



*Where to begin? In the first two chapters of my book I explore a variety of issues related to the difficulties in evaluating and treating patients with back pain. I wrote End Back Pain Forever to open up a discussion on back pain and provide insights on effective treatments.*

– Dr. Norman Marcus, M.D.

## Chapter 1

### **"Doctor, My Back is Killing Me!"**

You felt a twitch in your low back, then a heaviness and a sudden stab of pain. It struck without warning — when you were crossing the street, stacking the dishwasher, jogging, whacking a golf ball, lifting a baby, swatting a fly, carrying groceries, bending over, getting out of a car, or just turning on a faucet.

Now you're afraid to move. You're locked in place. You feel a belt of pain pulsing across your back from hip to hip. You wonder, what's happening? What did I do to get this? You feel as though you're cut in half as the pain seems to separate you from your legs. Will the pain go away? Will it stay? Gingerly you start to move, but the pain only strikes harder. No, it's not going away, not at all. And if — this is a big "if" — the pain does not ease off in a few days or go away in a couple of weeks, without proper treatment it is certain to return because your back is a target waiting to get hit again.

Back pain can be your personal bully. It can readily become chronic, enduring for months, years, even a lifetime. It may become so intense and disabling, that your life can change dramatically, for the worse. It can strip you bare financially, isolate you from family and friends, leave you anxious and depressed. It can banish even the mere thought of sex. The curious thing about pain is that the more you think about it, the worse the pain becomes. Preoccupied with your pain, you lose interest in hobbies and sports. Your decreased activity may lead to obesity, which in turn can cause diabetes and heart disease. You watch in despair as you decline physically, mentally, and spiritually.

This book means exactly what the title *No More Back Pain* says. I have written it so that you can end your back pain once and for all and avoid a life of despair. I say this as a physician who has treated some 10,000 patients in 35 years of private practice and as a past president of the American Academy of Pain Medicine, the medical society that represents physicians practicing a multi-disciplinary approach to the treatment of pain.

I have seen many patients so wracked by pain that they wished they were dead and some who actually attempted suicide before they saw me. So I am aware of the helplessness that you and millions like you feel when you first hobble into the doctor's office and exclaim, "Doctor, my back is killing me! I can't go on like this!"

Let me describe a not uncommon scenario: After some pokes and prods, the doctor says, "Go home, take an aspirin, lie down, and rest."

You do as the doctor says. But it does no good and two days later, having missed work, you see the doctor again. "Well," says the doctor, "you have a case of nonspecific low back pain. We see a great deal of it."

It sounds scientific, but it leaves you completely baffled and still wracked with pain.

"What does 'nonspecific low back pain' mean, doctor?"

"It means that we don't know the cause."

"You don't know the cause?"

Should you ask more, you'll learn that nonspecific low back pain, also known by the acronym NSLBP, is so baffling that an entire chapter devoted to it in *Functional Pain Syndrome*, published in 2009 by the International Association for the Study of Pain, draws the frustrating conclusion that "it is exceedingly difficult to identify specific pathology underlying NSLBP" which is no help to you or to anyone else.

"I can put you on strong [medication](#) to dull the pain," says the doctor. "It may be that your spine is the problem."

"Does that mean surgery?"

"It could. Surgeons do a million spinal operations a year."

Surgery on your spine is the last thing you want to do, but your back pain is horrendous. And, of course, you want to get better. So you say, "Can't we do an MRI or a CT scan to see if there's anything wrong with the spine?" MRI, or Magnetic Resonance Imaging, is a picture generated by magnetic fields, while a CT (computed tomography) scan is a picture generated by X-rays.

When you are shown the test results, the doctor points out that the images of your spine show that you have, say, a [herniated disc](#) (in which the cushion between two bony vertebrae is either protruding or has ruptured) or spinal stenosis (narrowing of the spinal column that houses your spinal cord), or some other spinal anomaly—and that, apparently, is the cause of your pain.

But if it were true that the abnormality on the MRI or CT scan was indeed the cause of your pain, I wouldn't have written this book—because almost no one has a "normal" MRI or CT scan of the lower spine, and what is read as abnormal is frequently *not* the cause of your pain.

