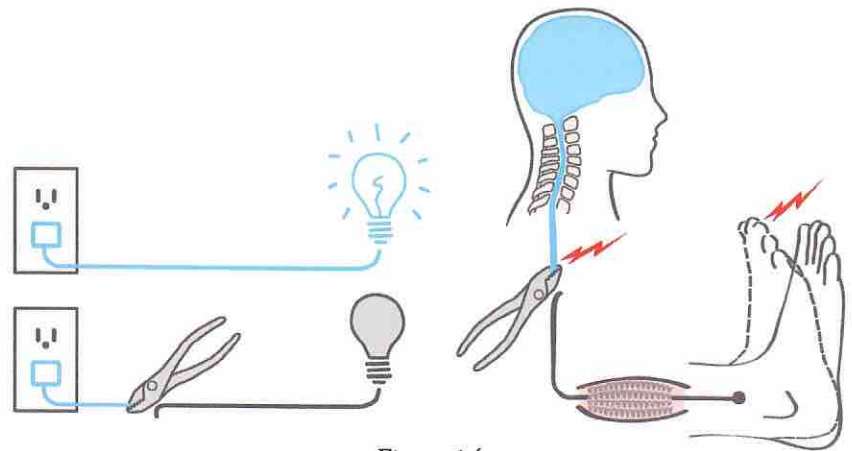


Figure 14:
Pinched nerve and wire being compressed.

If a particular nerve root does get "pinched", then spinal injections and even surgery may be possible to give that nerve root more space. **This explains why back surgery is helpful for patients who have radiating leg pain but not for patients with only back pain despite how intense the pain can become.**

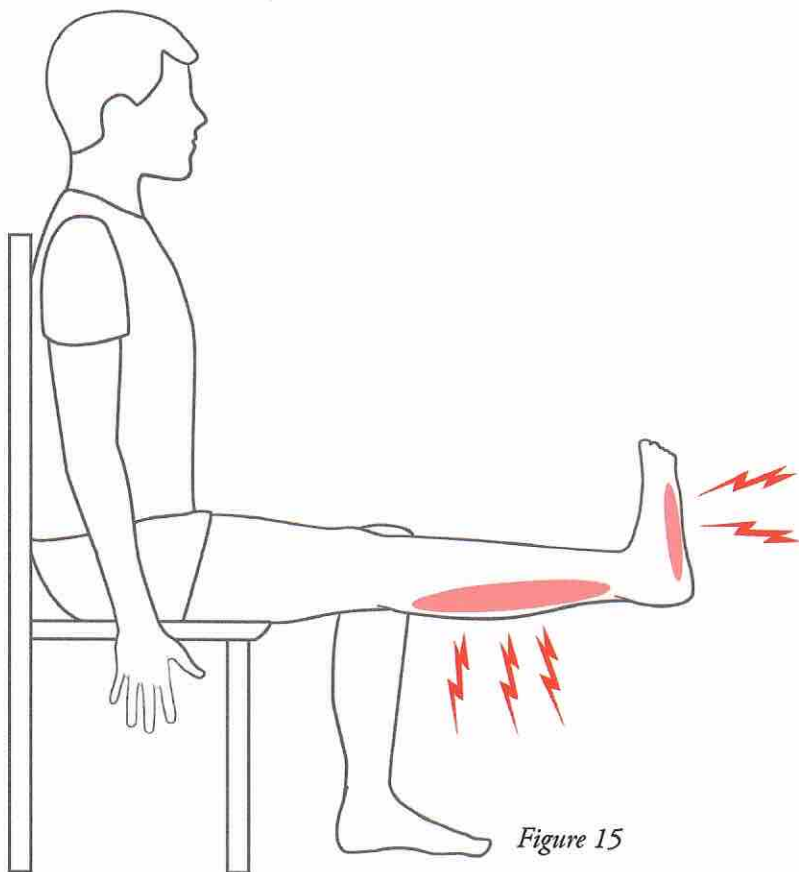


Figure 15

The role of the Central Nervous System

Central Amplification of Chronic Pain

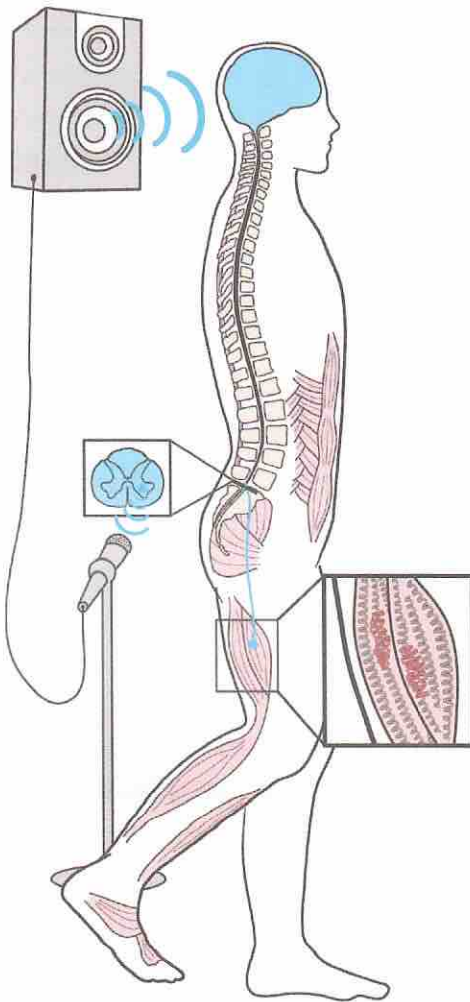


Figure 16:
Spinal cord nerve cells receiving
and amplifying pain signals.

The brain and spinal cord receive signals from these nerves and also send out massive patterns of signals to our muscles that control our arm, leg, and spine movements. These signal patterns develop over years, and explain how we learned to walk, run, ride a bicycle, dribble a basketball and even play a musical instrument. The signal patterns constantly update the spinal cord to include the status of sensors that detect our muscle flexibility, strength, and endurance.

We think chronic pain starts when these sensors in your muscles (peripheral signals), “mis-fire” or malfunction, and the computers in your brain and spinal cord (central signals) adapt improperly to those malfunctioning sensors and become “short-circuited”. In effect, what happens is the spinal cord amplifies a normally harmless pain signal creating a monstrously loud and noxious chronic pain signal.

Chronic pain involves many complex physical as well as cognitive aspects, and can be hard to understand. **Believe it or not, many of the predictors of who develops chronic back pain are not related to MRI findings, but by the cognitive or “central” environment in which the physical findings are found.** Many people then think, if my MRI is “normal,” then, “Is it in my head?” or “What could be causing my pain?”

This confusion can cause more uncertainty which increases a person’s cycle of pain, frustration, and immobility. Central sensitization (or amplification) of chronic pain is a real phenomenon that occurs but is a difficult concept for many to understand.

As peripheral pain signals are sent to the spinal cord, tiny cells determine whether the spinal cord nerve cells should to respond or not. For example, an itchy sensation, or even a sensation of having one’s sock fall down is typically filtered away from the spinal cord as “not critical” and this signal would normally be filtered.

A weak, stiff, or poorly contracting muscle’s signals can be amplified and then interpreted as pain. When your spinal cord has become exceptionally irritable and has “short-circuited,” instead of “filtering” normal pain signals, it incorrectly “amplifies” them. Some patients have intense pain with even the weight of a bed sheet over their feet can, or a gentle massage by a loved one, or engaging in physical activities that require them to “pay for it” with much increased pain afterwards. When this occurs, we call it “central amplification” of the peripheral pain signal.

It is important to understand that this central amplification process is **not voluntary**. You are not doing this yourself! If you could control this yourself, we would just tell you to stop doing this, and then your pain would completely disappear. Like a teacher whose ears are sensitized by rowdy children scraping their fingernails down a chalkboard, your spinal cord has amplified a particular peripheral pain signal so that it is interpreted as noxious and unbearable.

It's absolutely NOT in my head!

