Dolorology with Dr. Rachel Zoffness
Ologies Podcast
November 10, 2021

Oh heeey, it's that smoothie cup you should have washed yesterday, Alie Ward, back with an episode of *Ologies*. Let's get into it; Dolorology. *Dolor* means pain in Latin. Dolorology, it's the study of the nature and management of pain. It's a real thing. As it turns out, the folks who study it are pretty fired up about talking about it and it turns out, a lot of listeners are like, "I. Have. Questions."

So, this ologist reached out to me, told me that her mission as a neuroscientist is to help people feel better, and I was like, "Well, how the hell can I turn that down?" I happened to be in the Bay Area in October, following my new husband's new knee surgery.

> **Alie:** What's your pain level on a pain scale of 1 to 10?
>
> **Jarrett:** Umm… 4. 3, 4. It's not bad.
>
> **Alie:** 4? That's kind of a lot.
>
> **Jarrett:** 3?
>
> **Alie:** No, I'm not doubting you I'm just saying that sounds painful.

And after we battled some Friday afternoon traffic, we arrived at this ologist's Oakland office with Los Angeles-style punctuality, and then we settled into her couch to chat pain. Turns out, she knows her stuff. She has long brown hair, she was wearing knee-high boots, she has a very youthful exuberance, but a CV that slaps, metaphorically speaking.

She is a working Pain Psychologist and Assistant Clinical Professor at UCSF School of Medicine. She is on the Pain Education Faculty at Dartmouth, she's the Co-President of the American Association of Pain Psychology, she's a *Psychology Today* columnist about pain, and the author of *The Pain Management Workbook*, which might be the best $20 you can ever spend… other than Skee-Ball, which is also fun. This might be better.

We will talk about all this in a minute, plus questions from the folks at Patreon.com/Ologies. I have never received so many questions for any episode; it's great. If you want to submit questions for guests, it costs a dollar a month to join at Patreon.com/Ologies. But for zero dollars, you can send this episode to someone, you can mention *Ologies* to a friend, or a date, or you can subscribe, rate, or leave a review. That really helps the podcast. I read a new one each week to prove that I read all of your reviews. Thank you, ThelmaBurrito for the review you just left that said:

> *I was coming down from a psychedelic high on Wednesday and I felt like I needed to hear something comforting while relaxing in my sweats and fuzzy socks. I put on the episode of Sparklebuttology (Fireflies) and I don't know if it was the sparkly imagery, Alie's voice, or the sheer fact that I live in a world where someone would make content just so we can learn about things we would never otherwise learn, but I cried out of gratefulness. Thanks, Alie!*

ThelmaBurrito, thank you.

Okay. Dolorology, pain, what is it? Why does it hurt? How much does it hurt? Why do some people have more pain than others? How do pain meds work? Do redheads feel more pain? How long does it take to change your brain? How much pain training do doctors have? And is there a better alternative to that placard of miserable emojis that they have on the walls in the hospital? All this,

and life lessons, with pain psychologist, researcher, professor, author, mental health advocate, and Dolorologist, Dr. Rachel Zoffness.

[*pre-interview*]

Alie: We're only 44 minutes late.

Jarrett: Oh, okay!

Alie: Okay, first thing I'm going to make you do is if you can say your first and last name and your pronouns.

Rachel: I kind of want to sit on the floor. Let me see how weird this feels.

Alie: Oh yeah, no go for it! No, you can sit on the floor. It's like we're hanging out in a dorm room.

Rachel: Rachel Zoffness, she/her.

Alie: Got it. Dolorology, it's a thing?

Rachel: It's a thing!

Alie: Okay. How long have you known this word?

Rachel: The honest answer is, since I decided I wanted to be on *Ologies*. [*Alie laughs*] I'm not kidding. [*laughs*]

Alie: That's the best.

Rachel: I was like, "I know there's a word," because I do pain psychology, which is an ology, but I study pain science and pain neuroscience, which is outside of psychology, and there's a word for pain science, which is dolorology.

Alie: What's the worst pain you've ever been in?

Rachel: Oh, wow. The worst pain I've ever been in… I had chronic pain as a kid and I had, like, constant abdominal pain. But as an adult, I also had a running injury and it lasted for five years and I was on the couch for the better part of a year. So, that was probably the worst one.

Alie: What do people say hurts the most? I've heard kidney stones, I've heard birth, I've heard shingles, I've heard bullet ants. How do psychologists figure it out?

Rachel: So, the honest answer is this: people are trained to ask people about their pain on all these pain scales, and there's a lot of pain scales out there. And the most common one is, "Out of 10, what is your pain?" On the scale of 0 to 10.

Aside: Yeah, I just did that outside to Jarrett outside for probably the one hundredth time since his surgery two weeks before. Tee-hee.

Rachel: And the funny thing is, actually it's not funny at all, sometimes people will say, "My pain is a 10 out of 10," and it will be something that a healthcare provider will *think* should not be a 10 out of 10. So, the healthcare provider will say to the patient, "Imagine someone taking off your arm, that would be a 10 out of 10. So, now tell me what your pain number is," to try and get that person to lower the number, like sort of suggesting to the patient, "Oh, you're exaggerating." But in my mind, can you do anything worse to someone who is suffering than to say, "the number that you gave me is inaccurate"?

The answer is the most annoying answer in science which is: it depends. So, for one person, post-surgical pain might be a 6 out of 10, and for someone else it might be a 10 out of 10. So, I wouldn't say that there's any one thing that's the worst kind of pain.

Alie: That's a good answer! And when people are studying how sharp pain is, how do you even know?

Rachel: That is all you have. There is absolutely no other way to measure pain other than what someone tells you. So, if someone says their pain is 10 out of 10, that's what their pain is, the end. That's also why it's really hard to compare. Like, you can't compare your pain to my pain. You break your ankle, I break mine; if you're a 10 out of 10 and I'm a 5 out of 10, it's not like one of us is lying. Your pain experience is unique to you.

Alie: And as a kid, as someone who experienced chronic abdominal pain, which I cannot imagine is fun, and a running injury, for five years, were you in a position to choose your career at that point? When you had a running injury, were you like, "You know what, I'm going to change my major"? When did you decide, "I'm going to crack this code"? Because you're super passionate about this. You're like, "I looked up the word for this, I wrote a book about this, I want to talk about it." Where does that passion come from?

Rachel: So, when I was in college, I knew I wanted to live at the intersection of a bunch of things. I was fascinated by neuroscience, psychology, science writing, and working with kids, and medicine and I just… I wanted to find this thing that would let me live at the intersection of everything. And I took a course, a neuroscience course, in my freshman year at Brown because I was a nerd… To be clear, I was a library mouse, had no friends in high school. Total, total nerd.

And in Neuro 1, which was the best class I ever took, they taught us about pain, and it was the thing that seemed to live at the intersection of everything. Because as I'm sure we're going to talk about, pain is never purely physical, it's also emotional. And it's not located in the body, ultimately, it's produced by the brain.

Aside: So, pain is in the brain. Big revelation here. Much more on that, in a bit.

Rachel: And it's this thing that goes across psychology and medicine; it affects adults, it affects kids, it had affected me as a kid. So, when I went to do my Honor's thesis, my mentor who is a dear human being who recently, actually not so recently, passed from cancer, said to me, "There's this researcher here who studies pain. You should see if he'll take you on as a mentee." And he did, and under his tutelage, I did this long Honor's thesis on the gate control theory of pain.

And I just thought it was so dynamic and fascinating, and you know, everyone has pain at some point in their life. When you're a college student, you're still young, but as an even younger person, I had already struggled with pain. So, I was so fascinated by this intersection of all the things.

Aside: So, Rachel will explain the gate theory of pain in more detail later and how, essentially, kissing an owie does a sweet, neurological sleight-of-hand, kind of like a cool bat mitzvah magician.

But in terms of her backstory, Dr. Zoff got her bachelor's from Brown University in Brain and Behavior; two Master's, one in Psychology and Education from Columbia, one in Clinical Psychology from San Diego State; and then her PhD in Clinical Psychology from

University of California San Diego. Somewhere in there, she took a yearlong break to teach science at the Bronx Zoo, because she's rad. Anyway, she became a doctor and…

Rachel: As a postdoc, after I got my PhD in Psychology, I did my postdoc in pain management, and it was non-pharmacological approaches to pain. And I just went back down that rabbit hole and it was just so interesting to me that there were all these ways of treating pain that don't really get talked about in medicine, or at all, in psychology. If you're a psychologist, you never learn about what we call physical pain, never. And physicians very rarely talk about the psychological aspect of pain.

So, when I did my postdoc, I started doing trainings on pain. I wanted to know everything; I read every book I could get my hand on, literally. I spoke with a million people, I took a million classes, and then I decided that I wanted to start treating pain, and in particular I wanted to work with kids living with pain, when I first started. I was trained in adult and child psychology, but I felt like, in particular, teenagers get ignored a lot in medicine.

It's this really messy, weird age; they're not quite children, they're not quite adults. I wanted to focus on them, so I went to UCSF, and I offered to do some trainings for free on these non-pharm treatments for pain and how pain works in the brain. And in all these departments, for some reason, they let me come and give a talk to their physicians. Before I knew it, my practice was full of kids living with chronic pain.

Alie: [*hushed*] Wow.

Rachel: Yeah. But Alie Ward, one of the first kids they sent me… Can I tell you a story?

Alie: Yeah, yeah. [*"That's what I'm here for."*]

Rachel: One of the first kids they sent me was a kid who had been in bed for four years with chronic pain. He had chronic migraine, chronic body pain, diffuse, amplified body pain. He had been on about 40 medications, including Thorazine…

Aside: Okay, I want to do like an hour-long aside on Thorazine but I'm going to make this snappy instead. I'm going to put it in bullet points. Invented by a French doctor, 1952, to help with pre-surgery anesthesia; was also used as an anti-inflammatory; now, primarily used to manage hallucinations and mania and some symptoms of schizophrenia. But it's also been prescribed for everything from behavior problems, ADHD, to barfing, to hiccups.

