

I'm Ezra Klein, this is the Ezra Klein Show.

So maybe it's that I'm in my 30s now, maybe it's that I have kids and I'm always picking them up and pull them out of car seats and bending down.

Maybe it's my constant habit of emotional repression.

I'll come back to that one.

But for the past couple of years, I've had a lot of nasty neck and back pain.

And I've sought all the normal remedies and experts, doctors and sports medicine doctors and chiropractors and x-ray technicians and physical therapists and masseuses.

I got an ergonomic chair for the day, a standing desk, and I got a neck bolster at night.

And what I'm totally certain of is none of these people have any idea what is going on with me.

And I'm not telling you this because it's interesting, although I appreciate it because I want your theories.

I'm telling you because it's been all.

Roughly 20% of American adults, about 50 million people suffer from chronic pain.

For most people, that just means bad days now and again, a couple of days laid out in bed.

That means constant suffering and narrowing of the horizons of life.

And for too many, it's meant opioids, it's meant addiction, it's meant overdoses.

And spend even a few minutes talking to people about their pain experience.

Or for that matter, as I have, looking at the studies tracking treatment success.

And you'll realize it when it comes to chronic pain, we do not understand what is behind all this and we are not good at treating it.

So I've become interested in what we understand about pain.

What is happening at the frontiers of pain research and pain thinking.

And somebody who's sitting there is Rachel Zoffness, who is a pain psychologist at the University of California at San Francisco in their school of medicine.

And she's the author of the pain management workbook, which I would recommend to anybody dealing with chronic pain.

I found it revelatory.

But her core argument is a pain and particularly chronic pain, and this is all built on reams of research.

It's never just a biomechanical phenomenon.

It's never just something that exists in your shoulder or your elbow or your hip.

Pain, of course, is made by the brain.

And it also arises, importantly, and this is particularly true for chronic pain.

In a social context, it responds to where we are and who we're with and what is happening around us.

I sometimes run into books like this.

You have a book that claims to be about one topic, maybe a pretty narrow topic.

In this case, a workbook for pain.

And then you realize about something a lot bigger, how our minds and our bodies and our societies interrelate and co-create our experience.

And what that suggests about what human beings need to live well, whether you have daily

pain or not.

As always, my email is reclineshow at nytimes.com.

Rachel Zofnis, welcome to the show.

As a recline, so cool to be sitting across from you.

What is pain?

Pain is the body's warning system.

It's our danger detection system.

And I'm a nerd, capital N, and I've always been a nerd.

And I remember taking neuroscience at Brown as an undergrad, and I had this wonderful professor, Mark Baer, I think he said MIT now.

And he was explaining pain to us, and he explained that there are some people who are born with such an extremely high pain threshold that they don't really feel or experience pain.

And I remember thinking, that sounds so wonderful.

And then he went on to say, and those people don't live very long, because if you think about it, you go for a run, you break your leg, your body doesn't give you any danger messages.

That's extremely bad for your body.

You put your hand on a stove and your skin is melting off, and you don't get any danger or pain messages that is very bad for your body.

So at the end of the day, pain's job is to protect you, but there's many other things about pain that people don't know.

It's complex, it's subjective, and it isn't what you think it is.

It doesn't just live exclusively in the body is what I mean by that.

So oftentimes when people have pain, like a bad back or a bad knee, we are understandably convinced that that pain lives exclusively in our back.

But that's never, ever, ever true of pain.

It turns out there's a condition called phantom limb pain, which you may have heard of.

What phantom limb pain means is someone loses a limb, an arm or a leg, and they continue to have terrible pain in the missing body part.

And what that tells us about pain and its location is that if pain lived exclusively in the body, no leg should mean no pain.

And the fact that you can have terrible pain in your leg that's no longer attached to your body tells us that pain is not actually produced exclusively by the body, but rather is constructed by the brain.

And the treatment for that, or at least one of them, is a little mind bending that you put a mirror up on the other leg.

Can you talk about that?

That's right.

You've done your research.

There's a couple of different proposed treatments for phantom limb pain, but one of them is what happens in phantom limb pain is that your brain gets confused.

There's a part of your brain called your homunculus, and it's a map of your entire body that lives in your brain.

As I said to you right now, Ezra, sense into your foot, and notice if it's hot or cold,

and see if you can feel your foot on the floor, you can do that.

One of the reasons you can do that, your brain, it's complicated, but one of the reasons is because you have a whole map of your body that lives in your brain.

So what happens sometimes, not always when you lose a limb, is that the map in your brain doesn't disappear.

So one of the treatments for phantom limb pain is called mirror therapy, where we hold up a mirror so that the brain can get unconfused and recognize that the body part actually isn't there anymore, and the danger messages are no longer necessary, which is a slight oversimplification of what it is.

But again, this just drives home to me the point that when we have 15 back surgeries for back pain, or we see 25 knee specialists for the bad knee that we've had for 10 years, we're not actually doing our job when we're talking about treating pain effectively.

We're right at one point that, quote, the brain makes pain.

And then there's this other line you'll hear in our culture.

It's all in your head.

What is the difference between those two statements?

People with pain are often told it's all in your head when we can't find particular pathology, or there's like pain of an unknown etiology, which happens to a lot of us or will happen to a lot of us if it hasn't already.

Historically that happened a lot to women in particular.

So if they had pain, or God forbid, strong emotions, they were diagnosed with hysteria and told their problems were all in their head.

And pain is always real.

The pain we feel is always real.

So there's a difference to me between healthcare providers who may be well-intentioned, and maybe not, who say to patients, oh, it's all in your head because there's nothing on this scan, and explaining that pain always involves your brain.

So pain is never a purely psychological problem, never ever.

It's always a biopsychosocial problem, 100% of the time.

So we know that cognitions and emotions and perceptions matter a lot when it comes to making pain, but also signals and messages from your body matter too.

So it's not all in your head.

Your brain is a critical part of the pain experience.

And one of the most important things we want to talk about when we talk about effectively treating pain is that you can't just go after your back and you can't just go after your knee.

You also have to target your brain.

The message is that the brain is important too.