Many people get upset thinking that we are saying that they are “making up” their pain. Your pain is NOT imaginary. You are not doing this to yourself voluntarily! But let's face it, after the spinal cord receives the signals from the muscles, it does send signals to your brain. **Your best asset to deal with chronic pain is your brain and that is in your head.**

Although what initially started as a harmless error signal in the muscles, your spinal cord has amplified it into a raging fire alarm that your brain now has to figure out the meaning of the pain signal. This is where your thoughts and emotions can be a pivotal role in managing your pain. Even if your spinal cord has amplified a minor “achey muscle” pain into an unbearable pain, it is up to your brain to over-ride these signals.

Did you know that your pain intensity can increase if you live in a stressful environment? Do you remember the last time you were being scolded by your supervisor? Or the last time you remember an embarrassing or stressful event? Your brain does and can be taught to “over-ride” these signals by doing a “reality check” to confirm that those circumstances are no longer a problem.

Some conditions like chronic pain, anxiety, and depression all activate similar parts of the brain.² Certain parts of the brain are linked through biological and electrical circuits.³ **We also know that untreated depression can increase medical symptoms, decrease a person's pain threshold, and increase the intensity of pain.** Up to 70% of people consulting a doctor about depression have physical aches and pains.⁴ Musculoskeletal pain, depression, and anxiety are so strongly linked that health care providers should be on the lookout for all three. Many people believe that if doctors can just get rid of the physical pain, then depression and/or anxiety will also go away; however, **there has been no clinical or research evidence that treating only a person's pain gets rid of depression and/or anxiety. Many people who have been prescribed our most powerful opioid medications seem to have much increased depression and pain.** In fact, this approach commonly leads to misdiagnosis, frustration, and overtreatment of non-painful, age-appropriate structural “normal” abnormalities in the spine. Not all patients with scoliosis or abnormally curved spines have chronic pain.

Spine researchers also think that some people who have a history of depression, stressful life events, anxiety, considerable fears or catastrophic thinking or misunderstandings of their pain situation may have increased sensitivities to pain. Some researchers⁵ also believe that the concept of “mental defeat” or when people feel that their pain has taken away all of one's self-reliance and identity then drives them to see a doctor.

It is also known that injured workers with a combination of pain, depression, and anxiety are out of the workforce much longer than those who complain of pain alone. Because pain, anxiety, and depression are so interconnected, we can take advantage of treatments for all of these conditions. We know that depression and anxiety can be treated successfully with medications and cognitive behavioral therapy. All of these conditions, if left untreated, likely lead to overstimulation of the spinal cord and brain to start this central amplification process. Despite all our advanced medical imaging and testing, we still cannot analyze your spinal cord or brain to block these signals in any meaningful way.

Can training my brain lead to less pain? Yes

Yes, even simple cognitive or mental exercises can be helpful to decrease your pain. Did you know that if you believe something will cause pain, your brain becomes more sensitized to it? Pain-related fear may increase the susceptibility of your spinal cord to over-react and amplify normal signals. Some people have even told us that they fear they will end up in a wheelchair because of their pain; if a person always rates his/her pain a 12 out of 10, or uses terms like *excruciating*, *severe*, or *debilitating*, the brain quickly believes it. Psychologists call this catastrophization. Constant facial grimacing, limping, or groaning can stimulate the brain and spinal cord to amplify or expect these pain signals. Once these patterns have developed, it is even more difficult for the brain to reprogram them or over-ride them.

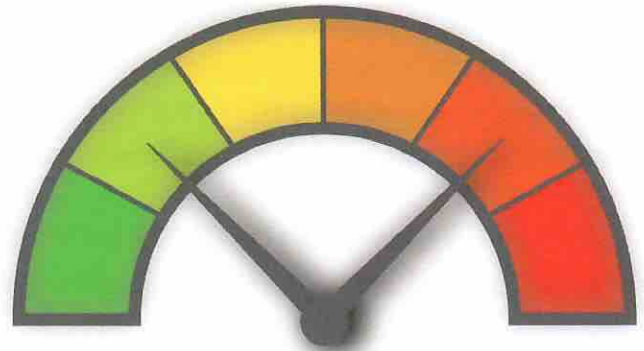


Figure 17:
Pain Amplification Meter

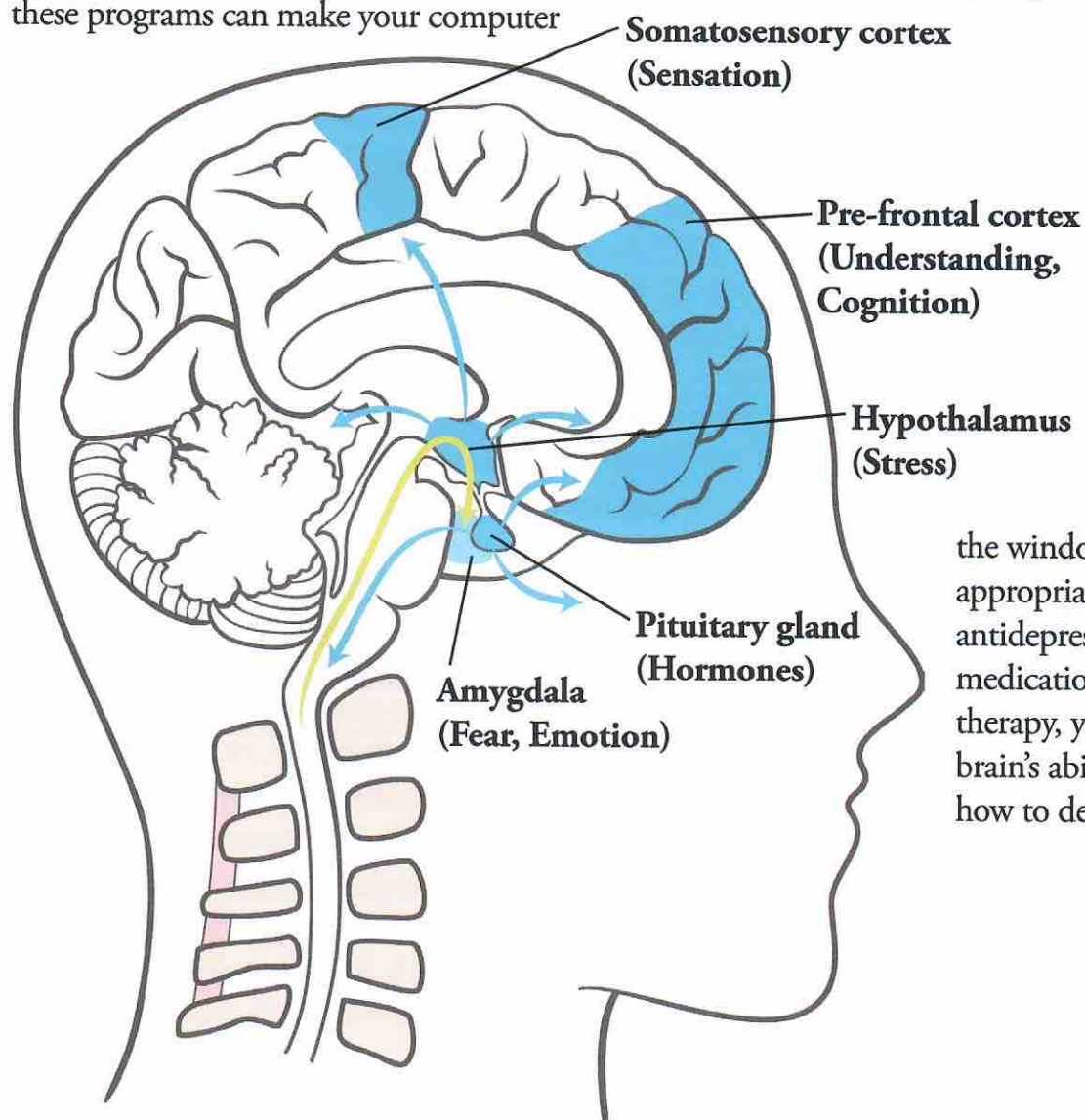
Psychologists have successfully taught people mental relaxation techniques and breathing exercises and mindfulness exercises to alleviate and manage their chronic pain. Cancer patients can also use these techniques to improve their function and decrease their pain medication use but it doesn't mean that their cancer has improved from day to day. Studies have also proven that exercise is an effective treatment for depression. Meditation, yoga, and stress management exercises can also be helpful. Mindfulness practice, or non-judgmental analysis of your thoughts and beliefs to reshape these thoughts can be helpful in learning to deal with chronic pain. These are techniques that allow your brain to wander, but when it happens to focus on pain again, simply redirecting your thoughts to something different in a non-judgmental manner. These exercises are similar to training a new puppy to sit, using repeated redirecting and practice without assigning any negative judgments or mal-intent.

