

Rethinking Trauma

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

the Main Session with
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National Institute for the Clinical
Application of Behavioral Medicine





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Table of Contents

(click to go to a page)

A Definition of Neurofeedback	4
Calming the Fear-Driven Brain through Frequencies and Inhibits	5
How a Videogame Calms the Fear-Driven Brain	6
Selecting a Site to Quiet Fear	7
How To Find the Frequency that Works	8
The Usefulness of Neurofeedback in Treating a Variety of Conditions	10
Neurofeedback: From Historical Perspective to Current Use	12
Neurofeedback’s Rate of Success	15
Training for Neurofeedback Therapy	15
Case Studies Showing Success with Neurofeedback	16
Attachment and the Repair of Attachment with Neurofeedback	19
Typical Procedures and Use of Neurofeedback	20
The Two Kinds of Trainings in Standard Neurofeedback Practice	23
Mindfulness and Neurofeedback	25
The Use of Neurofeedback with Chronic Pain	26
How Neurofeedback Can Impact Learning	27
The Use of Neurofeedback with Autism	28
The Use of Neurofeedback with Weight Loss	29
The Use of Neurofeedback with Alzheimer’s Disease	29



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

Table of Contents—Continued

(click to go to a page)

Home Training Systems for Neurofeedback	30
New Studies Using Neurofeedback with Immune Function and Stress Reduction	31
References	33
About the Speakers	34



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

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, *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.

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?

"Neurofeedback is biofeedback to the neuronal activity of the brain."

Dr. 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.

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.

Dr. 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.

“The major contribution that neurofeedback makes is affect regulation.”

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.

Dr. 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.

“You are asking the brain to make more of the frequency that would allow for a quieting of fear.”

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

Dr. Fisher: 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.

“You ask the brain to do three tasks: inhibit the excess slow-wave, the excess fast-wave – and then to make the targeted frequency.”

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.

“When the brain makes alpha-waves, the game will advance.”

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

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

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?

Dr. 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.”

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?

Dr. 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're going to target the temporal lobe of the right hemisphere in developmental trauma.”

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?

Dr. 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?

Dr. 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.”

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

“It is all data about how the brain has responded to certain frequencies as they are presented.”

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?

Dr. 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?

Dr. 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.

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*

"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."

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.

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.”

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 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?

Dr. 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.

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?

Dr. 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

“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.***”

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?

Dr. 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

“People could feel the difference between when they were and were not making alpha waves.”

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?

Dr. 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.

“They could learn how to make alpha if they were rewarded to do it.”

Dr. Buczynski: Was this during the '60s?

Dr. 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.

“When you do neurofeedback, you teach the brain how to regulate itself.”

Dr. Buczynski: Is it predominantly an operant conditioning?

Dr. Fisher: Yes, predominantly an operant conditioning.

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

Dr. 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 doorjamb; 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.

So 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.

"Neurofeedback is
deeply organizing to
the nervous system."

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?

“90% of the people I have worked with have responded positively to neurofeedback.”

Dr. 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?

Dr. 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 neurofeedback.

“The person who looked to be the straightforward, easy case was not at all.”

Training for Neurofeedback Therapy

Dr. Buczynski: What does the training consist of?

“Neurofeedback is advancing quickly, and you have to keep up with it.”

Dr. 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.

Dr. 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.

“There are four-day trainings that are hands-on, where you become familiar with the system and then you train your brain.”

It is recommended that people go home and work with family and friends – people who will forgive you for

“Even if there are mistakes, it's *all* information about what the brain needs and wants.”

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?

Dr. 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

Dr. Fisher: 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.”

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-disorder 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 bingeing 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?

Dr. 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.

“Once people achieve a certain capacity for self-regulation, the brain is invested in regulation.”

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?

Dr. Fisher: Yes – menopause can throw people off.

Dr. Buczynski: Or pregnancy?

Dr. 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?

Dr. Fisher: Yes.

Dr. Buczynski: Soldiers?

Dr. 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

“You are building a competent brain hemisphere when you are doing neurofeedback.”

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.

Attachment and the Repair of Attachment with Neurofeedback

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

Dr. 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.

“People always seem to want relational connection.”

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

“When you find a way to quiet the fear-driven brain, what emerges quite spontaneously are the attachment circuits.”

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 and Use of 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?

Dr. 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?

Dr. 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 . . .

Dr. Fisher: For a full hour.

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

Dr. Fisher: Yes, generally.

Dr. Buczynski: How many minutes does it take to put the stuff on?

Dr. 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 . . . ?

Dr. 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.

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

Dr. 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.

Dr. 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.

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

Dr. 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 is a learning technology that we offer the brain.”

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

Dr. 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.

“We are all working with the nervous system to have it *feel* good to us.”

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.

“Everybody who is using drugs is attempting to regulate their nervous system.”

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.

The Two Kinds of Trainings in Standard Neurofeedback Practice

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

Dr. 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.

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.

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?

Dr. Fisher: Alpha-theta training?

Dr. Buczynski: Or even alpha training.

“Neurofeedback allows a greater capacity for mindfulness.”

Dr. 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.

Dr. Fisher: Absolutely.

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

Dr. 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.

“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.

So the basic premise here for all of us is that, in working with pathological conditions, it may be much easier to reach the mind through regulating the brain than it is to regulate the brain through mind practices – meditation or psychotherapy – which if they are working have got to be affecting the brain. There is no question about that.

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?

Dr. 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?

Dr. 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.

“The process of quieting the brain’s fear circuits is where you’re going to get probably the best results in terms of chronic pain.”

How Neurofeedback Can Impact Learning

Dr. Buczynski: What about learning and learning issues?

Dr. 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?

Dr. 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?

Dr. Fisher: It is used widely for autism.

Dr. Buczynski: Effectively – do you know?

Dr. 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?

Dr. 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.

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?

Dr. 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.

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 a 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.

“With neurofeedback, the neurofeedback is a primary challenge and a primary learning for the brain.”

Home Training Systems for Neurofeedback

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

Dr. 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 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?

Dr. 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.

Dr. 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?

Dr. 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.”

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?

Dr. 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?

Dr. Fisher: Both.

Dr. Buczynski: That is so fascinating.

Dr. 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.

“It’s really quite amazing when you look at the brain’s inherent capacity for self-regulation.”

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.



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About the Speakers . . .



Sebern Fisher, MA is a psychotherapist and neurofeedback practitioner in private practice who specializes in attachment issues. She trains professionals nationally and internationally on neurofeedback, neurofeedback and attachment disorder, and the integration of neurofeedback with psychotherapy.

Fisher discovered neurofeedback for her own brain in the spring of 1996. She went into full time private practice in 1997 and began to integrate neurofeedback with psychodynamic psychotherapy. Her book, *Neurofeedback in the Treatment of Developmental Trauma: Calming the Fear-Driven Brain* is a direct result of this work.

Ruth Buczynski, PhD has been combining her commitment to mind/body medicine with a savvy business model since 1989. As the founder and president of the *National Institute for the Clinical Application of 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.

