A Patient's Guide to

Pain Management: Relaxation Training



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The First Name in Specialized Orthopedic Care

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Introduction

Learning to relax can help you manage your pain.

Most chronic back pain sufferers are very familiar with the fact that stress and tension tend to make pain worse. Increased stress and worse pain tend to go hand in hand. This is true whether we have endured a traumatic life event or crisis, or are simply living with ongoing, everyday stresses and strains that cause us to feel tense, tight, and unhappy.

This guide will help you understand

- **what is known about the relationship between anxiety, stress, and pain**
- **how learning to relax can be a powerful tool for effective pain management**
- **practical ways you can relax and quiet your body when in pain**

The Nature of Tension and Relaxation

Our physiology and emotions work together to produce the many personal experiences we have every day. These include thoughts, feelings and memories, and obvious behaviors. Our mental and physical processes are so closely linked, there's probably no way to really separate them. This is also true for the experience of tension, and for the comfortable resolution of tension, relaxation.

For our purposes, we will define *stress* as the set of physical and emotional changes that occur when we feel threatened. The intensity of the perceived stress can range from mild to severe. Stressors can be *acute* (short-lived) or chronic and long lasting. They can be huge and very obvious, or they may be quite *subtle* (not very noticeable).

Physiological Aspects

Let's first look at the physiological changes that take place in our bodies when we experiences stress. The human nervous system is very complicated. Billions of individual nerve cells communicate in complex signaling patterns. The results are intricate thoughts and behaviors that we take for granted each day.

For example, we may not even notice how smooth our movements are because of how well balance and coordination work together. We may not consciously recognize when we are having lofty ideas and subtle feelings or experiencing boredom, creativity, pleasure, or pain.

In an effort to try to simplify the nervous system so that we can study it, scientists have divided it up into several parts or systems. The *central nervous system* (CNS) is made up of two main parts: the brain and spinal cord. The CNS is the master control system of the body. It has the job of moving the body and overseeing all of its functions. It also manages all of the communication between the body and the brain.

The rest of the nervous system, the nerves that run from the brain and spinal cord into the rest of the body, is called the *peripheral nervous system* (PNS). These are the nerves that provide information to our brains about what's happening in our muscles, joints, skin, and internal organs.

The PNS carries sensory information from the body to the brain. This includes information about touch, hot and cold, pain, pressure, and so forth. The peripheral nerves also send signals from the brain to our muscles and internal organs. These messages tell the body when it's time to move or make other changes that will keep us safe, comfortable, and healthy.

Normal day-to-day living relies on the ability of the CNS and PNS to work closely together. Together, they accomplish a wide variety of integrated tasks. They perform a very specific and critical set of functions. Most of these processes involve maintaining the body's internal balance. For example, there are automatic daily functions of the body, such as temperature regulation and using and storing energy and nutrients that must be regulated. These systems also alert us to dangers or discomforts so we can respond in ways that keep us safe.

The nerves that make up this arousal and alert system are called the *autonomic nervous system* (ANS). The ANS is so named because this system looks after itself. It is not under conscious control. Our heartbeat, breathing, blood pressure, temperature maintenance, and body alert systems are part of the ANS. These functions do not require conscious thought or attention. If they did we probably wouldn't have time to do anything else, since we would be spending all of our time remembering to breathe and move our blood around.

It is the ANS that controls the physiological components of tension, stress, and relaxation. Remember that the primary function of this system is to alert us to any possible threats and to prepare us for action. When the alarm sounds, heart rate, respirations, and blood pressure all increase. Muscle fibers contract as the body prepares for either defense or escape. This is the fight-flight-or freeze response that most of us are familiar with.

Emotional Aspects

The emotional aspects of stress and tension refer to changes in our feelings that take place when we perceive a threat. These are feelings that we describe using words like worry, fear, distress, unease, and anxious.

Most of us don't think much about how our emotions are under physiological control too. In the CNS, a large part of the brain has developed as the emotional center. This is called the *limbic system*. Its job is to create the emotional reactions we have to life events. Then it sends information about our feelings to other brain centers.

In our bodies, and especially in our internal organs, numerous physiological changes take place in response to signals from the limbic system. All of these interactions help us interpret our emotions accurately. For stress and tension, these changes can occur in the body. For example, there may be an increase in heart rate and blood pressure. You may feel tightness in the chest along with faster and shallower breathing. You may experience a queasy or uncomfortable sensation in your gut or stomach. Muscles tighten up throughout the body.

When these changes occur in response to an event that we find threatening, we label our feelings as stress, tension, or worry. We find ourselves strongly motivated to change the situation in some way so that those feelings and tense body state will go away.

Why do we become tense?

It's clear that our brain has developed a very sophisticated and effective warning system. We know if our well-being is challenged or threatened in any way. Physical discomfort and arousal motivate us to either neutralize the threat or get out of the unpleasant situation. Our stress response is a warning system that allows us to care for ourselves.

Sometimes the system malfunctions or works too well. The result can be long-term bad effects on our health and quality of life. Remember that stress is the result of perceived threat. In some cases, the danger we sense may not be real. For example, worry is often described as the fear of what might happen:

- "Oh, I hope his surgery went OK. Why hasn't someone called?"
- "If this keeps up, I'm going to end up in a wheelchair."

We also have the ability to exaggerate perceived threats. In this case, we turn a situation that is uncomfortable or unpleasant into something much worse than it is.

We also have the ability to override or ignore the stress warning system. If we do this, our health and well-being may suffer. This probably happens to most of us. Most of the time, stress is very subtle. Humans can adapt to a tremendous amount of distress. We may do this to the point that we aren't even aware of it. We learn to ignore signals from our brain and body that tell us we need to make some changes in our lives. Eventually something in the system begins to break down or give way. This is how we end up with ulcers and high blood pressure or chronic tension headaches.

