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We live in a time of incredible advancement in medical technology. Doctors can give us new hips when ours wear out, new arteries in our hearts to replace clogged ones, and drugs to manage almost any condition. Body parts are being grown in labs, and surgery can be performed by robots controlled by a doctor who is thousands of miles away. It sounds like the stuff of science fiction.

These feats would have been impossible and practically unimaginable just a few centuries ago. Back then, we were more concerned with eliminating viral and bacterial infections that ran rampant through populations, killing thousands of people in a single outbreak. The practice of vaccination, widely considered to be the greatest accomplishment of modern medicine thus far, has turned these epidemics into distant memories for much of the world.

The near elimination of external threats to our health has given us the gift of a longer life span, but it plays a part in a larger trend which is

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proving to worsen our quality of life. Our successful dominance over our environment has brought with it a sedentary lifestyle, man-made toxins, nutritionally deficient and chemically enhanced food, and new kinds of stress for which we are ill-equipped to handle.

As a result, most of us live relatively long lives during which we encounter a myriad of internal threats. Heart disease, high blood pressure, mental illness, ulcers, cancer, autoimmune disorders, obesity, diabetes, chronic pain and physical degeneration have become the norm. We accept and even assume that we will experience one, if not several of these conditions by the time we reach middle age.

Until very recently in our history, the approach of treating an ailment from the outside in with antibiotics, vaccination or surgery was quite effective and appropriate, given that most threats to our health were coming from outside our body. Regrettably, the medical community has not adjusted its approach to address the vastly different internal threats we face today. To make things worse, we have at our disposal advanced technology that allows pharmaceutical companies to create drugs that keep chronic lifestyle-related conditions under control. These drugs give us the illusion that our conditions are being treated, when in reality they do nothing to address the underlying cause.

The traditional outside-in treatment approach has kept us from recognizing and accepting the fact that we have a tremendous amount of control over our own health. This mental block is exceedingly evident when it comes to chronic pain and physical degeneration. The myth that our bodies will inevitably break down and that we must experience pain as we age is so ingrained in our belief system that few people stop to wonder why this breakdown occurs and if it might be avoidable. As a

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result, research dollars are spent on developing new drugs that help us manage pain conditions and new surgical techniques that fix worn-out joints, rather than on investigating the underlying cause of musculoskeletal pain and degeneration.

While there are many causes of chronic pain, including cancer, autoimmune conditions and neuropathy, the majority of people who experience pain and physical degeneration do so because of the way that they habitually use their bodies—the way that they stand and move, day in and day out. Their postural and movement habits cause their muscles to be chronically tight and sore, their joints and nerves to be compressed, and their bones to be stressed, often to the point of causing actual damage to the structure of their body.

Throughout our lives, we each develop unique ways of standing and moving. While most animals come out of the womb already knowing how to move—picture the lanky foal who awkwardly stands up less than an hour after being born, and is soon trotting around—humans require at least a year of motor learning to reach the same degree of proficiency, and we continue to learn new motor skills and habits throughout our lives. A vast array of factors, including our physical and emotional environment, the way we react to stress, our personality, the injuries we sustain, and sports and other physical training contribute to the motor habits we develop. It is our incredible capacity to learn that sets us apart from all other animals, and that makes it inevitable that we will each acquire a set of motor habits that is entirely unique.

I am describing a learning process with which you are probably familiar: that of developing muscle memory. This term is most often used in the context of sports training, but the ability to form muscle memories

is not limited to athletes. Muscle memory pervades our lives, dictating the way that we sit at our desks, allowing us to type and text at lightning-fast speeds, and enabling us to multitask. Most importantly, it allows us to efficiently carry out our daily activities and at the same time be able to focus our conscious mind on more important things. Thousands of years ago, muscle memory allowed us to run after a buffalo while at the same time strategize how to kill the buffalo. Nowadays, it allows us to talk on the phone while we prepare breakfast and do the dishes.

Muscle memory is the result of a learning process that takes place automatically and constantly within our nervous system. This process is critical to our survival and highly beneficial in our daily lives. Without learned motor habits, we would spend all day figuring out how to brush our teeth and get dressed for work. The number of conscious decisions and voluntary movements needed to complete the most basic of tasks would overwhelm us.

Unfortunately, it is easy to develop inefficient and even damaging motor habits. And once learned, these habits feel so natural and automatic that they seem to be innate and unchangeable. They are, in fact, so deeply learned that they are nearly impossible to change unless you understand how your nervous system acquires new motor patterns and maintains levels of muscle tension.

The automatic motor learning process has been part of our neural functioning for as long as we have been a species, yet it is fairly recently in our history that chronic pain and physical degeneration have become such widespread problems. One reason for this is our increasing lifespans. The longer we live, the more time we have to develop motor habits, and the greater the chance that some of the habits we develop will damage our

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bodies. And the older we get, the more deeply learned our habits become, and the greater impact they have on our health and functioning.

