



Essential Alchemy

The Ancient Art of Healing Naturally

Season 2, Episode 20: The Coherence Advantage: Heart-Brain Dynamics and Optimizing Resilience with Rollin McCraty, PhD

Jodi: Hi. I'm Jodi Cohen, your host. And I'm so honored to be joined by Rollin McCraty, who is a PhD, the director of research at the HeartMath Research Center at the HeartMath Institute.

He is a psychophysicologist, and his research interests include the physiology of emotion, heart-brain communication, and the global interconnectivity between people and the Earth's energetic systems—so needed right now. Welcome.

Rollin: Thank you. Nice to be here.

Jodi: Thank you. So I'm curious. How do you define resilience?

Rollin: Our definition is basically the capacity to prepare for, recover from, and adapt in the face of stress, challenge, or adversity. So that's a little bit of an expanded, more modern, I would say, kind of definition of resilience.

I'm actually kind of honored to say that our definition was adopted by pretty much the US military, particularly by the Navy. In fact, we developed the resilience program, the pre-deployment resilience program for the US Navy in their highest stress mission. So we did a lot of training in this area.

So just to unpack that a little bit, if I may, capacity is a new word that you might not see in most definitions to prepare for. Is if we have a higher level of resilience, and I'm going to say a little bit more about that in a second, we have a more capacity to actually prepare for upcoming challenges that actually avoid us having to bounce back from losing all of our energy. It is kind of a way of thinking of that.

Of course, to recover from. And adaption, being able to adapt to the situations in a flexible way. And flexibility is also a key element of resilience in most people that know much about it or that ponder resilience much.

So by capacity, a model we use that we find works pretty well, it's sort of a metaphor, but it's very real at the same time. And that is to think that we have an inner battery. And so it's how much energy or charge do we have in our inner battery? And that's almost equivalent to resilience.

Rollin: So when our energy is depleted, so is our resilience, our ability to prepare for, recover from, adapt. Basically, our capacity to self-regulate is diminished. So the two correlate really quite well. And capacity is something we can build.

So another kind of aspect that's built into that definition. So in the old world, so to speak, old paradigm, resilience was something at least that was thought of as something that you have or you don't. You're either born, and you're genetically endowed with resilience and the way you're brought up, or you don't. No, that's not the way it is.

Now, we would all have different kinds of, I'll say, baselines or ranges of resilience, but our resilience varies day to day if you think of it as the amount of charge in our inner battery. And then, if we're in high stress or high challenging situation or context for a long time period, so the challenge is remaining constant, it's how are we able to maintain the charge in our inner battery or energy level or the capacity to self-regulate?

So that actually were skills that we can actually build our capacity. You can actually have more energy and learning how to be more intelligent about how we expend it and how we renew it. That's a long-winded answer to your question.

Jodi: No, I loved it because you touched on-- it's exactly what I learned after my son died. People kept saying, oh, you're handling it well. And I didn't really know what that meant, but then I learned that if you have resilience, you're able to navigate through trauma better.

And so, my whole goal with this summit is to expand people's capacity for resilience. So I'd love it if you could talk about some of the things that you've worked on with the pre-deployment resilience program or anything that might be a helpful tool to kind of charge that battery and build that muscle.

Rollin: Yeah. Well, I think maybe a good starting point for that is the way I look at it. There are what we actually teach in our resilience programs. Is that we have four different kinds of domains of energy or resilience. I'm going to kind of use those two equivalently if I may.

Jodi: Perfect.

Rollin: Because they really are. So we have physical energy, physical resilience. And if we want to measure that, it would usually be reflected in a person's endurance, their kind of strength and all that, but also flexibility. And flexibility is going to show up in all of these.

Rollin: So now, let's just click on that for a minute in terms of capacity because that's kind of an easier level for people to understand. If you wanted to increase your physical capacity, I must ask you this, Jodi. How would you do it?

Jodi: I would train. Like I used to run marathons. So I'd work up and then go back to balance.

Rollin: So if you run marathons, you've got a high capacity already, but the rest of us out here in the world we aren't marathon runners.

Jodi: No, but I started with Galloway on running. He had a training program. Start with two miles, build to six.