The Relationship Between Tension and Chronic Pain

It would be helpful if everyone learned how to manage stress to safeguard our physical and emotional health. But patients with chronic back pain have a special set of concerns to contend with. Remember that most of the time pain also serves as a warning signal. It alerts us to the fact that we have damaged or are about to damage a part of ourselves. In this function, pain is another kind of warning system. It can be a literal lifesaver.

Nerves that signal pain are linked to the ANS described above. Like the stress warning system, the pain system is designed to rouse us and put us on alert. It tells us we need to do something to get away from a potentially damaging situation. It informs us that damage is occurring and we need to stop it.

Or we become aware that damage has occurred. Now we need to rest the injured body part so it can heal. In this way, the pain system and the stress system work hand in hand. These two systems feed into each other in a way that makes the warning signals louder and more unpleasant. In other words, pain can be viewed as its own very potent source of stress. The more I hurt, the more tense I feel, and the worse my overall quality of life becomes. Likewise, as my stress level increases, there is a good chance that I'm going to hurt more.

A big reason for this has to do with the way muscles tense up in response to a threat, including pain itself. Even when our activity level drops because it hurts to move, we still have an automatic tendency to tighten our muscles. We brace ourselves in rigid postures or positions. The goal is to decrease the risk of making the pain worse. Along with these changes, breathing gets shallow and rapid, blood pressure goes up, and we feel tense and uncomfortable.

These reflexes are designed to serve a protective function. But they actually tend to make our pain worse. Tight muscles can cause inflammation in the body and contribute to the formation of *trigger points*. These are the sore, hard knots of muscle that sometimes develop at or near the site of an injury. Painful, tight muscles become weak and atrophied. This leads to tight connective tissue that is prone to further inflammation.

There is also a kind of negative feedback loop involving stress, pain, and emotion. The more tense and aroused we are in response to a stressor, the more uncomfortable we are

emotionally, and the more we hurt. The more uncomfortable and sore we are, the more tense we become, and so on.

There is a solution to these problems. We can learn how to manage stress so that it does not make an existing pain problem worse. Whenever possible, we need to solve the problems that are threatening to us so that they are no longer a source of tension. If solving the problem is not possible (and all too often it's not), then we need to find a way to cope with the problem that minimizes our physical and emotional stress response.

This is where quieting techniques come into the picture. We need to learn active relaxation as a pain management skill. We can do this through practice. Be aware that this is much more than just slowing down, relaxing for a few minutes, watching TV or reading, or taking a nap. It is a skill that changes the reflexive protective patterns in the body. The result is that we become more calm and comfortable and hurt less.

Specific Skills For Physical and Emotional Quieting

Below are five specific skills or practices for quieting the body's physical and emotional reactions to stress. Although they are not hard to learn, they require regular short periods of practice to be effective.

Deep breathing: This is perhaps the simplest and most underused quieting activity on the list. Our nervous system is wired in such a way that there is a complicated set of reflexes that connect breathing to other autonomic activities such as heart rate and muscle tension. Breathing is unique because it can come under conscious control. We can use our breathing to trigger the ANS to slow things down and ease off on the stress response. We can do this by developing a habit of slowing down our breathing and breathing deeply into the abdomen. In many other cultures around the world, breathing exercises have been practiced to improve health for hundreds of years. In the West, we are just now beginning to understand how vital and effective this practice can be for improving health and overall quality of life.

Deep muscle relaxation: Some kinds of muscle tension are also under conscious control. With practice, we can teach ourselves to loosen up and relax contracted muscles and muscle fibers. The easiest way to acquire this skill is by using audiotape instructions, perhaps with feedback from a therapist or coach. Some approaches to deep muscle relaxation involve first tensing tight muscles or muscle groups, and then letting go of the tension. In this way the brain begins to identify what tight muscles feels like. This in turn makes it easier to let go of tightness when you feel it. Another approach is to simply sit or lie quietly, pay attention to particular muscles or muscle groups, and then give yourself verbal instructions to "just relax and let go." Deep muscle training is always focused on releasing muscle tension. It is almost always practiced along with deep breathing.

Quieting imagery: Quieting imagery involves learning to tell yourself a story or developing a mental picture that you associate with being deeply relaxed. Typical quieting scenes may involve lying on the beach on a warm day or sitting in a sunny meadow in beautiful mountains. First you must find a scene that you find relaxing. Then you begin to practice by placing yourself in that scene. Using a combination of imagination and deep breathing is very helpful. Again, the key to success is a few minutes of regular practice, ideally on a daily basis.

Hypnosis: This is very similar to the use of quieting imagery. However the instructions are to focus on deeper concentration rather than a relaxing image. Often instructions are used for developing control of a mental or physical process reducing pain in a part of the body. And, like the techniques already mentioned,

hypnosis needs to be practiced regularly. Instructions to breathe deeply are a key part of this exercise. It's probably best to practice hypnosis with a coach or instructor, especially at the beginning.

Gentle stretch and exercise: Finally, we should note that all efforts at learning stress reduction are enhanced by regular exercise and daily stretching. Muscles that are toned and loose respond better to our efforts to relax them further. We also know that autonomic arousal tends to quiet down in response to gentle physical activity. Warm, loose muscles simply don't hurt as much.

Getting the Help You Need

Information and instructions that will help you learn to relax and quiet your body are available from a variety of sources. A good starting place is the Internet. Keep in mind that the quality of material available in cyberspace is quite variable. Look for information that is accurate, useful, and safe to follow.

All things being equal, finding a local coach, instructor, or therapist to work with face-to-face is probably a much better option. This is especially true when you are just getting started and need initial feedback about the new skills you are trying to develop.

Notes