That bears repeating: when an MRI shows a herniated disc, it does not necessarily mean that the disc is causing your pain. Many people have a herniated or degenerated disc as a consequence of aging, and yet they have no back pain. Furthermore, it certainly does not mean that surgery is needed.

Actually, studies have shown that patients who get imaging tests increase their chance of undergoing invasive treatment such as surgery or spinal nerve injections. Studies have also shown that when an MRI or CT scan for back pain indicates that something is "wrong" with the spine, patients are left to believe they will never truly be "normal" again, regardless of whether their pain is ever reduced or eliminated through any form of treatment. And bear in mind that as many as half of all spinal operations fail.

In fact, *the primary source of 75 percent or more of all back pain is from the muscles, not the spine*. In 2001, a study of more than twenty thousand patients at outpatient medical clinics in the United States found that sprains and strains of muscles and other soft tissue accounted for 70 percent to 80 percent of all back pain. This is strikingly similar to the findings of a study of three thousand patients with back pain conducted at Columbia Presbyterian Medical Center in New York City in 1946, which revealed that weak and stiff muscles were the source of pain in 83 percent of the participants.

It is truly astonishing that so many physicians who treat back pain have failed to make use of these findings. For years, medical schools have paid very little attention to the muscular system, even though muscles account for approximately half the weight of the body. Medical practice in recent decades has relied increasingly on high-tech imagery for diagnosis. Although high-tech imagery is certainly of great value—as is surgery, when required—neither X-rays nor MRIs nor CT scans are designed to detect the subtle nuances associated with muscle as a source of pain.

In a later section, I will discuss this further with the case of a lady I shall call Stephanie, a married attorney who in 2004 began to experience stiffness and debilitating spasms.

Take the case of a patient whom I shall call Stephanie. She is a married attorney who in 2004 began to experience stiffness whenever she got up out of a chair. She also had problems straightening up if she bent over. This was bothersome, but it was nothing compared to her first attack of spasms in her low back, on the right side. The spasms were incapacitating. She couldn't walk and had to lie in bed for four days, taking painkillers and muscle relaxants. When the spasms broke, she still felt an inkling of discomfort that would frequently and unexpectedly morph into repeat episodes of painful spasms.

It was during one of these crippling occasions that Stephanie went to a major teaching hospital, where an orthopedic surgeon ordered an MRI. The results showed that a disc in her lower spine was flattened, and the surgeon felt that the best treatment for this condition, called *degenerative disc disease* (DDD), would be a lumbar disc replacement. Stephanie wanted a less aggressive treatment and saw another surgeon, who referred her to a *physiatrist* (a doctor who treats physical impairments and disabilities). The physiatrist felt that her problem arose from one of the small joints in her spine, known as *facet joints*, rather than from the DDD. He treated her with injections of a local anesthetic to block the nerve that innervates the facet joint, which relieved some of her pain. Since the nerve block had proved partly successful, Stephanie's doctor suggested that the nerve be "turned off" temporarily with a procedure known as *radiofrequency ablation*. In this procedure, the physician makes a small incision in the skin and then uses a hand-held probe to deliver radio waves to the offending nerve, heating it until it can no longer transmit pain signals. Fearful of tampering with her nerves, she rejected this option. With no other conventional [pain treatment](#) options, and although there was no good indication for it, she agreed to an epidural steroid injection into her lower spine, but this was ineffective. Five courses of *physical therapy* were also unsuccessful, and some of the sessions made her feel worse.

Stephanie first saw me in 2006 during one of her periods of muscle spasms. Her pain was so severe that she had been unable to work for two weeks. The pain had spread on this occasion from her right low back to both sides of her back and buttocks, with pain going to her hips and groin and also to her lower legs, feet and toes. It consisted of a dull ache in her legs and a sense of pressure in the region of her spine. Her family, alarmed by the severity of the attack, urged her to finally have [back surgery](#) and "get it over with once and for all." Since she needed to "fix" the "damaged" disc sometime, why not now?