Now, if you're like, "Why does Thorazine sound like a superhero made out of electrified muscle?" Well, the lab that marketed Thorazine named it after the Norse god of lightning and hammers, Thor, "to reflect the reverberations that would roll across the medical world as a result of this revolutionary new drug," their president said. So yes, anyway, Thorazine, the thunderbolt of psychiatric drugs, sometimes striking where it was not needed.

Rachel: It knocks them the F out, and this was a child, and he was on Thorazine for his pain, and it would knock him out for days at a time. So, he wasn't going to school, he wasn't seeing friends, he wasn't functioning. It was wild. He'd seen more than 15 physicians. And I had been reading… there's all these protocols for treating chronic pain, in both adults and children, and I had worked with a number of other patients, but I had never worked with a kid who'd been in bed for four years. And I almost called the referring physician to say, "I can't do it. If you guys can't do it, I surely can't." I almost called them to send him back.

But instead, the kid was so hopeless. Just to describe him to you, he showed up at my office, he had long, unwashed hair, he was overweight because he hadn't moved his body in a number of years, and he was rocking himself back and forth on my couch with the pain. I asked him if he'd given up hope and he said yes. So, I made the decision to lie to him. Yes, I know, it's a dubious decision, and I said, "I can help you, but you have to do everything I say."

And I knew, especially as a pain psychologist, *nobody* wants to go to a psychologist for pain because pain is sold to us as this purely physical or physiological problem. If you go to a psychologist, the popular thought is, "Oh, they're saying it's all in my head, or they're saying my pain isn't real or I'm faking it." But that's not true; there's all these treatments that are evidence-based for pain that are non-pharmacological.

So, I said to him, "I can treat you, but you have to do everything I say." He said, okay. And we went through this cognitive behavioral therapy protocol for pain management, which is now what I live and die by, and we started out doing very small things. First, it was "just stand on your porch in the sunlight every day" and even that was hard for him. And we did a lot of work together, so then it was like, "walk to the corner mailbox and mail a letter." He was doing PT and OT at the same time. And then it was like, "can we get a tutor to help you catch up in school?" Small bits of activity, small goals, and really pacing him to desensitize his brain and body.

Within three months, he was getting back to life, he was doing jogs around the block, he did get a tutor, he caught up with friends, and he eventually went back to school and soccer. And the more he did, the more he realized he could do, the more his brain desensitized, the more his body was able to function, and he was able to get back to life. His pain remitted, and his anxiety and depression did too, and he actually graduated from high school a couple years ago and he invited me to come.

Alie: Oh my god!

Rachel: Yeah so, I went to his graduation, and this kid, he got on stage, and he said, "If you had told me four years ago, I'd be graduating from high school, I never would have believed you." We all cried, and he went off to college and is swim captain.

He still has pain episodes, but he knows exactly what to do, and he's never going to be that kid who's in bed for four years ever again. No kid ever needs to be the kid that's in bed for four years, ever. The way we mistreat pain just drives me nuts, so I think that really drives me. I think I went on a tangent… maybe a long one.

Alie: No, that's beautiful.

Aside: So, before we learn how pain psychology works, let's just beep, beep… back it up and address the fundamental question.

Alie: What is pain?

Rachel: Right, what is pain?

Alie: What is it? And how much is it mind? How much is it body? How much control do we have over it?

Rachel: You're asking amazingly hard and awesome questions [*Alie laughs*] and I'm going to answer them. So, you can ask 40 different people and you'll get 40 different answers and

I'm going to try and squish all the things together and make it as digestible as possible. If I don't do a good job, I'm going to rely on you to call me out. [*Alie laughs*]

Pain is your body's warning system. By that I mean, it exists to protect you and save your life. I remember learning in this dorky neuroscience class that there are people born without the ability to feel pain.

Alie: What?

Rachel: Yes, and I remember thinking, "That sounds delightful!" [*Alie laughs*] And our professor said, "Yeah, and they don't live very long."

Alie: Oh fuck.

Rachel: Right. Because if you imagine; you put your hand on a stove, and you don't take it off; you go for a run and you break your leg, and you just keep running. Because pain is actually your body's danger detection system. But like every system in the human body, the pain system can fail. So, one of the biggest errors we often make as humans is believing that just because you have pain, it means necessarily that a body part is damaged or broken and that's not always what pain means. You can actually have pain without damage in a particular body part, is what we've learned. And that's what chronic pain is, believe it or not.

Pain is also adaptive. Again, it's this thing that saves your life. It is also this word that I'm going to use, that I've been told I shouldn't use because it's confusing, but I'm going to do it anyway: biopsychosocial. Yeah, what does that mean? Pain is biopsychosocial. What that means is, 100% of the time, whether your pain is acute, which means short term, so any pain three months or less; or chronic pain, which is pain that is three months or longer, or beyond expected healing time; your pain lives in the middle of these three bubbles or domains.

One is biology, biological sources of pain. One is psychology or psychological sources of pain. And one is social or sociological. I want to say what that means. So, if you imagine a Venn diagram, so there are these three bubbles that overlap. And in the middle, where they overlap, that's where pain lives.

Aside: Okay, pay attention. So, Dr. Zoff is going to break down the three sources of pain, starting with biological.

Rachel: In the middle of these three things. So, the biological components of pain are the things that you hear about all the time. So, it's genetics, tissue damage, system dysfunction, immune functioning, sleep, diet, and exercise. And those are all very important when it comes to pain. We all know that. However, if you think about this Venn diagram, if you're only focusing on the bio component of pain, you're actually missing two-thirds of the pain problem. Because we know that pain is this biopsychosocial phenomenon, and I promise I'll explain why.

But then there's all these psychological components and all these social or sociological components, and the problem with pain management is that we focus just on the bio, which is pills and procedures. And a lot of people with chronic pain will confirm that it doesn't cure their pain because it's focusing just on one-third of the problem.

Aside: So, here is the second source of pain… and also where I freak out.

Rachel: In the psychological domain of pain we've got, believe it or not, thoughts. Because neuroscience tells us that how you think, shockingly, affects how you feel.

Alie: [*croaky and drawn out*] Fuuuuuuuck.

Rachel: Right. So, if you imagine [*Alie laughs*] you have this pain volume that lives in your brain, this pain dial, when you have anxious, stressed out, and depressed thoughts, pain volume actually gets turned up. So, the things you think affect the way your body feels 100% of the time.

Then, in the psychological bubble, we also have things like trauma. Because trauma, a hundred percent of the time, also amplifies pain. There's these great studies called the ACE studies, Adverse Childhood Experiences, and they have shown that kids who have had adverse experiences – and by the way, adults too, who have trauma – it also amplifies this pain volume, this pain dial. So, if you are someone who has had pain in childhood or in adulthood, chances are, you're going to be more susceptible to higher pain and/or developing chronic pain.

And in the psych bubble also, there's memories. There's a part of the brain called the hippocampus, and it stores all of your memories, and there's a dedicated portion for pain memories. So, the first time you were held down and given an injection as a child, your hippocampus stores that information. Why? It's adaptive to remember the things that are painful because those things might save your life. So, memories also affect pain.

There's also emotions. Emotions also affect pain; that seems not even intuitive, but research also shows that how you feel emotionally affects how your body feels. And we all know that; when you're depressed, your body feels heavy, your muscles feel sore, it's just harder to get off the couch because emotions affect the body too.

And then there's coping behaviors also in the psych bubble. Coping behaviors just means, "What are you doing to manage your pain?" When you have pain, what do you do? So, some people – including me, as I mentioned, for a year – will stay inside on their couch, not exercising, not seeing friends, not moving. But what we know is that that's going to amplify pain also.

Aside: Okay, so those first two bubbles were biological and psychological. What is the third bubble?

Rachel: And then there's the social or the sociological bubble and that's everything else. So, socioeconomic status and access to care. I mean, if you're not talking about that are you really talking about healthcare at all? Or pain or disease? Race and ethnicity and racism, in particular. What does that do to your stress system? How does that affect your pain? There's also friends and family; do you have a support network? Do you feel like you're connected socially, or are you isolated? Being isolated or being socially supported affects how you feel all the time also. So, all these things together as you imagine… Human beings are these complex animals with all these things going on and they interact all of the time to affect your pain system.

That was a long answer to your question.

Alie: No, it was great. It was visual.

Aside: Oh, and a fascinating fact. The definition of pain has recently been changed to reflect those social and psychological components. So, a 2020 piece in the *Journal of Orthopedic and Sports Physical Therapy* explains that the International Association for the

Study of Pain has updated its definition of pain for the first time in four decades. And that the original definition of pain was, "An unpleasant sensory and emotional experience associated with actual or potential tissue damage." Which was criticized for being too focused on actual tissue injury.

And so the shiny, new, updated 2020 definition of pain is, "An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage." So, now pain does not need to be associated with actual injury.

So, Dr. Zoffness says the new definition leaves much to be desired, but it is an improvement upon past, disco-era definitions. But yes, right in line with the three sources of pain and really different from this foggy, jumbled mess that I thought pain was… which is now painful to listen back to.

Alie: And I never knew that there were three aspects of it. When I picture pain, I picture you have this nerve that looks like a thread and it has an injury on it, and it sends out electrical pulses that make your cells twitch. That is what I would think pain was. And that's not accurate at all. [*Alie laughs*]

Rachel: Right, but that makes sense, A. And B, they have done all this research that shows, you do have receptors in your body that respond to things like touch, and temperature, and like, nociceptive input – which is potentially dangerous input. But what they've discovered is, here's this really cool, really nerdy fun fact; pain can't possibly live exclusively in the body. But we all think that. We all think, like, if we have back pain, that means definitely there's something wrong with my back. Or if I have knee pain, that means that the pain lives exclusively in my knee.

But here's how we know that pain does not live exclusively in the body. There's a condition called phantom limb pain. And phantom limb pain is when somebody literally loses a limb, like an arm or a leg, and they continue to have terrible, excruciating pain in the missing body part. So, if you can have excruciating leg pain in a leg that isn't there, that has to mean that pain is produced somewhere else, and that somewhere else is the brain.