If each of these interventions leads to a small improvement alone, then trying several items on the "menu" of treatments should result in more improvement. The sooner you learn how to recognize the elements that make up all your pain, the sooner you can learn how to manage each of these components. Understand the sources of life stressors so that you can make new life choices that can decrease depression, anxiety, or stress, and help to eliminate misunderstandings or fears about your pain.

There are lots of different areas of the brain that are associated with a person's experience of pain. One part of the brain involved in pain control is called the amygdala. This area deep within the brain is also thought to control a person's fear. This may explain why many people with chronic back pain have a magnified fear of physical activity causing injury or reinjury, and why pain can occur after actual damage or even perceived damage to an area of the body occurs. Neuroscientists are doing studies to see if the amygdala's fear response can be switched on and off but any successful treatment wouldn't be available for decades.

Another deep area of the brain that is involved in chronic pain is the hypothalamus and pituitary gland. These areas of the brain produce stress hormones that circulate throughout our bodies to allow us to respond instantaneously to such threats. Another way to think about stress and pain is that when a person is under extreme stressors like being chased by a bear, or having to deal with immediate threats to their body and safety, your body becomes accustomed to the living in a Fight or Flight response. Some researchers suspect that early childhood or previous trauma or stressors can lead to long-lasting impact on our hypothalamus and pituitary gland's ability to control production of these stress hormones. We don't yet know how to "re-set" these hormone levels using any of the medications that are currently available. We hope that by doing these cognitive-behavioral stress management exercises you will be able to decrease the levels of these hormones.

Another way to think about all of these issues is that your best asset in dealing with chronic pain is to use your brain's supercomputing powers. As with any computer, imagine that you have several different windows open with each of the open windows running complex programs that require you to constantly maintain your personal safety, manage your fears or anxieties or deal with depression. Running all of these programs can make your computer



inefficient and decrease the working memory that you have to deal with chronic pain, your overall happiness, or life satisfaction. A better way to deal with all of these stressors is to understand that by minimizing the windows by taking the appropriately prescribed antidepressant or anti-anxiety medications, or engaging in talk therapy, you can free up your brain's ability to deal with or learn how to deal with chronic pain.

Figure 18:
Brain cells involved in identifying, processing, and interpreting pain signals.

But my back hurts so much when I move or stand....

Sure, that's understandable. Some movements that human beings must do every day will stretch a painful or stiff and shortened muscle, or activate a painful group of muscles. **Don't be afraid of back pain associated with movement.** Some movements that human beings must do every day like standing or walking will stretch a painful or stiff or shortened gluteal muscle. Physical therapists can teach you to get used to safe exercises for day-to-day movements. By understanding that "Hurt" does not always mean "Harm" you can slowly train your brain to not over-respond to the pain associated with these physical activities. Even though these exercises may cause more pain, this doesn't represent "damage" or "harm" to your spine. We can teach you to challenge your fears and misunderstandings about unnecessary fears and misconceptions before sending you for other testing or treatment. We hope you are open to learning what we have taught successfully to people with chronic back pain for over 25 years. By recognizing patterns of belief and having the will to change, you can learn skills that will decrease pain in the short term⁶ and in the long term.⁷

Will my chronic pain ever go away?

We don't know why some people get chronic pain. A common factor is that our bodies do change as we age. Despite all of our preferences and needs or wants, no one wants to have a new diagnosis of a chronic medical condition whether it is cancer, heart disease, a spinal cord injury, neurological disease, or chronic pain. How resilient people are to accept these new conditions can influence how a person views his or her quality of life. A more satisfying explanation for chronic pain may depend on which factors are most important to you. Some feel that aspects of religion, philosophy, human nature, or personal resilience are key factors of how people respond to a significant change in their lives.

When doctors inform patients of a devastating diagnosis such as cancer, patients are frequently counseled to pursue those important activities that bring meaning to his or her life. Despite all medical treatments, some patients may be "incurable" and life expectancies for populations of cancer patients can be measured in 5 year time frames. When dealing with chronic pain, similar concepts also prevail. How do you want to live the rest of your natural life expectancy? Don't let chronic pain limit your personal goals.

By thinking of chronic pain as coming from an over-stimulated central nervous system, it may be possible to retrain areas of the brain being over-stimulated by engaging in other activities that stimulate other parts of the brain. Scientists call this process neural plasticity. Some have experienced reduced pain by concentrating on a new captivating or exciting hobby or learning a new language or activity requiring mental skill. The common factor with all of these approaches is that new or different parts of the brain become stimulated.

The MRI can see what is causing my pain.

FALSE

Go back to what we are thinking is causing your pain – the pain sensors and the spinal cord amplifying or getting short-circuited. The microscopic pain sensors are too small to be seen by an MRI. Painful muscles don't look any different than non-painful muscles. MRIs can be helpful to see either the medium, or larger nerve fibers. While most numbness, tingling, and funny sensations come from tiny unmyelinated nerve fibers that are scattered within our muscles, tendons, joints, and soft-tissues.

My discs are bulging and that's what causing my pain.

FALSE

Many have been told that their pain is coming from disc bulges or tears that look abnormal on their MRIs. Despite what you may have been told about your spine, research shows that chronic back pain frequently does NOT correlate with the structural abnormalities that may have been seen on MRI. **Many people with disc degeneration, disc tears, and bulging discs** are able to lead pain-free and active lives. Recently researchers¹¹ have concluded that an annular tear “had no clinical significance.”

MRI machines are so sensitive now in detecting even slight abnormalities in water content of the discs. Because of the lack of water in some of discs, doctors may say that your discs are “bulging” or even “leaking”. We like to explain the intervertebral disc as being a large jelly donut. During our teenage years, we have a lot of water in the discs. As we age over the next several decades, the water gradually decreases. As the height of the disc decreases, the ends tend to sag and “bulge” out the side, not unlike that in a jelly donut. **Many normal age-related factors, being overweight, performing physically demanding work, and even having a history of smoking can all increase the likelihood that the discs will bulge.**