We cannot just focus on body parts if we want people to get well, and that's part of why chronic pain is on the rise and not going down.

So the question of what it means to say pain is at least largely or in some cases heavily coming from the brain is part of what led me to you.

So I have neck and shoulder problems of, to me, a relatively uninteresting but quite annoying variety.

And when I mentioned this on the show, it must have been a year or two years ago, a bunch of people all at once sent me links to books by a guy named Dr. John Sarno.

And eventually I had enough neck and back pain that I read them.

And they're interesting.

The basic argument there is that you have a lot of back pain that in his view is really coming from repressed emotions and it's a way of distracting the mind from confronting something it doesn't want to confront, which on the one hand didn't strike me as hugely convincing or empirical.

And on the other hand, it seems to have helped a lot, a lot, a lot of people who are now sending me his book.

So as we into this, what do you think of Dr. Sarno's work?

John Sarno was a controversial and polarizing doctor.

And I want to say what I like about his work and I also want to say what I don't like about his work.

What I really deeply appreciate is that Dr. Sarno was a well-established, well-known and well-liked clinician who came out and said, emotions don't just live in your head, they also come out in your body and they affect your health and they affect your pain, which neuroscience confirms is true.

So he, what I liked about his work was that he was helping to bridge this gap that we have between emotional pain and physical pain and they're always connected, always.

What I don't particularly love about Sarno was that he sort of pretended that he was the Columbus of emotions live in the body.

He planted this white flag on land that was already populated with many decades of research and was like, I have discovered this thing and I'm going to give it a name and I'm going to call it TMS.

And he came up with this whole treatment and he thought it was about repressed emotions and there was a lot of psychoanalysis in there.

It's a very Freudian theory.

It is very Freudian and I do not subscribe to that.

And again, I don't want to dismiss what he did.

Like he, in my mind, he's done a great thing in medicine and he has helped many thousands of people and I admire that.

But the thing that I want to do is take all of this pain research and neuroscience that's lived in these stuffy medical textbooks that actually we've known for many decades and trotted out into the sunlight so that everyone who has pain or loves someone with pain knows what to actually do about it.

And by the way, for chronic pain, science says, and people will be mad at me for this, science says opioids are not the effective treatment for chronic pain, for acute pain.

God bless, like after you have dental surgery and you don't have a history of addiction and you're not in a high-risk category, blessings.

But I really appreciate what Sarno did in his move to reunite emotional and physical pain, but I do think he was a little bit off track.

One thing I really appreciated about your pain workbook is at least for me, struggling with some of these questions, it gave a fairly convincing account of what is happening when

the brain constructs pain.

And I want to quote from part of it.

You write, your appraisal, you meaning your mind, your appraisal of the situation is a critical determinant of the pain you feel, context, thoughts, prior experiences and memories, emotions, and the meaning you assign to your pain, all change your experience of it.

And this matches to what seems to be pretty current in neuroscience, this idea of the brain on some level is a prediction machine.

You got it.

Tell me a bit about that.

So you asked at the beginning what is pain and my response, you know, pain is this very complex subjective thing, but at the end of the day, your brain's job is to save your life.

And pain, again, is the body's danger detection system, your warning system.

So your brain has this beautiful machine, uses all available information in any given moment to decide whether or not to make pain and how much.

Because again, that's your brain's job.

So if you imagine what that actually looks like, your brain is using information from past experiences, it's using where you are and who you're with.

It's, you know, using emotions, how you feel, it's incorporating, of course, sensory messages from your body and all five of your senses.

And I want to give you a quick story that I think will illustrate this point.

So tell me the story of the two nails.

Great.

So 2007 Journal of Psychosomatic Medicine reported on two gentlemen, they were both construction workers because apparently that's the most dangerous job anyone can ever have.

So one was a 29-year-old construction worker and he was on a job site and he jumped off a platform straight onto a seven-inch nail.

And that nail went straight through his boot, clear through to the other side.

And he was in terrible excruciating pain and his colleagues were all horrified and they rushed him to the emergency room and, you know, he was screaming with pain and they gave him an IV of intravenous fentanyl, which is a very powerful opioid, as we all know.

And the good doctors removed his boot and they discovered that a miracle had occurred.

The nail had passed between the space between his toes.

There was no blood, there was no wound, there was no tissue damage, but his pain was real.

How is that possible?

His brain, aka his danger detector, used all available information, memories of past pain experiences, knowledge of the dangerous work environment, the panic that he saw on his friend's faces, this visual, of course, his five senses, this visual of a nail sticking out of his boot, I also would freak out.

And because...

I feel pain just hearing the story.

And because his brain decided that his body was in danger, it made pain to protect him.

So second tale of nails.

And by the way, of course, I like stories that rhyme, I call it a tale of two nails.

The second story, another construction worker was on a job site, he was somewhere in Colorado, and he was using a nail gun.

And the nail gun accidentally discharged and it ricocheted backwards and it clocked him in the jaw.

And he had a mild headache and a mild toothache, but he continued on with work and life for about six days.

And at the end of six days, he turned to his wife and said, you know, I'm going to get this toothache checked out.

He went to a dentist and the dentist did a scan of his patient's jaw.

And much to both men's surprise, they discovered a four inch nail embedded in his face, right?

And what had happened was when the nail gun discharged, he saw a nail shoot across the room and bury in the wall across from him.

So again, his brain, our danger detector, used all available information to determine whether or not to make pain and how much, so it used this visual of this nail shooting across the room and information also of this experience of having this nail gun clock him in the jaw and decided that not much pain was needed because his body ultimately was safe.

And I read this, like I went down this rabbit hole with these stories so far, you have no idea, I have like a collection of every interview, everything.

And one of the doctors who finally did the surgery to remove the nail said something like he's the luckiest man I've ever met.

So again, Ezra is shuddering everybody.

So again, to me, what I really love about these stories is that they illustrate the point, pun intended, that I'm trying to make, which is your brain is always using all information, not just some information, pain and tissue damage are not the same thing.

