ALSO BY SANJAY GUPTA, MD

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Monday Mornings: A Novel

Cheating Death

Chasing Life

IT DOESN'T HAVE TO HURT

YOUR SMART GUIDE TO A PAIN-FREE LIFE

Sanjay Gupta, MD

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For my three daughters, Sage, Sky, and Soleil.
Every word in this book is dedicated to you. One of our greatest fears is seeing the people we love in pain, and with this book I hope to prevent that from happening for you. Having parents who live a pain-free life is the gift I aim to give you, so that your mother and I may always be present, active, and engaged.

For my dear wife, Rebecca.
You, like too many others, have lived with physical pain. Yet during those times when I felt powerless to help, you inspired me to dig deep into what is possible and put what I learned in this book. Thank you for always taking the time to listen, encourage, and offer stellar suggestions for how to make this book the best it could be.

And for the millions of people out there with chronic pain.
I know it presents you with profound challenges, often invisible to others. I wrote this book for you, to share your stories and my confidence that together we can chart a path beyond pain—a path of action, hope, and healing.

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IT DOESN'T HAVE TO HURT

Introduction

Bess Talbot feared she was going crazy.

At age forty-seven, she was having debilitating migraine headaches. She'd had her first one two decades earlier while she was in law school, and for a while the migraines happened only occasionally. But after she had children, they "came back with a vengeance," she told me. Now she was suffering from them every day.

The near-constant pain was affecting every part of her life. Drugs prescribed by various doctors made her woozy and dizzy, fogging her brain. She forgot grocery lists and once left her keys in a fitting room at a department store. Not able to focus until she made her way to the parking lot, she fought back tears, trying to orient herself. *Where am I? Where are my things? Where is my car?* "It puts you in a very dark place," she says.

Even when her migraines were less frequent, they could last for days and still dominated her life. "At times I thought, 'Am I going crazy? Is this something more than a migraine? Do I have a tumor?' At one point I was even wishing that they would find something like that just so they could operate and alleviate the issue."

After years of trying, and failing, to find relief for her migraines, Talbot was at the end of her rope. That's when her neurologist, stymied by her condition, recommended she travel from her home in Alabama to the Michi-

gan Headache and Neurological Institute (MHNI) in Ann Arbor to see a physician he'd heard about named Joel Saper. Desperate, Talbot decided to make the trip. Maybe, just maybe, *he* could help.

Even before arriving in Ann Arbor, Talbot had phone conversations and evaluations with the team Dr. Saper had assembled. She spoke with neurologists and psychologists—doctors of the brain and the mind. She was evaluated by other specialists to fine-tune her treatment with physical and occupational therapy, as well as nutritional and pharmaceutical strategies. But the most important member of the treatment team was Talbot herself.

As simple as it sounds, this is Dr. Saper's most revolutionary concept: treating the patient not as a passive participant but as an active investigator working shoulder to shoulder with the experts. By focusing on not only the "what" of treatment but also the "who"—a patient's history, outlook, and expectations—he created an optimal healing environment. He helped people believe they could drive their own care.

In the course of her weeklong hospitalization for treatment, Talbot told Saper about a high school cheerleading accident from decades earlier. The team had been practicing a challenging new formation, and as a "flier"—the cheerleading daredevil who perches atop the human pyramid—Talbot had taken a steep plunge to the floor when the formation suddenly crumbled. She landed hard on her tailbone and felt a stab of pain in her back. Then the formation next to hers toppled too, and Talbot felt her head slam as a flier in that group crash-landed on her.

The team members disentangled, practice was canceled, and Talbot slumped home in excruciating pain. She had to skip the Guns N' Roses concert she'd planned to see that weekend with a friend, and when her doctor prescribed a bulky back brace, her mother had to alter her prom dress to accommodate it. But eventually the episode receded into the backdrop of her active life: College. Law school. Running, including marathon training and entering races as a way to manage stress.

A few years later, when she began to experience occasional migraine headaches, she did wonder if there might be a connection to her old injury. But even as the headaches worsened over time, whenever she

brought up that idea with new doctors, they dismissed the link as too flimsy to pursue.

Then she sat down with Saper.

