

# **The Neurobiology of Mindfulness: Clinical Applications**

A Teleseminar Session with  
Ronald D. Siegel, PsyD  
and Ruth Buczynski, PhD

The National Institute for  
the Clinical Application of  
Behavioral Medicine

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# **The Neurobiology of Mindfulness: Clinical Applications**

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A complete transcript of a Teleseminar Session  
featuring Ron Siegel, PsyD and conducted by Ruth Buczynski, PhD of NICABM

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with Ronald Siegel, PsyD and Ruth Buczynski, PhD**

**Ruth Buczynski:** Hello everyone. I'm Ruth Buczynski, a licensed psychologist in the state of Connecticut and President of the National Institute for the Clinical Application of Behavioral Medicine (NICABM). I want to welcome you to this call tonight, the second in our series on *The New Brain Science: Compelling Insights for State of the Art Practice*.

We have people calling in from all over the world, practitioners of all kinds; physicians, nurses, psychologists, social workers from so many different countries. We want to say welcome, and thanks for joining us—and a special welcome to you, Ron. Thanks for being here.

**Dr. Siegel:** Thanks for having me.

**Dr. Buczynski:** Now, last week, in our series, *The New Brain Science*, we talked with Bill O' Hanlon, and we talked about depression and neuroplasticity. This week, we're going to talk about the neurobiology of mindfulness.

But before we do that, I want to introduce Ron a little better. He's such a good friend and one of NICABM's favorite speakers, but many people on the call might not know about his work.

Just in case Ron is new to you, let me give you a little background. He's Assistant Clinical Professor of Psychology at Harvard Medical School; he is co-author of *Mindfulness in Psychotherapy* which, in my opinion, is the seminal work for psychotherapists in the field, and he has just come out with a new book that I highly recommend. It's *The Mindfulness Solution- Everyday Practice for Everyday Problems*.

But right now, let's get right into our conversation because we have a big agenda for tonight. Our whole call is on the neurobiology of mindfulness. So, let's start with, why should we care about that? Why does that matter?

**Dr. Siegel:** Well it's interesting. In general, as human beings, we seem to be interested in knowing how we tick. So, we tend to be curious how whenever we hear this or that experience that we have subjectively corresponds with this or that event in the brain.

But studying the neurobiology of mindfulness has other, more practical applications as well. One of the biggest, is simply, as we start to see various elements of our experience as reflecting brain mechanisms, and particularly reflecting brain mechanisms which make a lot of sense based on our evolutionary heritage, it becomes easier to take those processes less seriously, or to say it another way, for the upsetting processes to be less upsetting to us.

There are many, many reactions that we have in the brain that were designed for survival. We'll be talking about a number of them in the call today. Those very reactions, while terribly useful for survival, also make us very unhappy. They leave us anxious, they leave us depressed, and they leave us constantly thinking about bad things that might happen to us.

As we start to see that many of these reactions are actually hard-wired brain events that come from

millions of years of evolutionary history, and then start to see that mindfulness practices can alter both the structure and the functioning of the brain, and change those brain events, it makes us optimistic about our own capacity to do something about our own difficulties.

Now, that said, this area is one in which, we're really at our infancy in understanding, and part of that is because it's actually darn difficult to study.

I'll give you just a few examples to help orient everybody to what we'll be talking about next. For one thing, when we're talking about the neurobiology of mindfulness, a fundamental question is whether we're talking about state effects or trait effects.

Those of you who have studied psychology will be familiar with those terms. State effects have to do with what's happening in the moment. So that's the question of, what's actually happening in the brain during meditation practice. Trait effects are the questions that concern how meditation practice over time changes the structure and the function of the brain.

It turns out, both of these, which are really interesting questions, are very hard to measure. Let's look at the state effects for a moment. Let's say, for example, we want to know what's happening inside of a meditator at the time they are meditating.

**“State effects have to do with what’s happening in the moment. Trait effects concern how meditation practice over time changes the structure and the function of the brain.”**

Well, one very difficult question is: how do you figure out what a meditator is actually doing at the moment. Are they concentrating on their breath? Are they enjoying a pleasant fantasy? Are they remembering to run an errand they may have forgotten that morning?

And when the person is actually hooked up in a functional MRI machine or an EEG apparatus, you can't really... if you start asking them what they're doing, then they're no longer doing it when they answer your question.

So it becomes difficult to tell what people are actually doing when you're attempting to see what meditation does in the brain.

And when it comes time to stand in the trait challenges, those are tough also because when you're saying, how does meditation affect the brain over time, then the question of who chooses to meditate must be considered.

**“So it becomes difficult to tell what people are actually doing when you’re attempting to see what meditation does in the brain.”**

Maybe the people who choose to meditate already have brains that are constructed in a way that is somewhat different from people who don't tend to choose to meditate. It's very difficult to say, “We're going to collect a bunch of people, and we're going to have one group that we're randomly going to assign to meditate for the next 10 years, and the other group, not, and then record it at the end.”

