Rethinking Trauma

The Fear-Driven Brain:
How a New Intervention is Changing Trauma Treatment

Transcript of Part 2: Talkback Session
with Ruth Buczynski, PhD, Ron Siegel, PsyD
and Ruth Lanius, MD, PhDD
Talkback Session

with Ruth Buczynski, PhD, Ron Siegel, PsyD and Ruth Lanius, MD, PhD

Dr. Buczynski: Once again, we’re going to do our weekly TalkBack session. I’m again joined by my two colleagues, Dr. Ruth Lanius and Dr. Ron Siegel.

Ruth is a physician as well as neuroscientist, and Ron is a psychologist. Both are authors of several books. Ruth is the co-editor of *The Impact of Early Life Trauma on Health and Disease.*

Ron is the co-editor of the seminal work on *Mindfulness in Psychotherapy.*

To both of you, this was a very fascinating study.

What Stood Out Most

This time, let’s start with you, Ruth. What stood out to you most?

“Sebern equates certain symptoms that can occur across diagnoses and relates those to what kind of brain waves we experience.”

Dr. Lanius: Thanks for having me back, Ruth.

Sebern brings a whole new aspect of psychotherapy to us, and it’s very exciting.

What is so new is that she equates certain symptoms that can occur across diagnoses and relates those to what kind of brain waves we experience, which can be evident through EEG or electroencephalography.

She teaches us to get out of our comfort zone and to understand more about brain functioning: slow brain waves, fast brain waves, how they relate to symptoms, and then how we can use neurofeedback, a form of biofeedback, to directly train our brain to change some of the altered patterns that are associated with psychopathology.

What Sebern also brings to her work is that she doesn’t just stop there, but she emphasizes how important it is to be a good psychotherapist. When you’re changing at a very rapid rate, symptoms can change very rapidly, and this can often be frightening to people.

She emphasizes how important it is to have a therapist right there to make meaning of the experience and to help people transform their sense of self and to deal with the sometimes rapid change.

Her approach is new and unique, which is very exciting.

Dr. Buczynski: How about you, Ron? What stood out to you?

Dr. Siegel: What Ruth just spoke about certainly stood out to me.

“She teaches us how we can use neurofeedback to directly train our brain to change some of the altered patterns associated with psychopathology.”
The other thing that caught my attention was the remarkable range of symptoms that she’s had success in using neurofeedback.

I took a few notes during her presentation – she’s had success in working with attachment difficulties, PTSD in the military, substance abuse, chronic pain, weight loss, autism, Alzheimer’s disease, and immune system difficulties.

So, the question that arose in my mind is: how could one intervention affect so many different disorders? Which leads to: what do all these different disorders have in common?

I guess one of the things these all have in common is that they all have to do with what happens when our emergency response system – our fight, freeze, and flight system – gets stuck in a certain position.

What she is trying to do with neurofeedback is to regulate that response system when a person can’t do that on his/her own.

What she is suggesting is a pathway to neuron-regulation, which is somewhat different from most of our pathways, which are more about working with our thoughts, our feelings, or perhaps directing our attention differently as we might do in mediation training.

She’s saying instead, “No, let’s try directly to get feedback on what’s happening in terms of brain wave patterns and see if we can train those to be different.”

The other thing that particularly struck me, and this was what Ruth was just discussing, is that in doing this, she’s not leaving behind her general clinician thinking and sensibilities – Sebern said, “I’m interested in what works.”

What she looks for after the session is: What happened? What was different? Did the person, for example, start having bowel movements that they weren’t having before? Did they develop lower back pain where they hadn’t?

In some ways this is similar to what we’ve seen in traditions such as psychoanalysis that have tended to think that whatever manifests has to do with the transference.

In fact, the original meaning of the term, “acting out” wasn’t just about being rambunctious or difficult, it meant there was a reaction in the transference – in the fantasized relationship with the therapist – that was being enacted somewhere else.

So, she’s rather broad in that, and it would be very interesting to learn more about this and to get a sense of: Are there alternate explanations for some of these events that happen after the neurofeedback sessions? Or do we think that they are causal?
This brings up the whole question of, looking at this vis-à-vis placebo responses – which was the other thing that came to my mind – is it the act of being hooked up to a machine and the ritual surrounding that, that we’re measuring the results of or is it the specific feedback?

I knew a little bit about this beforehand, and I did do a quick check of the literature. It turns out, and I hate to hold up, frankly, any mental health intervention to the gold standard of a double blind placebo control study – it’s tough to get past that with anything.

But I found, and this was interesting, that while for ADHD, it didn’t turn out to be better than chance, for several other things such as depression and even helping kids with learning disabilities, neurofeedback was tested against an equivalent placebo treatment and actually showed different results. I found that very, very heartening, and made me more interested in exploring it.

**Dr. Buczynski:** I think knowing that research has been done on something rather than going entirely on the basis of anecdotal information is so important. Ruth, what are your thoughts?

**Dr. Lanius:** Let me just add to that for a second.

We’ve recently done a study looking at one session of neurofeedback, and looking at some major networks in the brain. We compared neurofeedback to a sham control condition, and it was only the neurofeedback condition that had a significant effect on the brain networks.

It’s a very early study. It’s only one session and it needs to be repeated, but I also thought that was encouraging.

**Dr. Buczynski:** I’m pretty sure Bessel van der Kolk also has an NIH grant to study neurofeedback.

### Brain-Body Connections: Examples of Neurofeedback Working

Ruth, moving on, Sebern talked about the elimination of constipation as a bodily example of neurofeedback working.

Can you talk more about the brain-body connection and perhaps give us some other examples of some bodily symptoms that would illustrate the impact of the brain on the body?

**“Whatever intervention we do, it's important to monitor not only what happens in the mind-brain, but also what happens in the body.”**

**Dr. Lanius:** Sure. Whatever intervention we do, it’s important to monitor not only what happens in the mind-brain, but also what happens in the body.

Something we do routinely, for example, is whenever people engage in a certain skill – for example, deep breathing, autogenic training, or mindfulness exercises – before and after you get them to monitor what happens cognitively, but also what happens in their body.

It’s amazing what people report as they get better. I’ve often heard that people experience less constipation.
Slowly, they experience a sense of lightness – sometimes a feeling of warmth begins to emerge within their bodies and sometimes those past anxious butterflies in the stomach can shift into happy butterflies in the chest.

It’s important to track how the body can shift throughout psychotherapy, especially as people start to bring on board their capacity to experience joy and pleasure.

**What Practitioners Can Learn from Neurofeedback Research**

**Dr. Buczynski:** Ron, Sebern works with neurofeedback, which isn’t something that most patients will probably encounter.

What can we learn or take from this to make it useful for practitioners, whether or not they will ever engage in training to become a neurofeedback specialist?

**Dr. Siegel:** That’s a great question, and it behooves us to understand what is going on in neurofeedback, what it can teach us about what patients need generally, and how else we might provide that to them.

Neurofeedback is a form of biofeedback. In essence, it is helping us to become aware of changes that are happening, in this case in our brain functioning, so that we can regulate that in a different way.

Many, many patients suffering from a wide variety of difficulties, whether it’s folks suffering from emotional difficulties, or folks suffering from physical difficulties, aren’t really in touch with what’s happening.

They don’t notice what feelings are arising from moment to moment. They don’t necessarily notice the relationship between thought and feeling, or in the case of stress related disorders, which neurofeedback is apparently quite helpful with, a lot of people who have these disorders don’t even know they are stressed.