The conclusion of the tale of two nails is you can have damage to your body and not a lot of pain, like a nail, four inch nail embedded in your face, and you can have no tissue damage and have a lot of pain like our friend who had the nail in his boot.

And we all know that this is true, like if you've ever gotten into the shower and you're like, whoa, I have a black and blue mark, how did that get there?

That's evidence of damage to your body without accompanying pain or if you're someone who's an athlete, I am not, I am a bookworm, but if you're someone who grew up playing sports and you ever had like a great soccer game or a great football game and at the end of the game, you discovered that you were covered in blood and you had no idea what happened and it was only then that the pain started, you also have had that experience, all factors matter when it comes to pain production and pain reduction.

Hey y'all, it's Kyra Blackwell from Wire Cutter, the product recommendation service from the New York Times, and I test mattresses.

Today I am testing seven mattresses, all brand concealed.

It just feels like such a daunting endeavor to pick the right mattress.

This mattress is very supportive, it's just like very easy to shift positions.

We've considered nearly four dozen foam, inner spring, and hybrid mattresses.

We're looking out for edge support, motion isolation, and firmness levels.

We are cross-referencing our data between testers, which includes people of all different

shapes, sizes, and sleep preferences.

When it came right out the box, it smelled like lavender.

I'm not sure how long it'll last.

I finished compiling all of my testers, surveys.

One tester noted the mattress had some give and underlying firmness and support.

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slash Wire Cutter.

It feels very squishy, but in a good way.

I think this gets at what is often, in addition to painful about pain, scary about having pain, which is an assumption many of us have, that it is signaling some kind of harm to the body.

You make this distinction, it's very central to the book, between hurt and harm.

Tell me about that.

It's a critical distinction for patients to get better from pain.

By the way, I include myself in that category.

We have this other myth in medicine that it's us versus them.

It's us as providers on the right and patients on the left.

I want to say clearly, none of us are going to escape pain.

It's coming for everybody, whether you've had it in the past or you have it now, you're going to have it in the future or someone you love will.

Pain is everybody's problem.

There's no such thing as a quote unquote pain patient, we are all pain patients.

There's a really important distinction between hurt and harm.

The tale of two nails stories in my mind really brings that to the fore.

Hurt is the subjective experience of pain that you have, for example, when you stub your toe.

Harm is the actual damage that occurs to your body.

If you look at that stubbed toe and it turns purple and it's swollen, that's inflammation and evidence of crushed capillaries, but it turns out that hurt and harm are not the same.

You can have damage to your body without accompanying pain.

You can have pain without accompanying tissue damage.

What has happened, understandably, is that our brain conflates the two and that is adaptive and it's not necessarily a bad thing because it saves our life, right?

Because one of pain's most important jobs is to grab your attention and get you to change your behavior.

If you go for a run and you break your leg and you don't stop running, your body is going to be in danger and it's pain's job to stop you in your tracks, make you go seek medical help and then rest for however long is required to heal, but the problem is because we're so used to, you know, acute pain is the more common type and I want to define my terms. Acute pain is pain lasting three months or fewer, that's how it's generally defined, and chronic pain is pain that's three months or longer or quote, unquote, beyond expected healing time.

So it's a bit nebulous in its definition, but acute pain is more common.

It's the pain of childbirth or the pain of an illness or, you know, breaking a bone and chronic pain is a little bit more rare, but with acute pain, it's adaptive and useful to pay attention to the pain message, which again is a danger message because there's a high chance that it is warning you of potential danger or damage to your body.

So, you know, if you're going for a run and your body's hurting, it's good to pay attention, it's good to stop, but the message here is that hurt, which is pain, the subjective experience of pain, which is your brain's opinion of how much danger your body is in, is uncoupled actually from damage or harm.

And I want to say, I'm not saying that when you have pain, it doesn't mean there's tissue damage, it most surely could mean that, but it doesn't always mean that.

Well, let me use an example for this, because I think it's easy to hear, say, the story of two nails and say, well, that's a freak situation.

But one thing in addition to when we are harmed, expecting hurt, is when we hurt, we go looking for harm.

Oh, so true.

And to quote something you say that is very striking, and somebody used to cover health care policy I ran into a lot, studies on back pain revealed there's little to no correlation between back scan abnormalities and pain.

In one study, disc degeneration and bulges were found in 80% of elderly patients who had no symptoms or pain.

In another, MRI abnormalities were found to be completely unrelated to the degree of disability or pain intensity reported by patients.

But what often happens to people is they're having a lot of, say, back pain, and you go in and you get a scan and say, well, it's got to be that, I mean, look, it's bulging out in seven places.

So there's also this question of, I don't want to always call it over treatment, but the assumption that hurt and harm are the same leads us to assume to go looking and then possibly go solving things that aren't always relevant.

I love that you read those studies because I'm a statistics person and I try, but those studies are so important in the science of pain.

And those of us who are down this rabbit hole with pain science quote them all the time and I would not have remembered the numbers if you hadn't said them.

So thank you for that.

So what happens is, and the reason we all run to the doctor when we have back pain understandably is because for decades we've been told that pain means to your point tissue damage and harm and that's not actually the case.

And pain is this complex experience that involves our emotional health and contextual health and environmental health and social health as well, but that's why we all run to the doctor.

And there's a diagnosis that makes me crazy.

It's called failed back surgery syndrome.

Failed back surgery syndrome is when a poor patient with chronic back pain has done the thing they've been told by all their doctors and surgeons to do, which is to just go after

the tissue damage, just go after the herniations and the bulges and seven back surgeries later, they still have pain.

And now there's a name for it, which I find very patient blamy, like you failed the treatment.

And it's like, no, our healthcare providers are unwittingly most of the time failing patients because at no point do my patients, like my patients come to my office and I'm the last stop on the train because no one wants to see a pain psychologist.

Nobody trust me back to the stigma and psychosomatic medicine and it's all in your head.

And at no point have my patients been told, by the way, pain is your body's warning system.

It's subjective.

It's tied up in your emotional health.

It's tied up in your social and environmental health.

And if we really want to treat your pain, we have to treat you like a whole person and not just a body part.