So even though we have all of this very high-tech equipment that can measure all sorts of subtle events on the brain, it's really hard to answer some of these big questions. But that said, we do have some really intriguing findings that have come out of the research literature recently.

**Dr. Buczynski:** So, the research is challenging, but that notwithstanding, let's jump in and get started talking about it. I'm particularly interested, and I bet a lot of people are that are listening tonight, in how mindfulness can counteract age-related cortical thinning? What are we finding about that?

### **Can Mindfulness Practice Counteract Age-Related Cortical Thinning?**

**Dr. Siegel:** That's a fascinating and brand new area. A lot of us worry as we're getting older that maybe our hair is going to thin. Well, our hair thinning is not much of a big deal, compared to the fact that our cerebral cortex thins!

The cerebral cortex thins normally just with age, and it thins in particular with various kinds of brain diseases. So an interesting question is: what's the effect of mindfulness practice, since it feels subjectively like it's healthy for the mind. In other words, people experience themselves as feeling more alert, more relaxed, better able to handle emotional challenges, better able to concentrate when doing mindfulness practices.

**“The cerebral cortex thins normally just with age, and it thins in particular with various kinds of brain diseases.”**

The question is: does this over-time practice actually help keep the brain more in tact—and the rather exciting answer is: it does seem to. At least, it seems to in some areas, and I can tell you a couple of the studies that I think are most intriguing, and then I could talk about their clinical implications.

My favorite study, which made quite a splash—and it's probably about two years old now, is by a friend and colleague of mine, Dr. Sara Lazar, at Mass General Hospital in Boston.

She's not a mental health professional, but rather, she's a biologist who's studying the effects of meditation practices on the brain. In her landmark study, what she did was take MRI images of longer western meditators and non-meditator control subjects who were matched in terms of age and the like.

In the study that really took the scientific community by storm, she took a group of people who had an average of nine years meditation experience, averaging six hours of practice per week. So, these were people who were fairly serious meditators, since that was the average. Then, she compared them to the age-matched controls.

It turned out that the meditators had thicker cerebral cortexes. The cerebral cortex is the newer part of the brain; it's the part of the brain responsible for thinking and judgment and the like.

They had thicker cortexes in three areas—the anterior insula, the sensory cortex and the prefrontal cortex. And it turns out that all three of these areas, not surprisingly are involved in paying attention to the breath and other sensory stimuli, as one typically does during meditation practice.

The prefrontal cortex, in particular, is also involved in what we think of as “working memory”, or, the ability to hold thoughts in our head long enough to reflect on them, make decisions, and solve problems—precisely the types of skills people worry about losing over time.

**“In the study that really took the scientific community by storm... It turned out that the meditators had thicker cerebral cortexes. They had thicker cortexes in three areas—the anterior insula, the sensory cortex and the prefrontal cortex.”**

It turns out the differences in sickness on these parts of the brain were more pronounced in the older subjects, and the degree on thickening was proportional to the amount of time that a person had spent meditating throughout their lifetime.

**Dr. Buczynski:** So, are you saying that in the older subjects, it’s more obvious who had or had not meditated?

**Dr. Siegel:** Exactly. That’s exactly it, and that the more the person had meditated over the course of their lifetime...those in the study had an average of nine years and six days per week...and some of course had much more than that and others had less than that...it was just the average. But it turned out that the ones that had more, had more robust changes.

**Dr. Buczynski:** So, it was pretty straight forward and the approach showed correlation.

**Dr. Siegel:** In fact, I’ve seen Sara’s charts, and it looks like the series of dots follow this line quite nicely...

**Dr. Buczynski:** And you’re also, I think saying, when you’re young, it may not seem like it matters all that much, but as you age the fact that you’ve meditated, really will show up and make a difference.

**Dr. Siegel:** Yes, it shows up much more vividly in your brain.

**Dr. Buczynski:** Did I read that into it?

**Dr. Siegel:** Yes, and that seems to be the case. I was actually one of Sara’s subjects. I went into the MRI machine and had my brain scanned for this, and I have to tell you that, while I feel like I’m losing my mind (as many of us often do) despite the meditation process, I think it would be a lot worse without it.

So, that was one study. I’ll talk about a couple of other ones that point in the same general direction. One was done back in 2007 with thirteen then meditators who were compared to thirteen control subjects, and there they did MRI’s again, and also had people do an attention test where they had to sustain attention over time.

What happened in that one was this: folks who had meditated more had less loss of gray matter than

**“Folks who had meditated more had less loss of gray matter than the people that had meditated less. In other words, they had more gray matter that was maintained in the brain, and correlating to that, their attentional ability was better. . .”**

the people that had meditated less. In other words, they had more gray matter that was maintained in the brain, and correlating to that, their attentional ability was better.

So, it turned out that there was a close correlation between a person’s ability to pay attention on these computerized tests and the degree to which the gray matter was in tact, and that meditators were in better shape than the age compared controls.

So, that’s pointing in the same general direction. In one more, just to mention it, a new study not yet published by Sara Lazar, they found changes in part of the brain stem that’s involved in the production of serotonin, which most of us know is a mood regulating neurotransmitter.