Rollin: There you go. Exactly. So let's say that kind of your current baseline is you can run five miles. For some people, it might be a couple of blocks, whatever it is. It doesn't matter. So then you have to kind of dig a little bit deeper and stress past your normal and go a little farther. Then hopefully, you rest, recover your energy. And then you do that again the next time.

After a few times of doing that, well, now that new goal is your new baseline. It's kind of casual. You're not having to dig in quite as deep and put that extra energy. So you've increased your capacity. Now, why would we do that?

Well, in your case, it's because you want to run marathons. But for a lot of people, like if you're in law enforcement or just a lot of fields, there might be times when you need more capacity drawn to handle a challenge that comes up in life. Kind of how you've built or increased your capacity in the physical domain in terms of energy.

But then also the other domain would be mental. That would kind of be reflected in our mental flexibility. It is kind of one of the key elements there. Our ability to focus, pay attention, incorporate multiple points of view. These will draw kind of in that mental domain.

And we actually do have a certain amount of mental energy. For me, I may not have expended much physical energy, but I could be at the end of the day after a lot of Zoom calls or this or that and writing and read a paper or something and get through a paragraph and realize I don't have a clue what I just read. I'm probably the only one. Yeah.

Jodi: No. I think studying for finals in college--

Rollin: Actually, we've expended enough mental energy that we don't have that same-- but you can build capacity there too. Then the more important one in terms of resilience is the emotional domain. So if we were going to measure that, that's kind of also emotional flexibility. What's our range of emotions—kind of positive outlook versus cynical kind of worldviews, these types of things.

But one of the key aspects there is the capacity to self-regulate our emotions. The reason that I'm going to focus more on emotions is that physiologically speaking and from an overall energy perspective, emotions are what run the show. And it's where most people unnecessarily expend and waste a lot of energy.

Jodi: I love it.

Rollin: So if we're draining energy, we're also draining our resilience. So emotions are, for example, a primary drivers of the activity in our body. In our nervous system, in our hormonal system, all of these things, it's emotions. And that's easy to prove here in the lab. We can have people wired up to all the stuff we do—your brainwaves and your blood pressure and your hormones and this and that.

And have you doing mental things, serial subtractions, and whatever. Yeah. You see some changes, but once you trigger an emotion, boy, big changes happen fast in the hormonal outputs in the body, the activity in our nervous system, heart rate, all of these things. You get embarrassed by making a mistake, but you're trying to subtract numbers, something like that. Positive or negative emotions.

So that might really run the show from an energy perspective. And then our fourth domain, we call it spiritual, and this doesn't mean religion, but it more has to do with how aligned and operational in daily life are our commitment-- commitment is the wrong word. But our livingness, if I could say it that way, of our core values.

Jodi: Oh, I love that.

Rollin: Our tolerance of others' beliefs. And so it's kind of a flexibility there as well. And so flexibility showed up in all of those. And if you think about it, one of the hallmarks of aging is reduced flexibility. I mean, not just physically.

I watched this with my own parents, for example. As they got older and older, it was the same stories and the same worldviews and very little tolerance for anything outside of that. And the older they got, the more the loss of that flexibility across all of those different domains.

Jodi: Can you talk about how we enhance our emotional flexibility?

Rollin: Well, self-awareness would be kind of a key there to what we're feeling. But self-regulation, as I kind of highlighted when we were talking about that, is really the key to really not only build resilience and capacity but also, I would say, sustaining it.

So we have different stressors in life, and that's actually where a lot of people get confused. We talk a lot about stress. So stress, if we look under the hood a little bit, what is stress? Well, it's always or almost always an emotion.

Jodi: You're totally right. Fear, anger, shame, grief.

Rollin: Yeah. So you're stressing me out. What are we really saying? You're not doing what I want you to. You are pissing me off. I mean, it really is. That's what it boils down to.

Now, by the way, kind of just to help make that point, not that many years ago, a few years ago, the number one stressor or thing that people feel stressed about was time-- it's actually called time pressure, which is defined actually as the feeling that we don't have enough time or the feeling that everything's taking too long. That's the actual questions about stressing time pressure.

So again, an emotion. That's actually changed a little bit. So more current surveys are showing up. It's still there, time pressure. But another one that's popping up to the top of the list oftentimes is dealing with difficult people.

That's true. I think just to finish out this thought, so there's what we call the stressor, the thing outside of us, and then the stress response. But the stress is actually in us in response to the thing that happened out in the world.