He was the first doctor to really dig into the aftermath of her fall. He learned that a few hours after the accident, her mother had insisted on taking her to the hospital emergency department. A workup with scans revealed hairline fractures in three upper thoracic vertebrae. Though none were considered serious enough to require surgery, she was admitted for a short hospital stay, followed by wearing that rigid back brace for six months. To Saper, these layers of detail were a significant part of the story—a history that held clues to her current condition.

A deeper investigation revealed a family history of migraines, which likely also increased the risk for Talbot. Without the cheerleading accident, however, that risk might never have manifested. Saper describes a person's propensity for migraines as a big rock perched on a high hill. "Genetics put the rock near the cliff," he says. And then "whether it's a glass of wine or a menstrual period, a bad emotional time in a person's life, something sort of tips it over the hill and it starts rolling." For Talbot, the cheerleading accident and the trauma to her spine, neck, and the base of her brain had tipped the boulder. Over the years, efforts at pain relief had never addressed that deeper issue.

As Saper described to Talbot how the pieces of her pain puzzle fit together, her misery and confusion gave way to something new—a hopeful sense of possibility. He used Talbot's history to inform her treatment plan, which now included dedicated physical therapy and exercises designed to specifically strengthen her spine and neck. Over the years, she had tried countless medications for migraines, including triptans, opioids, and others to address inflammation and depression, but no one had ever suggested adding a practical rehabilitation of the base of her neck.

The benefits of Saper's approach—the thorough initial evaluation, the continual calibrations of her medications, and the dedicated neck physical therapy—collectively made all the difference. Talbot gained more confidence in reading and responding to her physical and emotional cues for

an approaching migraine. What's more, when she began to experience her pain changing as she and Saper fine-tuned the treatments, she felt newly encouraged to focus more at home on exercise, stress management, and meditation. Even when she can't do all of them all of the time, they are an antidote to hopelessness. "It was life changing for me," Talbot says. And she told Saper so. "I said, 'You've given me my life back.' And I wonder, if I'd met him twenty years ago, you know, what a better mother I would have been. What a better wife I would have been. What a better *everything* I would have been but for the migraines."

Talbot's healing journey began simply, with a fresh conversation about pain. Dr. Saper had brought medical precision, multidisciplinary expertise, and a deeply collaborative partnership with his patient to frame her relationship with pain in a new way, rewriting the pain script and providing new options for treatment and prevention. I start with Talbot's story because it offers a sense of optimism for the hundreds of millions of people suffering from chronic pain, and particularly those who have felt forgotten, suffering inside bodies they believe have betrayed them.

There is a very real path forward through pain and beyond. In this book, I walk you through the steps that I am confident will take you there.

A dizzying amount of medical progress has been made since I became a neurosurgeon more than twenty-five years ago. We can remove tumors once considered inaccessible and fuse spines previously thought to be too broken. We have a pretty good idea where certain emotions and addictions lie in the brain and can even tinker with them using deep brain stimulation. Pain, because of its complexity and subjective nature, has presented a larger challenge, and yet even there, we have made important advances.

Over the past few decades, we've learned more than ever about the true nature of pain. We better understand what causes it, what may best relieve it, and what we can do to minimize or even eliminate certain types of pain. Many of those life-changing insights have not yet been made easily available to the public. With this book, I want to change that. Over the past few years, I've placed both my neurosurgeon's and my investiga-

tive journalist's lens on the problem of pain, and I am now convinced: *It doesn't have to hurt.*

There is hope. There is help. And there is healing beyond anything we may have imagined.

In these pages, I offer new accessible lessons from doctors and researchers who specialize in pain and have been steadily changing the way we understand and experience it. You will hear directly from patients, many of whom struggled with chronic pain through a broken landscape of health care but found relief through conventional (and sometimes unconventional) tools.

Their consistent message is this: if you are in pain, there are far more effective options than you may have previously realized, as well as important things you should start doing *today* to greatly reduce your chances of suffering pain *tomorrow.* These are strategies I have started incorporating into my life, as well as the lives of my wife, teenage kids, and eighty-year-old parents.