So, you definitely have these receptors in the body that are communicating messages up to your brain and your brain is always sending messages back down to your body; it's definitely a two-way street, they're always working together. But the part of your body ultimately that constructs pain, has to be your brain.

Alie: And how do you know, of those three bubbles, what is the biggest contributing factor? If you have a slipped disc in your back and that definitely hurts versus if the X-rays show nothing but there is chronic pain. How do you know how to start to address it?

Rachel: Here's the answer… [*laughs*] So the answer is, all three things are always contributing all of the time. And yes, in any given moment, something in any one of those bubbles might be like, activated, or up. But they're always, all three, acting all the time. So, there's always this recipe for pain, whether it's high or low, and the recipe always, 100% of the time, includes all three bubbles. But you're right.

With acute pain, which is short-term pain, it is usually a message that there is something going on with your body that you need to check out. So, for example, let's say someone has knee surgery, you bet your ass your body is going to be giving you all of these messages, "something's wrong." And yes, someone has just sliced into your tissue and

you're healing. So, with acute pain, yes, you want to check that out and find out what's going on with your body.

It's a little bit different with chronic pain and I'm going to tell you why. But to go back to your original question, if we don't address all three things, we're not ever addressing pain. So, if you imagine… There's this common analogy, if you stub your toe on a day you get fired, you've just lost your income, and you don't know if you're going to be able to afford your rent, when you stub your toe, you're going to be cursing and screaming and it's going to feel awful.

If you stub your toe when you're out with your friends eating ice cream, you're out in the sun, you're having a lot of fun, it feels qualitatively different to you. Your brain interprets the message differently depending on circumstance, environment, how you're feeling emotionally, where you are, who you're with, what's happening, how you interpret the sensation.

So the answer is, even with acute pain, all the time, all those things are working in concert. So, if you go to a children's hospital, in the ward, you'll see there's murals on the wall and stuffies on the chairs. There's a reason for that; when you help people feel safe and calm, your pain system is going to feel better too. It's going to be, like, less on alert. And that's true with adults also. So, whether acute pain or chronic pain, all the time, all the things are always working together.

Alie: And what about the biological methods that we have right now? How does Aspirin work? How does Aleve work? How does ibuprofen work? How do opiates work? What are they blocking? Because sometimes that absolutely blows my mind, that I can take something and a migraine will go away.

Rachel: 100% absolutely yes. That is totally true. And all the medications work in different ways, but they target receptors in your brain to block what I'm going to call pain messages.

Aside: So yes, chemically, it's pretty complex but just think of pain relievers fitting and locking into places and thus just ruining the vibe of the pain messages. Real cock blockers.

Rachel: But what's really interesting to me about opioids by the way, and all these medications – but opioids in particular because there's so much talk about opioids and pain – is that opioids work on an endogenous receptor in your brain. By that I mean, you already produce a chemical in your brain that opioids imitate, and they're called endorphins. So, if you hear of a runner's high… after you go for a run, your brain produces this opioid substance called endorphins. So, opioids bind to that receptor. It's true of all medications; whenever you take a medication, it's binding to a receptor in your brain for a chemical your brain already makes.

Aside: And side note, we're going to do a whole episode in the future on Meconology, which is the study of opium and opiates, including the epidemic of opioid addiction. But yes, medicines have pluses and minuses depending on their use.

Rachel: And I also need to be very careful and clear. I am in no way anti-medication. I am a person who is like, "Thank god that opioids and other analgesics exist for post-surgical pain, and things like migraine, and all the other horrible things that happen to human beings." Super helpful, super wonderful, and very important. And simultaneously, because pain is so mistreated in our country, and because there's such poor pain education in medical school, in psychology programs, in nursing programs, across the board, we completely and utterly mistreat pain and people are told that medications are the only answer.

So, people living with chronic pain oftentimes feel really helpless and hopeless. Because either their medication is being taken away from them, or there's a lot of controversy around it, or they feel like they don't have other options or alternatives. So, thank god for medication, and it is not the only answer. And, controversially, I'm going to get in trouble for saying this but I'm going to say it anyway, the problem with opioids for pain… and by the way, this is not… I didn't make this up, this is just what research shows. Over time, opioids sensitize the brain to pain. It's a sensitization syndrome; it's a well-known, established fact.

Aside: Google "opioid-induced hyperalgesia," it's like a closet just stuffed with items but instead of umbrellas and bowling balls falling onto your face, you're just going to be covered in studies about pain and opioids. So, Dr. Zoff explains…

Rachel: So, actually what happens over time is that your brain gets more and more tuned in to the sensory messages coming from your body, so if you ever try and go off, of course you're going to feel awful and terrible. And again, I am not anti-opioid, I'm not anti-medication but it seems important for people to know that, long term, their brain is going to get extra sensitive.

Alie: Now, what about someone who is experiencing pain – let's say it's chronic, let's say it's ongoing – where do you even start that CBT or something that is non-pharmacological? Do you just do a pain check-in? Do you just sit and try and figure out what hurts, where, and why?

Rachel: Can I answer your question in a sort of backwards way?

Alie: Yes.

Rachel: So, chronic pain is its own animal. It's considered its own disease process. So, here's what happens with chronic pain… To answer your question, the first thing that I do is I explain how pain works and I always ask people who come to my office who have been in pain for, like, ten years, "Hey, has anyone ever explained how pain works to you?"

Alie: And they're like, "No." [*laughs*]

Rachel: 100% of people say no, which is so wild to me when you've had pain for ten years. People will explain how the liver works but they never explain how pain works? That's crazy pants.

So, we've established that pain is constructed by the brain, of course in conjunction with the body. We've established that acute pain and chronic pain are different, they work differently. There's receptors in the body but the brain is always working with all of the information to decide whether or not to make pain and how much. With chronic pain, here's what happens... So, I'm going to ask you a question. Have you ever practiced anything? Any skill that you were bad at, and you practiced it, and got good at it?

Alie: Absolutely.

Rachel: Give me a thing.

Alie: Ukulele.

Rachel: Oh, that's the *best* one! [*Alie laughs*] Yes! Great, great. Have you noticed with the ukulele, eventually your fingers sort of know what to do?

Alie: Yeah, absolutely. And I can go faster on a song. I never have played in front of anyone. It's just something I do because it's fun to do alone.

Rachel: You know if I had known that I would have demanded that you brought your ukulele. [*laughs*]

Alie: Nope, nope. Can't do it in front of anyone. Yeah, I can think about the song before positioning each finger. Yeah. So, totally.

Rachel: Right. So, I'm going to say it back to you a little differently in the neuroscience, nerd way. The pathways in your brain are like the muscles in your body, the more you use them, the bigger and stronger they get. So, if you said to me, "Zoffness, I want huge biceps," I would say, "Alie, of course you do. Go to the gym and lift weights a lot," or like, actually be isolated at home, whatever, "lift weights a lot and over time your biceps will get big and strong."

It's the same with the pathways in your brain. The more you use them for any particular thing, the bigger and stronger they get. So, the more you practice ukulele, the bigger and stronger the ukulele pathway in your brain gets; you can hear the notes, your fingers know what to do on the strings, you know how to position the instrument, and that's with practice over time. Guess what happens when you inadvertently, accidentally practice pain over and over for weeks, months, and years?

Alie: Oy, same thing.

Rachel: The pain pathway in your brain gets really big and strong, and when that happens, we say that your brain has become sensitive to pain. What does that mean? That took me a long time to figure out. How do you explain that to someone? What does that mean that your brain is sensitive to pain? What it means is that small bits of sensory input from your body are interpreted by a sensitive brain as very big.

Dogs are sensitive to smell or scent, so if a dog came in here right now and sniffed around, they would pick up on these scents that you and I can't even detect because their brain is sensitive to smell. So, when your brain is sensitive to pain, it means that you might have little bits of sensory input coming from your body that are not dangerous, but your brain is going to amplify it and tell you that it's dangerous, and that's what pain is. It's this big danger response, this big danger warning message that actually isn't accurate and that's chronic pain.

So, one of the systems underlying chronic pain is this process called central sensitization. And it doesn't underlie all pain, but it explains a lot of chronic pain, and to me, it's so fascinating to be able to say to someone, "Hey, the chances are really high that your brain is hypersensitive and it's overreacting – it's not your fault – but it's giving you these danger messages when in fact your body might not be in danger."

So, for example with fibromyalgia, which is a chronic pain condition, you can go for a picnic with your friends and be sitting outside and be in terrible pain. But is having a picnic with your friends dangerous? The answer is no, but your brain is producing these danger messages and telling you that you should go home, and isolate, and be alone, and not move, and not see your friends. And that is a big, fat lie. And if you listen to your brain, and you do those things, and you go and isolate, and you lay on your couch for 40 years, you are not going to get better.

The treatment for chronic pain is the total opposite of what you think it is. Your body and your brain are telling you, "Isolate, stay home, don't move." And the treatment for chronic pain is like… My metaphor is, like, if you've ever been in a dark room and someone opens the blinds a little bit and you're like "Ahh, close the blinds, I can't see!" Because your brain

is sensitive to light when you've been in a dark room. But if you sit there for two minutes, your brain desensitizes to the light and then you're fine. And if they open the blinds a little more, you're like, "Shit! Close the blinds I can't see!" And then eventually, two minutes later, your brain desensitizes, you're fine.

Treatment for chronic pain – and that's what cognitive behavioral therapy is, by the way – is helping someone's brain and body desensitize to little bits of stimulation, a little bit at a time, until, like someone who's in a dark room, suddenly you're in a room full of light, gradually little bits at a time, and your brain and body are okay. So, that's the treatment. But you're not going to buy into the treatment unless you understand the science, so that's why it's so important for me to always lay that foundation.

Alie: And is the amygdala at all involved in this? Is anxiety and fear… is that a big part of pain perception?

Rachel: Yeah. Ahaaa!

Alie: Had a feeling, old Amy up there, fucking shit up, trying to help us.