Yet we see children and teenagers who have rounded posture, disc problems, chronic injuries and pain. This brings us to the second reason for our increasing pain: our repetitive and all-too-sedentary lifestyles. Repetitive activities, whether they be playing video games for hours on end or competing in sports, breed habits. Being sedentary is just as detrimental; when our bodies aren't moving, muscles become tight, connective tissue loses elasticity, and pressure is put on joints and nerves. We need not only to keep moving, but also to have variety in our movement.

The third reason we experience so much pain and physical breakdown is the type of stress we deal with in our daily lives. The human nervous system evolved to react to short-term, life-threatening stressors, like being chased by a tiger or being unable to find food. Our current lifestyles are drastically different than they have been for most of our existence. Today, our lives are rarely threatened and we perceive minor events, like traffic or an impending work deadline, to be major crises. Many of these psychological stressors never go away, so our stress response is constantly being activated. As you will learn in this book, stress causes and exacerbates many pain conditions by increasing muscle tension, triggering postural reflexes, and altering the way the brain perceives pain.

If you are like most of my clients, who come to see me after trying everything under the sun to relieve their chronic pain, you know that most of the solutions available for pain relief don't work very well. They aren't effective because they don't address the underlying cause of

the problem: the way that we habitually use our bodies. Passive, manual therapies, while often feeling good, simply attempt to fix the pain from the outside in. These therapies incorrectly assume that the structure of the body is the problem. The real issue is how we are functioning, and our functioning can only be changed through an active learning process.

The fact that our function—the way we habitually stand and move—leads to pain and degeneration is not news. Many health professionals recognize this fact, yet they continue to try to fix our musculoskeletal issues by manipulating the structure of our bodies. When their techniques have limited success, our chronic pain and degeneration seem mysterious. They chalk it up to overuse or old age and assume that there is nothing that can be done.

The life-changing news here is the fact that we have the ability to change the way we stand and move through an active learning process. It is only over the past hundred years or so, with an increased understanding of how our nervous system works combined with a great deal of self-exploration, that people have begun to figure out exactly how to retrain deeply learned muscular patterns and release subconsciously held muscle tension. The techniques of sensory-motor education that have been developed, which you will learn about in Parts Three and Four of this book, will change the way that the medical community and society as a whole think about chronic pain and physical degeneration.

There will come a time—maybe in five years, maybe in fifty—when taking care of our neuromuscular functioning will be akin to eating a healthy diet and exercising. It will be widely accepted that we have just as much of an ability to prevent chronic pain and physical degeneration as we do to prevent heart disease, obesity and diabetes. Getting to this point

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will require a significant shift in the way we think about our health, as well as fundamental changes in our health care and health insurance systems, but it is only a matter of time.

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I came across a groundbreaking method of sensory-motor education while I was going through a career change and exploring various approaches to movement, yoga and physical therapy. From an intellectual standpoint, I knew immediately that I had happened upon something big. As I began to practice the movement techniques, I felt the injuries and chronic tightness left over from years of intensive ballet training slowly melt away. I gradually became looser, more relaxed, and free from pain and physical discomfort. Looking back on the past seven years, it feels as though my body has been aging backward.

My goal with this book is to explain what causes most musculoskeletal pain and degeneration, and to help people understand that they have the ability to prevent, alleviate and eliminate their pain. I have seen people suffering from back and neck pain, joint pain, sciatica and scoliosis pain for ten or more years become pain-free in a matter of weeks. With such effective techniques available, it is simply not acceptable for people to believe that they have no control over their pain.

In Part One of this book, “The Science of Pain,” you’ll learn about the reasons and ways the nervous system creates the sensation of pain. In Part Two, “Why We’re in Pain,” we’ll discuss motor learning and how learned motor habits can put us in pain and cause damage to our bodies. Understanding the science of pain sensation and motor learning is an

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important piece of the puzzle. Knowing the inner workings of your brain and your body is incredibly empowering, and removes the sense of worry and hopelessness about your pain.

In Part Three, “Solving the Mystery,” you’ll read the stories of pioneering educators who each developed their own method of sensory-motor education. Then we’ll delve into the different factors that contribute to our unique motor patterns, from stress and personality to athletic training and injuries. In Part Four, “Moving Forward,” we’ll talk about ways to keep yourself out of pain, from having lessons with a certified educator to becoming aware of things you may be doing in your daily life that worsen your pain.

This book is for you. No matter who you are, how old you are, or whether or not you have chronic pain. You are human, and this fact makes you susceptible to the cumulative, negative effects of learned motor habits. I hope to educate and inspire you to take control of your musculoskeletal health. It is a process that requires some time and dedication, and it can only be done by you, from the inside. I promise that the payoff—the ability to relieve your own pain, release chronically held muscle tension, and improve your posture and movement—will be well worth the effort you put in.