The significance of reducing and even eliminating pain cannot be overstated. Nearly one-quarter of adults (24.3 percent) say they suffer from chronic pain, and nearly one in ten (8.5 percent) report high-impact pain—pain so bad it not only persists but in the previous three months also frequently limited their daily life and work activities. The outlook worsens with age. Among respondents to the 2023 National Health Interview Survey, the percentage of adults who had chronic pain in the past three months increased from 12.3 percent of those aged eighteen to twenty-nine, to 36 percent—more than one-third—of those age sixty-five and older. High-impact chronic pain increased with age too, from 3 percent of those aged eighteen to twenty-nine to 13.5 percent of those age sixty-five and older. Among those who reported chronic pain, almost two-thirds still suffered from it a year later.

New cases of chronic pain have also skyrocketed, and they now occur more often among US adults than new cases of most other common conditions, including diabetes, depression, and high blood pressure. These numbers translate globally. About one in five people around the world experience some form of chronic pain, making it one of the biggest burdens on the global health care system.

We recently got a glimpse of where Americans feel that pain the most.

In its 2022 survey report, "A Chronic Pain Crisis," the US Pain Foundation revealed the most common pain conditions:

- Back pain (67 percent)
- Joint pain due to arthritis (56 percent)
- Neuropathy (nerve pain; 53 percent)
- Neck pain (51 percent)

Also widespread:

- Muscle spasms (38 percent)
- Hip pain (37 percent)
- Headache (36 percent)
- Fibromyalgia (36 percent)
- Osteoarthritis (33 percent)
- Irritable bowel syndrome (28 percent)
- Migraine (27 percent)

Perhaps most striking, only 35 percent of respondents said their pain was a direct result of trauma or injury, such as from a car accident or workplace mishap. The vast majority of people in the survey cited no obvious cause, or entirely separate health conditions, that contributed to their pain. In fact, 20 percent had two to five contributory conditions, 30 percent had six to ten conditions, 24 percent had eleven to fifteen conditions, and 21 percent had fifteen or more contributory conditions. At least one person had a staggering forty-two conditions. Can you even imagine the burden that causes in their lives? Pain carries an enormous amount of physical, social, and emotional baggage, which is why, in part, it has been so hard to treat and too often ignored by doctors.

Pain can be acute or chronic. Acute pain is sudden or urgent, whereas chronic pain is long-standing, typically beyond three months. Acute pain is usually a straightforward response to a discernible injury. It serves a clear function: to grab our attention and teach us a lesson about avoiding potentially harmful stimuli in the future.

Chronic pain, however, can be a misfire of the body's central nervous system (CNS), which can be particularly bewildering because the persistent pain serves no obvious purpose. In some cases, though, the cause may be less a misfire and more a stubborn mystery until scientific understanding advances enough to solve it. Until then, any insights into why a person's system has gone haywire remain buried in complexities that have baffled the best minds in science and medicine since ancient times.

While writing this book, I was reminded of something I learned as a child: humans have a tendency to try and find lessons in awful situations, to try and make sense of them. They search for meaning in misery, a moral to the story that sometimes leads to blaming themselves. Yet when it comes to chronic pain, there's often no lesson to be learned and no blame to be placed. Sometimes pain is just that—pain. Nothing more.

Yet this hasn't kept societies from marginalizing and ignoring those who suffer from pain, in particular due to four chronic conditions: migraine, fibromyalgia, irritable bowel syndrome, and endometriosis. These conditions, among others, are often thought of as "invisible" or "silent," not only because the symptoms aren't always obvious but also because testing often doesn't reveal anything abnormal. For most mainstream medicine, that means there's nothing clear-cut to treat. The unfortunate—and incorrect—inference is that if the best medical minds can't solve the problem, the problem probably "doesn't really exist."

The lack of an objective standard of pain has even given rise to the term *subjective suffering*, which suggests that one person's pain is open to another's interpretation. Too often, this leads to dismissive attitudes toward those suffering from chronic pain. Some people judge them as personally failing or not trying hard enough to get over it. Others might see their complaints as a ruse to get drugs or to get out of work. But for those of us in health care whose aim is to relieve suffering—measurable or not—the fact that pain is subjective does not mean that it isn't real. It's just more enigmatic.