That’s why the SSRI’s, the selective serotonin reuptake inhibitors, target serotonin, and try to increase the level of serotonin. It turned out that this was an interesting study because this was where they took people who were non-meditators and put them through an eight week course of mindfulness practice, and after only eight weeks, they could measure a thickening in that area or more neurons causing the area to become denser.

That was the first study showing an actual experimentally controlled increase based on randomly assigning people to the two groups. And that’s very exciting.

It seems as though the brain really does change based on what we do with it and as we learned from this meditation practice, it goes through changes that we would think of as positive changes.

**Dr. Buczynski:** And do we find that there’s any correlation between thicker walls and people’s lack of stress from anxiety or their amygdala reaction?

**“They took people who were non-meditators and put them through an eight week course of mindfulness practice, and after only eight weeks, they could measure a thickening in that area or more neurons causing the area to become denser.”**

**Dr. Siegel:** I don’t think we know that at this point. With Sara’s research and this other research, we’re just looking at the degree to which people had meditated—how much and how long, and what their brains looked like. And this other study just looked at what happened to this part of the brain stem that produces serotonin, So, I don’t think we know that.

**Dr. Buczynski:** So we’re really at the beginning of our journey with the research on this.

**Dr. Siegel:** I think that’s the case across the board here. But it’s interesting and it has real clinical



implications if you think about it.

Because we do know, for instance, with the study with the Zen practitioners, that (with meditation) their attentional ability was better. And we know that a really big factor in memory is the capacity to pay attention.

**“It seems as though the brain really does change based on what we do with it and as we learned from this meditation practice, it goes through changes that we would think of as positive.”**

Let’s look at a clinical case. I have a patient; he’s a very bright guy, and he’s a physician, but he’s quite anxious about age-related changes in his cognitive abilities. And when we talk about it—and he’s been worked up with neuropsych testing—and it’s interesting, what he experiences as, “Oh God, my memory is no good”, is actually more of an attentional problem.

Because he’s anxious, he winds up not attending to things: he worries that he’s going to forget things, and he gets somewhat flustered by that, and it’s actually the attention problem that ends up seeming like a memory problem. He doesn’t take the time to notice things so that they can get encoded into his short or long term memory.

So, the fact that these (meditative practices) have been shown to increase attentional ability, means that they probably will have some effect on the memory loss that we all struggle with once we all get to be a certain age.

### **New Frontiers in Neurobiology: How Different Meditative Practices Affect Our Brains**

**Dr. Buczynski:** So, let’s now go on and talk about meditative practices. There are a variety of meditative practices. Do they have different effects on our brains?

**Dr. Siegel:** Well this is an area that is also very much in its infancy, but it has a lot of potential to be of use to us. Let me step back and talk about the human brain for a moment. Bill (O’Hanlon) may have talked about this before and many listeners may be familiar with it.

Basically our brain evolved over a series of evolutionary accidents. We have what’s often called the reptilian brain, which is the brain stem and disassociated structures. You could think of that as the “lizard brain.”

Then, on top of that is the mammalian brain, which involves our limbic system, all of our different emotional response systems, which we actually share with most of the other mammals, and of which a principle feature is our fight-or-flight system that responds to danger.

Then, we have the primate, or monkey brain that’s sitting on top of that. Here are all the higher cortical structures, so heavily developed in humans compared to the other animals, which allow for judgment, thought, and prediction.

So, this combination is sometimes called the Lizard Squirrel Monkey Brain Medley, and that’s what we



have inherited. And these different structures don't always work so well together.

As we know, how many of us haven't experienced ourselves at three in the morning suddenly awake because some combinations of these three brains are terribly activated, worrying about something, with lots of psycho-physiological arousal, when there's actually nothing at all we can do about it. There's no adaptive purpose to it, but, were up, and we're aroused.

And we have countless other examples where we experience ourselves being stressed, even though, rationally, we know it doesn't really make any sense to be stressed under these circumstances.

Well, what we know about meditation practices is that they generally tend to reinforce the ability of the cortical layers. The monkey brain, in particular, and the area called the prefrontal cortex, is the part of the cortex that sits behind the forehead, and it is particularly important for regulating a response to emotional events—regulating our response to what comes out of the mammalian brain.

**“Meditation practices generally tend to reinforce the ability of the cortical layers, helping us to achieve a balance among these different brain parts.”**

Meditation practice helps us to achieve a balance among these different brain parts. When there's a lot of limbic activity, something emotionally upsetting has occurred. Folks who have been meditating are better at being able to take a breath, think about what's going on, and come up with some kind of skillful response to that, compared to folks who haven't been meditating as much.

By the same token, some folks who become rather rigid in their personality organization have too much domination of the prefrontal cortex control. In other words, these are folks who are so dominated by their thinking that they don't even notice what they're feeling, and they might even feel emotionally dead or numb.

Mindfulness practices are useful there as well because they tend to enliven our emotional life in terms of allowing us to feel.