They are just so familiar with certain arousal patterns that that’s just business as usual.

What happens when you introduce a mechanical biofeedback device is that suddenly the person becomes aware, “Oh, there are these different states that are happening inside of me, and in fact, I can favor one state or another – or this behavior leads to this state and that behavior leads to another state.”

There are going to be many different avenues to helping all sorts of different patients or clients to come into contact with themselves and with their inner experience. Certainly, using a machine is going to appeal to some people, and perhaps some of us will train in neurofeedback and we’ll favor or be able to offer that.

“The body can shift throughout psychotherapy, especially as people start to bring on board their capacity to experience joy and pleasure.”
But there are so many other ways. There is a full range of introspective, meditative practices that help people to notice on a moment-to-moment basis what’s happening in the mind and body.

There are all the experientially oriented psychotherapies, like Peter Levine’s Somatic Experiencing or Pat Ogden’s work or Eugene Gendlin’s Focusing – all of which simply guide a person to begin to notice on a moment-to-moment basis, what is happening in the body and what the relationship is between the somatic events, thoughts, and images.

So, there’s a lot to think about. It occurred to me sometime relatively early in my training and it may be shocking that I didn’t know this at the get-go, but everybody doesn’t actually live in my mind and body.

My patients all have very different experiences of moment-to-moment consciousness, and it’s my job to understand what that is like, and then through curiosity and following closely their experience, to help them notice what’s happening moment-by-moment in their experience.

There are so many different pathways to that as long as we’re aware that that is indeed an important component of any sort of treatment for trauma and a great number of other conditions as well.

Dr. Buczynski: Thanks.

Looking for the Evidence: How Practitioners Know When Their Work Is Effective

Ruth, what are some specific behaviors or bodily indicators that practitioners could look for as evidence that their work with trauma patients is effective?

Dr. Lanius: This question ties into what Ron just talked about – it’s getting people in touch with the physical experience.

For example, we often use body scans – I’m sure Ron is the expert here – to slowly reconnect people with their physical sensations.

It’s important to realize that when people have experienced trauma, their emotions are useless. They were futile – when people got angry, they couldn’t express their anger or when they were frightened, they couldn’t run away or when they were sad and they needed to be consoled, they couldn’t reach out to somebody in order to console them.

So, people who are traumatized disconnected from their emotions. They disconnected from their body. They disconnected from their physical sensations, which of course formed the basis for their emotional experience.
Getting people to reconnect to that experience is important, but of course, at first, it’s very frightening.

Titrating body scans to traumatized clients means just taking it step-by-step – monitoring the patient’s comfort level, going at a pace to slowly reconnect to those painful sensations, and then linking them to the emotional states they experienced.

Once they’ve learned that, what you’re looking for is change. You’re looking for an increased capacity for people to be aware of physical sensations and connect them to emotional experience.

Over time, you’re also looking for their capacity to slowly experience positive emotions, which they often couldn’t do at the beginning.

You’re looking for change, and as I said earlier, you want to encourage people before any intervention: you do body scans, monitor what’s happening within their body, and then recheck that after the intervention is done.

That will give them hope, and it will also give them a sense of control, “By doing this, I can actually change the way I feel,” which can be incredibly powerful and empowering for the client/patient.

**Dr. Buczynski:** Now to you, Ron. Sebern said something that I couldn’t wait to ask you about. She said that it’s easier to change the brain to affect the mind than it is to use mindfulness to affect changes in the brain.

Given that you have studied the brain with respect to mindfulness, and I know you’re part of a group that studies mindfulness and probably more the integration of mindfulness and psychotherapy, but you are in contact with brain researchers as well, how do you see it? What were your thoughts on that?

**“Many studies say that brain changes and learning are actually synonymous.”**

**Dr. Siegel:** As you might expect, my ears perked up at her comment around that, and I started musing about it. It occurred to me that maybe this isn’t about there being such a dichotomy here.

All of the studies have experience-dependent neuroplasticity – the legendary studies of the hippocampus in London taxi drivers getting larger after their training and many other studies say that brain changes and learning are actually synonymous.

So really the question is this: What’s the better lesson plan for a given individual?

Anytime we learn anything, whether it’s London streets and landmarks or how to identify an emotion, it’s learning – it is changing brain structure and it is changing brain function.

**“Anytime we learn anything, it is changing brain structure and function.”**
So in some ways, I see the neurofeedback as analogous to a good chemistry teacher who brings in a really nice model of a molecule that illustrates how the thing works so that the student can grasp it in a way that he/she couldn’t otherwise.

Or perhaps even a closer analogue to bring in the feedback aspect would be the good English teacher who sends back the paper with constructive edits – the person learns through this iterative process.

So the question really is: Which learning tool is going to be more suited to which of us and when?

I suspect that’s a little bit of an experimental matter – also experimental in that it’s probably hard to tell in advance. It probably is a matter of trying one approach, trying another approach, and seeing what tends to grab or have traction with a given individual.

This also relates to something else she said – I was struck by her saying, “Maybe this can help people to meditate more effectively.”

There are a number of different neurofeedback schemes out there that purport to do just that.

My friend and colleague, Chris Germer, who’s been on some of your programs and many listeners may know of his work, came into a meeting recently with something called the muse, which is a little wearable neurofeedback device (and I have no financial interest in this).

I have no idea about this, but it was interesting. He was just playing with it, and he said, “Most of the time when I’m doing a simple concentration practice – let’s say focusing on the breath – and when the mind wanders off, I bring it back to the breath as a component of mindfulness meditation or mindfulness training. It takes me a little while to notice I’ve left the breath. Wearing the muse, I get it right away – I get an auditory signal saying that I’ve left it.”

I thought that was interesting because it seems like this could help my concentration to develop a little more rapidly.

It could be that these devices offer a very interesting, integrative, and interactive potential to us.

Maybe for some people, these kinds of neurofeedback devices are going to help them learn to meditate more readily, and then we can use the fruits that come from the meditation practices to work with a whole host of difficulties to help them engage more fully in life.

So, it’s an exciting area to think of what each can add to the other.

**Dr. Buczynski:** Thanks. We’ve got to wrap up tonight, but I want to thank you both for being here, and I want to thank everybody for participating. Take good care and I’ll see you next week.
About The Talkback Speakers:

Since 1989, Ruth has combined her commitment to mind/body medicine with a savvy business model. As president of The National Institute for the Clinical Application for Behavioral Medicine, she's been a leader in bringing innovative training and professional development programs to thousands of health and mental health care practitioners throughout the world.

Ruth has successfully sponsored distance-learning programs, teleseminars, and annual conferences for over 20 years. Now she's expanded into the “cloud,” where she's developed intelligent and thoughtfully researched webinars that continue to grow exponentially.

Ronald D. Siegel, PsyD is an Assistant Clinical Professor of Psychology at Harvard Medical School, where he has taught for over 20 years. He is a long time student of mindfulness meditation and serves on the Board of Directors and faculty of the Institute for Meditation and Psychotherapy.

Dr. Siegel teaches nationally about mindfulness and psychotherapy and mind/body treatment, while maintaining a private clinical practice in Lincoln, Massachusetts. He is co-editor of *Mindfulness and Psychotherapy* and co-author of *Back Sense: A Revolutionary Approach to Halting the Cycle of Chronic Back Pain*.

Ruth Lanius, MD, PhD, is a Professor of Psychiatry and the director of the PTSD research unit at the University of Western Ontario. She established the Traumatic Stress Service and the Traumatic Stress Service Workplace Program, both specializing in the treatment and research of PTSD and related comorbid disorders. She currently holds the Harris-Woodman Chair in Mind-Body Medicine at the Schulich School of Medicine & Dentistry at the University of Western Ontario.