One reason I wanted to write this book is because some members of my own family suffer from chronic pain, and being immersed in their experiences has taught me a lot. For example, I have seen firsthand how challeng-

ing it is for them to navigate the health care system, even with my help. I have personally witnessed remarkably talented doctors being dismissive of their symptoms, even after reviewing detailed records of their near-daily pain.

This is problematic, of course, but it's also an indicator of how complicated the problem is. What I've learned from my patients, colleagues, and family members, as well as from my own experience, is that pain and suffering can present in infinite ways, and yet we have tremendous control in choosing how we'll respond. We can not only change our relationship with pain, we can change pain itself.

That's what this book is about.

In the pages ahead, you will learn things you can start doing today—physically, nutritionally, mentally, and behaviorally—that can greatly reduce the chance of developing pain in the future. Some of it may surprise you. For example, you may have heard of rest, ice, compression, elevation treatment, known as RICE, to help with an injury. Increasingly, the evidence is instead pointing us toward MEAT—movement, exercise, analgesia, treatment. This amid a flurry of other tweaks and catchy acronyms over the years, including POLICE (protection, optimal loading, ice, compression, elevation), PEACE (protection, elevation, avoid anti-inflammatories, compression, education), and LOVE (load, optimism, vascularization, exercise). The thing these strategies all have in common is the emphasis on letting your body's natural healing processes work normally, rather than interrupting or rushing to manipulate them.

I will explain later why this is so important, but the headline is that not all inflammation is necessarily bad. And among the most critical tools you will need are muscle-massage foam rollers, which with regular use can diminish your chances of pain, especially after a soft tissue injury. As you will learn, the thin connective tissue called fascia, which surrounds all our muscles, can get painfully stiff and tight throughout your life, so keeping it loose and flexible with those rollers is critically important. There is also new, encouraging data emerging on acupuncture, trigger point injections, and hands-on physical manipulation as well. And what about substances

like cannabis and cannabinoids such as cannabidiol (CBD), ketamine, and the broad class of psychedelics? I'll examine the research we have so far on all of these, as well as the case for some natural pain relieving supplements.

With emerging evidence-based science, medical advances, and our own wisdom, we can rewrite the story of pain, as well as our own lifelong potential for managing it—and often preventing it. I'm ready to show you how.

While conducting dozens of interviews for this book, I saw firsthand that experts in pain science and medicine are impatient to see change in the understanding, diagnosis, and treatment of pain. In fact, over the past several years, despite increased spending on pain and new approaches to it, from better imaging technology to new drugs and surgical options, the prevalence and impact of chronic pain have worsened. A consortium pain task force white paper laid out these four reasons why:

1. Both patients and medical practitioners labor under the mistaken idea that most pain problems can be fixed . . . with a drug or procedure.
2. Medical school and graduate courses still emphasize . . . opioid medications rather than considering other options.
3. The business model of medicine . . . has promoted simplistic solutions to complex problems.
4. Patients are often regarded as passive participants, with little emphasis placed on self-care, pain prevention, or therapies that engage self-care strategies, despite demonstrated (lasting) benefit.

These four barriers can be overcome. And I am optimistic that the field of pain is ripe for massive change. Why? Because we—both patients and doctors—are at the dawn of a new era in the way we understand and respond to pain.

Here are some key takeaways I explain in the upcoming chapters:

- The brain "creates" pain, but it also has the capacity to profoundly change our experience of pain, reducing or even eliminating it.

- Because we have unique pain signatures in our own brain waves, highly personalized pain treatments may be possible.
- Your brain responds to sensory nerve signals by activating neural circuitry, which triggers physiological changes throughout the body. This two-way brain-body interaction creates opportunities for changing pain circuitry and chemistry.
- Gender, racial, and other systemic biases and inequities in pain treatment are now in the spotlight. A broad recognition of those biases will pave the way for more effective and individualized care.
- Advances in technology, including AI assists for pain assessment and management, are charting a new path for safer, more precise, and effective treatments.
- There is more evidence than ever before about the benefits of sleep, a healthy diet, exercise, mindfulness-based pain management (MBPM), myofascial therapy, yoga, and specialized psychotherapies, and as a result more doctors are focusing on them.

