# Treating Trauma Master Series

## The Neurobiology of Trauma – What's Going On In the Brain When Someone Experiences Trauma?

a TalkBack Session with
Ruth Buczynski, PhD; Ruth Lanius, MD, PhD; and Ron Siegel, PsyD

National Institute for the Clinical Application of Behavioral Medicine
nicabm

nicabm

Treating Trauma Master Series: TalkBack #1

# The Neurobiology of Trauma – What's Going On In the Brain When Someone Experiences Trauma?

## Table of Contents

(click to go to a page)

How Dissociation Is a Lack of Neural Integration ..... 3

How Neurobiology Can Inform Our Work with Trauma ..... 4

How to Work with Feelings of Paralysis ..... 6

The 3 Brain Networks Affected by Trauma ..... 7

How Shame Drives the Freeze Response ..... 9

Normalizing Dissociation ..... 11

About the Speakers ..... 14

Treating Trauma Master Series: TalkBack #1

# The Neurobiology of Trauma – What's Going On In the Brain When Someone Experiences Trauma?

**Dr. Buczynski:** This is the part of the session where we're going to focus on looking back at what we said in this session, chewing on the ideas, trying to synthesize them.

And I'm going to be joined by two experts, two dear friends and experts: Dr. Ruth Lanius – she is a psychiatrist and professor of psychiatry, and a researcher of Western University of Canada; and Dr. Ron Siegel – he is a licensed psychologist; he is associate professor of psychology part-time at Harvard Medical School.

So, guys, welcome, and thanks for being here – and you're a very important part of this program. And let's jump right in.

## How Dissociation Is a Lack of Neural Integration

**Dr. Buczynski:** I'm going to ask you this each module: what stood out to you this week? What stood out to you most this week? And let's start with you, Ruth, today, and then we'll go to you, Ron.

**Dr. Lanius:** Yes, I think what really stood out to me after this session is that dissociation is a really integral part of symptoms following trauma, and I think that Dan and everybody else in the webinar did a good job really explaining it and really showing us how dissociation is all about a lack of integration.

> "Dissociation is a really integral part of symptoms following trauma."

And such a lack of integration can present in various ways: for example, we can have a dissociative flashback where we relive the past and actually lose connection with the present; or we can have out-of-body experiences because things in our bodies can become so overwhelming that we have to detach from the emotions and the memories.

People will often report that they look down on themselves from above because what they experience in their body is not tolerable for them anymore. Sometimes people will also report feeling that their hands or their feet are detached – again, in a way to detach themselves from their past experience and their intense

emotions.

The lack of integration as a form of dissociation can be so severe that the self fragments, and a person can feel like they have multiple selves because they can't carry all the intense emotions and all the intense memories in one state of consciousness – that would be way too overwhelming.

So it gets separated and people can often feel very fragmented and feel that they don't have a sense of self.

These are just some examples of dissociation.

And then what was also pointed out today – which is of critical importance – is a disorganized attachment with the caregiver. If your caregiver doesn't know you, doesn't see you, and is not really there to provide safety, an attachment relationship like this is really one of the strongest predictors leading to dissociation.

> "It's really important that we ask about the client's attachment relationships and then really incorporate that into the symptoms we see, so we have a better understanding."

So, as a clinician, I think it's really important that we're aware of this, and when we get to know our clients, that we ask about their attachment relationships, that we ask about whether they ever felt safe with a person, and then really incorporate that into the symptoms we see, so we have a better understanding of why the dissociation may be occurring.

**Dr. Buczynski:** Thanks.

## How Neurobiology Can Inform Our Work with Trauma

**Dr. Buczynski:** How about you, Ron – what stood out to you?

**Dr. Siegel:** Well, those are all excellent observations, although I think what I was most struck by – and this may just be an emotional reaction – was how far the field has come in looking at trauma, and particularly how much we now know about neurobiology and how that can inform our work.

If you read the news or talk to other humans, it seems clear that we're not exactly entering the "dawning of the age of Aquarius," as it was one promised, and human beings still have a lot of trouble getting along with one another – not to mention simply getting along with ourselves. We now know a lot more about why this is

so difficult for us.