Jodi: Exactly.

Rollin: So it's important to distinguish those because once we understand that, we now have the capacity to deal with those internal responses to the external thing in new ways, in more intelligent ways that don't drain our energy unnecessarily.

So for a lot of people, drama is where we waste a lot of energy—putting too much significance into small things. When we are able to rise above and see things from a new perspective a little bit, it's like, really, I spent that much energy about that? You know what I mean? Not that you ever have a lot of drama, Jodi. I'm not saying that. You might know people.

Jodi: I have a teenager. I get to see it every day.

Rollin: Yeah. There you go. Sure. But you understand what I mean? But that's really blowing out a lot of extra energy.

Jodi: Yeah. There's a lot of energy that goes all over the place.

Rollin: So does that kind of help answer your question or?

Jodi: That's so perfect. I love it. And I wanted to shift a little bit into kind of heart rate variability as a tool for self-regulation.

Rollin: Sure. Well, I wouldn't say heart rate variability is a tool for selfregulation, but heart rate variability it's a really important aspect here because-- and well, just for our listeners out there, what that means is most people know what heart rate is, which is simply how many times did the heartbeat in a minute. But in reality, our heart rate changes with each and every heartbeat.

It's kind of a picture's worth a thousand words here. So if you measure the time between each consecutive pair of heartbeats, it's always different. So it's varying. And if this weren't the case, we wouldn't have a heart rhythm. This is kind of newer understanding. And the more of this natural variability we have, the healthier we are, and it actually correlates really well with resilience.

I should also say that we have the most amount of this natural variability when we're young, and as we age, it gets less. And there's almost a linear relationship between natural aging and reduced heart rate variability, the amount of it we have. And what you see or what we see is when-- and we've done a number of studies in like deploying military populations and law enforcement and things.

So that when people are under a sustained stressor, like being deployed into a war zone for a year or longer, that their heart rate variability really starts to decline in a much faster rate than you would expect from normal aging. And that correlates with basically reduced energy, reflex flexibility, and resilience. So the amount of HRV we have is actually a good physiological marker of resilience from this kind of perspective I'm sharing with you.

Jodi: Is that because of sympathetic? Like they're just in the sympathetic branch?

Rollin: No, not necessarily. And that would take us down a whole other discussion. So what the heart rate variability is reflecting-- so that's the longterm effects.

Rollin: We measure HRV. How much of it we have, but it's called heart rate variability because it's always varying. So there's the long-term how much do we have, but then in the shorter timescale, it also reflects the pattern of the HRV, reflects pretty much our emotional state.

So when you are frustrated or impatient, these types of things, anxious, you see that the heart rhythm, the pattern becomes very chaotic looking, and we call that an incoherent rhythm. Whereas when we actually feel good like, especially, an example, you walk out the door in the morning, and it's just one of those days—blue skies and the perfect temperature. And you just go, ah, God, what a beautiful day.

You may not be thinking it, but you're feeling that, ah, appreciation. Your heart rhythm shifts into a very different pattern that we call coherence. And as it turns out, if we follow that rabbit down the hole, that is an ideal state to be in because the heart actually sends more information to the brain, and the brain sends to the heart.

And let's call it the quality of the coherence or incoherence in the neural activity being set from the heart to the brain profoundly affects brain function. And it actually largely informs the brain to how we are feeling.

Jodi: I love that. So basically, what you're saying is if we can feel gratitude and joy, that's kind of like a resilience reset.

Rollin: It is. Yes. But that's easier said than done. You can't necessarily just think yourself into a more uplifting or what we would call regenerative emotion. We kind of divide emotions. We don't use the terms positive and negative as much as we would do to more describe the effect they have physiologically depleting and renewing.

Jodi: Got it.

Rollin: So if we go back to those four domains for a minute that I talked about earlier, they do interact, in other words. Well, I think most people have had the experience. You just get really mad at something, at somebody, or about something, and you have one of those good old-fashioned just blow out anger, blowouts and rant and rave. And you know what I mean? And how do we feel a few minutes later, say 20, 30 minutes after that, after we finally calmed down? Usually pretty depleted. **Jodi:** Yeah. **Rollin:** Yeah. So it's a great example of what I'm talking about, how we blew out a lot of energy. Even physically, we don't have the same energy. Emotionally depleted, mentally, all of it, it blows. It kind of affects all of those. But when you feel that, ah, appreciation, or compassion, these types of things, they actually renew energy.