And most encouraging of all:

- The push is on from all corners to bring a dose of reality to pain research, with new efforts to conduct treatment trials. Instead of pain sufferers being minimized, they are increasingly sought out to share their experiences, including being added to research committees and advisory boards. This is a long overdue acknowledgment that we should always start by listening to patients to understand their unique problems and needs.

If you've read anything about pain over the past twenty years, you have likely been angered by the opioid epidemic, a tragedy fueled by ignorance, arrogance, and greed. Like me, you have probably been saddened at seeing lives destroyed or devastated by addiction. I was a young trainee in neurosurgery at the beginning of the epidemic and followed it closely as a doctor and journalist—but there's an untold part of that story I want to share.

Because opioids have consumed most of the conversation, most people

don't even realize there are plenty of other effective options to help relieve pain. While I was writing this book, the FDA approved a new non-opioid pain medication for the first time in more than twenty-five years, and nowadays there are entire emergency room systems that use hardly any opioids. (I'll take you inside one to understand how it was done and what it means for the future of pain management.)

Some elements of pain relief and prevention have actually been around a long time, in the form of ancient healing practices handed down over thousands of years. Despite being effective for many people, they have too often been unfairly dismissed from serious consideration by Western medicine. I will explain how to apply some of these traditions to our daily lives. Finally, there have been breathtaking breakthroughs in pain management that would have been unimaginable only a few years ago. Modern science and ancient wisdom have collectively begun to crack the code on pain. You can too.

As you read the book, remember this. We are the most essential experts on our own pain. If we pay close attention to our own bodies, strategies to address our pain come into clearer focus. Each of us has inner resources that can help prevent or reduce pain now and for the rest of our lives. This begins with connections—between doctor and patient, within families, and among communities of caring. But the most important connection is the one within us, between body and brain.

Prevention is often the most powerful antidote to pain, giving you a range of ways to control your risk for acute and chronic pain. In this book, I'll recommend some tips and strategies that may reduce your vulnerability, strengthen your resilience to pain, and, when it does occur, work with the fullest range of tools to heal more readily.

I'll begin by reframing your understanding of pain, so you and your health care providers can intervene in the way your brain and body process those signals.

PART 1

The New Science of Pain

CHAPTER 1

Pain Comes Home

Not too long ago, I was skiing with my kids on their spring break when my mother called. As a trauma neurosurgeon and medical reporter, I'm always on call, and there are several people who can reach me any time of the day or night—among them, my wife, Rebecca; the chairman of neurosurgery at Emory University Hospital; the breaking-news producer for CNN; and, of course, my mom. She knew I was on the slopes, so I was concerned at seeing her number pop up. I pushed my helmet away from my ear and said hello, and she got straight to the point, no pleasantries. In a completely even tone, she said, "I broke my back."

My eighty-two-year-old mother, who's hardly ever been sick a day in her life, had fallen. It was a simple fall. She had lost her balance while rolling her suitcase and toppled backward, landing in a sitting position. It hurt, and afterward her back felt sore, but she didn't think much of it until the pain persisted. Despite massaging her back, resting it, icing it, and even heating it for a few days, the pain wouldn't go away. So nearly a week after the injury, she went to get an X-ray, which showed a fracture in the lower back, known as the lumbar spine.

The fact that Mom called at all was an indicator of how serious the situation was. She doesn't complain about anything. She wears adversity like a badge of honor, something to brag about later, usually while showing off a scar or a bruise. She declined to use an epidural during childbirth and is surprised that anyone else is surprised by that. When she had breast cancer thirty

years ago, she treated it like a blip on the radar. It came and went, and she rarely talked about it. She takes no medications, bounds out of bed in the morning, and regularly outworks her grandkids, rising earlier and staying up later than they do, cleaning the kitchen, cooking meals, and still making it to many of their school performances. Mom is the one regularly urging us to do more. Since I was a child, I envisioned her in constant motion, never sitting still. She has always been a human in a hurry.

I never imagined my mom injured, sick, or frail. So when I got the call that something was wrong and heard a tone in her voice I'd never heard before, it worried me.