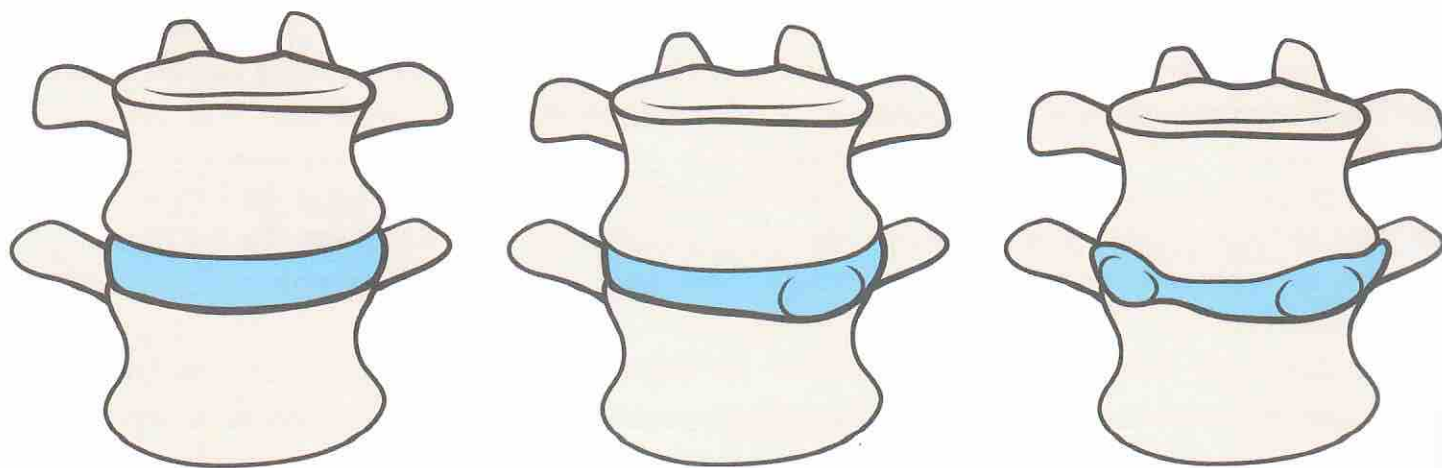
Disc degeneration is a normal process. In fact, the blood supply to our discs was the best when we were teenagers. Every year afterwards, the blood supply to the disc decreases. By the time we turn **40 years old, many of us even without back pain** will have radiographic evidence of disc degeneration. This process is completely normal. Unfortunately, many doctors in the past inadvertently linked the normal process of disc degeneration with pain. In fact, now fewer physicians believe that back pain comes from disc injury. Our spines have a tremendous capability to adapt to new environments and activities. Studies have shown that the disc actually benefits from increased physical loading and gradually adapts just as joints, bones, muscles, tendons, and ligaments do. **Researchers¹² found that physically handling heavy loads, bending, twisting, and working in awkward postures and driving in vibrating vehicles were NOT associated with accelerated disc degeneration.** These activities may have led to back pain due to insufficient muscle flexibility, strength, or endurance, but do not cause disc degeneration to become rampant. Heavier weight, greater lifting strength, heavier work all seemed to slow the process of disc degeneration and may even protect the lumbar discs from degenerating.

Discogenic pain is the term some physicians cite as pain coming from a painful disc. However, there are growing doubts that disc degeneration is a major cause of low back pain. Before, doctors felt that fusion surgery or disc replacement was successful in treating this type of pain. The Centers for Medicare and Medicaid Services found that the evidence on spinal fusion¹³ to treat degenerative disc disease was “weak”. At a spine surgery conference,¹⁴ surgeons were asked about their recommendations. Fewer than one quarter of the surgeons felt that disc degeneration was a major cause of low back pain. Only 1 out of 100 would have opted for fusion surgery and only one would have chosen disc replacement. Researchers in Washington State have reported dismal results in injured workers who have undergone spinal fusion for chronic back pain.

*I injured my disc lifting something heavy at work.
That is why my disc is bulging.*

FALSE

Researchers are now rethinking the whole concept that serious low back pain comes from minor trauma¹⁵ or structural damage to the spine or discs.¹⁶ Some people feel that repeated stresses of vibrations while driving in a truck or sitting in a car can be damaging to the discs. If it were true that these repeated cycles of activity were to lead to advanced disc degeneration, then researchers should find that marathon runners would have the worst disc degeneration in the spine or osteoarthritis in the joints. This is clearly not true. It may even be possible that cycles of repeated activities may actually improve the hydration or nutrient delivery of the discs and preserve the discs from degenerating.



*Figure 19: Do not be afraid of disc bulges which are extremely common in people **WITHOUT** back pain*

It is true that people who sit at work more frequently have back pain. There are numerous reasons why this occurs including not being able to engage in a consistent exercise program. Sitting, bending forward, or even changing positions are activities that require the back muscles to contract repeatedly. Muscles that don't have sufficient endurance would be expected to fatigue after prolonged sitting or similar activities.

Performing routine activities like bending forward to pick up a pencil or object at work are not likely to cause a disc to rupture. Some feel that just because the pain started at a specific time or with a specific maneuver, this maneuver caused their pain. This is another misunderstanding that we try to correct. Unless you undergo significant trauma to your spine as in being thrown out of a moving vehicle, the human spine is capable of absorbing quite a lot of energy without being damaged. Just look at professional football players being tackled repeatedly or weight lifters exposing their spines to incredible loads. It is much better to try to focus on returning to your usual physical activities rather than finding fault that a particular activity required at work caused your pain.

Another error in associating the timing of something that brakes with fault can be made if you were driving your 10 year old car around a parking lot and all of a sudden your axle breaks. Just because your car broke at that particular time does not make the axle wear the fault of the parking lot's owner. As most people know, if you drive a car that is more than 10 years old, you may be at risk for mechanical breakdowns. By the time we develop chronic pain, our bodies have usually had several decades of wear before the first sign of back pain occurs. In addition, if one has neglected giving your body routine maintenance for many years (like maintaining a healthy weight, dietary, and exercise habits) also makes the occurrence of these problems occur even more likely. Some individuals unfortunately perpetuate these misunderstandings for example by avoiding that particular parking lot or refusing to drive anymore because of fear that a similarly catastrophic event may occur again. Other cause and effect misunderstanding relates that more pool drownings occur in the summers when there are more ice cream sales. This does not mean that ice cream sales lead to pool drownings. This is another example of how superstitions or common misunderstandings are not based on scientific evidence.

Because I have back pain, I should stay away from work

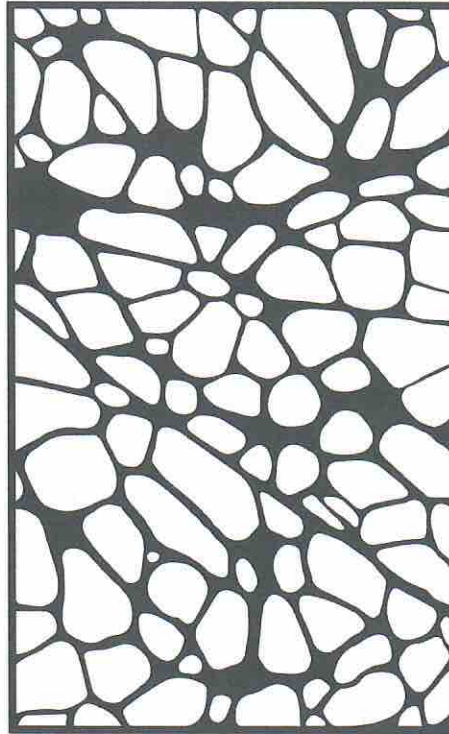
FALSE

We lose muscle strength and endurance much faster than we can regain it. Being off work deprives our bodies of physical activity for all of our muscles. You certainly could have strained some of the very deep and important “core”¹⁷ muscles in the spine with an incident at work, but depriving those muscles from the regular activity that you have done every day at work is a step in the wrong direction. Being able to take it a little easier while your muscle rebuilds itself is advisable, but long leaves from work deprive these deep muscles that need regular exercise they need in order to repair themselves.

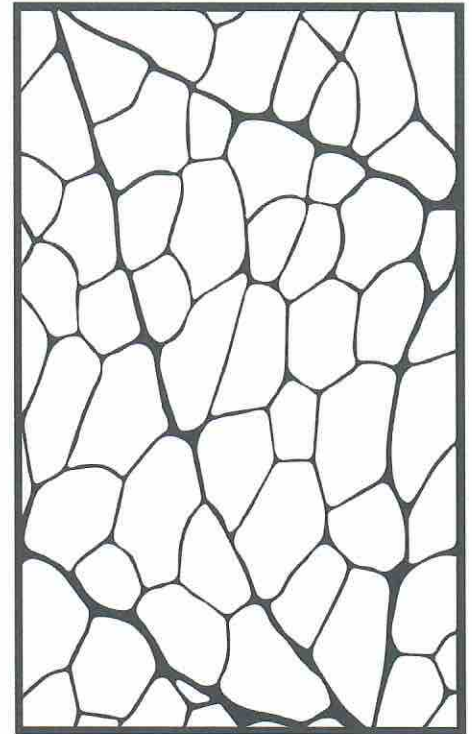
Even when going back to work, the muscles that we need to use during our regular day to day activities. This is why keeping our muscles in their best flexibility, strength, and endurance is so critical if you have a physically demanding work situation.