So this failed back surgery syndrome just really kills me.

Well, this goes back to the point about chronic pain being a less reliable guide to harm than acute pain.

And so tell me about this idea that the brain practices pain.

People often ask me, well, you know, I've had pain for five years, seven years, 20 years.

What makes pain chronic?

How does pain become chronic?

And there are multiple processes by which pain becomes chronic.

And one of those processes is called central sensitization.

Was there ever a skill that you were bad at and you practiced it over time and you got good at it eventually?

For me, it was piano.

I was terrible at it.

When my mom made me practice and over time I got good at piano.

What about you?

It took me a very long time to figure out how to tie my shoes, like longer than you would think reasonable.

I had a bunch of spatial reasoning issues when I was a young kid and things like that were hard for me.

Now, super easy.

Can do it.

Can tie my shoes, can tie my kid's shoes, can tie your shoes.

It's unbelievably straightforward.

The clinician me wants to ask so many questions about that, but I'm stopping myself.

Great.

So I'm going to say this back to you in neuroscience language.

We all know that the brain changes with time and experience.

We all know that the brain is plastic.

There's this term neuroplasticity and what that means is the brain changes again with time and experience and exposure to things.

So the pathways in your brain are like the muscles in your body.

The more you use them, the bigger and stronger they get.

So Ezra, if you said to me, softness, I want really huge biceps.

I would say that's cool, Ezra.

Go to the gym or get some free weights and lift weights over and over, over many days.

And you will see with practice and time and experience, the muscles in your arms, your biceps will get really big and strong.

A bunch of bros are like you just completely skipped over protein intake and caloric excess.

I think it's so many emails about this.

Oh God, I hope not.

And I just want to say up front, I am simplifying some very complex processes and I'm doing that on purpose.

So the pathways in the brain are like the muscles in your body.

The more you use certain pathways, the bigger and stronger those pathways get.

So for me, I mentioned that growing up, I didn't really like playing the piano, but my mom really wanted me to practice.

So I would sit in practice and over time, what happened and everyone who's ever played an instrument knows this, eventually my fingers just magically knew what to do.

I didn't even have to look at the sheet music and I could hear Chopin in my head.

Like I didn't even have to listen to the song to hear the music.

So what was happening is that, again, our neuroplastic brain will change with time and practice and experience.

So the piano pathway in my brain got bigger and bigger and stronger and stronger.

The more I played the piano.

That's what happens in the brain.

The more it inadvertently and accidentally, and I put in quotes, practices pain.

The pain pathway in your brain, which by the way is not a real thing.

There's no real pathway.

There's lots of parts of your brain that are contributing to pain in your central nervous system, but the more you practice pain for the sake of this analogy, the bigger and stronger the pain pathway in your central nervous system gets.

And when that happens, we say that your brain has become sensitive to pain.

When we have pain and our pain pathway has become big and strong, what that means is our finely tuned, wonderful brain is now picking up on sensory messages from the body and interpreting

them as dangerous and amplifying that even though they're not dangerous and they don't need to.

A great example I like to use of this is with my fibromyalgia patients who have chronic pain and they go to the park for a picnic.

And their brain gives them these loud danger messages, danger, danger, and I think everyone can agree that going to the park when you have fibromyalgia is not dangerous, but your brain is telling you that it's dangerous anyway.

And what I like about this analogy is that it really drives home this idea that pain is really a danger message and the pain system is your danger detection system and it isn't always right.

And if you're someone living with pain and you believe that it's dangerous for you to go outside and go for a walk and that it's dangerous to see friends, you are never going to get well because part of the chronic pain cycle is staying inside and staying in bed and missing out on life and that's understandable and a lot of people do need to do that. So I'm not saying to never do that.

But with chronic pain, it turns out that that kind of pain cycle is the thing that ultimately amplifies pain, perpetuates disability, and prevents healing.

So I had an interesting experience with your book over the weekend.

I'm dying to hear about this.

Because I mentioned that I have neck and shoulder pain and something will happen and I'll sleep weird and my neck will crick.

But also a couple of times I was working out and something happened and I couldn't move for three or four days and it was awful.

And then recently, after that experience, like the second really, really rough injury, which happened a couple of months ago, something weird has occurred and I've been scanned and poked and prodded and chiropractic and nobody can find anything wrong, there's no issue as far as anybody can tell.

Very small things where I feel a twinge will shut me down much more than they did before. Like I tripped over cobblestone but didn't fall and just felt like the vibration in my neck.

It was immediate like, oh no, or this weekend, my son dropped a cookie and I bent down to pick up the cookie and I just felt that as like, oh no.

And I don't think anything is going wrong actually, but I have gotten more afraid of it and the idea that I've become more sensitive feels very true psychologically that compared to where I was after a couple of really bad experiences, I am more afraid, I freeze up more and in a world where part of what is happening is my mind is predicting if something has really gone wrong, a world in which I am constantly wary and scanning for the possibility that something has really gone wrong is a world that might help explain why this thing nobody can pick up on a scan keeps becoming more sensitive and more problematic.

So it wasn't good for my weekend exactly, but it's extremely good for reading your book and being able to bring a lot of attention to it because it felt very sensitivity feels like what it's been.

You bring up a really good point which is about more than prediction, which is that emotions always impact the pain we feel and what neuroscience shows is that stress and anxiety amplifies pain and it turns up the brain's pain dial.

So the way I like to explain how pain works is if you imagine in your central nervous system which is your brain and your spinal cord that you have what I'm going to call a pain dial and it operates much like the volume knob on your car stereo.

You can turn pain volume up and you can turn pain volume down and there's many things as we all know that adjust pain volume.

So of course pain medication is one of those things, but it turns out that there's three other things that I want to talk about that also change pain volume.

One is stress and anxiety, one is mood and emotions, and the third is attention or what we're focusing on.

So specifically what neuroscience says is when stress and anxiety are high and our bodies and our muscles are tense and tight and our thoughts are worried, our brain raises and amplifies pain volume so pain will feel worse when we're stressed or anxious.

Thing two is mood and emotions.