Rachel: 100% yes. Okay, so crash course in pain neuroscience. Pain Neuroscience 101, here's how it goes. Ready?

Aside: Okay, I'm so ready. Let's hear what parts of your head are being a literal pain in your ass.

Rachel: So, there's lots of parts of your brain that contribute to pain. With some things, it's like, there's just one part of your brain. But with pain, it's a diffuse neurological process. What that means is, there's lots of parts of your brain that contribute to this experience we call pain. So, I'm going to tell you a couple parts of the brain.

One is your cerebral cortex. Your cerebral cortex is the part of your brain responsible for thoughts. Thoughts contribute to pain all the time. The second part of your brain is your prefrontal cortex and that's the part of your brain responsible for executive functioning and attention; what you're focusing on, what you're thinking about. And the third part of the brain is your…

Alie: Amygdala?

Rachel: Limbic system.

Alie: Limbic system.

Rachel: Yes. Your limbic system and your amygdala is a major part of your brain's limbic system. And your limbic system, by the by, is your brain's emotion center. And here's what this means; 100% – and I'm not exaggerating, 100% – of the sensory signals that come from your body filter through your emotion center before they become this experience we call pain. So, people always ask me, "Do you treat physical pain or emotional pain? You're a pain psychologist? That's so weird. Do you treat physical pain or emotional pain?" The answer is always, necessarily, "Yes. Yes." Because pain is always physical and emotional. It's filtering through your limbic system; it's filtering through your emotion center before it becomes this complex experience we call pain. So, yes.

Now I want you to imagine… we sort of touched on this earlier, that you have, what I'm going to call, a pain dial, like the volume knob on your car stereo and you can turn it up and down, and it lives in your central nervous system; your brain and your spinal cord which work together to control all the shit, including pain. So, here's how this works. Lots

of things can change pain volume, whether it's acute pain or chronic pain. Whether you've had it for five seconds or ten years. Lots of factors change pain volume to turn it up and down. So, three things I want to tell you about: one is stress and anxiety always changes pain volume.

Alie: Oh no!

Rachel: I know, right? During a pandemic?

Alie: Oh no! During a pandemic, oh no.

Rachel: Chronic pain during the pandemic went through the roof; opioid-related overdoses went up 40%; calls to suicide hotlines went up 8,000%. Dude, people are suffering, people are really suffering. People in pain, because of all this neuroscience we're talking about, it makes sense, right? So, stress and anxiety.

Thing two is mood and emotions always change pain volume. And thing three is attention or what you're focusing on. So, I'm going to tell you specifically how this works.

Aside: So, again that was stress, emotions, and attention.

Rachel: When stress and anxiety are high and your body and your muscles are tense and tight – which is what happens when you're stressed and anxious – and your thoughts are worried, your brain sends a message to this pain dial, turning up pain volume. So, whatever pain you had before, when you're stressed or anxious, like you just lost your job or it's a pandemic or like, whatever; you're stressed out because you're fighting with your partner or whatever… Your brain is going to amplify pain volume. Pain is going to feel worse when stress and anxiety are high. And anyone with any chronic pain condition will tell you that stress and anxiety can be a trigger or an amplifier of pain.

Thing two is mood. So again, negative emotions. So, when your mood is low and you're miserable and depressed – which ironically happens when you have pain – or emotions are negative in general, or you're angry, or you're very frustrated… your limbic system, including your amygdala, of course, which is implicated in all the negative… will amplify pain volume. So, pain feels worse when emotions are negative.

And thing three is attention, again, what you're focusing on. So, when you are sitting in bed, or laying on your couch and you're focusing on your body, you're thinking about your pain, that body part that's hurting, your prefrontal cortex sends a message to that pain dial, raising pain volume. So, pain feels worse when you're thinking about it and when you're focusing on the body part that hurts.

But the reason this is critically important for those of us who have pain, which is 100% of us, is that the opposite is also true. The opposite is also true! And if you think about the implications for pain management, that's pretty wild. So, let's talk about the opposite.

When stress and anxiety are low, your body and your muscles are relaxed and your thoughts are calm, your brain sends a message to that pain dial, lowering pain volume. So, pain feels less bad when you are relaxed and calm. Thing two is mood, emotions. When your emotions are positive, you're feeling happy, joyful, and grateful, and you're doing fun things with friends, your limbic system lowers pain volume; pain feels less bad when emotions are positive. And thing three is attention, when you are distracted, when you're so absorbed in some activity you briefly forget about your pain, we've all had that experience. That is not magic, that is your brain's pain dial.

So, your brain, your prefrontal cortex, will lower this pain dial when you are absorbed in things and you're not thinking about your body and you're not thinking about pain. So, that is why, when you go to give a child a vaccine – which everyone should do, get an injection – you give them a screen and they can watch their favorite show and they're distracted, and it hurts less. So, all these things together, in my mind, help us understand that pain, again, is this biopsychosocial thing that's regulated by mood, thoughts, what you're focusing on, and where you are, and who you're with, and your context. And all those things are going to matter to your brain when it makes this pain decision: whether or not to make pain, and how much.

Alie: So, what are some of the first steps? If someone doesn't have the privilege of being your specific patient, for example, or maybe their psychologists or medical doctors don't have this much information in their brains about it… Where do you start with people? Do you start with just, start meditating, go on the porch? Where do you even begin?

Rachel: So, I do this treatment called cognitive behavioral therapy and there's a lot of misunderstanding and misinformation about what that is and how it applies to pain. So, what it is, is it's a treatment that was originally developed for anxiety and depression that does have evidence of effectiveness. It also is a treatment, by the way, for sleep and family dysfunction, and all these other things that also contribute to pain, which is so fascinating to me. Because all the things are interconnected, so it makes sense to me that this thing might be useful for pain. And it teaches us that how you think affects how you feel emotionally, affects how you feel physically, affects how you behave or act. So, round and round in a circle: what you think affects how you feel, affects how your body feels, affects how you act. And I can give you an example of that.

So, let's say, someone invites you to a party. They're like, "Alie Ward, it's been a year and a half pandemic, [*Alie laughs*] come to my house, we're going to have a party in my backyard, it's going to be really fun." And you have this thought in your head, you think to yourself, "I am a loser and nobody likes me and if I go to the party, no one will talk to me and I'll just be standing by myself."

Aside: At this point, I was feeling depressed and ashamed.

Rachel: That thought is going to affect your emotions. How might you feel if you thought that thought?

Alie: Oh, depressed and ashamed.

Rachel: 100% yes. Right. So, you're feeling depressed, miserable, and ashamed. So, how does depression affect your body?

Alie: I think I would have a harder time getting up and getting ready for it.

Rachel: That's right.

Alie: I think I would sink into whatever soft fabric I am sitting on at the moment.

Rachel: Yes. So, we know that negative emotions impact the body, right? And I like to say that negative emotions don't just live in your head, they also come out in your body. If you've ever been stressed out or nervous and your palms get sweaty, [*Eminem's "Lose Yourself" plays in background*] your mouth goes dry and your heart races, [*"Mom's spaghetti."*] of course emotions come out in your body. Or if you've ever been depressed, you also know that you feel heavy and unmotivated. So that thought, "I'm a loser, nobody likes me, I'm going to have a terrible time," is going to trigger negative emotions, and that's going to

affect your body. You're going to feel unmotivated and heavy. So, what do you do as a result of those thoughts and feelings? You already said it perfectly. You...

Alie: Sink into a couch and then I send a text about being on deadline… which is a lie.

Rachel: Right. [*Alie laughs*] And you put on your fuzzy pajamas, and you get a tub of ice cream, and you binge watch Netflix. Exactly. But the cycle spins around. So now, you're missing out on the party, and you're sitting on your couch, and you're in your pajamas, eating a tub of ice cream and what are you thinking to yourself now? "I am a rock star?" Or are you thinking, "I am a loser."?

Alie: No, I am the loser that I thought that I was.

Rachel: 100% yes. And that's what we call the cognitive behavioral therapy cycle of how thoughts affect the brain, affect the body.

But now let me give you the opposite. Someone says, "Alie Ward, come to my house, we're having a great party, you can wear whatever dress you want, put on your nicest shoes." And you think to yourself, "I am a rock star, people love me, I am the life of the party. I'm going to breakdance, [*Alie laughs*] I'm going to pull out my breakdancing moves, and I'm going to bake brownies and bring them and everyone's just going to think…" How does that thought make you feel?

Alie: Oh, lighter, excited, and a little nervous.

Rachel: Great! Love that constellation of emotions. Totally excited, a little nervous. How does that affect the body? Usually, when you're excited you have a lot of energy, you know. You feel motivated. And then what's your behavior? What do you do?

Alie: Definitely put on lipstick, do some mascara, dig out the liquid liner, bake some brownies, eat some of the batter [*Rachel laughs*] if I want to, and maybe even leave the house on time.

Rachel: That's right, you go to the party. You show up at the party in your dress, you bring some brownies. Chances are pretty high some person is going to be talking to you and if you're really feeling and thinking, "I'm a rockstar, I'm going to have fun" chances are high you probably will. You'll attract someone to come talk to you.

So, the things you think, affect the things you feel, affect how you behave, always. That's always true. And the shit of it is, when you're anxious and depressed, you get stuck in these thought cycles that contribute to the perpetuation of the cycle, and you can see how that would easily happen.

And it happens with pain also. When you have pain, a lot of the thoughts that I hear are, "I'm broken, I'll never get better. Nothing has helped me, so nothing is going to help me. Why bother?" And that makes you feel anxious and depressed. And what we already know from pain neuroscience is that that's going to amplify pain. So, your body's going to feel worse and how are you going to act as a result? You're going to stay inside on your couch, with a tub of ice cream, in your Snuggie, or whatever; it's going to be very hard for you to break that pain cycle.

So, what we do in cognitive behavioral therapy or CBT is, every individual is unique who comes into my office and my job is to educate them about pain in their body because no one ever has, and then to figure out what's that person's unique cycle? Because you bet, they're thinking their own unique thoughts and feeling their own unique feelings and

they are down whatever coping rabbit hole they're down, and everyone is doing the best they can to manage their pain. Right, this is not a critique; everyone is doing the best they can. And if you really believe that staying on your couch for five weeks is the answer, or five years, that's what you're going to do.