Jodi: Or love, when you first fall in love.

Rollin: Absolutely. Yeah. Oh, yeah. I mean, way back when I was a youngster, the energy that we would have when we were in love. So the point of this is that if we're going to self-regulate kind of what I was talking about, the quality of the signals from the heart to the brain for all levels-- we actually have direct neural pathways to every major brain center.

And ultimately, self-regulation starts in the frontal part of our brain, prefrontal cortex, where we first have to become aware of what am I feeling. I'm getting triggered, or I got triggered. So kind of a way to think of this is from an emotional perspective. Somebody says something, does something, whatever, especially if we have histories with that person where they have done us wrong or whatever in the past.

And they even hint that something that reminds us of that. We can get triggered in a way that's way more energy than is probably justified in the current situation.

So that especially has a lot of extra charge to it. I'll just call it trigger happens, or that easily an unconscious perception. You could kind of think of it as the train that's down the tracks now, that emotion.

It's starting to go, there we go. But to self-regulate, it really means that we become more aware of that's what's happening. So the unconscious stuff starts to become more conscious as we become more self-aware. But then we want to turn around that energy expenditure, that train, before it gets too far down the tracks.

I mean, when people start thinking about what I'm saying, you probably have even had the experience of what I'm talking about that has happened, and you even knew it was happening, while it was happening, and knew it wasn't going to lead to a good outcome, but it happens anyway. You can't stop it, even though you know though this isn't going to work.

So self-regulation is going to the next level of really self-empowerment to be able to stop that train. And turn it around and hit it back in another direction energy-wise. So one of the key ways to do that is to change the input from the heart to the brain.

Usually, we can't think ourselves. I mean, sometimes you can't see. It just sends a different neural message to the amygdala and also up to the prefrontal cortex that gets you literally more synchronized, which allows you to perform better. More capacity to self-regulate.

Rollin: So one of the first steps in most of the HeartMath techniques, for step one, in most, not all-- and these techniques are designed to be used in that moment, by the way, rather than waiting.

Okay. I blew out all my energy. I'll go meditate or do a hot tub or something to kind of recover. No. I mean, yes, that's all fine, but we need a lot more intelligent to not blow out all that and waste all that energy, to begin with.

So when you feel that trigger, or you're starting to feel the impatience, which is a big one. We have so much energy on these under-the-radar feelings where they become so normal and natural that we don't even think about them as stress anymore. Anyway, we call it heart-focused breathing, step one.

Jodi: I love it.

Rollin: Heart-focused breathing, you basically focus your attention in the area of your heart, center of your chest, basically. And then pretend you're breathing through that area. I mean, you actually focus your attention there.

In the beginning, for some people, you can put your hand on your heart if you need to. And this is something you can do with your eyes open. Do it anytime, anywhere. Nobody even needs to know you're doing it. Breathe a little slower and deeper than normally. Try pretending you're breathing through that area.

Now, there's reasons for that because where we focus attention in the body, we can shift and change things. There's a whole industry based on that called biofeedback industry. So slower, a little bit deeper, and slower.

This is not about counting or pacing your breath, but in the beginning, it's about a four or five-second rhythm on the in-breath and four or five seconds on the out-breath. Okay. And that's the natural resonant frequency of the heart-brain axis. So we're wanting to shift into that, our natural resonant frequency. This is about a 10-second rhythm.

Okay. So that's step one. So heart-focused breathing, I call it grandma's wisdom. You know what I mean? You probably know what I mean. You've got kids.

So your young one falls down, and they start screaming and crying, and you pick them up and make sure blood's not squirting out. You know what I mean? A little humor there. But yeah, they are okay. So what's usually the first thing grandma says to them or tells you to tell?

Jodi: Oh, you are fine.

Rollin: Breath, honey. Take a breath, breathe, because you just know that until they calm down, they are not going to hear anything. And they're not really hurt. I used to do this with my son. He would fall down or do something. You know he's not hurting. He'd start to do the drama.

You'd laugh at him or something. And he would just shift like that, and off he'd go find those little ways to-- so basically, you're taking the drama out and the significance out. So now you're taking the charge or energy out of that emotional response just by the breathing.