What neuroscience says is when our emotions are negative or sad or miserable or depressed, our brain and in particular our limbic system amplifies pain volume so pain will feel worse when emotions are negative and by the way that includes anger and rage will amplify pain volume and thing three is attention or what we're focusing on.

And what we know of course is that attention changes the pain we feel too.

So if you're home in bed thinking about your pain, focusing on your pain, missing out on work and life and hobbies, your brain and specifically your prefrontal cortex will amplify pain volume so pain feels worse when you're thinking about it and when you're focusing on it. The great news for people living with pain and for people who treat pain is that the opposite is also true.

The opposite is also true when stress and anxiety are low, your muscles are relaxed, your thoughts are calm, your brain sends a message to the pain dial lowering pain volume.

There's a reason why a bazillion studies show even though people think it's fluff and pseudoscience that relaxation strategies and diaphragmatic breathing and mindfulness based stress reduction which have a fund of literature supporting them, lower pain volume.

Thing two we said is mood and emotions.

So when our mood is high, we're feeling joyful and happy, we're having pleasurable experiences.

Our brain sends a message to the limbic system, our brain's emotion center as well as other parts of the central nervous system and that lowers pain volume.

So pain feels less bad when emotions are positive, we're engaged in our lives, we're feeling good, we're feeling happy.

And thing three is attention.

It turns out cognitive factors, what we're paying attention to, what we're thinking about, what we're focusing on, even our belief systems change pain all the time too.

So when we are distracted or focused on other things like I like to ask my patients, will you tell me about a time you were so absorbed in some activity, you briefly forgot about your pain and almost everyone can give me an example of that and that is not magic.

That is your brain's pain dial.

So when you are distracted, you're out with friends, you're doing things, you're engaged in your hobbies, your brain sends a message to your pain dial lowering pain volume.

So pain feels less bad in summary when you are relaxed and calm, when you're cultivating positive emotions and when you are distracted and not thinking about your pain and engaged in your life.

But we know that negative emotions and stress and anxiety in particular will amplify the brain's danger alarm.

Let's talk about why that's so logical.

In an emergency situation, you have to pay more attention.

In an emergency situation, you are more likely to be harmed.

You do want to be paying more attention to your body and it's highly adaptive for stress and anxiety to drive your attention inward and to amplify this sense of danger.

And as long as you're in a state of stress and anxiety, all throughout your body, you're going to be more sensitive, you're going to be on more alert, you're going to be in this mode of is everything okay?

So we know from research that the experience that you just had makes perfect sense when you think about the emotional aspect of pain.

Let's talk a bit about some of those other pathways.

So we talked about sensitization to pain.

What does desensitization look like?

So if you think about the brain getting more sensitive over time, the opposite can also happen and desensitization is also known as habituation.

And there's all this literature and neuroscience that shows that just as a brain can become more sensitive to these danger messages, there are also ways to habituate and desensitize a sensitive brain.

So I like to use this metaphor of like if you've ever been in a movie theater and over time, you know, while you've been sitting there in the dark, your eyes have gotten used to the dark and they've acclimated.

And at the end of the movie, if someone throws on all the lights and opens up all the blinds, you're like, oh my God, my eyes and it's very painful.

The way you desensitize a brain that's become sensitive to light is that instead of throwing open all the blinds and flooding the room with light, you open the blinds just a teeny bit at a time.

So if you're in that movie theater and you crack open the blinds just a little bit and a little bit of light gets in, it might be uncomfortable.

But what's actually happening is that after five minutes, it won't be uncomfortable anymore and then you open the blinds a little bit more and your brain desensitizes a little bit more and gradually you're in a light filled room and you are okay.

And it turns out that the treatment for chronic pain, this is just what research says, do not shoot the messenger, is that gradually over time, we can desensitize a sensitive brain by gradually increasing little bits of physical activity and social exposure and movement and again, targeting this whole biopsychosocial pain recipe.

And what I want to be clear to say is, again, this is not just my opinion, I treat chronic pain, I've had this chronic pain practice for a very long time.

And I watch these miracles occur in my office all the time and I use that word with a lot of air quotes because it's not a miracle, it's just what science says.

And when I get these patients who have been in bed for four years, have no life and they have no hope and you can gradually, gradually increase their activity and social exposure and target all the pieces of their pain recipe, they get out of bed and back to life.

And my clinical experience and my personal experience, I think it's useful to have lived experience and also everything I know about, you know, 25 years of neuroscience research is that this process works for changing chronic pain.

Well, tell me broadly, what is a pain recipe when you use that term?

Yeah, so just as there's a recipe for brownies, there's always also a recipe for pain.

So we know, of course, like I am not a good cook or a good baker for that matter, but I do love brownies.

And we all know that if you want brownies to turn out, you know, fudgy and delicious, you have to add certain ingredients in a certain order, in an environment that cultivates their perfection, otherwise you will get truly terrible brownies, right?

And it turns out that the same is true for pain.

Just as there's a high pain recipe, there is also a low pain recipe.

So if I mapped out my pain recipe, for example, it's poor sleep and sitting for too many hours without moving and eating a crap diet, you know, without making sure that I'm getting appropriate fruits and vegetables and, you know, not exercising and, you know, fights with my partner or my family or whatever.

And that will contribute to a really high pain day, you know, and that's not true for everybody.

Everybody is unique and everyone has a different pain recipe.

But what I love about this recipe concept is that if you look at what goes into your high pain recipe, you can easily map out what goes into a low pain recipe.

So for me, poor sleep is a contributor.

So I know that I need to go and do a sleep hygiene protocol, for example.

There's a lot of protocols for sleep and medication is not the solution.

But I know that if I'm not taking care of my sleep, I'm not taking care of my pain.

I know that I need to take care of my emotional health.

I know that I need to take care of exercise.

I know I need to block off time to go outside and walk in the sun, even if it's for 20 minutes a day.

So my low pain recipe, I protect very carefully now that I know what it is, but I never would have known if I didn't know what this high recipe thing was.

One thing you say in the book is that with chronic pain, you often have to work backwards compared to how you would work with sudden acute pain you would get from a traumatic injury.