I examined her with an electrical instrument I devised that can identify specific muscles causing pain. The device works by stimulating a specific muscle to contract. If that contraction produces pain, it suggests that that muscle is a source of your pain. Using electrical stimulation, I determined that five muscles in her low back and buttocks were tender. But continued stimulation reduced the pain and actually eliminated it in most muscles. This told me that it was her muscles causing that pain, and that it was due to spasms, tension, and stiffness. I treated her with my spasm protocol: electrical stimulation to fatigue the muscle, followed by a different form of electrical stimulation to make the muscle move gently, followed, in turn, by gentle limbering exercises.



After Stephanie's first visit, her pain was reduced by 60 percent. She returned for two additional sessions to relieve the spasm and was taught all twenty-one exercises (found in Chapter 7 of the book). This brought her total relief. She now does the exercises every day, and four years later, remains completely pain free.

Stephanie had "abnormal" findings on her MRI. Nerve blocks to the facet joints of her spine had managed to relieve some of her pain. But with my treatment, she never needed or had a disc replacement or long-term blocking of the nerves that serve her facet joints. She had received a host of well-meaning, costly interventions and suggestions for even more. But all of her pain could have been treated from the start simply, inexpensively, and safely by addressing tense, stiff muscles.

Given Stephanie's previous experience with doctors, she well understands the quotation that hangs on my office wall. It is from Eugene Bauer, an internist at the University of Vienna Medical School, who said in 1931, "A word in the mouth of a physician is as dangerous as a scalpel in the hands of a surgeon."

By showing her the results of X-rays and MRIs, her doctors led her to believe that she was permanently damaged goods. What they saw on the MRI was definitely there. But in her case, as in so many others, the true source of her pain was elsewhere: in her muscles. The truth is that without a muscle examination, we do not have an accurate explanation for your pain or anyone's pain.

My professor of anatomy at SUNY Upstate Medical University, Philip Armstrong, MD, used to say, "Reiteration without irritation is the essence of good education," and so to repeat the mantra for you: *the primary source of 75 percent or more of all back pain is from the muscles, not the spine.*

## Chapter 2

### You Are Not Alone: The Back Pain Epidemic

If you suffer from back pain, you are not alone. The widespread failure by doctors to recognize muscles as the primary source of back pain is helping to fuel an epidemic. Back pain is now the most common disability in the United States. Every year twelve million Americans make new-patient visits to physicians for back pain and a reported one hundred million visits to chiropractors. At the current rate, eight out of ten Americans will experience back pain sometime during their lives.

In addition to the human suffering, medical costs are soaring. The cost of back pain, together with related [neck pain](#), came to \$86 billion in 2005, the most recent year for which figures were available. That was an increase of \$34 billion from 1997. More amazingly, 25 percent of patients reported being significantly impaired, compared with 20 percent eight years earlier. Spending on back pain now equals the amount spent on cancer and is largely the result of failed surgeries, various nerve block procedures, and the cost of pain medications. We are spending more and getting worse results.

Back pain is not only a challenge to civilians, it is one of the major reasons for loss of combat personnel in the army. Disease and nonbattle injuries have always caused more casualties than battle-related injuries. Currently, low back pain is the most common disabling complaint among soldiers in combat, and it is more likely to result in a soldier never returning to active duty than any other diagnosis, except psychiatric. Recent studies have shown that of soldiers disabled by back pain, only 2 percent returned to duty with their unit.



Why have you and millions like you been caught in this epidemic? The reasons are both obvious and subtle. The luxuries of modern society, not only in the United States but also in all advanced countries, just about guarantee that you will suffer back pain because you are (1) under-exercised and (2) subjected to stress.

Muscles are strong and limber only when exercised properly. Lack of exercise makes them weak, short, and stiff, all of which help cause back pain, neck pain, and other muscle pain. The fact that 63 percent of Americans are overweight is one indication that the majority of the population does not exercise sufficiently. Another is the multitude of labor-saving devices and conveniences that reduce our physical activity – cars, snowblowers, lawn tractors, vacuum cleaners, dishwashers, to name a few – not to mention computers and television, which seduce us into activity.