She has authored more than 100 published papers and chapters in the field of traumatic stress, regularly lectures on the topic of PTSD nationally and internationally, and has published *Healing the Traumatized Self: Consciousness, Neuroscience, Treatment* together with Paul Frewen.
The Fear-Driven Brain: 
How a New Intervention is Changing Trauma Treatment

with Sebern Fisher, MA
and Ruth Buczynski, PhD

Dr. Buczynski: Hello everyone. I’m Dr. Ruth Buczynski, a licensed psychologist in the State of Connecticut and the President of the National Institute for the Clinical Application of Behavioral Medicine.

I am so excited to introduce you to Sebern Fisher. She is a specialist, particularly in neurofeedback, and that is something that I felt would be important for you to know about.

I have had several conversations with Bessel van der Kolk, and he told me, “You must have her in this series,” so here she is!

Welcome, Sebern. It’s good to have you here. She is the author of a book that has recently come out – Neurofeedback in the Treatment of Developmental Trauma: Calming the Fear-Driven Brain.

We all work with the fear-driven brain, so this is really important for all of us.

I am not assuming that you are going to listen to this webinar tonight and become a neurofeedback practitioner, but it’s important to know about.

There might be times when you will want to refer patients for neurofeedback therapy and you will want to know what its potential is, and when it might be indicated (or perhaps contraindicated). Some of you might decide to go on for specialized training in neurofeedback.

So, again, welcome – and let’s get started.

Sebern Fisher: Thank you. It’s a pleasure to be here.

A Definition of Neurofeedback

Dr. Buczynski: Let’s start with a definition of neurofeedback. I’m sure everybody remembers the days of biofeedback, but now we’re calling the process neurofeedback. So tell us, what is neurofeedback?

Sebern Fisher: Neurofeedback is biofeedback to the neuronal activity of the brain.

It is in the rubric of biofeedback, but it is highly specialized. It is a computer interface where sensors are placed on the head, and you pick up the frequency domain – the firing domain of the brain – in the EEG in real-time.

“The patient can actually see what their brain is producing.”

It is scrolling there for you and a trainee to look at together. It will be changing that EEG or challenging that brain through feedback. You get change – and obviously the change that I am most concerned about is change in levels of fear…

“The patient can actually see what their brain is producing.”
Dr. Buczynski: The patient can actually see what their brain is producing. That has to be very powerful for someone to see that level of information, or feedback, about themselves.

Sebern Fisher: It is a mirror for the brain to be looking at its own activity, and the brain’s owner is watching it as well.

What we’re really ending up reaching is the way the brain fires, and that changes things for the patient. When we get the right frequencies and the right inhibits, then the brain operates more functionally.

The major contribution that neurofeedback makes, from my point of view, is affect regulation.

### Calming the Fear-Driven Brain through Frequencies and Inhibits

Dr. Buczynski: You used the word inhibits. Tell me more about how you are using the word, and why it is important.

Sebern Fisher: When you look at the screen, you are looking at that signal, and that is real-time EEG from a single site in the brain – it can be more but it is usually a single site in the brain that you have selected, and we can talk about how we go about selecting the site.

What you are asking of the brain is to make more of the frequency that you feel – what one feels in this context that would allow for a quieting of fear and to inhibit those frequencies that get in the way of clear thinking or functioning.

Generally speaking, what you are inhibiting is slow-wave activity, which you will see a great overrepresentation of in people with developmental trauma and many with standard PTSD as well. TBI, traumatic brain injury, will also show a lot of slow-wave activity.

### How a Videogame Calms the Fear-Driven Brain

You are asking the brain to play a videogame through these wave forms. The computer is hooked up and you are really just playing a videogame with your brain, and the videogame correlates to the frequencies.

When you make the reward frequencies and inhibit the brain making the frequencies that get in your way, which are excess slow-wave, only good at night when you are asleep, or excess fast-wave, which represents in most cases excess body tension, you put inhibits on those frequencies.

Then you ask the brain to do three tasks: inhibit the excess slow-wave, the excess fast-wave – and then to make the targeted frequency.
So, for instance, if you wanted to get into a relaxed state – we are not talking about any kind of pathological condition, but just say you wanted to get into a relaxed state, you wanted your brain to look a little bit like that of the Dalai Lama – what you can do is reward the brain when it makes alpha-waves.

When the brain makes alpha-waves, the game will advance. Over time – and it can be during the course of the game – a person will quiet, feel more relaxed, and often their body will feel heavy.

If that is the right frequency for calming, then that is what happens. People can often feel it right during the time they are training.

**Dr. Buczynski:** What exactly is the game? The object is to give feedback, but what is the game?

**Sebern Fisher:** There are a lot of different games. One that is probably the most well-known is called Space Race. There are three spaceships: the center spaceship is your reward frequency, and you want that center spaceship to go out in front of the others, and you want the other two to hold back.

You will see it – the representation: the slow-wave is one of the spaceships, the fast-wave is another spaceship, and the reward frequency is the third – the middle spaceship.

You try to win the race by making more reward frequency and fewer frequencies that get in your way.

**Dr. Buczynski:** Is everybody motivated by the game?

**Sebern Fisher:** Initially, people are motivated by the game, but pretty quickly, they become motivated by the intrinsic reward of their brain feeling better and overall just feeling better.

The games aren’t all that exciting, and that’s not what’s probably all that important.

The game is an exercise – a mirror to the brain about its own functioning and how it can change its own functioning.

### Selecting a Site to Quiet Fear

**Dr. Buczynski:** Let’s imagine the brain: you are in there and you have picked a particular site – let’s go into that for a moment. How do you pick one site over another?

**Sebern Fisher:** Mostly what I am concerned about – and this would depend on what condition you are addressing – but mostly what I am concerned about is quieting fear, so let’s take that situation.

We know that the fear circuits are in the temporal lobe and that survival’s fear circuit, the survival amygdala, is in the right hemisphere.
Generally, we’re going to target the temporal lobe of the right hemisphere in developmental trauma, because that is the part of the brain that is overactive, disorganized, and highly aroused.

We’re trying to say to the brain – not to the person, “Stop practicing that fear-driven over-arousal. Chill. Get quiet!” (If people could do this on their own, they wouldn’t need the game or the neurofeedback.)

We have to find the frequency that works for that particular individual – it’s going to be different for everyone.

**Dr. Buczynski:** What do you mean by works – how do you find the frequency that works for each person?

**Sebern Fisher:** They tell me two or three days later that, on the whole, they have been calm, they have been sleeping, they are less reactive, and/or they are making easier eye contact. That is what I mean by works.

### How to Find the Frequency that Works

**Dr. Buczynski:** What do you mean by having to find the frequency? Are you sitting there with the machine and turning it up or down?

**Sebern Fisher:** I can change the frequencies that are to be rewarded and to be inhibited. That is within my purview as a trainer.

The initial frequencies that I choose are based on assessment. Just like you would make any kind of clinical assessment, you are looking for what kind of arousal profile they have based on conversation with your patient or looking over their history.

Generally speaking, the developmental trauma group that I wrote about almost always comes in highly aroused – and that is felt as anxiety, fear, and often agitated depression.

It is incumbent upon me to find the frequency for their brain that helps them to feel less of all of that and to feel calmer and quieter.