Tell me what you mean about working backwards.

So with an acute injury like breaking a leg, your body gives you this danger message and of course you listen to it.

And what you need to do to heal from an acute pain episode like the pain of childbirth or breaking a leg is you have to rest and heal.

Your tissues have to heal before you can do the things.

And with chronic pain, it turns out that it's a little bit of the opposite, and I call this process working backwards, and working backwards means you reasonably think that you need to stop doing all the things.

And when you've stopped doing all the things, then the pain will go down and then you can resume your life.

But with chronic pain, research shows what you have to do is actually the opposite.

So it's called pacing for pain is one of the terms that we use.

And you're going to gradually increase activity and you're going to gradually increase exposure.

And we're not throwing people into the fire here.

It's sort of like, I think of pacing, like if you told me that you wanted to run a marathon and maybe you do, I do not, 26 miles of running.

Nope.

Sounds very painful.

Not a goal.

If you want to pace for a marathon, you're going to do a little bit at a time.

You're going to go gradually so that your brain and body adjust to this sudden increase in activity.

And pacing for pain is much the same.

You don't go outside and run a marathon the next day.

You pick an activity, whatever it is, and I usually like to pick the most beloved hobby or activity that someone is missing out on, whether it's fudge making or playing soccer.

And you map out what it would take to get back to that activity.

And if you can only start with standing in your kitchen for three minutes, that's where you start.

But pacing for pain takes the beloved activity that you like and divides it up into small manageable pieces.

And gradually you get back to the thing.

So I cannot tell you how many patients I've had where they had this impossible goal, like getting back to soccer.

And they ultimately play soccer again.

And the worst part for me of this whole thing is that people with chronic pain come to my office and say.

The internet says, that's my favorite, or my doctor says, chronic pain is untreatable.

And it makes me so infuriated because that is a complete and utter lie.

Healthcare providers who say that simply have not been trained in pain in my humble and strong opinion.

Chronic pain is treatable.

If the brain can change, pain can change.

And pain is always changing.

Anyone who's had pain will tell you that pain is always changing.

And if pain can change, pain can change.

You wrote something about that that I found kind of moving.

You wrote, quote, while avoiding and withdrawing from movement and activities seem reasonable and understandable, resting for too long actually makes it harder to return to the activities you love.

And this caught my eye because we're always told to rest more.

And oftentimes it seems to me that rest, or at least solely rest, isn't what's needed.

In this case, we stiffen, in other cases, we ruminate, you just sit in a room and think about your work or think about what you're nervous about.

And so it got me thinking about what the word is for what's needed here, like refreshing or resetting.

What is a word you'd use?

I mean, I think when it comes to acute pain, rest is exactly what you need.

And when it comes to chronic pain, I guess it's respite is the term I would use.

Respite is nice.

Yeah, where of course, and I want to be clear what I'm saying, this is not a one size fits all, like I treat a lot of chronic fatigue syndrome and resting is an important part of recovery and also getting back to life is an important part of recovery, depending on people's motivations.

But we do need respite when we have chronic pain.

So part of the pacing program, when I put someone on a pacing program, is making sure to build in rest and respite as you're pacing and getting your life back.

And as people who push ourselves very hard, it's very, very critically important to build in periods of rest and respite and to make sure that you're taking care of your body.

And I think especially for people who are, you know, again, forgive the term nerds and we use our brains a lot too.

Sometimes it's important for brains to rest also when it comes to recovering from pain. It can be maddening to be told endlessly in life that just everything is about your stress level.

And then you look over at the person next to you who's also stressed out and they're not crippled over in back pain or they're not having this autoimmune disease or whatever it might be that you've just been told is being worsened so badly by your stress.

And you think about past human beings who like until 80 years ago, just you caught a cold and you died.

And child mortality was super high and still in many parts of the world is.

And they didn't all seem to have back pain.

And how do you think about this?

Is this weird like we're privileged and we live in many ways easier lives and there is a sense of chronic pain rising and it gets attached to stress.

And yet there's something weird about the stress explanation or centrality to me given the comforts we have and the sort of idiosyncratic nature of who these things strike.

I do not think in any way that chronic pain is a stress disease.

And I want to be very clear.

We know that stress is an amplifier, but it's one of 642 amplifiers.

It's not the only one.

Chronic pain is not a stress disease and that is not what I'm saying.

So if I'm giving that impression, I want to make sure to undo that damage because not true.

Pain is not purely emotional.

Pain is never purely physical.

It's always both.

Pain lives at the intersection of neuroscience and biology and mental health and social health and environmental health always.

It is never, ever, ever purely emotional or purely to do with stress.

I do think that we live in a culture that is incredibly stressful.

Chronic pain during the pandemic was a crisis.

Chronic pain exploded during the pandemic and people who had chronic pain were suffering more and people who didn't have chronic pain started developing chronic pain.

And it turns out that opioid-related overdoses during the pandemic exploded as well, which

is not a coincidence.

They went up by something like 30%.

So there's a big recipe, but part of the reason the pandemic was a perfect pain recipe is because we were all isolated at home, mood crashed, people were depressed, suicidality went through the roof, like ask any doctor who works in an inpatient unit, any psychiatrist, like does demand for medications and inpatient hospitalizations.

In some parts of the country, calls to suicide hotlines went up 8,000% during the pandemic.

It was people were really suffering and stress and anxiety also went through the roof.

Obviously we didn't want to die, we didn't want our loved ones to die and we were being told that our groceries were potentially contaminated and watching the news was like this environmental

trigger and stressor for everybody.

So there was sort of this recipe of things that made the pandemic really challenging for people.

Your question about stress is an important one and I think we have a lot of comforts in life right now, but I don't think that means that life is less stressful.

Sometimes my patients will come to my office and say, you know, when I explain this concept of a pain recipe or the pain dial and they'll say, you know, I'm not, I'm not stressed out at all.

So, so I want to back up and say there are many stressors on the human body, like moving cross country is one of them and divisive politics is another one and death of a loved one is another one, but living with pain day in and day out is a major stressor on the human body.