So, it's like, what is your cycle? How do I help you break it? You can break it by going after the thoughts, and you can break it by going after the emotions, and you can break it by going after the behaviors. So, what I happen to like to do with my patients the best is change behaviors first.

Alie: Oh! So, you go backwards on the wheel.

Rachel: So, I should have said this, the wheel can go in any direction. Because if you think about it, if you just start with the behaviors, you're laying in bed for five years… What are you thinking and how are you feeling? That's what I like about the wheel, everything affects everything, it's multi-directional, it's always spinning in every direction. What I like about behaviors is, thoughts are really complicated, it's really hard to challenge your thoughts, but with behaviors, it's like, "Okay, what's one thing I can do today that will get me off the couch? I want to make fudge. Can I send my friend out to help me buy ingredients and walk to my kitchen?" So, what are small little things I can do to break the cycle, and I find that that's often a good place to start. Because once you change a behavior, you can get a little motivation or forward motion going.

So, full circle to the kiddo who had been in bed for four years, the first thing we had him do was stand on his porch and get a little sunlight. Eventually, within a couple weeks, he went and got a haircut, which sounds like a small thing, but when you have long, unwashed hair for four years and you look in the mirror all the time, that's reinforcing the wrong… you can't feel so great. When he went and got a haircut, dude, that kid was a different kid. It was a small thing, but it really pushed us forward. I know that sounds really weird when you're talking about pain.

Alie: No, no.

Rachel: But it really changes the cycle.

Alie: And so, do you ever recommend having an accountability buddy or a journal? Or what's a tool that you can use to kind of keep your mind in this CBT… other than a therapist and a workbook?

Rachel: I love accountability buddies, definitely. Science shows that social support absolutely, always changes the brain and body. So, if you have someone you can do the things with, 100% yes. I do also like journaling, I think that's very helpful too. Because when you write stuff down, you're your own accountability partner sometimes. And when you write stuff down, you can track your progress and you can see your change. You're like, "Oh, I did that thing and then I felt motivated to do that thing."

I do also think that workbooks are useful for people and they're sometimes really dorky, but it's a guided path toward accomplishing a goal and it's very hard to know what to do. Here I am spouting… I'm making it sound easy. It's so hard to live with pain every day. It's so discouraging, it's so hard.

Aside: So, Dr. Zoffness says, working with anyone on this can be helpful, whether it's a friend, a partner, an accountability buddy, you can get a physical therapist, or an

occupational therapist, any therapist who could maybe go with you through a workbook. Or you could try to find a pain psychologist which is… what, exactly?

Rachel: So, what is pain psychology? Again, I wanted to live at this intersection of neuroscience, medicine, psychology, and helping people and science writing… Pain psychology is kind of that. Pain psychology is, how do you put together this complicated thing we call pain and deliver it to the unique person sitting in front of you, in a package that they can digest and understand, that isn't stigmatizing? Because that's the worst part for me about being a pain psychologist, is everyone who comes to see me believes that their physician has given them this message, "It's all in your head, you're faking it." Or "It's just psychological. Your pain is just psychological." And that's never true of pain! We know that pain is always biopsychosocial.

You said migraines; it's always change in blood pressure, changes in blood flow, and it's changes in how your brain is working. But it's also changes in stress and anxiety, what's happening in your environment around you, and your diet; it's all the things working together. So, a pain psychologist looks at this complicated picture and tries to figure out, what do we need to do to help your pain? And what does your pain recipe look like? And I want to tell you what a pain recipe is.

Aside: Since she explained this to me, I have thought about it every single day since.

Rachel: So, a pain recipe, in my mind, is like… I don't know why I'm talking so much about brownies; I must really want them. [*both laugh*] But if you're someone who bakes brownies, you know, there's a recipe for awesome brownies; you have to mix these particular ingredients together, and particular amounts of them, and you have to put them in the oven for a particular amount of time, and if you don't, the brownies are not going to be cooked, or they're going to be burned, or they're going to taste really disgusting because you forgot the chocolate. And it's the same with pain, there's always a recipe for high pain, like a really bad migraine day, and there's always a recipe for low pain, a day I'm feeling awesome. And if you ask people, they will often know what their high pain recipe is.

Alie: Oh, absolutely! With migraines, I know exactly, like… Not enough sleep, not enough water, stressful day. And I know that it's got to have, usually those, three factors.

Rachel: Baby you got it, that's exactly right. So, the trick for me is, if we know what the high pain recipe is, how do we puzzle out what the low pain recipe is? You're right. In a high pain recipe, it's often this combination of sleep, and I'm not eating well, and I'm fighting with my partner, or there's a lot of stress at work or whatever… There's a lot of other stressors and things going on in my life too, and I'm not exercising, and I'm not taking care of my body. So, it's all these biological, psychological, and sociological factors, all the time interacting. So, when we think about a pain recipe, I'm looking at all three of those bubbles as a pain psychologist. I'm like, "Okay, what do I pull from this bubble, and this bubble, and this bubble to make this person's high pain recipe? And then what do I need to make a low pain recipe?"

And the thing about a low pain recipe is it's just the F-ing opposite. [*Alie laughs*] So, it's getting a good night's sleep, taking care of my body…

Alie: Drinking water.

Rachel: … managing my stress and anxiety, staying hydrated, and putting limits on toxic relationships, and saying no. I have a problem saying no. People come to me, and they are

suffering, and dude, it is so hard for me to turn people away and say no, or do things where I'm spreading, to me feels so critical, this information about pain and I have opportunities to do that, and I want everyone to know and to have power over their bodies. Anyway, there's all these lines we have to draw in the sand, if we want to have a low pain recipe. Like, how do we take care of our bodies in any given moment so that we're going to feel okay? So, that is my down and dirty, "what does a pain psychologist do?"

Alie: Oh, I love that. I love thinking of it as a pain recipe.

Rachel: 100% yes.

Alie: I have so many questions from listeners, can I fire them at you?

Rachel: Oh, you do?! Oh wow. Because pain is like… that's the thing. That's exactly why I want to do stuff like this. Pain is this ubiquitous human experience that no one has been told anything about. It makes me mad.

Alie: I know.

Aside: But real quick, before we take your questions, we're going to give some money away. Each week we donate to a charity of the ologist's choice and Rachel says that she sometimes sees kids with medical conditions who come out as gay or trans over the course of their treatment. She said she's always so honored to be part of their journeys and more safe spaces need to be created in medicine for kids to talk about gender and sexuality. Especially because suicide rates are so high in the LGBTQ youth.

So, she would like to please donate to The Trevor Project to support these brave, strong, amazing kids, she says. And The Trevor Project is the world's largest suicide prevention and crisis intervention organization for LGBTQ youth. So, money in their direction, thank you, sponsors.

[*Ad break*]

Okay, let's start by answering your burning curiosities about fiery redheads from patrons Mark Hewlette, Jason Krause, Andria Marsh, Carly Low. First-time question-askers Melissa Avignon-Redford, Erin Sorensen, Alyssa Benson, self-identified smokin' hot redhead Nina Giacobbe, and…

Alie: Okay, Nadine says: I've heard that redheads have a different pain tolerance than the general population. Is this true? Nadine is a first-time question-asker; many other gingers asked this as well. And as someone who is a fake ginger, [*Rachel laughs*] I feel like I have dentists be like, "I know redheads…" and I'm like, "Who are we fooling?" You see my gray roots. So, I am not a real redhead. But yeah, what's going on genetically with that?

Rachel: Here's the honest answer, and by the way, you know a good healthcare provider when they give you this answer. The honest answer is, I don't know what the research says. However, I will tell you this, if you are someone who is sensitive – and I have absolutely no idea if there's any actual data on whether redheads are more sensitive than any other person – but if you are someone who is sensitive, and by sensitive I mean, you were a sensitive child, smell, touch, and your senses are heightened, or you're emotionally sensitive and you pick up on things… that means, by the by, friends and listeners, your brain is sensitive.

When your brain is sensitive, guess what? It's more sensitive to sensory input from your body also. Why? Because a sensitive brain is more likely to amplify warning and danger messages from the body and tell you that there's danger when there might not be. So, I don't know about the redhead thing, but the sensitivity thing is a thing.

Aside: Okay, I looked up this flimflam, this weird myth about redheads and anesthesia because it's so annoying that it persists, and I found out… get this: it's true. Research backed. This is real, y'all. So, you can see the 2004 study in the *Journal of Anesthesiology*, titled, "Anesthetic requirement is increased in redheads." They're like, "Here you go." They found that redheads are more sensitive to pain, they need significantly "more anesthesia" than people with dark hair, but redheads need fewer opiates. So, that was in 2004. What's changed in 17 years?

Well, we know now, why. A more recent study found that a certain gene causes melanocytes in redhaired mice to secrete lower levels of this protein called POMC. (You will not be quizzed.) But that protein gets diced up into hormones, including one that enhances pain perception, so they need more anesthesia, and another that blocks pain, meaning that they need lower opioid doses. So gingers, you're magical mysteries and I am honored to pose as one of you.

But what if you don't have hair the color of a chestnut horse in the sunset? Well, you could just be a highly sensitive person, which is not a disorder, it's an attribute; it's a trait. And highly sensitive individuals appear in all kinds of species, from humans to fruit flies, scientists say. We're all unique little flowers. And some scientists at the Queen Mary University of London do call us flowers i.e., highly sensitive, 31% of people, they call orchids; a low sensitive group, 29% of you, called dandelions; and then a third group at 40% who have medium sensitivity, which they say are tulips. I don't know jack shit about botanical robustness but I hope that they asked a flower person first or else things could get… pretty thorny. [*mischievous laugh*] I *rose* to the occasion.

Alie: And is that like a highly sensitive person, HSP? I've heard of that, but I wasn't sure if that was recognized by the medical community, you know?