I can’t know ahead of time. One of my rules is that once we begin neurofeedback, everything relates to neurofeedback. So if a person has had a tough night that relates to the neurofeedback; if they’ve had a good night, it relates to the neurofeedback.

It is all data to me about how the brain has responded to certain frequencies as they are presented. It is always the reward frequency that seems to be the most important.

**Dr. Buczynski:** So you never assume that some of their good or bad nights are coincidental?

**Sebern Fisher:** No. I look at that, but the neurofeedback has to be the first to rule out. If I find out that their dog was killed by a car, then I don’t assume that it was the neurofeedback.
If, by their own report, they were even more upset about that event than they would have been, then it becomes data for me around the feedback. Or if they were less upset than they might have been, that’s data, too.

**Dr. Buczynski:** So, you have in your notes the frequency you used the last time.

If they say, “Oh, I was worse,” then what do you do – from a big-picture point of view? Do you decide to change it and in what way?

**Sebern Fisher:** It depends on which way they felt worse. There are certain indicators, like lower-back pain or neck pain that suggest that the frequency is too low. Or they feel like they just couldn’t get out of bed for two days after the training – they were just too tired – that would suggest to me that I had dropped the arousal of this brain too far.

> “It is very important to be a competent psychotherapist, so that you are reading the situation and understanding what the brain is trying to tell you.”

If they felt worse in that they were more reactive, they had a rage episode, they were crying nonstop, we would sort all of that out and I would say, “It’s very likely that we need to leverage this arousal,” and we do that through changing the reward frequency.

So that is the give and take. It is very important to have a competent person on the other end. It is also very important to be a competent psychotherapist, so that you are reading the situation and understanding what the brain is trying to tell you.

Many times it can be hard for some patients to recognize exactly what is going on.

I had a woman who has turned out to be a very successful neurofeedback case, who had come in – just dragged herself in. She was often crying and was self-abusive. She had had 20 years of psychotherapy – and from what I could tell, good psychotherapy – yet she was self-abusing in sessions and dissociative. She was just having a very, very tough time.

She reported that she would have episodes where she had no anxiety – and this would be within two or three sessions – and that would scare her, because she’d never lived with no anxiety, but that is another piece of the discussion.

She would often come in and say, “This isn’t helping me,” and I would have to sort out, find out, or look at other things aside from her self-report, because she was so anxious. I would pick up information from what she said about her partner, or I would ask about physical symptoms.

If somebody has been constipated their whole life – as this woman had been – and is suddenly having regular bowel function, then I know that the brain is being reached. This is à la Stephen Porges – and knowing that bowel function and vagal function is bidirectional is important information to have.

> “You want to look for as many objective measures as you can.”

But this is not typically what clinicians learn or know about – checking on all of these functions – but it becomes part of what you do with neurofeedback.
You want to look for as many objective measures as you can get. You want to look at the kind of sleep people are getting, a decrease/increase in nightmares, or bowel function.

If you had noticed them twisting their hair and they are not doing that anymore, or they used to bite their nails and now their nails start to grow longer – these are all the behind-the-scenes behaviors suggesting that the nervous system is regulating itself.

The Fear-Driven Brain: How a New Intervention is Changing Trauma Treatment - Talkback Session

The Usefulness of Neurofeedback in Treating a Variety of Conditions

**Dr. Buczynski:** Is neurofeedback mostly used with patients with a high level of either PTSD or Borderline Personality Disorder or conditions like that? Do you find it useful with patients who have depression or other issues that aren’t quite at the Borderline Personality Disorder level?

**Sebern Fisher:** Yes – it’s useful for all kinds of disorders. I can tell you a brief story – I was working with a professor who had severe monopolar depression. Her sister had killed herself in a bipolar episode. Although hers was unipolar depression, she always had that fear in the background.

When she came in, it was very shortly after I had trained – learned how to do neurofeedback – and she was crying, which was very atypical for her. She said, “I’m falling into this depression, and it’s scaring me – how fast I’m falling into it. I can’t teach my classes . . .” and she enumerated the problems she was having.

“I did a follow-up with her at 12 years and she said, ‘You can tell your audience that I have not had an episode of depression since.’”

She asked me – even though I was brand new to this – to try neurofeedback. She was not interested in meds and she was scared about her own state. This was not a very troubled human being, but she was having these episodes – this was not her first.

In the course of 30 minutes, I did left-hemisphere training, brought her arousal up – which was what I had been taught to do in the workshop that I had just finished – and I watched this entire transformation take place.

By the end of just this one session, she was out of the depression – out of the depression and ready to go back to work.

We did twenty-three neurofeedback sessions all together with her . . .

**Dr. Buczynski:** Was that weekly?

**Sebern Fisher:** Yes, and in her sessions we would do at least 20 minutes of neurofeedback. She never had another episode.

I did a follow-up with her at 12 years – she had left after those 23 sessions because there wasn’t much left to be done. She felt very secure in her brain.

On the 12-year follow-up – I was going to be giving talks in Australia – and she said, “You can tell your audience that I have not had an episode of depression since. Every once in a while, I wake up kind of blue, but it is nothing that a cup of coffee or a meditation doesn’t handle.”

So that is at one end of working with trauma – it is much less complex and not nearly as long as when you are working with developmental trauma – which is a term I prefer to **Borderline Personality.**
When you think about personality disorders, you’re working with people who have become very identified with what they feel – and they feel terror, they feel shame, they feel anger, and they don’t have much sense of themselves beyond those feeling states. Their brain has no real control over these constant feelings that lead to all kinds of cognitions that aren’t very positive.

**Neurofeedback: From Historical Perspective to Current Use**

**Dr. Buczynski:** There are so many ways to go with this. I feel like I should have asked you in the beginning to just tell us a bit of history – who invented this and approximately when?

**Sebern Fisher:** It was co-arising in three different places.

One was in England, where people were interested in how to advance meditation states.

It was being looked at in the University of Chicago with a researcher named Joe Kamiya, who was looking to see if you could induce states of insight through teaching people to make more alpha. That was his concern and he learned very quickly that he could do that, and people could feel the difference between when they were and were not making alpha waves.

The third researcher was Barry Sterman at UCLA, who got a contract from NASA. Because astronauts were exposed to the fumes of rocket fuel that caused a seizure-like phenomenon, NASA was interested in finding out if there was a way to control brain activity.

NASA couldn’t medicate the astronauts because they had a lot of work to do. So, using neurofeedback was an experiment to see if you could exercise conscious control over brainwaves.

They experimented first with cats by giving them a little bit of chicken broth whenever they made a bit of high alpha – the focus was on 12 to 15 hertz. (Named after a German physicist, Heinrich Hertz, a hertz, Hz, means that an event repeats once per second.) The cats were rewarded very much after the fact, but they started to figure it out . . . obviously not cognitively . . .

**Dr. Buczynski:** How do you reward a cat?

**Sebern Fisher:** Every time they would make the frequency, they would give them a little bit of chicken broth.

Then, they went to monkeys that had to do the same task. They were also able to make 12 to 15 hertz – they could learn how to make alpha if they were rewarded to do it.

Then, Sterman took people, who were on a waitlist at UCLA for psychosurgery to control seizures, off the waitlist, and they all learned how to control them through feedback – this exact process that I have been talking about. They used these same frequencies to learn to control seizures.

**Dr. Buczynski:** Was this during the ‘60s?

**Sebern Fisher:** Yes, this was published, I think, in ’68/’69. It was a long time ago.
So one of the interesting overlaps is that there is more and more literature coming out about how dysregulated the brains are of people who have had terrible childhoods – highly dysregulated childhoods.