So putting this together, what we have with mindfulness practices, in terms of the brain, is that these practices help us to both feel things very vividly by having contact with the limbic system, but not so much that we feel compelled to act on those feelings, but rather that we have the chance to take a moment, to take a breath, to think, and then to evaluate the situation.

So, we know, in general, that these practices are activating these brain structures in these ways. So the question is: do particular ones (mindfulness practices) affect particular brain structures in different ways, and this is really quite at its infancy.

There's an area called the dorsolateral prefrontal cortex, which is part of the prefrontal cortex. It's very much associated with tension and executive decision making. And, that, it turns out, is activated in all sorts of rather different meditation practices.

For example, kundalini yoga has been shown to activate it, mindfulness meditation, which we're talking about here, activates it, Tibetan Buddhist practices that use images of mandalas and deities activate it, and even saying The Psalms can activate it.

So, it would seem that there are some areas which are activated by all sorts of meditation practices.

**“Mindfulness practice begins with concentration, and then expands out the focus of the tension to turn attention to whatever is happening in the mind and the body at the moment.”**

What my friend Sara Lazar is working on at the moment is finding out if you take transcendental meditation, which many people know about as more of a concentration technique that focuses on a mantra, will that activate different parts of the brain more than doing mindfulness practices?

Mindfulness practice begins with concentration, and then expands out the focus of the tension to turn attention to whatever is happening in the mind and the body at the moment.

In other words, you might start with the breath and then move on to becoming mindful of the motions, becoming mindful of painful body parts...

So, a very interesting question is: Do these two affect different body parts of the brain? She's still studying it, and the answer isn't in yet. And one area of debate in the field is really: are these things all the same?

Herb Benson for instance, who many of you know, wrote the book *Relaxation Response*. He's done an awful lot of very useful research looking into how meditation practices generally help calm the central nervous system and keep us from getting stuck in too much activation of the sympathetic nervous system.

**“This (mindfulness practice) is mostly about gaining insight into the workings of the mind, and using that insight to free ourselves from patterns that create suffering.”**

Herb Benson tends to see all the practices as doing the same thing--- all causing relaxation. People who are involved in mindfulness practices tend to say this isn't mostly about relaxation. This (mindfulness practice) is mostly about gaining insight into the workings of the mind, and using that insight to free ourselves from patterns that create suffering.

So it's going to be very interesting to see whether transcendental meditation, which is clearly a sort of relaxation-response kind of practice, is actually activating any different parts of the brain than mindfulness practice.

We're just now beginning to investigate that. I will say one other thing about different practices. As it

turns out, and this is Richard Davidson's work at The University of Wisconsin, highly skilled Buddhist lamas, these are lamas associated with the Dalai Lama, are able to change their EEG patterns.

This isn't part of the brain so much as it's about the frequencies of brain waves that are dominant in the brain... They will do a deep relaxation practice, which creates a great deal of zeta and delta waves, and they will do mindfulness practice, which creates alpha and beta waves. So these different frequencies of brain waves seem to be associated with different practices.

So, there are differences, but we don't know how this is going to play out, but it will certainly be interesting. And if we do get a good understanding of this, perhaps we'll be able to use it to better prescribe various practices for different patients.

**Dr. Buczynski:** That's very interesting... would we get to a place where we say, "This type of patient needs this kind of change in treatment so instead of prescribing that they meditate this way, I'll suggest this other type of meditation?"

**Dr. Siegel:** I think that would be the hope, and particularly so, if research on which parts of the brain are more implicated in various kinds of psychological stress. If that continues to advance...we now know for instance that certain parts of the brain light up with OCD, other parts of the brain are highly activated in depression, other parts of the brain are more active when somebody is just in general, undergoing a lot of psychological stress.

So, if we can map that and we start to see that these different practices do affect the brain differentially, then absolutely, I think that would help us in trying to figure out who would benefit from a particular practice.

**Dr. Buczynski:** So Ron, as much as that's fascinating, I'd like to be sure we've got enough time to get into some of the other areas. One of the things that we had said we wanted to talk about was the Neurobiology of Narcissism. Can you share with us what you know about that and what your thinking is on it?

### **The Neurobiology of Narcissism: An Antidote to the Self-focused Brain**

**Dr. Siegel:** This is a really interesting area that has really important clinical implications. Everybody has a "sense of me" or "sense of I", but how we actually construct that sense varies from person to person. In fact, that same person can learn to emphasize one way or another way of experiencing themselves.

Researchers who have studied this call it self-reference, and have said that there are two broad types. One of them, they call a narrative focus, and that means when we think about ourselves, we think about our traits. So, for example, I think, "I'm a nice guy", or "I'm a mean guy", or "I'm a selfish guy" and we have these stories, that are narratives, which put together our sense of who we are.

I'll joke sometimes when teaching audiences of mental health professionals, and I'll ask who listens to NPR, and usually about three-quarters of the hands go up, and then I'll say out of those that listen to NPR, how many of them drive, or want to drive, a Hummer?