Rachel: Being sensitive is recognized as a predictor of pain and development of chronic pain. By the way, trauma makes your brain more sensitive. Why? Because having trauma as a child… your brain needs to be sensitive, it's adaptive. If something terrible has happened to you, your brain is always scanning the environment, your internal and external environment. Like, "Is a bad thing happening? What about now? What about now? Is there danger? Is there danger?" So, if you've had trauma, your brain becomes more sensitive.

Alie: Ilse Van Meerbeek wants to know, "Is there an observed relationship between pain tolerance and genders?"

Rachel: Ooo, that's so interesting. So, what we do know is that rates of chronic pain are higher in women. The thing about pain tolerance is, I don't exactly know what that word means. It goes back to that super subjective pain scale, that pain rating measurement where you ask two people or 25 people, "Does this hurt and how much?" and everyone is going to give you a different answer. I know that women in general are more prone to developing chronic pain and I don't know if that has to do with sensitivity, that's a really interesting question.

Alie: Yeah, I wonder if they've done studies too on people who are gender nonconforming and how much trauma that they've experienced too. I'm sure there's quite a bit of that.

Rachel: I'm going to guess there's almost no research on that because not enough research has been done on that. But should there be? Definitely.

Alie: Of course.

Aside: I wish that this had a name. Oh, it does. It's called the gender pain gap. Because for many, many hundreds of years, people who were not men were just not included in research, which hurts. And I want to get real spicy about it. Speaking of…

Alie: Umair Khakoo says: Can we talk about the TRPV1 receptor and pain tolerance with spicy foods? Is there any relationship between spice tolerance and pain tolerance?

And I have myself, my brother-in-law, Lee, who is also a heavy metal guitarist, can also eat the spiciest foods on Earth and none of us understand how he does it... What's happening with spice? [*Alie laughs*]

Rachel: Great. So, the answer is, yes you have receptors in your mouth that respond to touch, and heat, and sensation. So, you have sensors on your tongue that pick up on how hot or spicy a food is, but it doesn't become interpreted as pain until it gets to your brain, and your brain inputs all the other information also.

So, people who can eat extremely spicy food, usually are people who have been doing it for a long time and they started with low to medium, and over time they worked their way up to super spicy. And guess what's happening? Their brain and their tongue are desensitizing over time. Like being in that dark room and it gets a little bit brighter at a time. So, you can develop a really high spice tolerance if you want to, using this graded exposure, a little bit at a time.

Aside: So, fun fact: birds can't taste spicy, but squirrels can. Which is why some bird seed is sold laced with hot sauce. So, squirrels would be like, "Fuck this. Who am I, Paul Rudd? What is this, a YouTube show about hot wings?" But birders say, better just to get a squirrel-proof bird feeder. And to help prevent the spread of bird diseases, make sure to clean your bird feeders regularly, even if it's a headache.

Speaking of headaches, a lot of patrons wrote in about migraines such as Rahala, Shay Stemplewski, first-time question-asker Claire Garden Specialist Hafer, Brea Plum, Turtle Sarah Carter, Jade Pollard, Paulina Krasińska, first-time question-asker Rachel Shepherd, Ann M, Madeline Duke, Kelly Semon, Sonjabird, Kelly King, and…

Alie: Colleen Heather, migraine question: Why do some people like myself and my grandmothers get migraines right before it rains? Do you think that's anywhere in a pain recipe? Barometric pressure?

Rachel: It's got to be, I don't know the data. These questions are so amazing. I don't know the data on migraine and rain… So for me, I live with chronic leg pain and my chronic leg pain also changes with weather changes, so before rain my leg will also throb. I've heard people say that that's like… I hate this phrase, "an old wives' tale", whatever that means. But I've heard people say that that's not evidence based, and I've never looked into the evidence but now I'm going to. I don't know if there's sufficient data to show. But it would make sense to me that it would be part of a pain recipe because of course there's barometric pressure. If the environment around you changes, it seems reasonable that your pain would change too.

Aside: I had to look this up and sure enough, there's a 2019 study titled, "Blame it on the weather? The association between pain and fibromyalgia, relative humidity, temperature, and barometric pressure." Someone is out there asking these questions!

So, the short of it is that lower barometric pressure was associated with more pain in fibromyalgia patients, and arthritis patients, and even people with migraines. But the cause, it sounds like, is still murky. Lower barometric pressure can make tissues expand, which might cause joint pain. And migraine scientists say that blood vessel dilation associated with the influence of changes in atmospheric pressure can also maybe cause migraines. And lower barometric pressure reduces the amount of available oxygen in the air. But it also usually means shitty weather, which contributes to some psychological factors for some folks and pain hurts more.

So apparently, weather accounts for 20% of migraines in Japan. What else triggers migraines? Not much, just like over sleeping, sleep deprivation, premenstrual period, stressful life events, hot weather, cold weather, relaxation after stress, menstruation, high winds, intense emotions, hunger, bright sunlight, red wine consumption, food additives, MSG, nitrates, also serotonin changes can open and constrict blood vessels. If you've had migraines, you might be chuffed to learn that they're the most common neurological cause of disability in the world, according to a 2017 study, which also taught me the ology of Migraine Pathophysiology. Yeah? Future episode anyone? My brain says, "Hell yes, no question." Speaking of… this next question about emotional pain was asked by 4 million of you.

Alie: Scott Sheldon, great question, "Is there chemically a difference between physical and emotional pain?"

Rachel: [*"Oh my god."*] That question makes me so deeply happy. [*Alie laughs*] There are these wonderful, wonderful researchers who study social neuroscience… I'm going to answer your question in a roundabout way. They studied the neuroscience of social exclusion and being ostracized, the science of ostracization, which is a very hard word to pronounce. [*Alie laughs*] [*AI voice, "Ostracization."*] And they found that social and emotional pain maps exactly onto the parts of the brain that process physical pain.

So, is there a difference? Yes. Do they overlap and affect each other 100% of the time? Yes. Does emotional pain hurt physically? You know it does, ask anyone who is going through heartbreak how their body feels. You have chest pain when you are heartbroken. So, emotional pain and physical pain, always, always, always are connected in the brain.

Alie: It's funny because it's like, looking at Instagram, you might as well actually be hitting yourself in the face with a frying pan. Might as well just do that.

Rachel: [*laughs*] That is amazing. Amazing.

Alie: It does hurt.

Aside: So yes, physical and social pain overlap in an area of the brain called the anterior cingulate cortex. And yes, Jade Bawcom-Randall and first-time question-asker, Cary Anderson, pain relievers can soothe broken hearts or at least smooth ruffled feathers. For more on that, you can see the very directly titled, "Acetaminophen reduces social pain." fMRIs showed that acetaminophen reduced neural responses to social rejection. And I don't know how they tested that, but I hope they were nice to the volunteers. So yes, pain relievers, or better yet, CBT, might help when you're feeling butthurt.

Now, aside from your crack, how about your back? First-time question-asker, Jacob Leftwich, Amy Narimatsu, PixieMuffin, FuzzGoddess, Ilse Van Meerbeerk, and Savannah Bigley all have 99 problems, and a back is one.

Alie: Now, Michael Swords wants to know: When it comes to back pain, how can we get rid of it? I feel like I know *so* many people in various levels of athleticism and age that have back pain. What's going on there?

Rachel: Back pain is one of the most common types of chronic pain and the answer to your question is, if you're not treating it in a biopsychosocial way, your back pain is going to stay exactly the same. So, if you ask every single person you know how they've treated their back pain, I'm going to bet a bazillion dollars – which I don't have to give you [*Alie laughs*] but I do have the capacity to receive – that they have been told to treat their pain with medications and potentially surgeries.

And check this fact out, ready? There is a new syndrome in medicine called, failed back surgery syndrome.

Alie: [*moans*] Oh noooo.

Rachel: That's right, they've given it a name. And that's a highlight, a beautiful example of when you treat pain purely biomedically, chronic pain in particular, it is not going to work. And by the way, that's not to say that back surgery doesn't heal people. It surely does and there are lots of things that can go wrong with a back, totally. But pain, chronic pain, is processed by the brain. So, we have to think about the whole person and the whole picture. So, if someone is living with chronic back pain and the pills and the procedures have not worked, the answer is, let's go after the other things in the pain recipe to figure out what's going on.

Alie: Great answer. Tabitha Whitt wants to know: Why do some people hold their breath when experiencing high levels of pain? Asking for me, [*Alie laughs*] they say.

Rachel: Love that. Right. So, if you remember that pain metaphor we were talking about, this volume knob that operates… One of the things that happens when you have pain, believe it or not, is that stress and anxiety go up. If you ask human beings in general, what are the biggest stressors on human beings? Death of a loved one, moving… but pain! Pain is one of the biggest stressors on a human being. It's so stressful to be in pain. So, we do these things, like we clench. Sometimes we don't even know we're doing it. So, we clench our whole body or the part of the body that hurts, and we guard, and sometimes we limp, or we change our posture because pain is miserable and you're trying to do everything you can not to have it.

So, holding your breath is a pain behavior. It's a clenching, often involuntarily, because pain hurts… which is the most basic thing I've said all day. [*Alie laughs*] Pain hurts! So, you're clenching and you're trying to fight it off. And the irony there is, as we know from the pain dial, the more you clench, and the more tense and tight your body is, the higher your pain volume is actually going to be.

So, somehow finding a way to help your body relax and be calm is actually one of the things that we're going to need to do to help pain. And by the way, easier said than done. I'm not just seeing, "Oh, be relaxed," because that's not a thing… I hate that, when people are like, "Oh, just relax." It's not just that, it's more complicated than that, but the tensing and the tightening actually is going to make pain worse.

Alie: That makes sense. Quinn West had a question: If you take medication that blocks pain signals, is the pain still there? This is kind of a philosophical question.