In one study in Massachusetts, there was as high a rate as 72 percent of children who met the criteria for developmental trauma, who had abnormal EEGs, and who looked like they were having something akin to seizures – completely dysregulated brain activity.

Very often, people who are so fear-driven and so difficult to treat are given mood stabilizers. A mood stabilizer is the same drug, an anticonvulsant, given by a neurologist to help and support the brain to organize itself.

Psychiatry is really on the same path. The problem with medications is that the brain can rely on medications and can organize with the help of medications, but the brain doesn’t learn its organization.

If you withdraw the medications, the brain will go back to the pattern or habit of firing that was predominant before the meds. When you do neurofeedback, you teach the brain how to regulate itself.

**Dr. Buczynski:** Is it predominantly an operant conditioning?

**Sebern Fisher:** Yes, predominantly an operant conditioning.

**Dr. Buczynski:** Are you always working with alpha waves?

**Sebern Fisher:** No, you could be on the entire spectrum. I just talk about alpha because a lot of the research has been done on alpha.

But for children in particular, reinforcing alpha, the reward being alpha, 8 to 11 hertz or 8 to 12 hertz, may not be low enough to quiet their nervous systems. You might have to reward something lower than that. But that gets into a specific situation.

You know the brain has to calm down, and you start at 8 to 11 hertz or you start at 10 to 13 hertz — and then you find out if it quieted the brain. Did it quiet this person? Did they feel better? Did they sleep better? Did their bodies work better? Were they more coordinated?

I had a young woman, who had been adopted from a third-world country. She had been in an orphanage after having been delivered in a shoebox from a police station. They fed her with an eyedropper, not ever expecting that she was going to live.

She had every possible level of disorganization: she couldn’t read; she bumped into doorjambs; she had a very difficult time negotiating through life.

I was now meeting her out of a mental hospital, and she was in her twenties.

She comes in and tells me this story. She was always the last one chosen for any sports team, as you can imagine, when she was a kid, and she’s stabilized enough to be dating. She is out with a guy and they are waiting to go to a movie, and they go into a batting cage – she hits 90 percent of the balls.
That’s not therapy – right? Therapy could never get somebody from bumping into walls to being able to hit 90 percent of the balls! Her boyfriend was very impressed. He was relatively new in her life, and she said, “Oh, I do this all the time” – which was hardly the case. But it was fine.

Neurofeedback is deeply organizing to the nervous system.

In the book, there are pictures of kids who do self-representations – representations of themselves and their families.

Within forty or fifty sessions, these representations, in terms of the way they draw, are completely different: they are much more nuanced; there is much more detail; they look like they have jumped, in a six-month time, at least three or four years developmentally.

This goes deep into the nervous system; neurofeedback is healing deep into the CNS, the central nervous system, and through the brain.

**Neurofeedback’s Rate of Success**

**Dr. Buczynski:** Approximately what percent of the cases you have worked with has it helped?

**Sebern Fisher:** I would say that probably about 90 percent of the people I have worked with have responded positively to neurofeedback.

**Dr. Buczynski:** Do you have any understanding of who makes a good candidate and who might not make a good candidate?

**Sebern Fisher:** Unfortunately not – there should be a way to meet every brain.

There should be a way, but we can’t always find it, and I can’t tell up front.

I had one situation where I had this very lovely woman who felt stuck in her life, would have anxious moments, and managed it with Coca-Cola – it was a very benign picture. She played the cello and she wanted to get better at it.

She came in almost the same week as a guy who was a former alcoholic with a major rage problem. I was able to help him and not able to do much for her.

I don’t think it was because of the severity of the situation or the brain problem – although it might have been – but that has always struck me: the person who looked to be the straightforward, easy case was not at all.

That just illustrates how very difficult it is to know up front what brain is going to be responsive to this neurofeedback.
Training for Neurofeedback Therapy

**Dr. Buczynski:** What does the training consist of?

**Sebern Fisher:** It’s ongoing! Neurofeedback is advancing quickly. The technology changes and you have to keep up with it.

The initial training – and this is still the case – is four days, where you are introduced to the system – and there are many, many systems out there. The one that I use is called EEGer (a software neurofeedback system).

**Dr. Buczynski:** And you are not a shareholder in that company.

**Sebern Fisher:** No. I have no connection to the company at all. It is just the system that I have used all along and the one that I’m most familiar with, but it is not the only system that works, for sure.

There are four-day trainings that are hands-on, where you become familiar with the system and then you train your brain and somebody else’s brain. You become familiar as well with the effects of the training and how to move with what the effects are that you have seen. That is just the beginning.

It is recommended that people go home and work with family and friends – people who will forgive you for making the inevitable mistakes that you will make. But even if there are mistakes, it’s all information about what the brain needs and wants. Ultimately, it’s all data.

We hear a lot about brain plasticity, and brain plasticity seems to reside in these frequency-based oscillations that we are conditioning. We are saying, “Oh, yes – I’ll make more of that, or I’ll make less of that,” and people change.

**Dr. Buczynski:** How much did your setup cost?

**Sebern Fisher:** When I bought the setup, probably twice as much as it costs now. The systems generally fall in the range of $6000, they last forever, and you get upgrades.

Case Studies Showing Success with Neurofeedback

Most of the training is to say, “What are the protocols that help particular conditions? How can we think about those conditions?”

You mentioned a case in the book about a young woman with Asperger’s and a pretty severe eating disorder – Asperger’s and trauma. She was 15.

“The eating disorder subsided although she had fought to keep it. At one point along the way she said, ‘The problem with neurofeedback is that it works.’”
The eating disorder subsided although she had fought to keep it. At one point along the way she said, “The problem with neurofeedback is that it works.”

She had identity issues on the line, too, and they had a great deal to do with her symptom formation and who she was in the world related to her Asperger’s and to her high level of arousal.

“But as that got quieter, she accommodated to it, and this was interesting, it was very important for her to go into an eating-disorders program – this was part of her script. She wanted to do that.

She ended up in an eating-disorders program. She was the only compliant person in her group. She had been recently given an anticonvulsant because she had an EEG test that showed that she needed one. She told them that she was taking this anticonvulsant and also doing neurofeedback.

They put everybody on the anticonvulsant and never called me about what this neurofeedback was all about.

What I saw – and I think this is accurate – is that when she stopped binging and purging, which she did in this program, and she seemed to be the only one who did, it was as if all the training that we had done just slotted into her brain and she felt a level of calm, capacity, realness and genuineness that she hadn’t felt before.

**Dr. Buczynski:** Did it have any impact on her Asperger’s symptoms?

**Sebern Fisher:** Yes. I would say that by the end of our engagement – we are talking 300/400 trainings – she made the statement to me – and this was around 9/11 – “Relationships are the only harbor.”

That is not an Asperger’s statement. I think she met all criteria for Asperger’s when she started – now called high-level autism – and none by the time we ended.

Now, I haven’t seen her for a long time – I don’t know how much that encroaches or how much that is an overly determined pattern – if that has done the trick for good.

Generally, once people achieve a certain capacity for self-regulation, the brain is invested in regulation. That is what it does. It learns how to regulate the system better. It doesn’t have an incentive to stop doing that.

But a virus can throw the brain off; puberty can throw the brain off; major changes in hormones – which are the neurotransmitters – can throw the brain off.