I flew straight to Florida to see her, and over the next few days, I reviewed her images, spoke with her doctors, and helped determine the best course of therapy. When I first arrived, she was in so much pain she could barely get out of bed. Up until that point, my mom had barely seemed to age, but now her cheeks were hollowed and the wrinkles around her eyes were more pronounced. She winced with every movement, leading me to jump out of my chair to try and help her, even though I wasn't sure what I could do.

Mom had a fracture of the first vertebra in her lumbar spine. The human spine has three sections. The cervical spine, or neck area, has seven vertebrae. The thoracic area behind the chest has twelve more vertebrae, each one generally corresponding with a pair of ribs. And the lumbar spine, which attaches to the sacrum, situated between the hip bones of the pelvis, has five more.

With the type of injury my mom had, the first branch of the decision tree is typically: surgical versus nonsurgical. Is operating the best option? For some injuries, such as a large collection of blood on the brain or a ruptured appendix, surgery is more clearly warranted. It was a bit more nuanced in my mom's case, however.

In medical parlance, she had an L1 compression fracture, meaning the bone had been compressed or flattened from its normal cube shape to that of a pancake. Luckily, she was "neurologically intact," meaning she had no weakness or numbness and was able to use the bathroom normally. Her

predominant symptom was pain, and that generated another set of questions.

- Was the pain so bad that nonoperative pain measures, such as medications or physical therapy, would be inadequate or intolerable?
- How long was the pain expected to last while the fracture healed, and could she tolerate it for that long?
- Might her age and bone health affect that healing time, possibly prolonging it—along with the pain?
- And most important, would an operation actually help alleviate that pain?

My mom left little doubt how she would answer that first question. "I cannot live like this," she told me. I knew the excruciating pain could be expected to last at least a couple of months, which would feel like a lifetime for her. I also knew she wasn't interested in taking high doses of opioid pain medications. She's small and thin, and whenever she has taken such medications in the past, they've left her zombified, complicating her recovery. Finally, she made it clear that she didn't want an aggressive operation, given her age and frailty.

So, along with her doctors, we landed on a relatively new approach to deal with her pain, a minimally invasive procedure known as kyphoplasty. I was very familiar with the procedure and had written scientific papers about how it was performed. This is how I explained it to my mom:

Picture a cardboard box. Now imagine that box crushed from the top down. As you visualize it, you'll realize that two things happen simultaneously: the box loses its height and it gains width. That's what happened to the vertebra in my mom's back, and that's what was causing her pain.

With kyphoplasty, the surgeon inserts a hollow needle through the skin and into the broken bone, then slowly advances a small balloon through the needle's opening. Once the balloon is in the bone, the surgeon inflates it. As the balloon enlarges, the bone starts to regain its normal height. X-rays make it possible to assess when the bone looks close to normal again, and

then the balloon can be deflated and removed. The final step is to use that same hollow needle to inject a dollop of hot liquid cement, which quickly hardens and helps the vertebra maintain its normal anatomy.

The data suggested that kyphoplasty would help restore the height and reduce the width of my mom's flattened bone, so after much discussion, we scheduled the procedure for her. "How likely is this to help, Sanjay?" she asked. It was a fair question but difficult to answer. One of the biggest challenges in medicine is trying to insert the highest level of certainty into a probabilistic discipline. The truth was that I had a good feeling about the procedure, but I couldn't be sure about the outcome. She understood.

On the morning of her procedure, as we were driving to the hospital, she looked at me and said, "If this doesn't help with the pain, I think my time here on earth is done." It was devastating to hear. My tough mom, who had lived in refugee camps during her childhood and still went on to become the first woman hired as an automotive engineer at Ford Motor Company, now seemed so weak. And there was no doubt it was the pain that was making her feel this way. That is the thing about pain. When you are in agony, it is all-encompassing, robbing my mom of the ability to simply imagine a future.

Thankfully the procedure, which took about an hour, went well. And, quite remarkably, she felt almost instantaneous relief. In all honesty, it's still not completely clear to me (or to many of the doctors who perform the procedure) why kyphoplasty is so effective at alleviating pain. Is it because the anatomy of the broken bone has been restored? Or is it, as her surgeon suggested, that the warmed cement heats up and dulls the nerve fibers that provide sensation to the bone? It certainly seemed that a significant amount of her pain relief was psychological, because the procedure had provided a much needed dose of hope. Things were finally moving in the right direction for my mom, and that alone likely gave her some comfort.