Population studies have shown increased death rates and increased complications of chronic diseases when

people are taken away from their usual social environment, colleagues, and role or identity in life. Similarly people who think they are not capable of working in society often become “professional” patients endlessly attending doctor’s appointment after doctor’s appointment further proving to be costly to society.



Unhealthy muscle



Normal healthy muscle

Figure 20 : Comparison of unhealthy muscle and healthy muscle

Back pain often leads to permanent impairment of disability

FALSE

Surprisingly, the most important predictors of chronic disabling pain are not related to how “bad” or abnormal an MRI looks to the physician, but relate more to how the person responds to their pain. Researchers have identified that people with the highest risk factors for developing chronic pain typically have many psychological stressors including depression and anxiety. They also have more difficulty performing normal day to day physical activities, show non-organic physical signs such as pain with even light palpation or minimal movement, and are in overall poor physical health. Another nationally known spine researcher has said, “The development of chronic disabling low back pain is more about psychology than anatomy.”¹⁸ This can be very surprising to many physicians. Physicians are trained to detect slight physical findings or see abnormalities on imaging tests. **These subtle findings are not good indicators of the people who develop the most disabling back pain.** Instead, psychological factors seem to be much more predictive of who will need additional services. It is also important to note that the people with chronic, disabling back pain seem to get better **more often** with counseling, cognitive-behavioral therapy, and exercise programs rather than from medications, pain injections, or surgery.

Because I have back pain, I will need permanently modified work

FALSE

It may be surprising to many that the likelihood that an individual will develop chronic back pain has little to do with actual work requirements. One of the earliest predictors of a reported work injury is job dissatisfaction or a feeling of lack of autonomy in the worksite. Prior population studies have shown that those workers who recently had a poor performance review are also at the highest risk for reporting a work injury. These psychosocial risk factors are much more predictive of who will develop chronic low back pain rather than actual physical job requirements.

If you are in a job that doesn't match your physical abilities, you should strongly consider looking at seeking alternative work arrangements. Your employer does not have to find work for you if you cannot perform the essential work duties of your job. Reduced or modified lifting programs also do not reduce severity or incidence of back pain episodes. Specific types of lumbar supports and shoe inserts have also not been proven to be effective. Only a regular exercise program was found to be effective for preventing back problems.

If you are involved in a workers compensation claim and end up having surgery or a permanent structural change to your spine due to a fracture or surgery, then you may need permanent work restrictions. Again, there is a significant difference between “Hurt and Harm”. Those who have had surgery will very likely have increased pain in the future. This pain or “hurt” does not mean “harm” to the spine even if the symptoms feel similar to the initial pain. Those who have had surgery should carefully consider whether their post-surgical physical abilities continue to match the requirements of their chosen occupation. Those who are not able to continue their rigorous physical requirements may need to consider that they may be facing the end of their chosen occupation or have had a “career-ending” injury.

Most patients with chronic back pain do not qualify for Social Security Disability because there are usually at least some work activities that can be considered gainful employment. A person who understands the causes of their back pain and is sufficiently motivated to improve their ability to cope with their pain can participate in some form of work, physical, and recreational activities with minimal modifications.

I should rest until my back pain goes away

FALSE

We at the UI Spine Center do NOT agree with this statement. Too much rest is the worst thing for a weak, stiff, or painful muscle to have. Activities to get the muscles back to normal are essential. Many other spine specialists, including Dr. James Rainville, a well-known spine specialist in Boston, have said "For individuals with back pain, exercise is therapeutic. It may even reduce the risk of developing further back pain episodes. There is no evidence that exercise places patients at increased risk of harming their backs or accelerating spinal degeneration. We commonly see patients who have muscle soreness after exercise, but this is not a sign that the spine has deteriorated but rather the muscles are repairing themselves." A failure to exercise has been linked to several chronic diseases including chronic back pain.¹⁹ Regular exercise may actually have a preventive effect in terms of frequency of back pain and recurrence.

My back pain means something is significantly damaged or diseased

FALSE

In a study of 1200 patients with acute back pain, less than 1% of patients with back pain had a serious condition including a fracture, infection, cancer, or multiple nerve root compressions. Several treatment guidelines²⁰ can identify certain items in your personal history or examination that may lead us to suspect underlying serious medical condition.

X-rays, CT scans, and MRIs can identify why I hurt

FALSE

The National Institutes of Health Task Force on Research Standards for Chronic Low Back Pain²¹ determined that, "The precise anatomical basis of back pain can only be identified in a small proportion of cases." Many spine specialists feel that lumbar spine MRIs are unnecessary in the presence of a good and normal physical examination. Dr. Scott Boden, a well-respected spine researcher once remarked, "Let's get an MRI scan to see if there is anything wrong with the spine' is the beginning of a dangerous thought process."²² Studies have shown that patients who obtain early MRIs actually have a worse outcome than patients who are simply reassured that there is no significant abnormality in their spine. Another study indicated that only 1 out of 2500 x-rays of the spine showed anything helpful in determining an individual's back pain.

The majority of people with low back pain have problems with poor muscle flexibility, strength, or endurance. Painful, stiff, or weak muscles do not appear any differently on an MRI than a non-painful muscle. Many of the other common abnormalities found on MRI (disc tears, bulging, herniation or degeneration) have not been proven to cause pain. Therefore, we do not recommend MRIs on people who can have their pain so easily reproduced by stretching or activating their muscles unless there are special circumstances.

Studies have indicated that more medical care for back pain does not necessarily mean better care. Patients should be careful in requesting expensive and unnecessary evaluation. Some people may just want to know what their MRI shows and say they will feel better knowing that they don't have anything seriously wrong like a tumor, infection, or other abnormality. An interesting research study was done to see whether people who got an MRI early on in the course of back pain did better than those who didn't get an MRI for their back pain. It was thought that early MRIs could help patients understand their condition better, and make them feel better about their back pain. Many subjects had MRIs that showed annular tears, disc protrusions, endplate changes, and degeneration. Seeing those MRI images led them to have a lesser sense of well-being. **The researcher concluded that information supplied by an early advanced imaging test appeared to have a negative impact on patient outcomes,** and higher surgery rates might ultimately increase costs.²³

Another study²⁴ reported that "Findings on MRI imaging taken within 12 weeks of the start of low back pain are highly unlikely to represent new, clinically significant, structural changes." These findings have led national physician groups such as the American Pain Society and the American College of Physicians to recommend **against** routinely obtaining advanced imaging or other diagnostic tests in patients with nonspecific low back pain.

My back pain must be curable with some form of medical treatment

FALSE

Once reassured by your doctors that there is no fracture, infection, tumor, or a sinister medical condition that is responsible for your pain, the next step is to look for whether there are any factors that you can improve your pain.

"Low back pain was recently termed the "most over-treated" condition in the US"^{25 26} According to the NIH, US spending on back care increased from 1997 to 2005 up to \$86 billion dollars which is close to what the country spends on cancer treatment. An article from a 2008 Journal of the American Medical Association reported on "increased back care spending without evidence of corresponding improvement in patient's health." Back pain is second only to mental health conditions as a reason for work disability among individuals in their working years. Clearly back pain is a problem for our entire country and our collective productivity. Dr. Richard Deyo has written an informative book titled, **"Watch Your Back! How the Back Pain Industry is Costing Us More and Giving Us Less and What You Can Do to Inform Yourself in Seeking Treatment,"**²⁷ (Richard A. Deyo MD, Cornell University Press, 2014.)

The expectation that passive treatment will cure a person's back pain is a bad sign. Back pain is not like cancer. You are not dependent upon the physician to prescribe the perfect concoction of chemotherapeutic medications that will destroy rapidly growing cancer cells. Think about your back pain from an activity standpoint. Go back to the concept that chronic back pain is coming from overactive nerve or pain sensors that are being amplified by the spinal cord or brain. We cannot break into your spinal cord to adjust your pain filters. We cannot give you any safe prescription medication that will make your muscle flexibility, strength, or endurance get any better.

So I have to own my back pain?