About 30 percent of the population participates in exercise of some kind: tennis, swimming, jogging, lifting weights, and so on. This reduces the risk of developing back pain but is not guarantee against it. After all, professional athletes, from tennis stars to major league baseball players, are often afflicted with back pain. In their case, lack of exercise is not the issue, but rather improper stretching or insufficient warm-ups and cooldowns, in addition to injuries.

Compounding the problem is stress, which occurs in two forms: external and internal. External stress can come from frustration you may feel sitting in a traffic jam or being subjected to an automated telephone menu. It may be brought on by irritating noises – a neighbor's loud music, jackhammers tearing up the street – or perhaps by your anger at rude service in the supermarket. Internal stress comes largely from anxiety. Ordinary worries about any number of concerns in daily life – jobs, rent, mortgage payments, grades, health, sex – can bring it on.

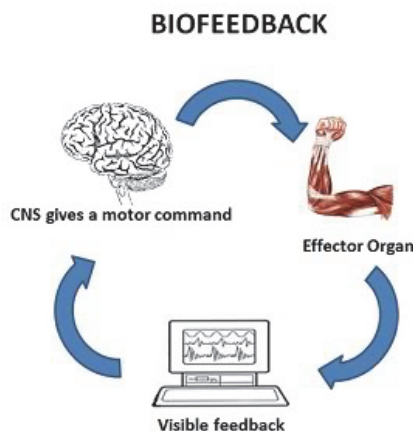
In 1915, Dr. Walter B. Cannon of Harvard Medical School, who made up significant contributions to medicine, was the first to use the engineering term "stress" in an emotional context. He found that when an animal is threatened or irritated, it releases the hormone adrenaline (also known as epinephrine) into the bloodstream, causing a rise in respiration, heart rate, blood pressure, and blood sugar, and increases muscle tension. The animal then fights or flees, discharging the energy that came from its preparation to ward off the threat. When the challenge is over, its body returns to normal.

Although we humans are animals, we do not respond the way that other animals do. Society demands that we bear with our external and internal stress. We don't have the opportunity to fight or take flight to relieve our tension. As the stress builds day after day, it increases the tension on our already under-exercised, weak, short, stiff muscles. I will talk more about stress and its effect on pain in Chapter 7.

As a physician specializing in [pain](#) medicine, I know how intimately mind and muscles interact. I can literally see a patient's mental stress in tense, taut muscles. Early on in my training at Montefiore Medical Center in psychosomatic medicine, which is the study of how the mind and body interact, I could see that the separation of mind and body in medical practice made little sense. This drew me to a newly introduced technology, biofeedback, which enabled me to integrate my medical education with my psychiatric practice at the time.

The term "biofeedback" means measuring a function of the body – for example, temperature of the skin, heart rate, or muscle tension – and providing feedback in terms of sound, light or a meter reading that reflects whether those physiological elements are increasing or decreasing. This is done by attaching a probe to your finger that senses temperature change, a probe to monitor heart rate, or an electrode attached to the muscle that you wish to study that senses electrical activity in that muscle – these electrodes lead into the device that gives you the feedback and makes you more aware of the changes occurring. With that information, you can actually raise the temperature of your skin, lower your heart rate, or lower muscle tension, all of which have been associated with producing relaxation and decreasing various pains.

Thus, if you are attached to a biofeedback device and are asked, for example, about something you dislike, you may see your muscle tension and heart rate go up, while your skin temperature goes down. These changes suggest that you are experiencing stress or tension in your body, and that a part of your nervous system called the sympathetic nervous system is being stimulated. The sympathetic nervous system controls the heart and blood vessels and is generally stimulated when we are anxious or stressed. With practice, patients can be taught and eventually can teach themselves, by trial and error, how to control their physiological responses to emotions, thereby reducing the muscle tension that generates pain.