None of the hands go up. How did I know? Because we tend to all have these images of who we think we are, who we want to be, and these are stories that go along with those images, and some of them are even a little

comically predictable.

**“There’s another experience which is simply noticing moment to moment changing phenomena that’s happening in the mind or body. This way of experiencing self, which is called the experiential focus, is very close to what mindfulness practice helps people to develop.”**

So that’s one way we construct the sense of self. There’s another experience which is simply noticing moment to moment changing phenomena that’s happening in the mind or body. And this other approach is more about noticing in a certain moment, there’s a specific feeling that is arising. This other way of experiencing self which is called the experiential focus, is very close to what mindfulness practice helps people to develop.

So, some folks came up with the idea of a study—it was Norman Farb and Vendel Siegel, some listeners might have heard of Siegel’s work because he’s one of the founders of mindfulness based cognitive therapy, which has been known to be helpful in treating depression.

Both he and his colleague have been interested in the question: can we help people to move from thinking of themselves in terms of self esteem stories such as, “I’m good,” “I’m bad,” “I have these positive attributes,” or “I have these negative attributes,” to simply experiencing the moment to moment of unfolding experience without what we might call narcissistic preoccupation.

Obviously one of the reasons he’s interested in this is that with depression, it’s so clear that people’s negative thoughts about themselves do a lot to perpetuate the problem. And so what they did was set up a very elegant experiment, in which they would train people to respond to a list of adjectives, and to practice responding one way or the other way.

So if you took an adjective like angry, an experiential mental focus would be, “I’m noticing some anger at this moment,” whereas a narrative focus would be, “I’m not an angry person,” or “I am an angry person.”

They put people through an eight-week training in mindfulness meditation and found that, indeed, once someone starts meditating in this way, they have a dramatic shift toward being able to experience themselves, not in terms of the narrative, but in terms of what they are experiencing moment to moment.

**“They put people through an eight-week training in mindfulness meditation and found that, indeed, once someone starts meditating in this way, they have a dramatic shift toward being able to experience themselves, not in terms of the narrative, but in terms of what they are experiencing moment to moment.”**

It turns out there are neural correlates to that. When we're involved in making up the stories of ourselves, in this kind of thinking of our traits as enduring traits and connected to our self-image, there's a part of the cortex called the medial prefrontal cortex which lights up and is activated, and it's quieter when we have an experiential focus.

**“In doing mindfulness meditation practices, the subjects had this ability to not be so stuck in the narrative, but rather to simply see their emotional experience as unfolding moment to moment.”**

It turns out, in doing mindfulness meditation practices, (and this is true for the subjects that did it), they had this ability to not be so stuck in the narrative, but rather to simply see their emotional experience as unfolding moment to moment.

This has huge implications for treating things like depression, and it has huge implications for us as therapists...to be with our clients or patients while there are emotions that are rising in us. In order to be a good therapist, we have to be able to tolerate these emotions and still stay very present and very alive in the therapist-client relationship.

**“If we can not see the emotions arising as a commentary on us—on who we are in this narrative, but instead can see ourselves as just feeling an emotion rising at the moment, and ride those waves, we would be able to tolerate much more emotion and we would do a much better job at being able to be present with our patients....”**

If we can not see the emotions arising as a commentary on us—on who we are in this narrative, but instead can see ourselves as just feeling an emotion rising at the moment, and ride those waves, we would be able to tolerate much more emotion and we would do a much better job at being able to be present with our patients... and their interpersonal lives, and in our own interpersonal lives, having this ability to ride the waves because we're not taking it personally and we're not so concerned with what it means self-esteem wise. This would give us tremendous flexibility.

**Dr. Buczynski:** So we've got some clinical application here, both here as a therapist in just our own processing of our experiences as we're listening to our patients, but also in how we're seeing our patients in their relationships with others or how we see ourselves in relationships with others. That sense of not taking your experience too seriously, it's really relevant in both areas. Would you say that's true?

**Dr. Siegel:** Yeah, I would say so and probably the clearest way to think about it is what it's like to go through the world with events happening, but we don't take them personally, because taking them

personally is when they're constructing a narrative and saying what this means about me and how somebody is treating me, and what kind of person I am, and all of that kind of thing. Just to even imagine one day without any self esteem concerns... what a relief, how nice that would be.

**Dr. Buczynski:** Now in working with couples how does this play out?

**“Virtually everything that goes wrong in a couple’s relationship is about taking personally what the other has done.”**

**Dr. Siegel:** I think this is an area where it’s particularly important because virtually everything that goes wrong in a couple’s relationship is about taking personally what the other has done.

If I’m with my wife, you know a typical situation that happens with guys in relationships—it certainly happens to me—is missing some type of emotional cue, or doing something that was relationally insensitive and I hurt her feelings. It may have been quite inadvertent on my part, but she’s then hurt and angry and I’m feeling ashamed.

To move into the narrative level of, “What kind of guy am I?”... what usually happens is I may be apologetic, or I may just get defensive, and tell her I didn’t do it or she never told me or all the various things that we do because we can’t stand the negative narrative. It’s too painful.