YES, be open towards reshaping how you view your chronic back pain. Our goal is to give all patients an adequate explanation for their pain so that they understand what medical care can and cannot do, and they can start to focus on rehabilitation. A key focus of this guide and many of the international medical treatment guidelines²⁸ for chronic back pain is helping people self-manage their condition: reduce pain and its impact on a person's day to day life even if the pain cannot be cured completely. We encourage people to stay physically active and continue with normal activities as far as possible. We provide information about the expected course of their pain and effective self-care options. Treatment should take into account patient's needs and preferences, informed decisions, and involve good patient-physician communication. Studies²⁹ have shown that patients who do not receive an adequate explanation for their pain frequently want more diagnostic tests and were less satisfied with their visit or to want the same doctor again.

Look at what you can do for reversible factors include your weight, exercise or activity level, and even your mental approach or understanding about chronic pain. It should not be a surprise that the average American has been increasing in weight. You may still recall that just a few years ago that you could burn off those extra 5 pounds through increased activity over the summers. As we approach our thirties and forties, it is not uncommon for our metabolism to change and we become entrenched in our typical activity and dietary habits. Aging is an example of an irreversible risk factor but our dietary and exercise habits are certainly reversible but only if one so chooses.

People who have physically demanding work activities and need to be able to perform constantly at such a high level are especially at risk for developing chronic pain. For these people, even a simple "injury" or incident may have the effect of becoming a "career-ending" injury. For those people, we suggest that they view their back pain as a realistic calling to consider less physically demanding or alternative work options. While Olympic athletes sometimes have sponsorships that they can rely upon when they end their sports careers, the reality is that most of us don't have that safety net and vocational counseling or retraining services are not so glamorous as retirement from a satisfying sports career.

Spine experts warn, "Buyer beware!" Another common analogy to seeking back pain treatments is similar to shopping for groceries in a foreign country where when you are hungry and don't fully understand the label and someone else (your insurance company) is paying for the majority of the final cost.

Even with our best advice, many still consider that their back pain must be coming from an insidious or sinister process that eludes medical treatment. Unfortunately, those people who "catastrophize" about their back pain rarely get better. Those who tend to assign blame for developing chronic back pain because of a particular incident also tend to do poorly. Don't view chronic back pain as something that will "ruin your life" or that only doctors can free you from this pain. People who understand that they need to take an active role by doing physical exercises and even learn some simple cognitive-behavioral exercises can lead fulfilling lives engaging in most of their preferred recreational physical activities and manage bouts of intermittent episodes of chronic back pain.

We frequently like to believe that back pain comes from an “injury” to our spine such as an accident, arthritis, or even “old-age.” it may be more helpful for people to understand that we are all susceptible to chronic conditions such as cancer, diabetes, heart disease. Many such conditions strike adults in the prime of their working years. No one wants to develop a chronic disease, but the reality is that much of medical treatment already focuses on management of chronic conditions. We would all love to be able to be as physically active or “disease-free” as when we were younger. Our development of these chronic conditions is usually not dependent on only one specific injury, incident, or accident but rather a host of reversible factors and some non-reversible or genetic factors. We are not certain why some people are at risk for developing these conditions and it may be a matter of a person’s individual genetic make up. The best explanation is probably that much like other chronic medical conditions, there are some genetic risk factors that cannot be changed, some environmental factors that may or may not be easily changed, and some personal factors or behaviors that definitely can be changed. Some researchers are looking at whether our genetic makeup plays a role in controlling our body’s response to pain. There is even thought that a particular gene, the Catecholamine-O-Methyl Transferase gene, is thought to play a role in the body’s system of modulating pain. Successful genetic treatments for humans with pain are not available now and probably won’t be available for several decades at least. In the meantime, understanding that our susceptibility or vulnerability to develop most chronic conditions depends on reversible factors and some non-reversible factors.

As with many other chronic medical conditions, your outlook and understanding of your medical condition can greatly impact your overall quality of life. Do you know of any people with cancer, spinal cord injury, or other serious medical conditions who lead more fulfilling lives than you? If you don’t, then you should consider relooking at how you define your quality of life. Helpful ways to manage chronic pain include engaging in some consistent level of activity even despite pain. If you can convince yourself that chronic pain comes from an over-excited or over-responsive nervous system that is attached to your musculoskeletal system, then you are much less likely to be afraid of activity that causes increased pain. Harmful ways of managing pain are to think that with every step you take, your discs or “leaking, degenerating or bulging” retreat and respond by becoming fearful of any and all normal activities that cause further pain. **Hurt does not necessarily mean harm when it comes to chronic back pain** especially if your doctor has reassured you that you don’t have a fracture, tumor, or infection causing your pain.

What do national guidelines recommend for reasonable treatment for chronic back pain?

For people who do not improve with self-care options, several national³⁰ and international³¹ guidelines recommend up to 8-10 sessions of individual or group exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation over a period of 12 weeks. For people who have failed the above treatments or have high disability or psychological distress, physicians are recommended to consider referral for a combined physical and psychological treatment that include approximately 100 hours over 8 weeks. The UI Spine Rehabilitation Program includes approximately 80 hours of professional contact involving the physician, psychologist, and physical therapists over two weeks.

Do these pain rehabilitation programs really work?

YES, if you can make positive behavior changes. Researchers³² have “clearly revealed that chronic pain programs offer the most successful and cost-effective treatment for persons with chronic pain even including spine fusion surgery.” This has also been confirmed by the American Pain Society and the American College of Physicians and has been an integral part of their Clinical Practice Guidelines.³³ There is also strong evidence that a graded activity program using a behavioral approach is more effective than usual care in getting patients back to work.³⁴

We hope you can see why we do not recommend opioid medications when we have the Spine Rehabilitation Program which has a long track record of success and virtually no risk of harmful side effects.

So if I continue to have severe pain after a combined physical therapy and psychology program, would surgery then be helpful? No...

NO, that's another common misunderstanding. Some people thinking that their pain now isn't “bad enough” to need surgery now. What the surgeons are looking for is any extension of pain into the leg or a substantial change in the **quality** of a person's pain. They are not likely to operate on you just because the intensity of only back pain has increased because of the concept of central sensitization as we discussed earlier.

“Intense pain is not necessarily an indication for surgery,” says Dr. Richard Deyo, Professor at Oregon Health Sciences University. Surgery for radiculopathy or ankle or toe weakness or pain can be effective. Surgery for axial back pain generally is **not successful** in eliminating back pain. People typically overestimate the potential benefits of fusion surgery for degenerative disc disease.³⁵ Less than half of patients surveyed had good outcomes³⁶ as defined as having only rare pain, slight limitation of function, and only occasional use of pain medications. In another study³⁷ of patients who underwent spinal fusion, 64% who had fusion were still off work more than 1 year after fusion surgery, Only 6% had gone back to work, 20% had complications, 27% reoperation rate, and 90% were still taking opioid medications.

What are national guidelines recommending for medications to use for chronic back pain?