In 1975, I became a staff physician in the Montefiore Department of Neurology's Headache Unit, founded by Dr. Arnold Friedman. Two years later, with Dr. Edith Kepes, an anesthesiologist at the hospital, we started the first outpatient pain center in New York City, effectively following the lead of Dr. John J. Bonica, a medical giant to whom we owe the study of pain as a recognized discipline. As a young army anesthesiologist during World War II, he pioneered pain-relieving techniques and treated ten thousand wounded soldiers. Dr. Bonica went on to write a 1,500-page medical classic, *The Management of Pain*. Dr. Kepes and I began a team approach with practitioners from different fields – including colleagues from anesthesiology, neurology, orthopedic surgery, neurosurgery, psychiatry, and psychology – all of whom were interested in what could be done for patients tormented by chronic pain.

I subsequently expanded on this concept by starting the New York Pain Treatment Program at Lenox Hill Hospital in 1983. It was considered a state-of-the-art treatment center in a hospital setting, with an integrated team that involved not only doctors but also physical and occupational therapists, psychologists, and pain rehabilitation nurses. We used a variety of treatments: biofeedback and relaxation training; physical therapy to increase strength, mobility, and endurance; hypnosis to help control pain; stress management to provide coping skills for handling daily upsets that may increase muscle tension; occupational therapy to teach patients how to complete their routine tasks effectively through proper time management; individual, family, and group psychotherapy to resolve personal difficulties related to living with chronic pain; and medication management to eliminate many ineffective drugs that patients were taking in their journeys from doctor to doctor.

But our program had a basic flaw. We were convinced that teaching people how to live with their pain was usually the best we could do. We didn't believe that we could *eliminate* their pain. Many of our patients remained on strong medication indefinitely. If a patient had a 35 percent decrease in pain, I considered that good. If we got it down to 50 percent, it was considered a success.





Along with the vast majority of physicians, I was committed to the fallacy that most chronic pain couldn't be cured. Then, in 1993, I met Dr. Hans Kraus. He was to transform my life and the life of my patients.

Then, in 1993, I met Dr. Hans Kraus. He was to transform my life and the life of my patients. He was eighty-five years old and had just retired from his practice as a specialist in physical medicine and rehabilitation. He had also given up mountaineering and rock climbing. In all those pursuits, he had won international acclaim. Originally trained as an orthopedic surgeon at the University of Vienna, Dr. Kraus was well known for having successfully treated President John F. Kennedy's back after all prior treatments had failed. Yet his nonsurgical approach to treating patients with muscle pain, especially low back pain, was not accepted by other doctors, including some of the very doctors who referred their own patients to him for what proved to be successful treatment.

For example, one prominent orthopedic surgeon at the Columbia University School of Medicine, Dr. Frank Stinchfield, who routinely sent many of his back pain patients to Dr. Kraus, underwent spinal surgery rather than consult him for his own back pain after a herniated disk was diagnosed. The surgery failed, and Dr. Stinchfield was never able to work again because of unrelenting pain.

Another disappointing example was that of Dr. Jonas Salk, best known for developing the first safe and effective polio vaccine. Dr. Salk *did* consult Dr. Kraus for back pain, and the treatment *was* successful. It eliminated Dr. Salk's pain and allowed him to avoid surgery. Yet when Dr. Kraus needed Dr. Salk's help to obtain research support, the famed medical researcher declined. He said that muscle pain didn't have a "scientific foundation." That has since changed, and we will look at the basic research explaining the mechanisms of muscle pain in Chapter 4.

In our first meeting, Dr. Kraus asked what I did. I told him that I treated patients with chronic pain.

"How do you do that?" he asked.

"I teach them how to manage their pain, how to deal with it, live with it."

"Why not get rid of their pain?"

"Because it's chronic pain," I said. "You can sometimes reduce it, but you can't get rid of it."

He persisted. "Have you treated the muscles?"

"We treat the muscles with aerobic exercises."

"Aerobic exercises? Really? Muscle pain caused by muscle spasm, tension, stiffness, and trigger points does not respond to aerobics. But it will respond to other types of exercises: prescribed exercises designed to treat the specific source of pain. That's what I've done."

"Low-impact aerobics are the standard way," I said.

"They may be the standard way," he replied. "But they are sure to make many of your patients feel worse."

He asked if I had "very difficult cases," and I told him that I did. "Some," I added, "are impossible to treat."

"Would you mind if I were to examine one of them?"