Whatever the case, she immediately reduced her pain score from "I want to die" to a 3 out of 10. Her mood improved, not only because she was in less pain but also because she no longer needed powerful pain medications. While the narcotics had initially helped with the pain, they had also

caused her to become depressed. They made her constipated, which took away her appetite, and because she wasn't eating, she had become lethargic. It was a vicious cycle.

All of that changed when she got the pain under better control. Over the next few days I spent with her, first in the hospital and then at home, I was reminded that everything is connected—her symptoms, her pain, her very self. She was soon like a new woman, with a new lease on life. Even though she had been near suicidal a week earlier, on the day I left her she was whistling in the kitchen as she cooked.

Pain's Complexity Holds Opportunities

Pain is an incredibly elaborate biological process, but it is also mostly a product of the mind.

The stubborn puzzle of pain persists in part because all pain is generated in the brain, and the brain is a complex organ. Even after thirty years of practicing neurosurgery, I am still regularly fascinated, delighted, and bewildered by the human brain.

Here's what we do know: Pain does not start where you might think, at the broken bone in your wrist or your twisted ankle. It begins when your brain scrambles to make sense of the sudden new signals coming from these injured places. Your brain rapidly tethers new information to existing information such as previous similar exposures, corresponding expectations, social norms, and other sensory data. Looking down and seeing blood on your hands, for example, will in all likelihood objectively worsen your pain.

Now imagine your brain trying to decipher all that incoming information in just a split second. On top of that, it has to instantly determine whether the information is accurate, authentic, and noteworthy, or if there's a component of "fake news" (to steal a term from my other field of journalism). It's why a child may not cry out in pain until he sees the look of concern on a parent's face. He's looking to a trusted source to interpret the significance of the sensation.

When you anticipate pain—say, at the first sight of a needle—your brain primes for a pain response, even if whatever follows next might not objectively cause pain. As "danger or distress" signals travel to the brain through nerve fibers in the spinal cord, they're upregulated or downregulated—meaning, given more or less importance. It's as if the brain is scrolling a social media feed, then suddenly comes across something incendiary. If that alarming message comes from a familiar, reliable source the brain trusts, that message gets immediately prioritized—amplified. If it's a garbage source, the message may be minimized or even ignored.

As the brain tries to make sense of all this new information, it may sometimes send out convoluted, imprecise pain signals. Typically, the brain gets it right, but more times than you might realize, it misinterprets pain because it doesn't quite recognize or trust the source.

One example is something known as *referred pain*. This is the response that makes your jaw ache when you're having a heart attack or gives you a "brain freeze" when extreme cold touches the top of your mouth. In that case, the brain's imprecision might cause you to clutch the sides of your head when the better solution would be to press your warm tongue against your cold palate. The brain can even create a very real experience of pain in a body part that no longer exists due to amputation or other loss, a phenomenon called "phantom limb" pain.

Regardless of what's happening in the rest of your body, it is your brain that decides how much to turn up the pain, whether to turn it off completely, or maybe even to create pain for seemingly no reason whatsoever. Your brain's response is dependent partly on your genes, but it might arise from the most surprisingly arbitrary things. What you had for lunch might influence how much pain you suffer by dinnertime. Whether you had a good call with your mom or your boss could do the same thing. If you've lived a life with pain, then you and pain have a history, and for better or for worse, that could affect how much pain you have in the present. For those who've suffered adverse childhood experiences, that can be a setup for a life of increased pain sensitivity.

Interestingly, there are also people with significant pain tolerance at the

other end of the spectrum. Some of the same factors described above, including your genetics, can decrease your chances of developing or feeling intense pain. When I was a surgical resident, I once had an equestrian show up in the ER with a badly fractured hip. He wasn't even planning on getting it checked out until his wife insisted. The hip is a ball-and-socket joint, and when we saw his X-ray, the ball was completely out of the socket, which was smashed into several pieces. And yet he was itching to be discharged as quickly as possible.