But if we can instead notice that the other person’s feelings are hurt, maybe feel our own shame for the moment, but not have it go into a story about what an inadequate person I am, I’d be much more likely to be able to say “I’m sorry” and see what the other persons need’s are and that certainly makes relationships go better.

**Dr. Buczynski:** Now we promised when we constructed this brain series, that we would be focusing on applications so I’m really excited that we’re able to talk about some of the clinical applications.

I’d like to look at a couple more before we go on. One being something that I think almost everyone either has had or is having, and that is the parent- child relationship. How do you see that playing out here?

**Dr. Siegel:** I’m mindful of the time, but I’ll tell a brief story.

When I moved to the community that I’m in, there were a lot of “tree-huggers” in the community, and they have an organized hike in which many, many families go up and hike in the White Mountains together.

The first time I went, I went hiking with my kids and it was a fairly long hike to the hut that we were going to, and at one point, one of my neighbors asked if I were hiking with my kids, and I said sure, and they said that if there was any time that I wanted to hike in another part of the woods, they would hangout with my kids.

I thought it was a strange comment until about an hour or two later, when things were getting steep, and



my kids were getting tired and started to get cranky, and I started to get agitated because the other kids seemed to be holding it together better than my kids were.

The other kids were more experienced hikers. It occurred to me, it wouldn't be the worst idea for me to hike somewhere else and I took my neighbor up on her offer, and I did fine with the other kids, and then we all met up at the hut maybe forty-five minutes or an hour later, and my kids were fine.

I asked my neighbor how it went and she said fine. And why was that? Partially because my kids were on their good behavior, and the other part was because my neighbor wasn't going to take my kids' "meltdown" personally.

She wasn't going to take my kids' "meltdown" as a measure of her competency as a parent, or her eligibility to join this new community, which was how I was taking it and ...having trouble and starting to get testy with my kids.

So, in parenting, if we could not take it personally, it's enormously helpful. One of the really big ways that mindfulness practice is useful to us is by helping us no longer be so caught up in our narrative about who we think we are. And it's very interesting to see that there's now some neurobiological evidence showing that the part of the brain which is involved in that narrative is less activated in people who are practicing mindfulness.

**“In parenting, if we could not take it personally, it's enormously helpful. . . there's now some neurobiological evidence showing that the part of the brain which is involved in that narrative is less activated in people who are practicing mindfulness.”**

**Dr. Buczynski:** Let's move on and talk about mindfulness as a path to cortical well-being. How is what we're finding out lately relate to that?

### **Mindfulness as a Path to Cortical Well-being**

**Dr. Siegel:** This is a really fascinating area of research. It's also out of Dr. Richard Davidson's lab at The University of Wisconsin. He's been studying what is called affective neuroscience, or the neuroscience of emotion for many years, and he does it predominately through very sensitive EET studies, in which the brain is wired in many, many spots.

What he finds is that, in general, people who are typically distressed, and these are folks who generally are diagnosable with things like depression, or just in general describe themselves as being hyper vigilant, stressed, down, etc. tend to have more activity in the right prefrontal cortex of the brain compared to the left side.

This right side activation is most prominent the more severely distressed a person is. On the hand, people who are generally content, and have fewer negative moods, tend to have more activity on the left



prefrontal cortex.

So, Dr. Davidson and his colleagues have gathered data about the relative degree of right or left activation on hundreds of people, and it turns out that the person who showed the most dramatic prefrontal activation, meaning the most in the direction of contentment was a Tibetan monk with many years of experience with meditation and other mindfulness meditation practices.

**“It turns out that the person who showed the most dramatic prefrontal activation, meaning the most in the direction of contentment was a Tibetan monk with many years of experience with meditation and other mindfulness meditation practices.”**

So, he then studied many other monks, who had between 10,000- 50,000 hours of meditation practice, and found that among all of them, the shift to the left was way more than you would see in the normal population.

But, he’s a good researcher and he considered this possibility that I mentioned at the beginning in studying a trait: people who become Tibetan monks are already content people.

So he and Jon Kabot- Zinn did a really nice study where they took a bunch of stressed out bio-tech workers, and randomly assigned half of them to do an eight- week meditation course and put the other half on the waiting list, and looked at this left verses right activation.

Before anybody started meditating, they all were leaning toward the right because they were a stressed-out group. Once one half went through the meditation course, they diverted from the wait list crew and they started leaning more to the left than they had previously.

**“What’s also very interesting is that once the people had gone through training, they had a stronger immune response.”**

When the second group went thorough the training, they caught up with the first group. It seemed pretty clear from the training that the left side is the side more associated with well being.

What’s also very interesting is that once the people had gone through training, they had a stronger immune response. They tested it by giving them a flu vaccine and seeing how robust the antibody response was. And that was stronger, as well, in that group. And they subjectively said they felt a lot better having done the practice.

It seems that mindfulness practice measured this way, in term of EEG patterns, is very strongly connected to a sense of greater well being. And that, of course, has clinical implications for anybody that we treat since I think all of our patients would like to have a better sense of well being, and we would ourselves.