And we know particularly why it's so difficult when we've experienced misfortune in the form of an impaired attachment relationship so that we didn't grow up with the necessary supports – the necessary empathic attunement from the adults around us – or the misfortunes that came from very painful experiences which were too intense at the time they happened for us to be able to integrate them.

But the neurobiology now allows us to see a little bit more about what's going on in the brain when these events occur. And clinically, I think one of the great gifts of that is it helps us to see it somewhat less personally.

"All that self-blaming can be softened by the understanding of the neurobiology."

So often when we've suffered trauma, there's *so much* self-blame – it's either the blame that, *It's my fault it ever happened…,* or *I was a bad kid – that's why I was mistreated,* or *I shouldn't have dressed that way/I shouldn't have gone to that place* – all those kinds of self-critical thoughts that it's our fault. Or blaming ourselves, as so many of my patients blame themselves, because of their symptoms: *I'm so weird. Everybody else can sleep – why can't I sleep? / Other people aren't afraid to go to the mall – why am I afraid to go to the mall?*

All that kind of self-blaming can really be softened by the understanding of the neurobiology and seeing that, you know, this is just what a human brain does when it's been either not well-cared for as a child and/or exposed to events that are overwhelming.

"Each of the neurobiological realms points to a possible kind of clinical intervention."

And it really points to the different realms – because we've looked at what's going on neurobiologically.

Each of the neurobiological realms points to a possible kind of clinical intervention; for example, noticing hypo and hyperarousal responses and realizing, *Okay, they're both natural parts of trauma and we need to address them and intervene with them independently.*

"When we start to see neurobiologically what dissociation looks like, it calls on us to look for how to help people to integrate body, emotions, and thoughts."

What's involved with *reassociating* instead of *disassociating* – how, when we start to see neurobiologically what dissociation looks like, it calls on us more to look for how to help people to integrate body, emotions, and thoughts.

The salience network that Ruth spoke about in her discussion –

you know, helping people to notice that *of course* you're not going to have a clear sense of what's really threatening and what isn't really threatening, and understanding there's this network – but you can *learn* to discern what's threatening and what's not.

Developing executive functioning, and noticing that the lack of executive functioning when we're overwhelmed is perfectly normal – and, finally, safely connecting to others.

So I'm really looking forward to the sort of clinical ways we can intervene with all the various neurobiological networks that become impaired in trauma.

**Dr. Lanius:** Yes, because I think this is also showing us that really the *whole brain* is being affected by trauma – right?

From the reptilian brain on, that seems to be the first part affected and then it has effects really on almost every brain system, as we're learning now. So, yes, thank you for that summary.

**Dr. Buczynski:** Yes, it's going to be a good program. As we put people together and see the ideas and how one part fits into another part and so forth, it's been really exciting.

## How to Work with Feelings of Paralysis

**Dr. Buczynski:** So, Ruth, I wanted to talk to you and ask you about something that Bessel talked about. He was discussing the feelings of paralysis that trauma creates. How do you work with traumatized clients to break through those feelings of utter helplessness?

"At the time of the trauma, emotions were useless. There was no point to have the emotions, because you couldn't act on them."

**Dr. Lanius:** This paralysis is absolutely critical in traumatized individuals, and I think often it's related to two things.

First of all – of course, the trauma. At the time of the trauma, emotions were useless. There was no point to have the emotions, because you couldn't act on them: you couldn't run away; you couldn't fight; you couldn't shout. So if it goes on long enough, what you move into is a state of helplessness and paralysis, in order to survive. So I think that's one critical cause of the paralysis.

And then, often, what we see in our traumatized clients is that this paralysis is even exacerbated because of

the system they've often been in. Often their symptoms haven't been recognized – you know, they've had a number of different diagnoses and the trauma has never been identified to be at the root of their difficulties. And so they have all these symptoms – they don't know why; they think they're crazy; they think they're alone with all these symptoms, that nobody else experiences them – which I think really furthers this helplessness and paralysis.

"The first important step is to really engage in installation of hope—and very soon people feel much less alone; they feel much less crazy."

So I think the first important step is to really engage in installation of hope. Start talking to people about their symptoms and explaining them that they're normal in context of what they've experienced – and very soon people feel much less alone; they feel much less crazy.