Rachel: Great question. So, I'm going to answer that with another question. If pain is produced by the brain and you're blocking the messages in the brain, are you actually blocking the pain messages? I think the answer has to be yes. Because you're blocking the messages that your brain is interpreting as pain. So, the sensory signals coming from the body are not yet pain. So, the sensory messages coming from the body, whether it's a broken foot or a bad back, it's not pain until it gets to the brain, it's just sensory information. So, when you target the brain in your treatment, yes, you're blocking the ability of the brain to interpret that message as pain.

Aside: So, a lot of folks such as Roberta Amalia Conti, Cheese, Leanna Shuster, Alice Clare, Dorrie Coffman, Brent Maphis, Michelle Jacobs, Lilah Weller, Lindsay Mixer, Catalina, first-time question-askers Kelly Shaver, Andrea Cassidy, Edda Rós, Monica Sweet, and Molly had questions about fibromyalgia, which is a disorder that causes pain and tenderness all over the body. It also causes sleep problems and fatigue. In my opinion, it sounds not fun.

Alie: Heather Circle wants to know: For those experiencing symptoms of fibromyalgia, what are some good tests to request from a doctor?

Rachel: There are no good tests for fibromyalgia. Diagnosis of fibromyalgia has been a shitshow. There's lots of different ways of diagnosing; it's like, a certain number of body parts have to be in pain but as everyone with fibromyalgia knows, different parts of your body hurt in any different given moment. So, if you only have pain in eight body parts tonight, does that mean you don't have fibromyalgia? So, there's no real great test, is the honest answer. But if you're living with fibromyalgia, you absolutely have a biopsychosocial pain recipe, and we need to figure out what that is.

And again, I always want to talk about the stigma around recommending psychology for the treatment of pain. I live with that stigma every day. I always recommend psychology for everybody living with chronic pain. Why? Because if you're not targeting the brain, you are not targeting pain. And psychology really goes down the rabbit hole of, what are you thinking? How are you feeling? And how are you acting? So, I would honestly, from the bottom of my heart, recommend a pain psychologist or even any psychologist for people living with fibromyalgia, in addition to all the other things you're doing; PT, OT, and going for walks with friends, and doing fun things, and baking brownies.

Aside: So, some pharmaceutical therapies for fibromyalgia are actually also used for neurotransmitter balance and the brain's ability to tamp down pain signals. Researchers have even tried low doses of naltrexone, which is prescribed for alcohol use disorder and opioid use disorder. But in many studies, cognitive behavioral therapy provided what researchers call, "Worthwhile improvement in pain-related behavior, coping strategies, and overall physical function." And they noted that, "The beneficial effects of CBT can be achieved in 10 to 20 sessions compared with many years required for classical psychoanalysis."

So, CBT has also been shown effective for reducing neuropathy pain and improving pain interference and mental health functioning. So, retraining your actual brain to tell those pain signals to cool their frickin' jets please, and thank you. And Rachel says this is so exciting because of neuroplasticity.

So, in an email after our interview, she added, "The fact that the brain is always changing means that the brain can change. And if the brain can change, pain can change. Which is good, not only for pain havers but for the people who love them." Like Megan Stingle, who asked: When someone tells me about an injury, why do I sometimes feel a vague sense of pain in that part of my body while they're telling me a story? And another patron echoed that.

Alie: Stacey Sevelowitz asked: Is sympathy pain real? Do twins feel it more? Or is it more likely for people who consider themselves empaths?

Rachel: Oh my gosh! These questions are lighting up my brain. Yes, sympathy pain is real! So, they do these studies in neuroscience where they look at a mother's brain and a child's brain, and if the child is suffering and experiencing pain, the mother's brain, the pain pathways in the brain, light up as if she's in pain. Which is why moms have such a hard time tolerating their children crying. It triggers you in that way.

So yes, we have mirror neurons in our brain and we do feel other people's feelings. Anxiety contagion and emotional contagion are real and yes, if you are someone who is empathic, or an empath, I'm going to tell you what that means. It means your brain is really, really, really sensitive and you pick up on things other people can't pick up on. So, you feel other people's emotions when you walk into a room. And I'm going to bet a lot of money that you're an empath, Alie Ward.

Alie: [*Croaks*] Yeahhhh.

Rachel: Totally. Right, right. So, it means our brains are more sensitive so we're more likely to pick up on things that other people are feeling emotionally, but the downside of it is that we're also more likely to experience chronic pain.

Alie: A lot of people who I will list in an aside…

Aside: Mariana Hülsen, Dene Dryden, and Ashley Homme…

Alie: … want to know how touch inhibits pain and if scratching or applying pressure helps alleviate pain? What's happening there?

Rachel: I want everyone to know I'm doing a dance of joy in my chair. [*Alie laughs*] So, I mentioned back in the day when I was a nerdy undergrad that one of the things that really excited me about pain was this thing called the gate control theory of pain. And the gate control theory of pain is just this nerdy neuroscience. It's like, back in '65 these guys came up with this gate control theory of pain and they forever revolutionized pain science. And it's still evolving, there's the neuro-matrix theory of pain now and there's all this other cool pain science.

However, what we know about pain is that touch does actually gate pain. So, back to our metaphor of this pain dial… So, for me, I remember this really resonated with me, my professor said, "You bash your knee. You're sitting under the table, and you bash your knee, what's the first thing that you do?" You rub your knee. And the reason you rub your knee is because touch messages get up to the brain faster than messages that code for the sensory information that codes for pain. So, touch is actually one of the things that can lower your pain volume.

So, one of the things that can be on a low pain recipe for people, by the way, is getting massages, and hugging people, and sensory things that really make you feel soothed and

calmed, like a Snuggie, or a really lovely blanket, or a dog. But yes, touching the part of the body that hurts, will actually help your pain.

Alie: Ha! Sooo… adopt a dog, you guys! [*laughs*]

Rachel: Yeah, or rub your bashed knee, or get massages, back massages or… yup.

Alie: Maren Ellis, first-time question-asker, asks: Why do we forget pain? I've had three babies with no meds, but I have forgotten the amount of pain I was in with each and gladly had the next. What is happening there with really, really intense pain?

Rachel: So, there is research on childbirth pain, and that is a unique kind of pain. And the research shows that after giving birth to a baby, you are flooded with all these wonderful, delightful chemicals, it's like a bath for your brain. It's like oxytocin which makes you feel connected, and dopamine which is this reward chemical, and serotonin which makes you feel happy and joyful, and endorphins which are your brain's endogenous natural pain killers. So, your brain takes this lovely bath, and it feels so good, and it connects you to your baby, but it also changes your memory of childbirth. But why is that adaptive? If childbirth is so aversive or terrible that you never want to do it again, we might go extinct. So, your brain does this funny trick.

But that is not true for many other types of terrible, terrible pain. And you ask anybody who has been in a car accident or some terrible trauma, they have not forgotten their pain and their body has not forgotten their pain either.

Alie: Yeah, I guess with Jarrett's knee surgery, it's not like his knee is going to suckle for the next year.

Rachel: It might. You never know.

Alie: I thought this was a great question from Val McKelvey: How well does mari-ju-wana work for pain relief as compared to traditional pain relief medicines? Like, all of the CBD that's on the market, the THC, things like that. Good for pain? Not good for pain? Somewhere in the middle?

Rachel: Here's the complicated answer. I think the thing that we know now is that with pain it's always a complicated answer. So, here's the complicated answer. Research shows that the chemicals in marijuana can actually lower pain volume. [*"Righteous."*] They can. Here's the problem; marijuana – and I am not opposed in any capacity – also can do funny things to sleep in not a great way, that can negatively affect pain. And the thing that actually is most concerning for me is the patients I'm working with, who are using it as their only pain management strategy and nothing else.

So, if you lean on any one thing, it doesn't matter what the one thing is as your primary or only coping strategy for pain, you're targeting only the bio domain of pain and there's a lot of things contributing to anybody's pain recipe. So, if we're just solving it with weed, we're not actually addressing that big, complicated problem that's contributing to the pain.

So, the answer is yes, science shows it can lower pain volume, raises pain tolerance, whatever that fancy word means, but there's also a couple other complicating factors. I do think it's great for things like cancer pain because people can't eat but that's also sort of a problem because with overuse of marijuana, you can stop eating, there's an emesis syndrome that develops where your stomach doesn't want you to eat any more food. So,

what is my TLDR? Yes, it can be useful short-term, not all day every day, and not as your only strategy.

Alie: Cool. Last listener question. Danielle Larmon, Alia Myers, Lux, and Ari B want to know, in Alia Myers' words: So, uh, what's up with masochism? Asking for a friend.

Aside: Perhaps their friend was one of these patrons, Chris Baumann, Piper, Donnielle O'Neill, Lux, Ari B, Mikayla Kwant who asked, "Why does it make me so horny?" Or the wonderful Skella Borealis, who responded to that, "I spent several minutes trying to type this out in a concise way and saw this comment and was like, 'Yeah, that's pretty much what I was trying to say.'" Also…

Alie: Danielle Larmon: Why do I like pain? Please tell me why I'm so weird. Masochism and recreational pain-seekers, probably not so weird?

Rachel: Not weird. Also, such a delightful question and I'm so glad we get to touch on it before the end of this because I really wish I had even said this sooner. Pain is a subjective experience. When we're talking about the definition of pain, that should have been in there. It's always subjective. And like we said, context and environment matter; if you're choosing it, it's going to change your experience. If someone punches you in the face, and you're not expecting it, and they're stealing your purse, or slaps you, it's going to feel very different than in the context of sex where you're turned on, you love your partner, you trust them, or whatever, you want it. So context, environment, all the things are always going to matter when your brain is interpreting the message.

So yes, pain can be pleasurable, of course! That's super normal and human. It's not weird at all that for some people some of the time, pain is pleasurable. And again, back to that thing like, you stub your toe on a really bad day when you've been fired, it feels very different than you stub your toe when you're out with your friends eating ice cream. So always, the context by which the messaging happens determines how your brain interprets the signal. Did that make sense?

Alie: Yeah, absolutely. Sometimes I just love the interview so much I make sure we're still recording because in my nightmare we've somehow… [*laughs*]

Rachel: Totally, it's not recording.