The American Pain Society³⁸ and the American College of Physicians recommend acetaminophen or nonsteroidal anti-inflammatory medications. Second line treatments for chronic back pain may include tricyclic antidepressants. The following chart is used by many of our Spine specialists at the University of Iowa.³⁹

Medication class	Common examples (brand name)	Advantages	Disadvantages	Cost
Analgesic	Acetaminophen (Tylenol)	Effective in osteoarthritis and chronic pain; analgesic of choice for patients with renal disease; option for children	Potential for hepatic toxicity with long-term use; minimal anti-inflammatory effect	\$
Non-steroidal anti-inflammatory drugs (NSAIDs)	Ibuprofen (Advil), Naproxen (Aleve), Diclofenac, Nabumetone, Etodolac	Effective in a variety of pain, inflammatory conditions	Risk of gastrointestinal bleeding; CV toxicity	\$
Tricyclic antidepressants (TCAs)	Amitriptyline, Desipramine, Nortriptyline	Effective for associated sleep disturbances	Do not stop quickly; sedation; dry mouth; adjust dose in elderly	\$
Anticonvulsants	Gabapentin (Neurontin)	Effective for neuropathic pain; large dosing range allows flexibility in dose adjustments;	Sedation; balance or gait problems; use low dose in renal dysfunction	\$
Neuropathic pain agent	Pregabalin (Lyrica)	Effective for neuropathic pain, fibromyalgia	Weeks before full effect; do not stop quickly; sometimes poorly tolerated	\$\$\$
Selective serotonin reuptake inhibitors (SSRIs)	Citalopram (Celexa), Escitalopram (Lexapro), Fluoxetine (Prozac), Paroxetine (Paxil), Sertraline (Zoloft), Venlafaxine (Effexor)	Effective for associated mood disorders	Do not stop quickly; Weeks before full effect achieved; sexual dysfunction; suicidal ideation possible	\$
Serotonin/norepinephrine reuptake inhibitor (SNRI)	Duloxetine (Cymbalta)	Effective for fibromyalgia and chronic musculoskeletal pain, and associated mood disorders	Weeks before full effect achieved; Do not use with hepatic insufficiency	\$
Mixed mechanisms	Tramadol (Ultram)	Effective for neuropathic pain (also can be beneficial for hyperalgesia and allodynia)	Avoid use with other serotonergic agents (SSRIs, TCAs); caution in elderly	\$
Combination analgesics, Opioids	Acetaminophen/hydrocodone (Vicodin), Acetaminophen / oxycodone (Percocet), Morphine (MS Contin), Fentanyl (Duragesic patch), Oxycodone (Oxycontin)	NOT RECOMMENDED	High risk of overdose, diversion, misuse, addiction, death	\$\$\$\$ Costs to society

Will you prescribe opioid medications for me? Sorry, but no...

Opioid pain medications for the control of chronic back pain have been controversial. Over 9 million adults⁴⁰ in US (3% of the adult population) receive long term opioid therapy and another 5 million abuse them for chronic non-cancer pain yet this form of treatment is not supported by research. A recent summary⁴¹ from a National Institutes of Health conference noted, "Despite what is commonly done in current clinical practice, there appear to be few data to support the long-term use of opioids for chronic pain management." The American Pain Society and the American Academy of Pain Medicine⁴² are concerned about harms of opiate medications including drug abuse, addiction, and diversion. Of the patients taking opioid medications, only about a quarter of the patients had their pain decrease by 1/3.⁴³ Only 1 in 6 people actually improved their ability to function or return to work or do more activities.⁴⁴ Higher dosages were not associated with any increase in clinical improvement. Serious opioid overdoses occur among stably insured patients⁴⁵ on long-term opioid therapy for chronic pain.⁴⁶

The following YouTube video, Brainman Stops his Opioids, <https://www.youtube.com/watch?v=MI1myFQPdCE>,⁴⁷ is very helpful for patients who are currently taking opioid medications and may want to think about stopping.

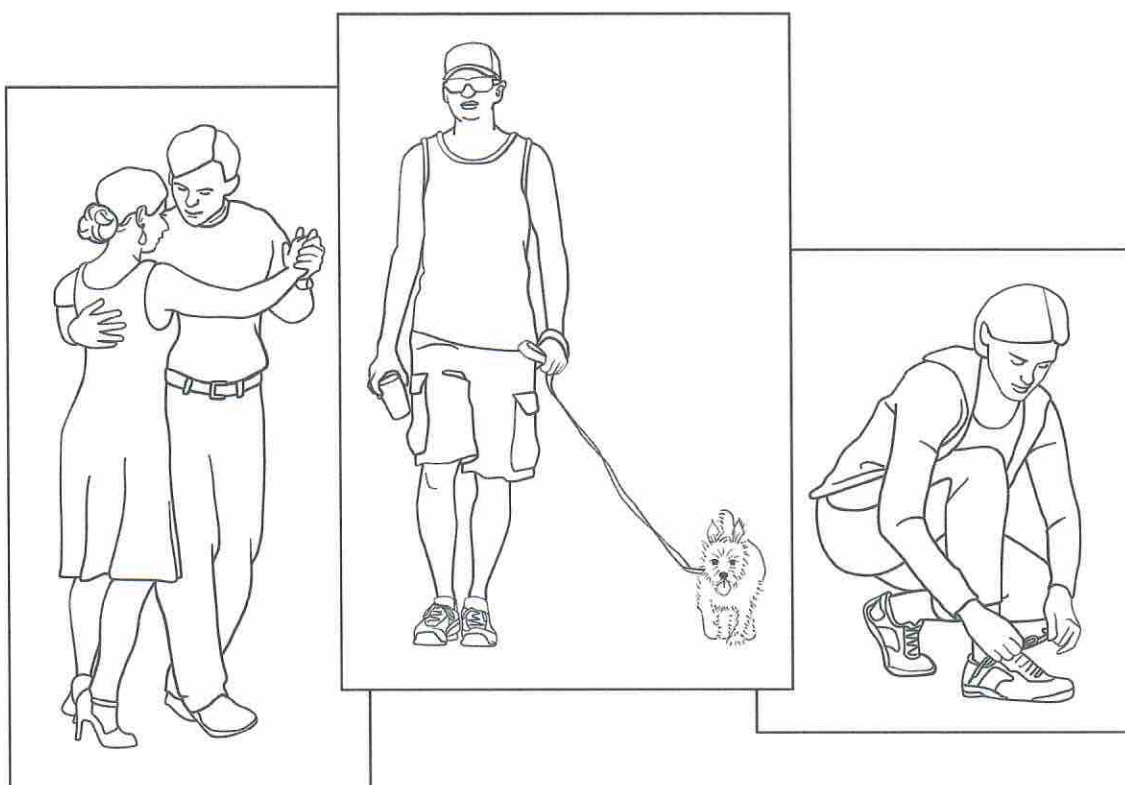
Did you know that over 16,000 people die every year due to use of opioid medications? These deaths are not from people abusing or addicted to pain medications. These are good, hard-working people who take their medications as directed by their physicians. Unfortunately opioid medications can depress a person's respiration at night and can be deadly when mixed with consumption of alcohol or other sedating medications. Researchers have indicated, "New evidence from observational studies suggests that long-term opioid use vs. non-use is associated with increased risk of opioid abuse and dependence, overdose, fractures, myocardial infarction, and markers of sexual dysfunction."⁴⁸ At the same conference they also noted, "The United States has a dysfunctional healthcare delivery system that promotes clinicians prescribing the easiest rather than the best approach to addressing pain." In another study of a large claims database⁴⁹ nearly 50% of patients with low back pain were prescribed opioids but only 8% received psychological therapies, 19% received exercise therapies, and 12% received physical therapy.

For all the above reasons, the UI Spine Center does not recommend the use of opioid medications. There are many reasons we feel this way: opioids do not decrease chronic pain very well, what short-term effectiveness they have eventually wears off, and there are serious long term harmful effects including addiction, osteoporosis, immune suppression, sexual dysfunction and increased pain. Our most successful patients have been able to wean themselves off their opioid medications over several weeks. If you are currently taking an opioid medication contact your prescribing physician for instructions on how to start this process. Many of our patients say that they feel far better when they are not taking opioids. Fear about experiencing increased pain can lead to increased use of even more powerful pain medications and long term disruption of hormonal function. **You are the best person to decide when to stop this cycle.**

It is not easy for us to discuss these difficult issues with all the patients we see. We also understand it's not easy for all of our patients to understand these complex issues especially when they have been dealing with chronic pain for so long. Our best advice is that these are our best recommendations whether you were our spouse, family member, friend, or neighbor.

Spine fusion operations are expensive. Twice as many of these surgeries are done by American surgeons as done in European countries, and up to five times more in the US than done in England. There is no epidemiological studies that indicate the spines of human beings living in the US are that much weaker than the spines of human beings living in European countries. The New England Health Care Institute estimates US could save \$1 billion a year by eliminating unnecessary back surgeries. We at the UI Spine Center are also concerned about the excessive use of opioid medication, unnecessary advanced imaging and testing (MRIs and EMGs), overuse of pain injections for low back pain, and the potential for overuse of lumbar fusion surgery.