**Dr. Buczynski:** And so as we meditate more, we're better able to see things that are more contentment-related and make us happy, and overall, we're experiencing more contentment and sense of happiness.

**Dr. Siegel:** And that's a very interesting point to raise because what we see out in the world has a lot to do with our predisposition...the glass is either half empty or half full. I expect that if you asked people to describe what the world looked like to them when people were having more left-sided activation and were feeling more content, they would see the world as a more benevolent place.

**Dr. Buczynski:** Whereas when you're depressed, all we see are things that are negative, and depressing, and frightful... which would perhaps go right to this whole thing about how we're wired, some of us, to experience one type of trait more than others.

**“The neuroscience tells us the brain is designed like Velcro for negative events and Teflon for positive ones.”**

**Dr. Siegel:** Well, unfortunately for us, we're all kind of wired to see the negative. The neuroscience tells us the brain is designed like Velcro for negative events and Teflon for positive ones.

And that makes a lot of sense evolutionarily if you think about it because...were our ancestors to forget what they saw the tiger do, or to forget what happened to someone who got too close to a cliff, that would be the end of our DNA line and the ancestor who didn't remember that kind of thing wouldn't have survived to produce their offspring.

Fortunately, they weren't our ancestors—they died out. The ones that survived were the ones that were really good at remembering every bad thing that happened in life.

And we as modern psychologists, and other health professionals, tend to think stress related disorders are such a huge health problem, and even though they are, most of them don't kill us before we're done reproducing, especially if you go back a few thousand years where people didn't live beyond forty.

So, the stress related disorders make us miserable, but they don't kill us. They allow us to reproduce. It seems as though the selection pressures have been selection pressures for remembering bad events, and not so much remembering positive ones, which is all the more reason that mindfulness practices are helpful and allow us to bring our attention back to the present rather than to be stuck thinking about past misfortunes.

**Dr. Buczynski:** Let's take a minute to talk about the compassionate brain.

### **The Benefits of a Compassionate Brain**

**Dr. Siegel:** Well, this is very interesting and I'll be brief because I know we're getting toward the end of our time.

We know that when people are experiencing compassion, there are certain changes in brain chemistry. In particular, there's a fair amount of oxytocin secreted in the body, and that's a chemical that's associated with nurturing.

In fact, it's interesting, when you look at the Buddhist text that talks about exercises to generate compassion, the image they always use is of a mother caring for her child, so there's an intuitive sense that we're connecting to that same energy, and if you will, probably the same biology that's involved with moms and parents generally as they nurture their kids.

**“When people are experiencing compassion, there are certain changes in brain chemistry. In particular, there’s a fair amount of oxytocin secreted in the body, and that’s a chemical that’s associated with nurturing.”**

One of the other things that Richard Davidson does in his lab is to experimentally try to, in his lab, cultivate compassion by having college students take up various compassion meditation exercises, where basically each day you spend some time wishing well to loved ones or wider communities. And turns out, this works.

The way they study it, by the way, is fascinating. You can't just ask people if they are compassionate or not because everyone wants to say that they are. But instead you can put people in these economic modeling games.

For instance, in one of them, they would give three subjects money, the first, a hundred dollars, the second, seventy- five, and the third, fifty dollars. So each of the three got a different amount, and they were put in a room together.

They were told that they could do what they wanted- walk away with what they had or share. It turned out that the group that had gone through the compassion exercises were much more likely to share.

What was even more interesting...it turns out that when people are involved in compassion training, one part of the brain called the insula becomes activated. When they did neurobiological evaluations of the people that had been through the study, the more the insula was activated, the more money people wanted to give to charity at the end of the study. Participants were offered the opportunity to take home their stipend, or give some portion of it to charity, and when their insula was more activated, they were likely to give more of it away.

**“When people are involved in compassion training, one part of the brain called the insula becomes activated... If we can be more compassionate, we’re likely to be a better clinician.”**

And again, that has enormous implications both for our function as a clinician. If we can be more compassionate, we're likely to be a better clinician. Compassion is also essential to romantic relationships, parenting relationships, all of them really that are part of the interpersonal life. And compassion is essential to happiness.

**Dr. Buczynski:** I wanted to take a moment to get into our final topic, but before we do, I would like to talk briefly about your course. You've a course coming up that actually started last Sunday on Mindfulness and Psychotherapy, and there we take people through an eight-week training course in how to apply and use mindfulness with their patients. Can you talk a little bit more about that course?

**Dr. Siegel:** Sure. We're just at the beginning of it so definitely anybody could still join if they're interested. What the course really surveys the various ways that mindfulness practice can help us as therapists to be more present and more effective, and frankly to enjoy the moment to moment process of doing therapy a good deal more, as well as how mindfulness practices can be applied to treat various clinical conditions such as depression, anxiety, parent- child work, stress related health conditions and the like.

We do it over the course of eight weeks, and the really wonderful part of it to me is the kind of intimate consecutiveness that grows in the group. When I first started doing this online, and you actually introduced the idea to me, I thought, what an oxymoronic idea to teach mindfulness practices over the internet.