Alie: The batteries have run out. The thing that sucks most about pain, what is it? What sucks so much about your job? What sucks about pain? What's frustrating? Vent it out.

Rachel: The thing that sucks most about my job is the stigma associated with psychology and pain. Like that thing that people think you're saying they're mentally ill, that drives me mad. The thing that sucks most about pain is the lack of agency and control we feel like we have over it. And we feel that lack of agency and control because no one has ever explained pain to us. Why has no one ever…? When I was a 12-year-old kid with stomach aches, why didn't anyone ever say, "By the way, this might be mediated by anxiety and stress."?

And by the way, it was; I was socially anxious. No one ever explained to me… I was poked and prodded and blah, blah, blah. So that, as you can tell, infuriates me. [*"It, it, it– Flame, flame, flames on the side of my face."*] Who doesn't deserve to understand pain? It is a ubiquitous human experience; we are all going to have it. None of you are going to get away with not having pain. So, we might as well know what it is and know what to do about it.

What also infuriates me about pain medicine is the way that nobody gets educated about it. So, here's a fun statistic. 96% of medical schools in the United States and Canada have zero, and I mean *zero*, dedicated compulsory pain education. [*Alie groans*] So, if 96% of our doctors are not learning about pain, who then knows about pain? So, *of course* we have an opioid epidemic, *of course* we're throwing pills at pain. The people who are treating pain aren't being adequately educated. And it's nobody's fault, it's just a really broken system. And in psychology programs, we get zero pain education also. In PT programs, and OT programs, nursing programs, a lot of providers will tell you, insufficient pain education.

So, it's like, if you think about this as a trickle-down phenomenon, our providers are the first people we see, and if no one's ever explained pain to them in this way, where it's a biopsychosocial phenomenon, how are they ever going to tell us?

Aside: So, side note, in addition to being a clinical psychologist, Dr. Zoffness is also a researcher and a lecturer at UCSF and she and her colleagues conducted a six-part pain training with UCSF doctors. And in a study just published in June, they found that 90% of the physicians said that the pain curriculum changed the way that they conceptualized and approached or managed pain. 90% said it changed the way they did it! So, the conclusion she said, education matters… Yeah. Especially when it comes to doctors. You want them to eat books, school up. Thank you so much.

Rachel: So, in my mind, if we're ever going to target the opioid epidemic, if we're ever going to target effective pain management, we have to start with education. Which is why I chase people like you [*Alie laughs*] because how do you spread the word? How do you tell people, "By the way, there's hope for treating your pain, we just have to do it differently."?

Alie: Yeah. I think you should be the Brené Brown of pain management.

Rachel: Okay, okay great.

Alie: Yeah, I feel like the typical thing we're used to seeing is just a laminated placard on the wall with just a series of emojis.

Rachel: Yeah, totally. Oh my god.

Alie: That's pain education for doctors.

Rachel: You got it. So, what Alie's talking about, it's called the faces pain scale and you've probably seen it before. I think it's 0 to 10 not 1 to 10, I can't remember. But it's all these faces that show, how much pain are you in? And have you ever read *Hyperbole and a Half*?

Alie: Yes!

Rachel: Allie Brosh, am I saying her name right? I love her. That girl is so brilliant and so talented. Allie Brosh, you probably listen to this podcast.

Alie: Augh, I wish.

Rachel: Is it Allie [*short O*] Brosh? Am I saying it right?

Alie: Yeah. Or [*long O*] Brosh, I have no idea.

Rachel: So she… If you google "hyperbole and a half pain scale," you will laugh your ass off. I use it in my lectures; she revised the pain scale. Yes, I think it's 0 to 20 and 20 is like this face, the eyeballs are falling out, blood is coming out of the ears, you know. She also redoes the 0 to 10 pain scale and she's like, this is just not accurate. 5 looks like I got Ben & Jerry's

cookie dough ice cream and there just isn't enough cookie dough in it. [*Alie laughs*] The faces don't adequately convey what the experience of being in pain is. Her pain scale is infinitely better. Allie Brosh, hyperbole and a half pain scale, you will laugh. And only a pain nerd would really know that there's a better pain scale out there, written by the author of *Hyperbole and a Half.*

Alie: What about your favorite thing about what you do?

Rachel: Oh my god. So absolutely, this is the most addictive work I've ever done in my life. And I also feel selfish doing it because that kid who had been in bed for four years, when that kid stood on stage and went off to college, I felt so rad! And I am not performing magic, you know? This is something I was trained to do, it exists in books, the knowledge is out there, I'm just a conduit for the thing that already exists. But when people get better, and they get their lives back… This kid got asked to prom by two girls, not one but two.

It's so delightful to see people re-engage in the world, get their lives back, and feel like they have power again over their bodies and their lives. That is like… I will never do anything else. It's the most addictive thing I've ever done. People write me these crazy emails that make me cry. Yeah, if I start talking about it, I will cry. It's just crazy, the work changes lives. Again, it's not me, I didn't make it up, but this work changes lives.

And I just want to say, the other thing that makes me really infuriated about pain is that what I do is not affordable to everybody. A lot of people can't afford pain psychology because insurance doesn't reimburse it and that's actually why I stuck everything that I do into a book for 20 bucks because pain education and pain medicine should be affordable and accessible to everybody. Why is it only affordable by a few people? That's crazy pants. So, *The Pain Management Workbook*, which I gave you, literally is intended to be like… you don't need insurance coverage, it's $20, everything I'm talking about is in there. Again, it's not magic, and it shouldn't be unaffordable for anybody. Is that the word?

Alie: Yeah. Absolutely.

Rachel: It makes me so mad; you can tell.

Alie: I love it. [*laughs*]

Rachel: Yeah, like, why is treatment only for people with money?

Alie: It's… nonsensical.

Rachel: Finances drive pain management. How is that okay?

Alie: Bonkers. Any one piece of advice that you want people to know to keep them going?

Rachel: Yeah. Pain is treatable, you do not need to be alone on a pain journey; a lot of people are suffering alone. There's a lot of support available. Pain psychologists, there's not many of them, again, because psychology programs don't train us in pain, and they should and it's a problem. So, this is a call to action to anybody in the world of psychology and in medicine to up your game when it comes to pain education.

But a couple of solutions for people who are suffering alone. You can google "pain psychologist near me," there might be one. *Psychology Today* has people on there who list chronic pain as one… You want to find out if they're trained in cognitive behavioral therapy. If you have a therapist you like, or if you're willing to find a therapist you like, hand them *The Pain Management Workbook* – or any pain management workbook, there's

others besides mine out there, doesn't matter – and ask them to go through it with you. You don't have to go through the journey alone, it's isolating, it's miserable, it's painful, and support is available, and help is available, and change happens. Pain treatment is totally, totally possible.

Alie: Thank you for being on.

Rachel: Thank you so much for having me. This is so cool.

Alie: Seriously, Brené Brown of pain, I'm calling it!

Rachel: Rad.

Augh, so for god's sake, ask smart people doofy questions because your brain can learn from the things that their brains learned from other people's brains. And I hope that this episode helps anyone with pain get better care, helps loved ones understand that pain is real, and give some hope and maybe some alternative approaches to turning that pain dial down.

So, Dr. Zoff sells her workbook for $20 bucks, it's on Amazon, it's wherever you get books, it's probably in libraries near you. And she wants to make it cheap and accessible for everyone. You can follow Dr. Zoff @DrZoffness on Twitter and @TheRealDocZoff on Instagram. Her website is Zoffness.com and those will all be linked in the show notes, as well as links to The Trevor Project and the sponsors you heard about.

We are @Ologies on Twitter and Instagram. I'm @AlieWard on both, please say hi. More links are always up at AlieWard.com/Ologies/Dolorology, for this one. Thank you to Erin Talbert for adminning the *Ologies* Podcast Facebook group. Thank you to new bride Boni and Shannon of the podcast *You Are That* for helping with the merch. Noel Dilworth and Susan Hale for all the scheduling and behind-the-scenes business.

Thank you to Emily White of The Wordary who makes our professionally done transcripts, Caleb Patton who bleeps episodes, which are up for free on our website. Zeke Thomas Rodrigues for the *Smologies* episodes, which come out every other week, they are kid-safe, classroom friendly, now with kid-safe ads as well. Thank you to Kelly Dwyer for the website; she's available to make a website for you, if you'd like. Her link is in the show notes. Thank you to Nick Thorburn for the theme music. Thank you to Jarrett Sleeper and Steven Ray Morris who endure the biggest pain of all, which is me, and I appreciate them so very much for it.

And if you stick around to the end of the show, you know I tell you a secret and this week's secret is that I like to burn incense sometimes. And I love when you're burning an incense stick and then suddenly you start smelling the burning stick itself, like the little bamboo stem and you're like, "Oh, that marks the end of this incense stick. Thanks, nose." Unless you're my friend Micah, who can't smell anything, sorry Micah. Okay, berbye.

Transcribed by Aveline Malek at TheWordary.com

More links you may enjoy:

A donation was made to The Trevor Project

How pain relief works

Opioid-induced Hyperalgesia: A Qualitative Systematic Review

More opiates, less pain tolerance

Sensitized brain response

New 2020 definition of pain

Chlorpromazine: a retrospective

Mild encephalitis and schizophrenia

History of Thorazine

Oh shit thorazine is named after Thor?!

Blame it on the weather? The association between pain in fibromyalgia, relative humidity, temperature and barometric pressure

Migraines and the weather in Japan

Does rain really cause pain? A systematic review of the associations between weather factors and severity of pain in people with rheumatoid arthritis

Migraines 101

Migraine Pathophysiology

Gate Control Theory

Intro to CBT

Redheads and pain threshold

Anesthetics and analgesics

Why rejection hurts

Dandelions, tulips and orchids: evidence for the existence of low-sensitive, medium-sensitive and high-sensitive individuals

The Gender Pain Gap

Harvard article on fibromyalgia treatment

CBT study for fibromyalgia

Neuropathy info

Doctors pain management training at USCF

Neuropathy and CBT

Social pain relievers

Why you get butthurt

Mom's spaghetti