The point is that the brain creates pain on cue from a vast array of stimuli—biological, psychological, social, emotional, environmental, even cultural. And just as we now understand that the brain can be nurtured, developed, and optimized at any age, there's growing evidence that the brain can also rewire itself in ways that change the neural circuitry for pain, reducing its intensity or duration and potentially eliminating it altogether.

For all these reasons, pain can be hard to predict, measure, diagnose, and treat, and as a result, wildly different approaches may work for one individual versus another. Many treatments fail entirely for reasons no one can explain, and others provide an unanticipated burst of relief. The subjective quality of pain has always been described as the fundamental problem with treating it, but after this experience with my mom, I realized it could also be part of the solution.

Think of it as harnessing the untapped power of your own biology. This may involve a variety of approaches, including medications and procedures, as well as nonmedical ones like exercise, nutrition, and breathing techniques. Additionally, psychological approaches are increasingly being recognized and recommended as a first response rather than a last resort. For example, a visit to a psychologist both before and after surgery is increasingly being used to promote optimal recovery and minimize the risk that acute pain will turn into chronic pain. And with chronic pain patients, psychological therapy has helped manage pain enough so that sufferers can avoid unnecessary surgery, reduce the need for medication, and feel they are living a full life.

The Promise and Possibility of Personalized Pain Treatment

As I write this chapter, my mom is still recovering. She recently ditched her cane, and before that her walker. Now she's back to her brisk morning walks, though she's always clutching my dad's hand while doing so. We talk regularly, and after getting through medical updates, I've asked how the whole episode affected her. I listened intently as my mom, never especially self-reflective in the past, described the loss of control she felt when her pain was calling the shots. I saw someone far more human than the pioneering engineer I grew up with. I saw a vulnerability that was at once frightening and deeply bonding. I don't know what would've happened had the procedure not worked and whether she was serious about wanting to end her life. But I do know that for so many of the people I spoke with for this book, that negotiation is a constant one.

What I can tell you is that in my mom's case, our discussions themselves and the optimism they nurtured became part of her healing experience. Simply talking made her feel better, and my listening validated her pain and reminded her how much she was loved. Through these conversations, she also felt the need to share what was happening as she worked through her pain, and how she had become open to new approaches for its management. Once she was on the mend, she became focused on preventing an episode like this from ever happening again. For example, she wanted to incorporate everyday ways to improve her balance (including better ways to get that suitcase to the car!) and get herself in better shape to weather pain of any kind with greater intention. I was all for it. I'd learned my own lesson from her experience as well, and felt changed by it.

As much as I was able to bring medical expertise to my mother's situation, I realized that when it came to her pain, what I was seeing and hearing from her—the subjective experience so often discounted—provided the most valuable insight. Her personal experience was absolutely essential for me and her doctors to know. To someone who's suffering, pain is an objective fact, but the subjective nature of it makes every person an expert on their own pain.

The human body has a remarkable capacity for healing if we simply let it. This isn't meant to replace medical advice, but to share a perspective encouraging you to think differently about pain. The way to do this is by paying close attention to our unique pain experiences, listening intently to what our bodies are telling us, and intervene only when necessary.

To do this, we need to first understand the language of pain.

CHAPTER 2

Tell Me about Your Pain

HOW WE TALK ABOUT PAIN, HOW WE LISTEN, AND WHY IT MATTERS

The flagstone path that leads from the rear door of Wendy Miller's century-old Maryland house to her backyard studio is typically an easy walk. But lately, Miller's first steps along that path every morning have ignited deep pain where a knee injury has been slow to heal.

A long personal experience of chronic pain has informed Miller's work as an art therapist. On a recent morning, she gently seats herself in a chair across from a table and couch, waiting for a client to arrive for a therapy session. On the table sits an array of waxy, colorful oil pastel sticks and a blank sheet of paper. The client, an accomplished artist in her late forties, will sketch as they talk, conveying through drawings a dimension of the daily pain she suffers.

The woman arrives and takes her seat on the couch. She plucks an oil pastel stick from the tray and reflects for a moment. The idea that you can tap into past experience to express yourself is not news to an artist. In this case, she draws from an inner palette of pain that helps her convey her suffering in ways modern medicine generally does not recognize or appreciate.

As the woman sketches and shades on the paper, Miller occasion-