So it's sort of this thing that we can't escape, we can't avoid and there's a million things that trigger stress.

We've been talking here a lot about the ways in which the brain constructs pain, the ways in which pain can be affected by prediction or by mood or by sleep.

How do you think about how you know when it actually is harm?

How you, because it's very alluring if you're often in pain to come up with this theory that, oh, my brain has just become too sensitive, I've just over learned it, I just need to meditate more, but maybe there really is something there.

You have this great metaphor in the book about sometimes a car alarm goes off and nobody's trying to break into the car.

But of course, sometimes somebody is trying to break into the car.

How do you distinguish?

So what we know about chronic pain, like this is not a theory of mine.

What we know about chronic pain is that the brain does become more sensitive over time and it does misinterpret these danger messages as amplified when they don't need to be.

So if someone's experiencing chronic pain and they haven't had the tests and the pokes and the scans, I will send them out to have them, obviously, because again, I do not want to miss that there's a broken bone or some chronic illness.

There's some biological, biomechanical contributor to the pain recipe that I am not paying attention to.

Again, I am not saying that medications don't treat pain.

I am not saying that biomechanical and biological processes aren't involved here. Of course they are.

So what we know is there's this difference between acute pain and that process and chronic pain and that process.

So I think what you're asking about, like if someone comes to me and they've had chronic pain for 10 years and we've not investigated all the biomechanical drivers or the bio part of their pain recipe, then I haven't done my job.

When somebody has chronic pain and they walk in to get care, after I mean the initial doctor looks at them and nothing is broken, how should the medical system be structured for them? What kinds of care teams or resources or sort of new specialties?

I got the sense, I have never in my years of reporting on healthcare policy, I've never found a doctor who thinks the medical system is correctly structured.

Fair.

And I'm curious in this respect, like we have this huge pain problem for a while we tried to treat it through opioids, we've realized that's a disaster, but how should teams be set up?

What should we have, what should a person have access to they don't know?

So when I think about the answer to that problem, I think about, and again, like I am just a nerd and I want to synthesize all the research and what the research says is that the treatment of pain has to be multidisciplinary.

This is not my opinion, none of this by the way is my opinion, it's just a synthesis of what I'm reading, that treatment has to be multidisciplinary and what that means is, again, treatment for chronic pain, and I am talking about chronic pain, not a broken leg, needs to involve everybody on the team.

We want physicians, we want pain psychologists, we want PTs, we want OTs, we want to consider things like biofeedback and mindfulness based stress reduction, which I rolled my eyes at my entire life until it helped my pain volume go down.

But we want the multidisciplinary picture, we want to look at your whole pain recipe and the full biopsychosocial recipe of all the ingredients that are in there that are contributing to your pain, including sleep and diet and movement and of course, biomechanics, like we want everything in there.

And if you think about, again, what's going to make a low pain recipe or what's going to lower pain volume, most of the time, I am not saying always for everyone, it's not just going to be a pill or a procedure and we know this, again, this has been said in the literature for many decades that pills and procedures alone for pain are not enough and all the major governmental institutions and medical institutions are calling for a multidisciplinary approach to pain and we're just not seeing it happening.

So what we want is for more, in my mind, what we want is for more healthcare providers across disciplines to be trained in pain because what's happening now in medical education is that almost nobody is getting trained in pain.

Like there's this paper that came out in 2018 that showed that 96% of medical schools in the United States and Canada are lacking pain education and that the 4% of medical schools that are teaching pain are focusing on the erroneous and outdated biomedical model, again, where we're just looking at the body part that hurts, we're just looking at the back,

we're talking about mechanistic.

I want to end by talking a bit about the brain itself and what all this implies for it and

I guess one thing to ask is why there is this difference between hurt and harm.

Why it is so possible for the nervous system to send such wrong signals?

Why we think the system didn't evolve to keep a tighter linkage between the two of them?

How do you understand the cause of wrong signals or incorrect interpretation?

Two things that come to mind for me is we're seeing this anxiety epidemic in America but around the world also and the way we talk to patients about anxiety is very similar.

The body is getting stuck in emergency danger mode even though there's not actually a lion coming to eat you, which is biologically the purpose that your fight or flight system,

your stress and anxiety system exists for, but again, when I think about this with people

and including myself, I look around and now I'm hyper attuned to this now that I understand this pain process and I'm constantly thinking, what are the drivers of anxiety?

What are the drivers of stress?

What are the drivers of this chronic pain recipe?

There's a lot of things in our environment I think that are contributing to what we're seeing with this explosion of anxiety and this explosion of chronic pain, which again is not coincidental, this relationship.

And the other thing I think about when you say that is, you mentioned earlier, the body keeps the score and I talk about that book all the time because what happens in that book is it's very clearly shown, the science all illustrates that trauma like everything else doesn't just live in the brain, it also lives in the body.

It's like the brain is connected to the body 100% of the time, which I think is what we're trying to illustrate here today.

And then the body keeps the score.

You see how trauma changes your physiology, it changes your nervous system, it changes even your immune functioning and your endocrine functioning, it changes muscle tension.

And what we also know is that trauma changes the brain also to amplify pain.

It makes your brain more sensitive and like more of a finely tuned instrument.

And if you think about why, if you've experienced a trauma, what it means is your brain wasn't quite properly prepared for this terrible thing that happened.

So after a trauma, people experience a lot of different symptoms and one of them is called hypervigilance.

Hypervigilance is when quite literally you're extra vigilant, you're extra aware and in your environment around you and outside of you, small bits of sensory information from the environment can trigger an exaggerated response.

So if you've lived through a trauma and a trauma can be many different things and someone taps you on the shoulder and you're experiencing these symptoms of PTSD or post trauma, you'll be hypervigilant, you'll jump out of your chair from something as not dangerous as someone tapping you on your shoulder.

And similarly, the reason that's happening, of course, is because your brain has become extra sensitive as a result of that trauma and the same thing happens with internal sensory messages also.

After a trauma, your brain is not just scanning your external environment for possible danger.

It's also scanning your internal environment.

Is anything wrong?

What about now?

Is that dangerous?