Jodi: I love that.

Rollin: So the key is remember that, to self-intervene. So that's step one. So now you've reduced the intensity. So maybe that trigger was-- it could be anything. It could be anxious, fear, whatever. But let's just use frustration here. That you're starting to get frustrated. So the breathing step to heartfocused breathing will take the intensity out.

But if you stop there, that's awesome. You've taken the intensity out and reduced the emotional brain, but now you're just feeling the same emotion at a lower level. So it's still having the same biological and hormonal effects and things.

So the next step, and I'm not giving you the exact steps here but just to basically know. Replace that, say frustration, with another emotion, like calmness or patience. If you are feeling impatience, heart-focused breathing, then step two, breathe in a feeling of patience. So now you're consciously taking charge of your emotional diet.

And then with some practice, and this is not something that you only do, practicing, when you're getting triggered. If you're feeling good, that's great. Feel even better. Go ahead and breathe in a feeling of calmness or appreciation or inner ease or whatever, love.

Jodi: Yeah. Well, and people have a lot of opportunity to practice, in traffic, in lines.

Rollin: Exactly. Meetings, emails.

Jodi: Yeah. That's great. Beyond step two, what else do you recommend?

Rollin: I mean, a lot of our techniques go and even having four or five steps, but that's a good starting point. Yeah.

Jodi: Yeah. No, I love that. And I'm curious. What other tricks-- like, how else do you kind of move up from the lower resonant emotions, the depleting emotions to the higher emotions? Like you can do that in the moment of overwhelm or anxiety, but what are some other things that people can incorporate every day to enhance their heart coherence?

Rollin: Well, we've kind of talked about the turnarounds and using this in real-time. But another thing you can do, it's actually very helpful for a lot of people. There's actually very inexpensive devices that actually measure your heart rate variability. The pattern of it and tell you how coherent or incoherent it is.

So doing regular, not when you're out and getting stressed and all that and triggered, but just written on the times, just practicing another technique called the Heart Lock-In where you actually shift into coherence. This is something that you would do more when yourself in a quiet time and really sustain that coherence for like five minutes, maybe in the beginning, or into 10 minutes.

And it is useful to have the biofeedback devices called Inner Balance or emWave2® Pro, these types of devices that work with your phone or computer. That's how you're getting the actual feedback. And you actually see what your heart rhythm is in real-time. So it's awesome to see how you can shift it and practice that.

But once you practice being in coherence and then sustaining that for longer times, what you're literally doing is training your brain and nervous system to that as the new normal or familiar state. So we're doing that in our normal kind of quieter times. Maybe I do it in the mornings before I start work. Just kind of prep set my day with a more coherent perspective.

And also in the evenings. That by training your system into that is what we would literally call our new familiar, new normal. It's a whole lot easier to make that shift when we do hit a challenge.

It's a bit naive to think, oh, I learned these steps or these techniques. I'm just going to wait until I get hammered in a traffic jam or something, and I'm late or that person in the meeting that always does X. So that would be an awesome thing to practice.

Jodi: No, I love it. I mean, we all brush our teeth every day as preventative maintenance. It'd be great to have some emotional resilience maintenance.

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Rollin: Yeah. And so what I'm really saying is this is really about in-the-moment stuff. It's not asking you to take any more time out of your day. I mean, you can actually do this when you're in a conversation or while you're driving. You have to breathe anyway. Why not be a little more conscious of that and breathe in a way that's really adding energy to our inner battery and our resilience. And training our system into that new norm, new familiar. So practice in-between times. I'm walking to the photocopier. Okay, I got it.

Why not take that opportunity to do some breathing and instate a feeling of appreciation or care or kindness or kind of things we need more of a new world.

Jodi: Absolutely. Is there anything related to heart coherence and resilience that we haven't touched upon that you'd like to--

Rollin: Tons of stuff. So, I mean, there's literally well over 400 independent studies now that have taken these concepts and techniques and shown that learning how to shift into this coherent state, heart coherence, benefits us in so many ways. I mean, there's everything from reducing blood pressure to better hormonal balance to health outcomes, but also in terms of our ability to maintain our composure in stressful situations, better test scores.