**Dr. Buczynski:** Does that mean menopause, too?

**Sebern Fisher:** Yes – menopause can throw people off.

**Dr. Buczynski:** Or pregnancy?
Sebern Fisher: Yes. You have to make accommodations for that.

I had one patient who was given the diagnosis of Borderline Personality Disorder and had been hospitalized multiple times. She very much wanted to do neurofeedback training because she felt like she had gone as far as she could with psychotherapy, and she still wanted to drive off a bridge every day!

We used two different protocols: the eyes-open protocol – it doesn’t matter what the specifics were for her – but she got quite stabilized in 20 sessions, and then we did the alpha-theta protocol, which we can discuss if you wish.

She did 30 or 40 sessions. All together, she had about 60 sessions, and it was over. She did not meet any criteria for Borderline Personality and she no longer wanted to jump off a bridge. She actually got married and had a baby, and went on to advance her career.

I saw her once after that ending, and it was when a pet that had been her primary object of attachment, was killed in a freak accident. She came back in and she was very distressed.

An additional trauma can also throw the brain back into its known pattern of firing. So we trained about four times, to address the state she was in, and she very quickly reorganized and was off again.

Dr. Buczynski: Is this used with adults who have PTSD?

Sebern Fisher: Yes.

Dr. Buczynski: Soldiers?

Sebern Fisher: Yes. I think probably single-incident PTSD can be as well addressed through EMDR and other kinds of approaches like that, but the multiple-incident PTSD, or what is called complex trauma, or more and more being called developmental trauma, where it has happened in childhood within an entire surround of your environment, and there has been no mother or no regulating other – those are brains that are in a lot of trouble.

They need primary organization, and that can take a lot longer – you are building a competent brain hemisphere when you are doing neurofeedback. That is the goal with that population.

Dr. Buczynski: How do you think of attachment and repairing of attachment in regard to neurofeedback?

Sebern Fisher: Oh, that’s a wonderful question, and it is somewhat amazing that this happens. In my experience, what I have seen is that people always seem to want relational connection.

Things can get in the way – if you are having something akin to a seizure and you’re constantly living in fear; it is very difficult to imagine relationship as a primary part of your life.
But we are social creatures; we are meant to relate to one another. That is our safety; that is our harbor, as my patient said, and when you find a way to quiet the fear-driven brain, what emerges quite spontaneously are the attachment circuits.

I had one patient – this is the one I was speaking about – who was self-abusing and dissociative when she came into sessions. She had not seen her mother nor talked about her mother – so this wasn’t a result of conversation – but her mother had not behaved ideally.

She came in one day and she said, “I think you might be interested in this: I called my mother last night.” It was spontaneous, and now we could talk about the reality of her mother’s trauma.

Now, this had been presented to her multiple times, and it even occurred to her, but the dysregulation and high arousal of her nervous system made it pretty meaningless.

I see that happening a lot. I see spontaneous family reunion that I have nothing to do with orchestrating, and often, without even talking about it, I see it happen with people who train their brains.

**Typical Procedures in Using Neurofeedback**

**Dr. Buczynski:** I want to get a little clearer picture. One of the cases you mentioned took about 300 sessions. Do you typically see people once a week?

**Sebern Fisher:** If I can, I see people at least twice a week. You are trying to train the brain to pattern itself differently – giving it more feedback initially.

At the same time, I like to know what has happened over the span of a couple of days with the challenge I’ve given them.

**Dr. Buczynski:** Are you typically doing a 45 to 50-minute session?

**Sebern Fisher:** Typically about 20 minutes, and the rest of the session is finding out how they responded to the last one.

**Dr. Buczynski:** So they are in your office...

**Sebern Fisher:** For a full hour.

**Dr. Buczynski:** Of which about 20 minutes is the actual neurofeedback.

**Sebern Fisher:** Yes, generally.

**Dr. Buczynski:** How many minutes does it take to put the stuff on?
Sebern Fisher: Oh, probably five minutes to get the stuff on and off.

“As the science emerges around neurofeedback, there will be more consistent insurance reimbursement.”

Dr. Buczynski: Does insurance pay for it …?

Sebern Fisher: Increasingly so, but that is still a gray area. There are codes for biofeedback/assisted psychotherapy that people can use, but some insurance policies don’t acknowledge it.

As the science emerges around neurofeedback, there will be more consistent insurance reimbursement.

Using Neurofeedback in the Military

Dr. Buczynski: Is it used very frequently with veterans’ hospitals or the military?

Sebern Fisher: I wish with more frequency. The military is investigating neurofeedback, and this would be a great person to interview – Michael Villanueva, who is a major at a forward-operating base in Afghanistan.

Essentially, he opened up a neurofeedback clinic at his base, and they saw dramatic reductions in sleeping medication, migraines, anxiety disorders, and no suicide on that base in the time that he was there.

He was very, very pleased with the outcome – what he saw – and this was in the field. The soldiers all wanted to do it. They liked how it felt.

Dr. Buczynski: Wow! I would think it would appeal to certain types of people who love more anatomy – it uses computers and it is neural anatomy. This could appeal to those who don’t like talking treatments – it could really resonate with them.

Sebern Fisher: Right. A good number of people who come to see me say that their therapy has failed and they have no truck with psychotherapy whatsoever – if anything, it just caused more trouble.

“I would say that usually within ten sessions, they want to talk, they are starting to make meaning out of their lives, and their level of arousal is such that they can actually talk and relate to me so that it becomes a talk therapy as well as a biofeedback-to-the-brain session.”

Dr. Buczynski: Yes; I would think it would be very powerful in the hands of a psychotherapist as opposed to perhaps other kinds of people who might also use it.

How Neurofeedback Provides an Opportunity for Self-Regulation

Are there patients that you wouldn’t use it on?

Sebern Fisher: For some, I can’t. If someone calls me and says that they have a seizure disorder, I refer them to a medical person because I can’t, in the scope of my license, treat seizures.
That being said, we have just talked about the amount of seizure-like activity that is apparent in the brains of many patients with developmental trauma.

I can treat for everything else that they come in for: I can treat for anxiety or depression, and in that process, it’s all the same brain being dysregulated by history.

So, yes, I can treat these patients as long as I am not stepping outside of my scope of practice and making claims of cure – which I don’t do.

Neurofeedback is a learning technology that we offer the brain – an opportunity to learn its own self-regulation.

So that could be true for somebody with seizures; it could be true for somebody with developmental trauma, anxiety, Asperger’s – anything that begins in the brain we could theoretically address through giving feedback to the brain so that the brain sees itself in action and can make corrections.

### Neurofeedback and Substance Abuse

**Dr. Buczynski:** Would you use it with a substance abuser?

**Sebern Fisher:** It is _often_ used for substance abuse, yes. There were studies in the 1990s with Eugene Peniston and Paul Kulkosky, and they were looking at hospitalized Vietnam veterans who had been in at least five hospitalizations for PTSD, alcoholism, or both.

They focused on the alcoholism, and the effects were pretty astounding. These were very small numbers, which is part of the problem because they’re all self-financed studies.

This was in the VA in Colorado, and what they found was that of the ten – and there were ten in the control condition, which was regular therapy as in AA – all of them relapsed.

In the population that did a particular kind of alpha-theta training, which they did for 30 days in a row – of those ten, eight were sober and stayed sober on follow-up, and I think that follow-up was over three years. So, we are talking about an 80 percent rate.

One fell out of the statistic because he went to have a drink and then got sick, so that data had to be dropped as positive.

Then the tenth person drank, but he never drank to excess. He wanted to continue to drink and he would drink socially.

So, the neurofeedback was _very_ effective, and they found the same thing with quieting posttraumatic stress.