Dr. Kraus and I met a week later at Lenox Hill. I had chosen a patient whom I shall call Beth. She was a forty-five year-old woman so defeated by pain after three unsuccessful spinal operations that she could no longer hold a job. Her life had revolved around her work, which was at the core of her sense of self. She was devastated. No one had found a truly successful treatment for her, and I did not believe that anyone could. She was on high doses of morphine, 60 milligrams orally five to six times a day, to relieve her pain.

After reviewing her case history, Dr. Kraus gave her a comprehensive and thoughtful mental and physical examination. Starting with her neck, he used his fingertips to palpate her muscles to distinguish between those that were supple and pain free and those that were stiff and painful. He found five pairs of painful muscles on both sides of the lower back, buttocks, and thighs. "If these muscles are treated properly," he told me, "it should reduce or eliminate her pain."

I couldn't believe that this would be the case. Her diagnosis was arachnoiditis, inflammation of the deep layer of the membranous tissue surrounding the spinal cord. In Beth's case, it was caused by the dye that radiologists use to outline the spinal cord when performing a special X-ray called a myelogram. The oil-based dye used in the past sometimes irritated the tissue, producing scarring that could squeeze nerves and bring about pain in the back and legs. (Today a nonirritating water-based dye is used instead.) I had done my best to help her live with the pain in my pain management program. Even though she reported a 50 percent improvement, she was still taking large doses of morphine and couldn't return to work.

Beth and I had nothing to lose by trying. She demonstrated all of the reasons for muscle pain that I will explore with you as you get further into *End Back Pain Forever*. Beth was tense, weak, and stiff (deconditioned). She had areas of persistent painful contractions, or spasming, and tender spots in her muscles that Dr. Kraus knew from experience would respond to injections of lidocaine, a numbing solution. Beth would need prescribed exercises, but because her pain was so severe that all movement hurt, Dr. Kraus decided to start her treatment with injections into the identified painful muscles and then quickly add exercises.

The injection technique – different from the trigger point injections popular among other pain physicians – concentrated on the areas where the muscles attached to the tendon and the bone, in contrast to the tender nodules in the muscle tissue. (More on this later.) Only one muscle could be treated per day, and each injected muscle received three days of a special physical therapy protocol to restore its flexibility.

Four weeks later, the patient that I had considered "impossible to treat" returned to work free of pain. This was the most important medical awakening in my career.

Beth's arachnoiditis was a bona fide diagnosis. I had seen her CT scan following a myelogram. In fact, it had shown *severe* arachnoiditis. But her pain at that moment came from her muscles, not from her arachnoiditis. If we had not examined and found the painful muscles, she never could have been treated properly for the pain, and she would have been on the same medication, getting marginal results, for the rest of her life. It forced me to wonder how many other patients of mine were suffering needlessly because I had reflexively attributed their pain to their existing diagnoses, and whether they too were not receiving the proper treatment that could eliminate or diminish their suffering.

The successful resolution of Beth's case was such a revelation that I asked Dr. Kraus if he would be good enough to come to the Lenox Hill clinic for two hours once a week. He agreed, although that soon changed to one full day a





week. He would come in at nine in the morning and leave at six. He did this for five years and quickly became a close friend and mentor.

I learned an extraordinary amount from Hans, all to the benefit of our patients, who began returning to normal lives following successful treatments that relieved their pain.

The number of back surgeries continues to rise. Today, in fact, back operations are by far the fastest-growing surgery in the country. There are now on the order of 400,000 back operations annually; 150,000 to 200,000 are spinal fusions. Additional studies have shown as many as half the operations are failures. A more measured, thoughtful approach than [spine surgery](#) could help patients suffering with back pain. But even many of the competing interventions, such as nerve blocks and nerve stimulation techniques, are bound to fail because they too are aimed at the wrong target.

The history of medicine is replete with examples of significant advances that were met with opposition, even ridicule, by the reigning authorities. Some were as sophisticated as the discovery of blood circulation, others as simple as the need for doctors to wash their hands. We can add to the list the fact that muscles, not spinal deformations, are the cause of most common back pain.