What about that?

So having lived through all the things that we've collectively lived through over the last couple of decades, it's not actually a surprise to me that chronic pain is on the rise when combined with the lack of pain education across disciplines, when combined with the major stressors that we've had, when combined with the fact that we're treating pain incorrectly as a purely biomedical problem rather than a biopsychosocial problem.

This gets to this weird metaphysics of the self sometimes.

When we're even talking in that conversation about you, if you say, well, who are you?

What are you?

My mind, my consciousness is up here in this lump of tissue somewhere.

But then we're having all this difficulty, me, right, convincing my brain, my mind.

It does not listen to me when I tell it, all kinds of things, frankly, in my life.

And it gets a little Buddhist, right, who is thinking these thoughts.

But there is something interesting to me across a bunch of these disciplines from the trauma response work to chronic pain, to how difficult it is and how uncertain of a task it is or how sort of circuitous of a task it is to convince your brain of something, right?

Even though in theory, you can think of thought and it happens in the same vicinity of the brain, it's not like the rest of the system listens.

How do you think about that?

Like what is the brain's learning system?

I think as the brain's danger detector, it's really adaptive to listen and pay extreme attention to a danger message and to say, this means I have to stop doing all the things.

This means I can't go to work and I have to stop exercising because for acute pain, again, that's life saving.

You don't go for a run when you've broken your leg.

I know I keep using the same example, but it's just such an obvious one and a lot of people have had injuries like that where your body is telling you to stop.

You cannot use that body part.

So pain is really hardwired.

There's a lot of stuff about pain that's like this is instinctive and it's life saving.

So it is, of course, very hard to tell your brain, yes, this is an instinct you've had for evolutionary eons and it has saved your life, but now ignore all the instincts and don't do all the things that you've instinctively done to save your life.

It's your sort of going against nature in a way.

So it turns out, and I don't think this will surprise you, that better understanding pain actually changes pain.

And we can explain why now that we know about the biopsychosocial pain recipe.

Once you understand pain better, you're going to be hopefully less scared of getting out of bed and going for a walk even if it's just for 60 seconds or five minutes or whatever.

You're going to be less scared of attempting to resume hobbies.

Maybe you will seek out appropriate multidisciplinary care and you will go to a trauma therapist to treat untreated trauma because trauma and pain are best friends.

There's an 80% comorbidity of trauma and chronic pain.

Maybe you will get a PT and an OT.

So learning about pain actually changes your pain experience in part because you have this new understanding and appreciation for what the pain experience is and maybe you're going to go about treating it differently, but you're surely going to understand it differently.

I want to go back to something here that we had talked about earlier, which is the ways you take control of the pain dial.

And your five parts here are stress and anxiety, mood, attention, interpretations and understanding of pain and coping behaviors.

And as I read through that part of the workbook, something that seemed very clear was that this was just how to live.

That if you had no pain whatsoever, or maybe no pain yet as a person, that it would still be true that trying to understand what is a good day for you and a bad day for you, trying to understand the ways in which you sleep and see friends and stress and all the rest of it, there's something, I mean, beyond just that pain needs to be treated holistically, it was striking to me how much the way to think about pain just seems to be an offshoot of the way to think about or try to approach your life.

And pain sometimes forces a sharpening of that, a more systematic approach.

But it was more similar.

And that struck me as in a way profound.

I'm curious, all this work you do on pain, how it changes your thinking about just how to live a day?

I think that is a profound interpretation of what we're saying here about how pain works and why we have it and how to get back on track.

And I think what you're getting at is this totally true idea that we're all really out of balance.

We know that a lot of the times as human beings, we've become more isolated.

We don't really exist in communities the way we're biologically built to do.

And we are sedentary for so many hours and we do have all these insane stressors piling up and I don't think we're managing them very well.

So I think what you're getting at, which is very true, is if you want to manage a pain problem, you sort of have to get your life in order.

You have to learn sleep hygiene and a lot of people are reliant on medications because again, the biomedical model, we have a lot of pills and procedures as solutions for every problem.

We have to get our social connections.

We have to pay attention to those and not ignore them because social medicine is real.

We have to pay attention, of course, to our bodies.

Are we going outside?

Are we moving our bodies?

Do we have enough support in that realm?

For example, if you're going to try and build up your muscles, do you have a physical therapist

to work with?

Do you have an occupational therapist?

So you're sort of seeing the matrix, which is, yes, everything is interconnected when it comes to human health and I think to me that's what's so compelling about this idea of biopsychosocial health.

It turns out that the treatment for depression is not just a pill.

We know that now also with all this recent research and the treatment for anxiety is not just a pill and shocking to no one, the treatment for pain is also not just a pill.

And then always a final question.

What are three books you would recommend to the audience?

One is Why Zebras Don't Get Ulcers by Robert Sapolsky and it explains how emotional health is always implicated in physical health and it's always implicated in pain.

Emotional health and mental health matters when it comes to treating pain.

If you're not treating emotional health and mental health, you're missing a significant part of the pain problem.

The other book is The Body Keeps the Score, Bessel van der Kolk.

It's been a bestseller for a very long time for a reason.

And it shows us unequivocally that trauma and emotions, again, don't just live in the head.

They also come out in the body.

Emotions are somatic by definition.

Trauma is somatic by definition.

That's not a bad word.

If we want to help people who are suffering, we want to reconnect trauma and emotions with physical pain.

They're all connected.

And the third book is going to be Pain, the Science of Suffering, which is by Patrick Wall.

He's one of the founders of pain science as we know it today, and he was one of the creators of the gate control theory of pain.

And a lot of the stuff that I talked about today is from this fund of science that he sort of established with his partner Ron Melzack back in 1965.

And pain neuroscience has evolved a lot since then, and we know a lot more about human health and all these drivers of pain.

But pain, the science of suffering, even though some of the science is outdated really in my mind lays a foundation for how all of this works and why.

Great job, Ness.

Thank you very much.

The Ezra Klein Show is produced by Emma Fagawoo, Annie Galvin, Jeff Gell, Rache Karma, and Kristen Lin.

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