And then guide them further to explore their strengths. You know, so often our traumatized clients never think they have strengths, so really helping them to see what their strengths are can really further that hope.

"So often our traumatized clients never think they have strengths."

And then start skill-building: how can they manage these intense hyper and hypoarousal states so they can feel an increased sense of mastery, and really be in their bodies more and feel safer with all these overwhelming feelings?

**Dr. Buczynski:** Thanks.

## The 3 Brain Networks Affected by Trauma

**Dr. Buczynski:** So, Ron, I want to talk to you about something that Ruth talked about earlier in the program. She talked about three different brain networks: the default-mode network, the salience network, and the executive network. Which do you think is most impacted by trauma and where do you go first? Where do you start?

**Dr. Siegel:** I think it's *very* helpful to have the three systems outlined in the way that Ruth did it.

**Dr. Buczynski:** Yes, I did too.

**Dr. Siegel:** And knowing about these different neural networks *really* helps us to start to make sense out of

"Knowing about these different neural networks really helps us to start to make sense out of our clients' experience."

our clients' experience.

Very much dovetailing on what Ruth L. just said – people feel so *crazy* when they have these symptoms. If they can start to see the symptoms as the natural consequence of what happens in each of these networks, then it starts to make a lot more sense, and they start to feel human, and they get to join the "human family."

"If they can start to see the symptoms as the natural consequence of what happens then they start to feel human."

In my clinical experience, which network is going to be more radically affected depends on the person and on the circumstance. Wherever the person has the greatest perspective on the *fact* that the network has been affected is going to determine where we might intervene. Let me explain a little bit.

Let's say it's **the default-mode network** – which is basically a complex set of structures, but one of the functions involves our self-assessments: thinking about ourselves, how we compare to others and the like. This system is active all day long for all of us; we're always talking to ourselves about ourselves, and giving ourselves report cards like, *Oh, that was good, the way I just said that. Oh, that wasn't so good, the way I just said that,* and all the social comparisons that occur.

"In the case of trauma, virtually ***everybody*** blames themselves on some level."

And in the case of trauma, virtually *everybody* – I mentioned this earlier – blames themselves on some level: *If only I hadn't walked down that street/ gone on that trip/been the bad child/dressed the wrong way.*

And we also have narratives of being defective, usually based on the symptoms – that we don't operate like normal people in the world if we've been traumatized; we kind of get that, and we start to be filled with self-criticism.

I think of one patient that I've worked with for a long time who feels fundamentally ugly and unloved – and this is based on early childhood experience, a kind of repeated mental trauma of a parent who was totally fixated on this stuff and idealized her sister. She will go into all situations and feel, *People are rejecting me because I'm ugly*. And you see this happening over and over and over. All day long her default-mode network is talking to herself about her ugliness and her inadequacy.

So, for her, that's the network which is most active and probably the one that needs the most attention. It

might not be the first one to start addressing though, because it may feel so *solid* to her, this idea that *I'm ugly and unlovable*, that it might be easier to start with some other areas where she's better able to get perspective – like **the salience network**, which is basically what's threatening and what's not.

I think of another patient of mine who particularly sees men as threatening – she had a very physically abusive father, so it makes perfect sense – and she's always fearing child abduction because horrible things happen to kids in her family.

So every news story about some violent guy or somebody abducting a child – and there are plenty of them to be found – totally overwhelms her. So for her, actually talking about the salience network is very, very helpful and she starts to get it – like, *Oh, yes; I guess I'm not appraising risk in the same way other people are appraising risk – and it makes sense that I'm not, given my history.*

And talking about the executive-functioning network – the "deer in the headlights" experience: *I can't think;* we wind up with distortive thinking, with overgeneralizations, with catastrophic thinking, with difficulty planning.

If somebody knows that when we've been traumatized these prefrontal-lobe activities tend to go offline, they don't wind up feeling, *I'm so stupid. I'm so inadequate* that way. Rather they can notice, *What are the conditions that I need for my executive functioning to go well or not?*

"You might not start with the most impaired system."

So, in terms of what to do when, I think it depends on which of these is most impaired and how much perspective the person might have on it, because you might not start with the most impaired system.