People just feel much better and do better when they practice these skills. And one of the big multiple studies now-- in fact, there's a meta-analysis of healthcare workers, about 12,000 people now that show that their energy levels-- we are talking a lot about energy. So if we look at in-hospital data, which you got about 12,000, and we do a lot of work in healthcare and nurses and doctors.

That it's kind of scary, but about 40%, 45% on average in that profession, report being extremely exhausted and fatigued most or often with time. And after practicing these skills, even just for a few weeks, that this dropped in half.

So the big difference is in the amount of energy we have at the end of the day, so to speak. And do the things we like, spend time with our families, hobbies, these kinds of things—a lot more energy.

Jodi: So for the listener that has loved everything you've said and wants to know what the best next step is, where would you send them like a book, a course?

Rollin: Well, there's a lot of resources on the heartmath.org website, .org. I emphasize .org because people can't help .com sometimes, but it's actually heartmath.org.

Rollin: You can access our staff and our books. A heartened book called *Heart Intelligence*. It is a great first step. It's kind of one of our more recent books. If you have kids or teenagers, actually, one of my books is called *Transforming Stress for Teens*. It's actually a really good book.

I mean, I'm not just saying that because I'm one of the authors, but in fact, it's one of the favorite books of a lot of adults because it's kind of written in a language for a little bit younger, but it's so simple and straightforward— impactful tools and techniques.

Jodi: I'm ordering that right now.

Rollin: Okay.

Jodi: Thank you.

Rollin: We have the science, which we've only kind of briefly touched on. Another book called *Science of the Heart, Volume 2*, actually. That's a great resource. For those that are more interested in the social sides of this--

I'll go ahead and go there. So we talked about personal self-regulation and what goes on inside of our body, but what we feel inside if we get frustrated or impatient or whatever that is, that doesn't just stay inside of us. That actually affects those around us in a surprising way.

Now, of course, we know that if you're having a gathering or something and somebody shows up in a bad mood and blah, blah, blah, that's going to have kind of an impact on the energy of the group. What they say and their tones of voice and all that. But there's another maybe even more important level that's going on, which is the energetic communication.

Now, what I mean by that, I'm not going new age here on you. Not that that's bad, but when we put electrodes on the body to measure the heartbeat, the electrocardiogram, or on your head to measure brainwaves, when you stick the electrodes, what you're literally measuring there is current flow. It's electricity. That's why it's called the electrocardiogram.

And the heart produces by far the largest electrical voltage in the body. We can measure the heartbeat anywhere on your nose, toe, anywhere. It's huge. It's by far the largest current flow, rhythmic current flow in the body.

But whenever we have a flow of current like that, that we measure, you also generate a magnetic field. I mean, it's basic physics. Current flows, you create a magnetic field. And magnetic fields, one of their properties is they penetrate things. They go right through the skin.

Rollin: And by the way, this is the same magnetic field our cell phone would use. I'm an ex-communication engineer. I used to work for Motorola, so I know a little bit about. So if people don't believe me, then stop using your cellphone indoors because that's why the signal from our phone, how it gets to the cell tower, even if we're in an elevator. Cellphones still work.

It's the magnetic field that's going through the walls and out and carrying the information, our voice or text message, whatever between our phone and the cell tower.

Well, the heart's doing the same thing. So every time it beats, we radiate a magnetic field into the environment, which we can measure. So I know this because we can measure it with a device called a magnetometer, which measures magnetic fields.

And when you look at the magnetic field, you find that-- and this is all published for people interested in the science of the heart. I mentioned the chapter on this that you can see that you have literally different informational patterns being carried by the field.

So, in other words, if we look at the information being carried by the field when we're angry versus appreciative or something, it's very different. So we are literally radiating our emotions probably a lot more into the field environment. And then other studies show that-- I mean, we know that. This isn't a concept. This is fact measured and all that, but that also has a measurable impact on others around us.

And we can measure how it affects others' physiology. In other words, we're detecting at this unseen level; energetically, there's always a communication going on, a communication dance. And studies have shown when we're more coherent, we are literally radiating a more coherent signal into our field environment.

And that can have a lifting effect on others around us, even if they don't have a clue what's going on. That's just eyes open radiating love. Doing heartfocused breathing and radiating love into the field can measurably affect others.

Jodi: Well, I love that, and I think that's very needed always on this planet, but especially now. Thank you so much for your time. This was amazing.

Rollin: You are welcome.

Jodi: Thank you.