Mindfulness practice is about being present and we'd be so distant from one another. But quite the opposite of distance occurs in this course. My favorite example of this is, once when we were running the course somebody wrote in on the message board, "Anybody noticed the effects of mindfulness practice on their sex life?"

**"Because there's a distance geographically, a tremendous amount of intimacy develops where people really talk about their own experience with mindfulness practices. . ."**

I don't know about you, but when I'm in face-to-face seminars, people don't bring up things like that. Because there's a distance geographically, a tremendous amount of intimacy develops where people really talk about their own experience with doing mindfulness practices and particularly they speak in a very genuine way about what it's like to be a clinician trying to integrate all this material into their work. It's been very rich and rewarding. I learn a great deal from the class and it seems the students benefit from it a great deal, and it's a wonderful addition that we tend to have people from all over the world—we have folks from Canada, Europe, South America, Asia, and that makes it such a rich mix to see how people from these various cultural perspectives are approaching mindfulness practices personally and in their clinical work.

**Dr. Buczynski:** The way this is laid out, there's a new lesson out every Sunday, and again midweek. Each lesson consists of a lecture, a meditation, an assignment and a message board to talk about the experience and so often Ron will actually lecture for a while, have people go to the meditation and have them experience it, and then have them come back for part two of the lecture where he'll teach from that meditation experience. Then, he'll do some further applications. Ron, let's now move on to our final point. We don't have much time, but let's just briefly talk about cultivating an open-focused brain.

## Cultivating an Open-focused Brain: One Way to Make Any Therapy More Effective

**Dr. Siegel:** Yes, and as an aside, this also is in its infancy. But there are certain qualities in a therapist that seem to support the therapy relationship, and we do know from a lot of data that strong therapy relationships are correlated to good outcomes in psychotherapy.

Some of those qualities seem to be the ability to be able to tolerate strong feeling, and the ability to be open-minded, to not be too stuck on some preconceived notion of what's going on with our client of patient, but really being able to be flexible and open to what's happening in the moment.

**“There are certain qualities in a therapist that seem to support the therapy relationship, and we do know from a lot of data that strong therapy relationships are correlated to good outcomes in psychotherapy.”**

Based on this, it would seem as though mindfulness practice is pretty good training for the therapist and there have been some initial studies done with therapists in training that indicate that, indeed, this is the case.

What they show is both that the students feel better, and they have fewer negative effects: less anxiety doing the work, less rumination about their cases, and less perceived stress. There's a lot more positive affect and a lot more compassion in doing the work, and it turns out when you train one group of student therapists in mindfulness meditation practice, and another group, not, and you set them out to do their work (and this is largely done in in-patient settings), the outcomes (on the part of the patients) are better when people have been so trained.

It seems that what we intuitively feel, which is that mindfulness practice makes us better therapists, is beginning to be supported by some data although it's preliminary.

**“It seems that what we intuitively feel, which is that mindfulness practice makes us better therapists, is beginning to be supported by some data although it's preliminary.”**

**Dr. Buczynski:** Thank you, Ron. Unfortunately, we're just about out of time. Thank you for being with us on this call. We've had people from all over the world listening together. Thanks for participating. We hope to see you on next week's call as well. Ron, thank you so much for taking the time to be part of this series.

**Dr. Siegel:** Thank you, Ruth. I just want to mention one other resource for people because the book that you mentioned at the beginning actually has both, a variety of meditation practice exercises associated with what we've been discussing, and also many of the bits of research that have been mentioned here are found in that book also. If you want more information on that, you can go to <[mindfulness-solution.com](http://mindfulness-solution.com)>.

**Dr. Buczynski:** Okay, and again, thanks a lot. And everyone, thank you for joining us today and take good care.

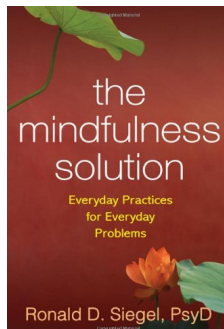
## About The Speaker:



Ronald D. Siegel, PsyD is an Assistant Clinical Professor of Psychology at Harvard Medical School where he has taught for over 25 years. A long-time student of mindfulness meditation, he serves on the Board of Directors and faculty of the Institute for Meditation and Psychotherapy, teaches nationally about mindfulness, psychotherapy and mind/body treatment, and maintains a private clinical practice in Lincoln, Massachusetts. . [...more HERE](#)

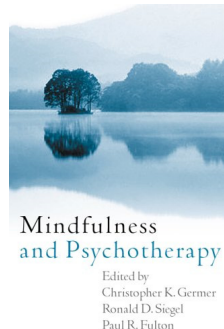
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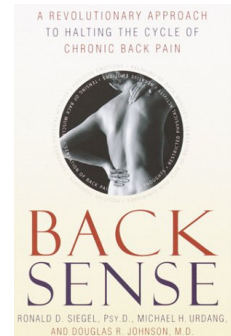
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