**Dr. Buczynski:** Thanks.

And, Ruth, it really *was* helpful to put together the three networks as a framework for thinking about how trauma affects the brain and really affects the healing experience.

## How Shame Drives the Freeze Response

**Dr. Buczynski:** So, I want to go on, Ruth, to ask you about the freeze response or the feigned-death response and how *that* impacts a client's ability to heal. Do you have any particular strategies for working with

someone who's had that kind of response to trauma?

**Dr. Lanius:** Yes, and I think my patients have taught me a lot recently about the freezing response, and how much more complex it actually is than it always appeared to me.

"What is the feigned-death or freezing experience about? What are residual effects?"

And so the way I've been thinking about it more is, what are precursors to freezing or feigned death? You know, what is the feigned-death or freezing experience about? And then and what are residual effects?

And one thing I've really learned a lot about in the recent little while is that shame and guilt seems to be a big precursor, which then leads people to freeze – so, having this freezing response where they can't move even if they want to, they can't act on something.

For example, I had a patient whose little brother fell into the swimming pool and his mother said to him, "Come on! Get into the swimming pool! Help your little brother!" – but he froze, so he *couldn't* help his little brother. So, his residual effect was also intense shame and guilt that he wasn't able to help his brother.

"Shame and guilt seem to be a big precursor, which leads people to freeze—they can't move even if they want to; they can't act on something."

I think shame drives the freezing responses – and then the shame is further potentiated because people can't act. And we know that shame really kills the capacity to experience positive emotions, and so I think this makes the whole freezing experience much more complex.

"Shame really kills the capacity to experience positive emotions."

But of course, at the core of treatment is not just the shame, but also – how do we help people shift from not being able to move into active defensive action such as being *able* to run or being *able* to defend themselves?

I think that's something we have to really work on in therapy: how can we decrease the shame that's often a precursor to the freezing response; and then how, out of that, we can help people moving from an immobile state into an active defensive response where they can really protect themselves or run away, rather than freezing. And I think they really have to practice that within their

"That's something we have to really work on in therapy: decrease the shame that's often a precursor to the freezing response; and help people move from an immobile state into an active defensive response."

bodies in sensorimotor therapy – Peter Levine talks about this – and I think that's absolutely critical for people to shift that in their bodies so they can experience the difference between freezing and actually engaging in defensive action.

> "When people are able to change their instinctual responses, you see that positive affect come online."

And so I think we can really change these instinctual responses, and when people are able to change them, you see that positive affect or positive emotion is really able to come online.

**Dr. Buczynski:** Thanks.

## Normalizing Dissociation

**Dr. Buczynski:** Ron, let's talk about something Dan Siegel said: he was saying, "If you think of therapy as a way that you change the brain, it's a reasonable statement to say that the purpose of therapy in the treatment of trauma is to create more integration in the client's brain."

How, in your perspective and in your experience, how do you go about working to create integration?

**Dr. Siegel:** Well, I actually think that what Dan's talking about is applicable to both "small t" and "large T" trauma, and therefore it's applicable to *all* therapy – because, at least as I understand it, pretty much all therapy involves at least working with "small t" trauma. Let me explain a little bit –

> "All therapy involves at least working with ***small t trauma***."

Basically, what we're doing when we move toward integration is, we are trying to undo dissociation or dissociation we might think of as attributing disintegration. And I think it's *really* helpful that Dan helped to normalize this, because we all dissociate, to some degree, all of the time.

> "We are trying to undo dissociation—it's ***really*** helpful to normalize this, because we all dissociate."

Every time *any* of us experiences even a slight emotional hurt, sometimes we're able to be with the feeling fully, but very often we shift our attention away: perhaps we're involved in a task and the emotional hurt would be a distraction from that task so we kind of push it aside; perhaps we're involved in an interpersonal connection and the nature of the relationship isn't sufficiently intimate that we can tell them about every hurt that arises.

There's the simply distracting ourselves from unpleasant experiences and forgetting them, which is a form – a very mild form – of dissociation.

You know, Google says that we check our smartphone 143 times a day! Now, I don't think that's all for vitally important information; I think some of that is little bits of feeling, thoughts. Images are beginning to arise that are somewhat uncomfortable; we push our attention away from them and we split off from them – not to mention going to the fridge unconsciously and the like.