Again, it is the same brain dealing with the same issues in terms of its own capacity for self-regulation.
People drink or use drugs or do whatever they can to get *this brain* to work right. We *all* do it: we drink coffee in the morning, a glass of wine at night – we are all working with the nervous system to have it *feel* good to us to be living in.

It is no different if you have Borderline Personality or PTSD, but it *is* different by level of intensity and felt experience. Everybody who is using drugs is attempting to regulate their nervous system.

Or they get trapped: they try a drink or drugs once, get trapped by them, and then they continue to use – people are self-medicating with all drugs.

### Two Kinds of Neurofeedback Trainings

**Dr. Buczynski:** Tell me about the trainings – especially alpha-theta.

**Sebern Fisher:** There are two kinds of trainings in standard practice – and there are more that are coming along.

There is eyes-open, where you are training the brain to make more alpha waves, so they are playing the videogame and they are very engaged in that activity.

> “They are listening/hearing when they are making alpha.”

In alpha-theta, the person is generally lying down in a reclining chair with eyes-closed and they are listening – their feedback is almost completely auditory.

They are listening/hearing when they are making alpha – the goal here is to make alpha and theta – and when they are making alpha, they will hear a certain sound that is actually the same frequency as alpha – it will have that same frequency component.

And when they are making theta, for instance, it is the sound of an ocean. Probably one of the reasons that we go to the ocean, is that it induces theta – it entrains the brain toward theta, which feels very dreamy and drifty.

> “Probably one of the reasons we go to the ocean is that it induces theta — it entrains the brain toward the theta, which feels very dreamy and drifty.”

It appears that in those states, spontaneous changes can happen. That was in Elmer Green’s work that Peniston picked up on, and it was in the 1970s and 1980s that they were doing that work in the Menninger Clinic.

They worked with people to replace a script – if drinking is the problem, for instance, then you have them replace that activity with something else and you read the script ahead of time, “When I feel like I want to have a drink, I will exercise/I will spend time with a friend/I will smile at myself/I will see rainbows” – whatever it is that feels right for that particular person.
That becomes part of the script as they drift into this state: they are getting feedback to make more theta and more alpha, and they go into very deep states.

With this patient who wanted to jump or drive off the bridge all the time, she had always wondered – and no one would confirm – if her father had molested her as a very young child.

In the alpha-theta state, she saw herself as looking down on herself – this is a very common report – from the ceiling, and she watched her father abusing her as a baby, sexually molesting her.

She came out of the session – and this was at the height of the repressed-memory debate and it’s probably not gone but it was at its height – and she told me what she had seen and what was confirmed for her.

But other things that she felt her father had done, she didn’t see. She said, “I didn’t see him doing any of that in the session. I don’t think he did X. I think he did Y.”

What happened in the relationship between the two of them was that she never confronted him; she believed that there was not much that he had done or that he ever had done it. She was very forgiving of him.

She just knew to protect her child from him and to make sure that her baby was okay, but she was fine. It was absolutely a moment of spontaneous healing for her.

Now, that’s not true for everybody. People can go on this journey and not have much happen or they can just feel relaxed.

I myself have done it and had some extraordinary dreams that have been healing in and of themselves, but nothing so spectacular has happened to me during the training, but these are reports we get frequently that things like this happen.

Of course, her tolerance for alcohol was absolutely nil after doing this. She didn’t have a problem with alcohol, but if she started to drink after that, she would feel the signs of the Peniston flu – she would feel sick after having a drink. So, she didn’t drink. That was just an aside for her – it wasn’t a focus of our treatment.

### Mindfulness and Neurofeedback

**Dr. Buczynski:** To what extent is neurofeedback used with mindfulness?

**Sebern Fisher:** Alpha-theta training?

**Dr. Buczynski:** Or even alpha training.

**Sebern Fisher:** Neurofeedback allows a greater capacity for mindfulness.
As I said earlier, one of the first threads of research was conducted by a woman named Anna Wise who wrote a book called *High-Performance Mind*, and her entire focus on neurofeedback was how to help people learn to meditate more deeply. So meditation is one aspect of neurofeedback.

I think general mindfulness is enhanced greatly when there is reduced anxiety or reduced depression or reduced volatility in the nervous system – it is much easier to be mindful. It creates the conditions for mindfulness; neurofeedback isn’t a practice of mindfulness per se.

Dr. Buczynski: But it could go along with it well.

Sebern Fisher: Absolutely.

Dr. Buczynski: And does mindfulness enhance neurofeedback at all?

Sebern Fisher: Probably – the premise here is that it is more effective to reach the mind through training the brain than it is to reach the brain through training the mind.

Our practices of meditation and psychotherapy are working with the mind to try to get control over the brain. I’m a meditator, so I understand that endeavor, and it is not all that easy to do.

We are sort of reversing that mind-brain interface of where we intervene, and we are intervening at the level of brain regulation.

Any effective therapy or meditation has got to be affecting the brain, and there is a lot of research out about that. It does in fact do that.

But we are reversing that. We are saying that we can help the brain learn its own regulation, and then pathology drops away, or mindfulness is enhanced, or the capacity for attachment is enhanced.

It is the directionality that’s different. In my experience, particularly with these fear-based disorders of fear, shame and rage – these limbically driven disorders – it is difficult to work with the minds that arise from those limbic challenges.

It is much easier, and that’s a caveat: it is not necessarily easy, but it is more effective to work with the brains of people who suffer like this to get cortical control over the subcortical drivers.

Then, a different kind of mind and a different kind of personality – a different kind of person – arises out of that.
The Use of Neurofeedback with Chronic Pain

**Dr. Buczynski:** We’ve been talking a lot about the effect of neurofeedback on developmental disorders and upon trauma in general.

How about with chronic pain?

**Sebern Fisher:** This is not an area that I am too familiar with but there are a lot of studies where there is chronic pain (which is not atypical, again, in that population of trauma), and their pain tends to diminish.

Interestingly, there are people where chronic pain shows up in an fMRI. If you do an fMRI scan of somebody who is in chronic pain, the part of the brain that shows up is the amygdala.

The amygdala is the fear, shame, and rage center of the brain, and they each have their separate little chambers in the amygdala.

It is as if the mistake that has been made in chronic pain is that if *I don’t stay in pain, I’m in danger* – the amygdala activities like that.

The amygdala is not the smartest part of our brains, but it is devoted to keeping us alive. If a switch has been thrown that says, “I need to continue to feel pain in order to survive,” the amygdala is going to be very much engaged.

It is in the process of quieting the brain’s fear circuits – the amygdala being the focal point to those circuits – where you’re going to get probably the best results in terms of chronic pain.

**Dr. Buczynski:** Is anyone using it with acute pain – some kind of pain that is caused by something that happened very recently?

**Sebern Fisher:** I broke my arm and used it – I could rely less on painkillers as a result of that. It is not – it would be incidental to anything else because no one would come to me for the use of it for acute pain, and it is a bit of an elaborate procedure for something that is transitory.

“*You will see what are called right-hemisphere learning deficits in kids with developmental trauma histories.*”

How Neurofeedback Can Impact Learning

**Dr. Buczynski:** What about learning and learning issues?

**Sebern Fisher:** It is used widely for learning problems.

Again, in the developmental trauma population – I know you don’t want to focus entirely on it – but in that population, learning is disrupted because there is no established cause and effect, which is right-hemisphere learning.
If you, as a baby, cry, the mother will come and take care of you; it is a random universe response to that signal. There is nothing predictable, and that is encoded in these brain patterns of developmental trauma.