We firmly believe that the patient knows best the care he or she wishes to undergo. Our job is to help you learn about your medical condition, the risks, benefits, and likelihood of success. Studies indicate that when informed patients share in the responsibility of making their treatment decisions, they are more likely to choose conservative (non-surgical) treatment options. It is also comforting to know that scientific research studies from multiple reliable sources indicate exercise with cognitive behavioral treatment or lumbar fusion surgery share **similar long-term functional results**.⁵⁰ **Spine fusion surgery for back pain is NOT the only way to get better.**



But I heard about a lot of different treatments that my neighbors have had that “cured” them of their back pain....

Don't I need an epidural steroid injection?

Epidural steroid injections for nonspecific low back pain have been found to be ineffective according to the National Institute for Health and Clinical Excellence in Britain. Their National Health System does not provide reimbursement for these injections anymore. For one-sided pain radiating below the knees, the American Pain Society Clinical Practice Guideline does provide recommendations that an epidural steroid injection can be moderately effective for short term pain relief.

Don't I need Facet Joint Injections?

If your physician recommends says that you have a lot of arthritis in the facet joints in the spine and wants to perform facet injections, be cautious. There has been no form of imaging that has proved capable of identifying painful facet joints. As we age, more people will have arthritis in the facet joints. Up to 25% of some young adults had radiographic evidence of facet arthritis. Nearly 70% of older adults have facet arthritis even without any pain. There was no relationship between facet joint arthritis and low back pain at any spinal level. We understand that the spine changes continuously throughout life and few of the routine changes labeled as “degenerative” have a predictable relationship with pain. The American Pain Society has found good evidence that facet injections are not effective.

Prolotherapy?

The American Pain Society has found good evidence that prolotherapy is not effective.

Radiofrequency treatments?

The American Pain Society has found good evidence that radiofrequency thermo-coagulation is not effective.⁵¹

Spinal Traction?

A recent Cochrane Collaboration systematic review⁵² concluded that there is not enough evidence to recommend any form of traction as a solo treatment.

Laser Treatment?

According to National Institute for Health and Clinical Excellence in Britain, laser treatments are not recommended.

Interferential Current?

According to National Institute for Health and Clinical Excellence in Britain, interferential current treatments are not recommended.

Ultrasound?

According to National Institute for Health and Clinical Excellence in Britain, Ultrasound for pain treatments is not recommended.

TENS (Transcutaneous Electrical Nerve Stimulation)?

According to National Institute for Health and Clinical Excellence in Britain, TENS Units are not recommended.

Lumbar Supports?

According to National Institute for Health and Clinical Excellence in Britain, lumbar supports are not recommended.

Glucosamine?

A recent review⁵³ found that glucosamine for back pain is not effective.

Intradiscal Electrotherapy Treatment?

According to National Institute for Health and Clinical Excellence in Britain, intradiscal electrotherapy treatments are not recommended.

How can a family member help a loved one with chronic back pain?

After chronic pain sets in, a person with back pain usually has many important questions: “Will I need surgery?” “What can the doctors do to get rid of my back pain?” “Should I exercise?” “What can I do about work?” These concerns about back pain can worsen due to fear of increased pain, frustration from not being able to do work or recreational activities, hopelessness about the future, and loss of financial security from missed work opportunities. The situation affects not only the patient, but his or her entire family.

Family members are key people to provide encouragement, empathy, and compassion for those who deal with chronic back pain. There is a fine line between being helpful and enabling a family member to be completely disabled and neglect their family obligations. Being helpful includes providing psychosocial support in times of need. **Chronic back pain should not lead a person to become totally disabled and dependent upon family members to perform their personal chores.** Even putting on shoes, while painful for some, requires a certain amount of muscle flexibility. If a family member tries to be helpful in assisting a person with back pain with even such common tasks, one runs the **risk of depriving the person of exactly the muscle activity that is helpful for their recovery.** Teaching patients and their family members about the effective treatments for chronic back pain is extremely important. If your loved one is too distraught understanding this material, you can take the time to review, explain, or analyze this information for him or her. Do additional research on chronic pain on your own. Read the references below⁵⁴ or view the YouTube videos^{56 57} listed at the end of this booklet.

Please come with your questions! We welcome you to the UI Spine Center.

Informational YouTube Videos:

Dr. Mike Evans, Acute Low Back Pain, <http://www.evanshealthlab.com/>

Understanding Pain: What to do in less than 5 minutes, by Painaustralia

Understanding Pain: Brainman chooses, by Brainman

Additional recommended readings:

Watch Your Back! How the Back Pain Industry is Costing Us More and Giving Us Less and What You Can Do to Inform Yourself in Seeking Treatment, (Richard A. Deyo MD, Cornell University Press, 2014.

The Back Book, (Burton AK, Waddell G, Tillotson KM, Summerton N, Spine 24:2484-2491, 1999

So, what's left?

If you understand what medicine can do and what medicine cannot do, you will soon realize that doctors have little control over curing chronic back pain. Think about your back pain as coming from microscopic nerves or sensors that are stimulated when muscles become too stiff, weak, or unable to function, and attached to an amplifier magnifying the intensity of such an alarm. We cannot block all of these sensors and we don't know how to stop the amplifier from working. Your best asset is to use your brain to try to turn down the amplifier and understand that the loudness of the signal is not a reflection of the severity of the pain.

Healthcare providers must clarify misperceptions about back pain and guide patients toward effective active management of their symptoms. Educating patients and their families about back pain is not easy but we feel it is our duty to improve our health as a nation, decrease health care costs due to unnecessary surgery, and get productive workers back to contributing to society and restoring people's self esteem. A mass-media campaign in the 1990's in Australia was successful in changing public attitudes and beliefs about back pain. Benefits included changing the behavior of Australian healthcare providers and reducing workers compensation claims related to back pain. These are outcomes that would be helpful to our local and national economy.

We understand that much of this information may be confusing or contradictory to what you have been told by other respected health-care professionals. This revelation can also be potentially upsetting. We treat all patients respectfully and hope to have respectful conversations. We assume you are here for our best professional advice and are open to considering our treatment recommendations. We understand that some patients may not believe this approach will work for them. For those patients who continue to fail to understand or hold unrealistic beliefs or expectations of their pain, unfortunately we may not have any further treatment recommendations. You may need to consider yourself "incurable" with current medical technology. Just like some cancer patients, you may need to take stock of your personal goals and values to determine what you want to do for the remainder of your life expectancy. As far as we know, chronic pain does not lead to a shorter life expectancy. There are many chronic conditions associated with chronic pain that are linked to reduced life expectancy including obesity, long-term unemployment, and untreated mental health conditions. If you have any of these conditions, you should view this as a call to become better engaged in your own health by seeking and following through with the recommendations of your healthcare providers.

We hope that by reading, studying, and understanding this material, you will become more empowered and educated to ask questions of your healthcare providers and challenge them to explain to you what they are going to do to help you. **Please do not overlook how important your role is in controlling your muscles, responding to your pain receptors, and deciding how you can help yourself.** We believe that patients are best served when they and their healthcare team share in the decision making process and agree upon treating pain in a collaborative manner.

There is no perfect way for you to manage your chronic pain. We hope that you do not retreat from all your life activities and become professional patients going from one doctor to another hoping that someone has the magic wand to cure you of your chronic pain. At the UI Spine Center, we have developed this Guide to present to patients and their families a clear explanation for chronic back pain and how you can use using scientifically proven and safe advice to manage the frustrating condition of chronic back pain.

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PAIN AMPLIFICATION METER



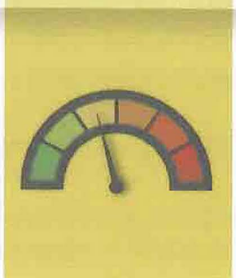
"Great job son!
I'm so glad I got
out to watch
you play"



"I feel so much
better after my
daily exercise"



"I feel great
spending time
for myself"



"First my back, then
my neck, now I'm
limping and have a
headache. I just hurt
all over"



"You've missed
your quota again
this month.
I'm putting you on
probation again."



"I can't do
anything right.
I just can't get out
of bed."