There's a whole lot of feelings that we often find difficult. For one person it's sadness, for another it's fear, for another it might be anger, for another it might be lust or sexual interest.

And basically, unless we're *completely* mindful all the time, aware of present experience with acceptance, then we're at least dissociating to some degree – which basically means splitting off some unwanted content and trying to hold on to some more wanted content.

> "Unless we're ***completely*** mindful all the time, we're at least dissociating to some degree."

And even what we think of as defenses in psychodynamic terms – well, defenses are forms of dissociation. Again, I'm defining it very broadly, and I think it's actually useful to define it broadly – not to deny that some people actually feel they're disconnected to their bodies, they don't know the other personality. Obviously this comes in very extreme versions.

> "Defenses are forms of dissociation."

But if we can see it all as part of a continuum – and I think Dan was trying to help us to do that – then we don't pathologize it so much. And then even the person who is experiencing an out-of-body experience like Ruth was just talking about can see, *This is human. This is what we all do. It's happening at a greater intensity for me.*

> "If we can see dissociation as a continuum, then we don't pathologize it so much."

**Dr. Buczynski:** Yes.

**Dr. Siegel:** Now, there's a lot of things that can help us to dissociate less.

Certainly mindfulness practice can help, but we've got to go easy with that because it means really sitting with material and it can be too much for somebody at a certain time – particularly this sort of standard idea of, *Go off for 30 or 45 minutes and be with the breath and notice what comes up.*

"Safe engagement in the therapy relationship is a form of integration or undoing dissociation."

Safe engagement in the therapy relationship is a form of integration or undoing dissociation – which has been there from the beginning of psychotherapies, not to mention just people telling stories to one another and the like.

Certainly self-compassion, lovingkindness works – the kinds of things that we do to bring a sense of soothing to ourselves all help to ease dissociation because it makes it safer to integrate the material.

Just talking about the thing that's hard – to *anybody* – helps to undo the dissociation.

But I think the critical point is that this is universal; it's on a continuum, and pacing is going to be very, very important – you know, who's ready for what degree of integration at what point. And I'm sure we'll dive into that in greater depth as we go along here.

"The critical point is that dissociation is universal."

**Dr. Buczynski:** Yes. I think that the idea of a continuum, when we think about dissociation, really does help to take away some of the pathology that we may have at one time inadvertently started.

Okay, that's it for us for tonight.

To everyone, you do very, very important work. Thank you for what you do.

To you, Ruth; to you, Ron, thank you very much for contributing to this program.

Bye-bye.

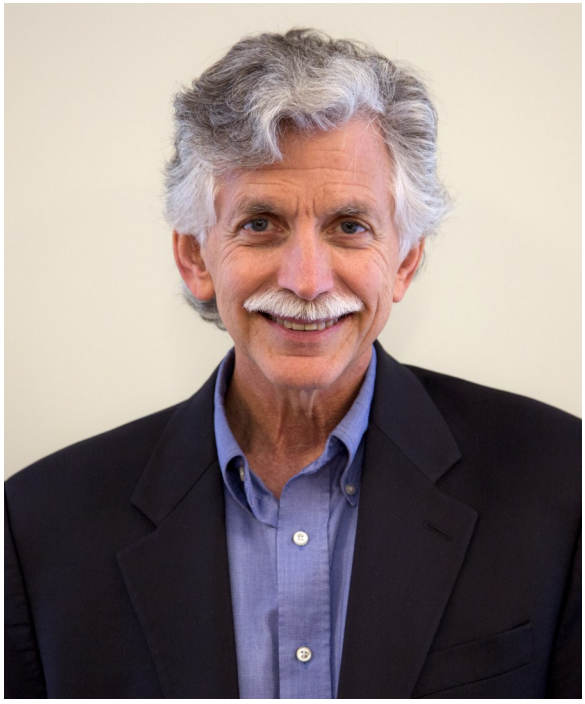
nicabm

# About the Speakers . . .

**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 and 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.

**Ron 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 mediation and serves on the Board of Directors and faculty for the Institute for Medication and Therapy.



Dr. Siegel teaches nationally about mindfulness and psychotherapy and mind/body treatment, while maintaining a private practice in Lincoln, MA.

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.*