Cause and effect, which is pretty important for learning, is disrupted. You will see what are called right-hemisphere learning deficits in kids with developmental trauma histories.

“You can also see this with dyslexia – how the brain is communicating to itself within certain patterns – they underlie every activity – even reading.

I was speaking before about this kid who had been fed by an eyedropper in an orphanage. She came in, and it was about 90 sessions in or so, and she was now at a Community College, and she said, “Why do they make us read this stuff?” And I said, “What are you reading?”

They had been reading Toni Morrison’s *The Bluest Eye* and it really distressed her. I said, “What’s going on?” She said, “Well, it was that I saw it.” For the first time, she was visualizing what she had read. It had never before *come up on the screen*, and I didn’t even know to ask that question.

Now, when people have reading problems, I ask if they are having trouble seeing what they are reading – getting that picture of what they are reading.

Actually, a lot of people have that difficulty. Suddenly, she was able to see it, and it just happened to be at the very moment she was reading Toni Morrison – which I could imagine being a shock. It’s like you’ve never *seen* what you’re reading, and suddenly that’s what you see. That could be tough.

We can work with straight-out dyslexia – that’s not a group that I work with, but if it comes with “the package” I will work with dyslexia, too.

**Dr. Buczynski:** Are school systems experimenting with it at all?

**Sebern Fisher:** I assume there are places, and I have a colleague in Connecticut who is trying to bring neurofeedback into the Stamford School system. I am about to go to Baltimore where they are very interested in bringing it into the school system – and in my way of thinking, that’s exactly where it should be.

When everyone has access to neurofeedback, development is enhanced at whatever age they enter school and they will have a better shot at life than they would without it.

**The Use of Neurofeedback with Autism**

**Dr. Buczynski:** How about autism?

**Sebern Fisher:** It is used widely for autism.

**Dr. Buczynski:** Effectively – do you know?
Sebern Fisher: Depending I guess on how compromised the brain is: people definitely get better with autism, but are they free of autism? Some are – and my patient now would have been considered, in the DSM V, to be autistic, and she had no indication of autism.

With lower-level functioning autism, yes, it’s helpful. Whether neurofeedback cures it, I don’t know. Cure is not a word I’m comfortable with.

The Use of Neurofeedback with Weight Loss

Dr. Buczynski: How about weight loss?

Sebern Fisher: For some – when anxiety is the reason that you are eating, which is not uncommon for any of us, and anxiety goes down, then there will be weight loss.

“When anxiety is the reason that you are eating, and anxiety goes down, there will be weight loss.”

In as much as food is a person’s attempt to regulate themselves, and in as much as they become regulated about food, there is a much better chance of losing weight.

But I would not say that everybody loses weight with neurofeedback. If they did, I would be on a world tour!

The Use of Neurofeedback with Alzheimer’s Disease

Dr. Buczynski: How about Alzheimer’s disease?

Sebern Fisher: I have only had one experience with this – and it was a woman who was doing home-training – she had a home-training system. She was working with her dad, who had Alzheimer’s, and he was wandering and very agitated.

According to his doctors, he progressed much more slowly into this disease. It eventually claimed him – but he stopped wandering, he became a very pleasant person to be around, so the quality of his life was much enhanced.

“There are claims out there that people, if they are training regularly, can stay ahead of Alzheimer’s.”

I think there are claims out there that people, if they are training regularly, can stay ahead of Alzheimer’s, but I don’t know that for a fact.

If you think about Alzheimer’s, you think about the nun study where the nuns all had Alzheimer’s disease but they had no symptoms of the disease.

When they were looked at in autopsy, they all had plaque and tangles in their brains, but they were functioning very well.

They were asked to function – they had to function, so they were cognitively challenged every day, and so the symptoms of the disease were not apparent.
With neurofeedback, the neurofeedback is a primary challenge and primary learning for the brain.

That is something – at least I hope – will prevent any Alzheimer’s in me since I train fairly regularly. I have had a lot of head injuries so I am at a greater risk of Alzheimer’s than other people are, but all of the signs of head injury and traumatic brain injury that I had are all gone.

"Neurofeedback presents both challenge and opportunity to the brain."

Home Training Systems for Neurofeedback

Dr. Buczynski: You mentioned a home-training system. What kinds of systems are there?

Sebern Fisher: EEGer, the system that I use, has a home-training system. I think almost all manufacturers have a system that people can use at home. It is important that the person is competent and that they are not trying to treat a psychological disorder.

For instance, autism is going to take a long time; cerebral palsy can be helped – it can take a long time and developmental trauma can often take a long time, too.

"You can train three or four or five times a week and people can move along more quickly and much less expensively."

You have a kid who needs a lot of this and they are in an adoptive family, and the adoptive parents are competent and good at this, then that can be overseen by a clinician.

You can train three or four or five times a week so that you get purchase on this brain, and people can move along more quickly and much less expensively.

Dr. Buczynski: How is this different from cranial electrical stimulation or transcranial electrical stimulation?

Sebern Fisher: There is no electrical current in the system that I am speaking about. There is no electrical current going into the brain at all.

All that the brain is getting is information about its function, and it changes its function based on that – really astounding – and there’s no electrical current introduced into the brain.

In transcranial stim – and there are neurofeedback systems that are based on stim – there’s an electrical signal going into the brain. The brain is organizing itself around the stimulation that is being given to it.

I haven’t done a lot of them. I am right now investigating a particular system that introduces a current into the brain, and I am seeing some very interesting possibilities with this system, but I’m not quite ready to go on record about this.

Dr. Buczynski: Sure.
Sebern Fisher: I prefer, as a basic principle, that we invite the brain toward its own regulation rather than making an electrical demand on the brain.

However, I would if that were to be a much more efficient thing to do and had no side effects – and that’s the possibility I’m investigating now. It may help, long term, to shorten the course of neurofeedback – this kind of approach to stimulate the brain.

Some people get good results. I haven’t with any transcranial or CES, prior to the one that I am experimenting with now, but that is just my experience. People have done well with it – it just moves the brain, nudges the brain a little bit and uses very, very low amounts of electricity.

New Studies Using Neurofeedback with Immune Function and Stress Reduction

Dr. Buczynski: Has it had any impact on immune function?

Sebern Fisher: Yes. There is such a high correlation between stress and immune problems, and if you think about what we are doing, whether it is posttraumatic stress or daily stress, we are making a system that is more stress-resilient.

Along with stress resilience, there is an increase in the immune system, whatever way you go about doing that.

Dr. Buczynski: Is anyone publishing studies on this?

Sebern Fisher: The FDA allows you to advertize that neurofeedback reduces stress. So there are a lot of studies.

Those markers would be different for different studies.

I had a patient who would come from Miami, and he would be here for several months. He had HIV and full-blown AIDS. He would come with a T-cell count at around 100, and when he would return to Miami, his T-cell count would be at 700.

The variable that we could isolate was neurofeedback – that was the only thing that happened, and there was a definite shift in his immune system. There are people doing studies on this as we speak.

Dr. Buczynski: Doing studies on people with HIV…or immune function and neurofeedback?

Sebern Fisher: Both.

Dr. Buczynski: That is so fascinating.

Sebern Fisher: Yes, it’s really quite amazing what can happen when you look at the brain’s inherent capacity for self-regulation.
Dr. Buczynski: Absolutely. Thank you so much. We have gone way over, but this is a fascinating area, and I think there are a lot of people who will want to know about this.

Sebern, thank you for giving your time and letting us talk about this with you. You have taught us a lot today. Thank you so much.

Sebern Fisher: Thank you.

References: