Frontiers in the Treatment of Trauma

The Neurobiology of Trauma - What Is Happening in the Brain of Someone With Unresolved Trauma

the Main Session with

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Dr. Buczynski: Hello everyone and welcome back. I am 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 – and I’m so glad that you’re here today.

She has done so much work I need to catch up on and catch you all up on as well.

To start, I’d like to say hello and welcome. Thanks for being here.

Dr. Lanius: Hi, Ruth – thanks for inviting me.

How the Parent/Child Attachment Relates to Trauma

Dr. Buczynski: To start with, I’d like to set the stage – let’s start with the mother/child attachment and how it relates to trauma.

I know you have some other work you want to mention, but before we get into that, let’s just talk about the parent/child. What is the connection between the parent/child relationship and trauma?

Dr. Lanius: What the parent/child relationship really does is set the stage for emotional development – for people to be able to be emotionally aware and to regulate their emotions.

When you think about going back to Bowlby’s work, we see an infant having a secure base. When it’s upset, when it’s crying, or when it’s hungry, there is a secure base, hopefully, there that can really calm down that nervous system.

Then as the child grows older, it can start to explore and to be curious, knowing that it has a secure base to come back to.

The problem in a lot of our traumatized patients is that they don’t have the secure base.

The nervous system doesn’t learn how to regulate intense states of arousal, and that is one of the crucial
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causes of our patients having such intense emotion dysregulation.

They often tell us they are on an emotional roller coaster; in the morning they may feel okay – two hours later they may be in intense distress; half an hour later they may be angry; two hours later, they, again, may be okay.

If we don't understand that as one of the core problems – that they cannot regulate their emotions – then as healthcare professionals, we may say to them, “Well, what the hell is wrong with you? You were okay half an hour ago.”

But that is the core problem – it is this inability to regulate intense emotional states, and it’s very tightly linked to the attachment system.

Unless we have the secure base, this normal development in emotion regulation cannot occur.

**Dr. Buczynski:** Would you say that is true whether or not trauma was involved? Or are you adding the insecure base and trauma together?

**Dr. Lanius:** Having this disruption in an attachment relationship really can set the stage for a higher risk of developing trauma-related disorders.

If you haven't had that secure base – if you don't have that foundation of the secure attachment – that really puts you at a much higher risk of developing all sorts of trauma-related psychopathology.

**Dr. Buczynski:** So the insecure attachment creates an underlying vulnerability.

**Dr. Lanius:** Absolutely. Yes.

**Dr. Buczynski:** It’s down at the level of the nervous system that we see that vulnerability – where this insecure attachment affects the nervous system’s response, the autonomic response.

**Dr. Lanius:** Autonomic response, cortisol response, as well as – there’s some emerging data – brain activation patterns.

It’s also important to realize – and Allan Schore speaks a lot about this – how the anterior cingulate only comes online in the first six months.
It is really attachment relationship and that mother or parent/infant dyad that is crucial in bringing some of those emotion-regulatory brain regions online. That’s how people can learn to be aware of their emotions and how to regulate them.

**The Emerging Evidence**

**Dr. Buczynski:** How do we know that any of this is true? I mean, theoretically, it sounds true.

What kind of work has been up to now to confirm that this hunch – the intuitive sense of “This makes sense” – is actually true?

**Dr. Lanius:** There’s a lot of emerging research looking at parent/infant interactions in terms of the neurobiology.

There have been a number of studies looking at what happens in the mothers’ brains, for example, when they’re interacting with their infants, as compared to other infants where there is no interaction.

It is becoming clear that in mothers who have had psychopathology and trauma that they process the emotional states of their infants very differently. They have been seen to have an overactive regulation of the amygdala, for example, and maybe react more.

In other cases, what we’re also starting to see is that they’re reacting less, especially when they’re in dissociative states.

They aren’t able to react to some of the cues of their infants; they sort of shut down and really remove themselves from the situation – not consciously, obviously, but this is being driven by their dissociative symptomatology.

**Dr. Buczynski:** So that is the parent. What about the child?

You said that the baby – Allan Schore said that during the first six months, secure attachment affected the interior cingulate in the baby.
Dr. Lanius: Yes, we’re also learning more about how infant brains develop over time.

For example, one brain network that our group has been looking at is called the default-mode network, and this is the idling state of the brain. It is key to when we’re just sitting here self-reflecting and not engaging in any specific cognitive task.

This network is also thought to be absolutely important in regulating most other brain networks that are involved, for example, when we engage in doing something or when we’re planning for the future.

We’ve learned that this is one network that develops over time. When the infant is born, this network is not fully connected – but it actually takes until adolescence for this network to be fully connected.

What we’ve seen in our adult patients with a chronic history of childhood trauma is that their network actually looks like the network of seven to nine-year-old children.

Of course, the question arises: is there a developmental arrest that is related to trauma? I think really important studies will need to be done in the future to track these infants and children over time and compare different groups – groups of infants that have had a secure attachment, groups of infants that haven't had a secure attachment, and infants that have had different types of attachment plus different forms of abuse.

Then, we can figure out how much of a role attachment is playing here and how it is interacting with different types of abuse.

It’s really interesting to look at how the brain develops over time and how our adult patients may be suffering from a developmental arrest because of a trauma that occurred at crucial developmental periods.

The Default-Mode Network

Dr. Buczynski: Let’s talk more about the default-mode network. Is that an abstract network or a cluster of anatomical parts of the brain? What exactly do we mean by the default-mode network?

Dr. Lanius: It is made up of certain parts of the brain that are connected, especially at rest.
We have, for example, the posterior cingulate cortex, which is important in helping us figure out what is self-relevant. Of course, when we think about traumatized individuals, they have a really difficult time figuring out what’s self-relevant.

Somebody may go into the forest if they have been raped in a forest twenty years ago, and all of a sudden they may feel like this forest is self-relevant – feeling like they may be raped all over again – even though really it isn’t self-relevant.

The posterior cingulated cortex is one brain region that is involved in the default-mode network.

Another one is the medial prefrontal cortex, and this is a really important brain region involved in self-reflective awareness – knowing what you feel.

Again, if we think about our traumatized individuals, that’s a tremendous problem they often have – they’re cut off from their emotions.

Now, the reason for that is when they were going through the trauma, the whole point of an emotion is usually to lead to an action.

For example, if you’re afraid, you can run away. If you’re being attacked, you can defend yourself by pushing away whoever may be attacking you.

But when you’re in a chronically traumatic situation, that connection between emotions and actions is disrupted.

In a way, emotions become futile – there’s no point to them anymore. People start disconnecting from their emotions and their bodies feel numbed-out.

They don’t know what they feel, they lose having words for their feelings, and this whole capacity for self-reflection really disappears.

Or, alternatively, the capacity for emotions may never develop fully in patients who’ve had chronic early-life trauma from a very early age.

That is another key region of the default-mode network – the medial prefrontal cortex, and especially the
The dorsal medial prefrontal cortex is involved in self-reflective functioning.

That is involved in this self-reflective functioning.

Also, what’s interesting and has been shown about this brain area is that the more mindfully people are able to observe what’s happening in their bodies, the greater activation you see in the dorsal medial prefrontal cortex.

So, the question arises: Can we, through really engaging trauma patients in mindful observing, bring this network back online? That’s just an aside.

**Dr. Buczynski:** That sounds like to me why mindfulness could be so relevant.

**Dr. Lanius:** Absolutely, and actually, we use mindfulness all the time in the treatment of chronically traumatized populations.

**Dr. Buczynski:** When we’re talking right now about the posterior cingulate cortex and also the medial prefrontal cortex, are we saying that the lack of attachment just impairs the development of these parts, or that the lack of attachment floods these parts?

What exactly does the lack of attachment do? How exactly is the one affecting the other?

**Dr. Lanius:** That’s really a great question, and we don’t know yet. But I think we would hypothesize that the connections between those parts may be affected by the attachment relationship and by early-life trauma.

**Dr. Buczynski:** Would that be the synapses?

**Dr. Lanius:** Yes. What we see in the normal development of children is that the older the children are, the more connectivity we have between those areas – the posterior cingulated cortex and the medial prefrontal cortex.

We’ll also have to look at whether we have fewer fibers in the synapses connecting these two areas – the connections between the nerve cells.

Again, it’s known that this development of the fiber systems, or the myelination of these fiber tracts, can be affected, and negatively affected, by stress hormones.
So, one possibility is that the more stress and the more stress hormones that are secreted, the less development we have of this fiber system connecting these two areas.

**Dr. Buczynski:** I’m just going to write that down, but how do you know any of this? Are you doing MRIs with the babies?

**Dr. Lanius:** No. What we have done is we have looked at this network, this really resting-state default-mode network in patients with posttraumatic stress disorder related to chronic early-life trauma.

Then we went to the literature that looked at children’s development of this network, and we compared our findings through the developmental literature.

We came across, very interestingly, default-mode networks of people with posttraumatic stress disorder related to early adversity and they looked like the default networks of children aged seven to nine.

So yes – that led us to think about: is there a developmental arrest as a result of this trauma?

**Dr. Buczynski:** But still, what I’m asking is different. You go to the literature and you read Allan Schore, but how does he know?

**Dr. Lanius:** There’s an emerging literature from other laboratories that is looking at infant development, and, of course, that is key literature for us because this is the time when a lot of the trauma in our patients occurs.

Slowly, we can start to track the results we get in the adults and in the children and relate it to the normal development of infant brains.
Mother/Child Attachment Research

Dr. Buczynski: Let’s talk a little bit about your research, the research that you’re involved in now.

You have some mother/child attachment research going on – not parent/child because they’re all mothers. Tell us a little bit about that.

Dr. Lanius: We’re interested in looking at how mothers, who have a history of trauma and suffer from posttraumatic stress disorder, are able to interact with their children, as opposed to mothers who don't have a history of trauma and posttraumatic stress disorder.

Here’s the reason we got so interested in this. In our clinic, the mothers with a history of significant early-life trauma and PTSD often told us that they had significant difficulties mothering.

They were trying really hard and they had tremendous feelings of guilt, but often they weren’t able to read the children’s cues. They were very overwhelmed, or they dissociated often – they just really had difficulties interacting with their babies.

We wanted to find out what happens in the brains of mothers when they’re looking at their own infant versus a standard infant in a happy, sad or neutral state.

This research is still ongoing; we haven't analyzed the results because we haven't completed our data collection yet, but we’re learning a lot just in terms of collecting the videos, helping the mothers to engage their infants and watching the behavioral videos.

We’ve noticed that some of the mothers, for example, have had tremendous difficulties getting their infant to smile or engage them in a positive interaction.

That really surprised us, but we’re finding that a number of these mothers had no idea or found it very difficult to make their infant smile.

So, what implications does that have? How can we help those mothers to bring their infant more to a positive state?

These are all very important questions that are emerging. It also brings us to the whole concept of early intervention.
If it is so difficult for not just mothers but caregivers with a history of trauma to feel comfortable with parenting, how can we intervene early to help them feel as competent as they can be in their parenting skills?

**Dr. Buczynski:** It must be so sad, to not be able to make your infant smile. There must be such a disruption in their connection.

It must kill any connection if the mother can’t bring some joy between her infant and herself.

**Dr. Lanius:** Absolutely, and often, it also leads to tremendous guilt in the caregivers.

So, yes, I think these programs that have been developed in a number of places including Toronto or Rotterdam, for example, and also Boston, that focus on this early intervention are absolutely key.

**Dr. Buczynski:** How do you teach mothers who don’t know how to do that – how do you teach them how to pick up cues?

**Dr. Lanius:** Peter Fonagy’s group and others have done some work with this – one of the key steps is to increase the self-reflective capacity.

If you’re completely cut off from your own emotions and if you’re not in touch with how you feel, it is very hard to figure out how somebody else, for example, your baby, feels as well.

So, step one is teaching self-reflective awareness – mindfulness – of your own emotions.

This means helping them to “mentalize” or know the mind of the other and figure out, “Okay, if the baby engages in this kind of behavior or emotion, how does that make you feel? How can you use that to then figure out what the baby feels?”

Eventually, the caregiver is able to hold the mind of the baby in their own mind. Does that make sense, Ruth?

**Dr. Buczynski:** Yes, but tell me – let’s back up a minute and talk about the self-reflecting element of that part of your hypothesis. How did you come onto this? how did you discover it?

**Dr. Lanius:** There is literature by Peter Fonagy’s group that has shown the relationship between a secure
attachment and self-reflective functioning.

He has a scale that measures self-reflective functioning. He looked at that in relationship to attachment patterns, and it was found that the more self-reflective functioning in the mother, the greater the chance of having a secure attachment with the child.

**Dr. Buczynski:** What hypotheses did that lead you to for your studies?

**Dr. Lanius:** We began a large set of experiments looking at emotional awareness and self-reflective functioning in PTSD related to early-life trauma and found significant disturbances in self-reflective awareness in those individuals.

That led us to think about this as being one of the major reasons for caregivers often having such difficulties in knowing what their infants are feeling and helping their infants and children to regulate intense emotional states.

This helped us to increase that capacity in our patient population – the more self-reflective functioning they developed, that became beneficial in their ability to regulate their children’s emotional arousal as well. Over time, it really helped them to be able to know what their child was feeling.

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**Epigenetics and Secure Attachment**

**Dr. Buczynski:** I wrote myself a note to ask you while we were talking about this: when a person is not able to get their child to smile. I wonder if that is almost genetic – that at some point you’re passing down genes in an epigenetic way.

**Dr. Lanius:** Absolutely, and I think that brings us to epigenetics – the influence of the environment on gene expression.

That idea is absolutely crucial here and we need to think about what genetic vulnerabilities are, especially those related to adverse environments.

This has been done in a number of labs now – the more someone has of these genetic vulnerabilities, the higher risk they are at being affected by an adverse early environment.

“The more self-reflective functioning in the mother, the greater the chance of having a secure attachment with the child.”

“The more someone has of these genetic vulnerabilities, the higher risk they are at being affected by an adverse early environment.”
Dr. Buczynski: Now, you may not know exactly how other people do their research, but to the best of your knowledge, can you just tell me, approximately, how that research is done?

For example, how are you looking at genetics and their connections? How are you doing that?

Dr. Lanius: You would take a blood sample or saliva sample, and from that you can look at different genes that have been identified to be involved in the attachment relationship.

For example, one key gene is the short versus the long serotonin transporter gene.

The short allele of the serotonin transporter gene has been associated with greater vulnerability to early adverse experience.

Simply by taking a saliva or blood sample, that can really give you a lot of insight into the genetic makeup of an individual.

Dr. Buczynski: Would they be doing that with adults who report having trauma, or would they be doing it with infants that appear, or have been observed, to have less attachment?

Dr. Lanius: Probably both. Yes. You can track that over time as well. With a blood or saliva sample.

Dr. Buczynski: That’s very interesting about the short versus long serotonin transporter gene. Are there other genes that might turn out to be relevant?

Dr. Lanius: Yes, there is a glucocorticoid receptor gene that’s relevant to early adverse experience. There’s also a dopamine transporter gene.

We see a number of genes emerging that are very relevant. We’ll have to track them in terms of how vulnerable they are to mediating early adverse experience.

Dr. Buczynski: Let’s summarize where we’ve come so far.

You’re doing research on the parent/child attachment and we have found for quite a while — that this attachment affects vulnerability to having trauma be more disruptive should one, any time in life, encounter a traumatic experience.

We’re also finding that attachment affects self-reflection, and that sets up a cascade of events in how a
Is there more to say about this? Can you fill in any parts that I might not have quite laid out clearly?

**Dr. Lanius:** Where attachment takes us is into this whole concept of social cognition and social emotions – being able to have good relationships.

Relationships are so drastically affected in individuals with a chronic history of childhood trauma.

For example, let’s think about eye contact. When we think about our patients and how difficult it is for them to make eye contact, often they’re looking away; it is very shameful for them to look us in the eye.

When we ask them about that, they will often tell us, “Oh, my god, if you were to look into my eyes, you would know what a terrible person I am.”

That, again, takes us back to the attachment relationship. When is the first time an individual should really be exposed to direct and frequent eye contact? It is as an infant – right?

You wonder about the relationship between the difficulties of making eye contact later on that takes us back to the attachment relationship.

Then, of course, there are the feelings of being ashamed, but it’s the attachment relationship that is the first step in experiencing direct eye contact.

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**Social Cognition: The Capacity to Mentalize**

**Dr. Buczynski:** Let me stop you for a moment and ask you to define social cognition.

**Dr. Lanius:** Social cognition deals with one person interacting socially with another, which involves, again, awareness of your own emotions and your own feelings, but also being in tune with the emotions and the feelings of another person.

“Social cognition is this whole capacity to mentalize – being able to hold another person’s mind in your own mind.”

It is this whole capacity to mentalize – being able to hold another person’s mind in your own mind. I think
that is the key to good social interaction, and that forms the basis of social cognition.

**Dr. Buczynski:** What have you found about the capacity to mentalize in terms of the people you’re studying?

**Dr. Lanius:** We have tried to approach it from a variety of perspectives. In the first set of experiments we did, we created a number of social scenarios, both positive and negative.

A positive social scenario would be: being greeted by your friends with a hug for your birthday. A negative social interaction would be: getting a negative job evaluation. We got people in the MRI scanner to imagine themselves in those scenarios.

This is what we found. In patients with posttraumatic stress disorder related to early-life trauma, the brain areas that are crucial for social cognition were much less activated than in the healthy controls.

“**In patients with PTSD related to early-life trauma, the brain areas that are crucial for social cognition were much less activated than in the healthy controls.**”

Again, these areas include the medial prefrontal cortex, especially the dorsal medial prefrontal cortex – the area that we talked about being involved in self-reflective awareness.

There are also two other areas that are really important. One is the temporal pole, right at the front of the temporal lobe, which is important in mentalizing – being able to hold another person’s mind in your own mind.

The other important area is the temporal parietal junction. That is important in social cognition and mentalizing.

So, our patients with posttraumatic stress disorder have less activation in those brain areas compared to the healthy controls.

**Dr. Buczynski:** How is the research done? How do you know any of that? Not to be a skeptic, but how do we know that it is in the temporal parietal junction? What do people do to figure that out?

**Dr. Lanius:** This is why you do an MRI scan – we do a functional MRI scan, which involves getting people to, for example, imagine themselves in this social scenario, and while they’re doing that, we are tracking the brain activation of different brain regions.

Usually the more active a brain region becomes, the more it is involved in a certain task. **Through** those
experiments, we’re able to see that patients with posttraumatic stress disorder related to early-life trauma had significantly less activation in those brain areas.

We have people in the fMRI scanner tracking how much brain activation we see, for example, when imagining yourself in a certain social situation.

Through that, we can compare how much brain activation we see in people with posttraumatic stress disorder related to early-life trauma as compared to healthy controls.

And what we’re seeing is that in the people with posttraumatic stress disorder, they have much less activation in these areas of social cognition.

This also led us to do another set of experiments – to track what happens in the brain when our patients are confronted with direct eye contact versus averted eye contact.

As we talked about before, it is so difficult for our patients to be engaged in a social interaction with direct eye contact because they’re so afraid that if anyone were to look into their eyes, they would find out how bad they are – what a bad person they are.

Quite a large body of literature is emerging in looking at healthy individuals and what happens in terms of brain activation during direct versus averted gaze.

Virtual characters have been developed that we can use in the scanner, and this is what happens. A person would lie in the fMRI scanner and we have these virtual characters either approaching you with direct eye contact versus averted eye contact – which is not perfect, but it’s a beginning to look at the effects of direct eye contact on brain activation.

We found some results that quite surprised us at first. We saw in the healthy control subjects without a history of early adversity that when they were confronted with direct versus averted eye contact, they would activate those areas we just talked about in social cognition – dorsal medial prefrontal cortex, temporal pole, and temporal parietal junction – all of those areas are involved in social cognition.

When we looked at our PTSD individuals with a history of early adversity, those brain activation patterns
were very, very different.

Almost *none* of those higher areas of social cognition were activated. What was activated were the superior colliculus and periaqueductal gray, which is a brain structure in the brainstem. It is a much lower activation level.

That is a brain area that is usually involved in a defensive response – a self-defensive response and in cowering – and that leads to decreased social interaction.

From that we need to think about different levels of consciousness that may be involved. Certainly with our control subjects, they’re activating high-level brain areas that allow us to be able to reflect on what we’re feeling, what the other person may be about, and that allows us to evaluate the situation at a higher level.

Whereas the PTSD subjects, when confronted with this direct versus averted eye contact, they go into this defensive response. They activate no higher areas that allow them to self-reflect – to think about, “What is the situation? Is this character really going to attack me, or what is this character about?”

They simply activate these very low areas that promote defensive response.

Are we dealing with the higher versus lower level of consciousness? That is an open question.

It also raises a number of other questions that we need to think about. For example, if you’re in a psychotherapeutic situation, if you’re in a room with a therapist and if the therapist makes direct eye contact in certain cases, do our patients go into this lower-level brainstem response – into this defensive reaction?

What kind of implications does that have for the ability to engage in psychotherapy?

**Dr. Buczynski:** So what *would* you do? This is especially critical for psychotherapists, but I’m thinking now that you could be an emergency room nurse, or you could be in any of our professions and have people who can’t tolerate eye contact.

What should we do? I can see that we have shed some light on what we could understand about what is going on for them, but what are you finding that we would suggest practitioners do?

**Dr. Lanius:** Psychoeducation is the first step for *all* practitioners.
Whether a mental health nurse, an emergency nurse, or an oncology nurse, we need to be aware that early-life trauma can be related to tremendous difficulties making eye contact, and what many people feel when they’re confronted with direct eye contact – how bad it makes them feel about themselves.

It’s absolutely crucial for health professionals just to know and be aware of that.

The next step is: How do you approach that with your patient or client? When you become aware, “Oh, this client really has difficulty making eye contact” – do you bring that up with the client or do you just quietly realize, “Oh, there may be something going on” – or say whatever may be appropriate in the situation.

This approach would really decrease the tendency to judge – to say, “What’s wrong with this person? Why can’t they look at me? How strange is that?”

We want to promote an understanding and a respect – allowing the person not to make eye contact if they’re not comfortable.

Margaret Wilkinson, who is a psychotherapist in the United Kingdom, has suggested that we should always sit at an angle with our patients so if they choose not to make eye contact, they can. She says that this would be less shame-inducing.

That’s important as well in the psychotherapeutic situation, but also in the emergency room situation or in any other situation – allowing for our clients not to engage in eye contact if they aren’t able to tolerate it.

Dr. Buczynski: Going back to your parent study – you might have a parent who doesn’t have the ability to make eye contact and finds that shameful, not making eye contact with their child would just perpetuate insecure attachment.

Are you trying to teach those parents to make eye contact? How are you looking at this?

Dr. Lanius: Yes, I think this takes us to a really important question, and that question is: when caregivers with a history of trauma are exposed to direct eye contact from their child, do they actually have those same brain activation patterns? We don’t know that at this point, but it’s a crucial question.

Certainly what we see clinically is that patients with a history of early adversity can often have tremendous
difficulty making eye contact with their children.

I’ve had a situation where a mother came in with her five-month-old child and she put it on a blanket in front of where she was sitting, and I was sitting across from her.

The child actually looked back and tried to make eye contact with me because her mother had such difficulty making eye contact.

So, these future studies will be crucial to look at the effects of eye contact between caregiver and child, and how we can promote that to foster good, healthy relationships.

**The Neurobiology of Dissociation**

**Dr. Buczynski:** Let’s talk some about the neurobiology of dissociation. I would hate to talk to you and not get into that because you’ve taken a look at. Let’s start by getting into what we know so far about dissociation – the dissociative disorder?

**Dr. Lanius:** Obviously, there’s a lot of literature – but just to simplify it a little bit, we know of two different types of dissociative responses.

One I would call emotional under-modulation. That is when people get hyperaroused. They go into flashbacks, and they lose contact with reality.

They feel that they’re back at the scene of the trauma and they don’t even realize, in extreme cases, that they’re in the present – that’s a real dissociative flashback.

Usually, the heart rate increases and they become extremely hyperaroused. I would call that emotional under-modulation.

It’s usually associated with decreased medial prefrontal cortex activation, and the medial prefrontal cortex that we have talked about in terms of self-reflective functioning, again, becomes important here because it has dense connections with the emotional brain, including the amygdala.
With adequate activation of the medial prefrontal cortex, we can regulate the emotional limbic brain or the amygdala. If we activate the medial prefrontal cortex, we can dampen the amygdala.

But when we have this emotional under-modulation, such as during intense reliving of experiences, what we see in the MRI scanner is decreased activation of the medial prefrontal cortex.

That may lead to the amygdala, or the emotional part of the brain, being overactive and therefore involved in this hyperarousal response.

But dissociation can also occur very differently, for example, when people have depersonalization responses – they “leave” their own body, or have derealization responses during which they feel that everything is unreal around them.

We see this occurring in about thirty percent of our patients when they recall their traumatic memory in the scanner. They usually tell us, “It was too overwhelming to really recall the traumatic memory and I left my own body / everything felt unreal around me.”

That’s what regulated the emotional intensity of the memory. What we see in those people is that they don’t have an increase in heart rate while they’re trying to recall the traumatic memory – they’re removed from the emotional content of the memory.

We would call that emotional over-modulation as opposed to emotional under-modulation.

What happens here in the brain is that we have increased activation of the medial prefrontal cortex – whereas in the flashback, reliving response, we had decreased activation.

During these out-of-body experiences, we have increased activation of the medial prefrontal cortex. That is thought to lead to an over-dampening of the emotional brain, or the amygdala, and therefore leads to this hypo-under-emotionality, often without an increase in heart rate associated with it.

Let me say this again. We have more activation of the medial prefrontal cortex, and because that has such dense connections with the emotional brain, the amygdala, that activation over-dampens the amygdala and...
therefore you get a hypo-emotionality – less emotion associated with a memory.

This is also often associated with a lack of increase in heart rate when people are remembering their trauma.

So, you can have two very different responses that can both be thought of as dissociative, and in terms of brain activation as well as phenomenologically, they’re very, very different.

Of course, we also need to think about treatment responses.

If someone, when they’re engaged in traumatic memory recall, has this out-of-body depersonalization, derealization response and can’t engage with the trauma, we first have to help them to be grounded in the present before we do any trauma-focused work, because essentially, they’re shut down.

Dr. Buczynski: When you’re helping them be grounded in the present – can you tell me a little more about that? Are you talking about having them be aware of their feet on the floor and using approaches like that?

Dr. Lanius: Yes. We’re looking at how we can bring them back into their own body and feel safe in their own body.

For this, I’m thinking of two forms of mindfulness.

One is using the five senses to bring yourself into the present – “What do I see in the present? What do I hear in the present? What do I feel in the present?” For example, “Can I feel my butt on the chair? Can I feel my feet on the ground? Can I see what’s happening in the room? Can I hear what is happening in the room?”

The second form of mindfulness is also this somatic mindfulness – just being aware of your external senses isn’t enough – you also need to be grounded in your own body.

That means: “What do I feel? Can I get in touch with the physical sensations in my body? Can I connect the physical sensations with what emotions and feelings I have?”

Once you’ve helped an individual to feel safe with grounding themselves both somatically as well as with the environment, they’re in a much better place for, first of all, increased emotional awareness and also increased emotional regulation. Does that make sense at all?

Dr. Buczynski: Yes, absolutely. Are there other issues that you think about or are concerned about when you’re thinking of treating people who have dissociative disorders?
Dr. Lanius: Certainly, emotional awareness is one of the first steps that we help people to develop.

A lot of our clients come in completely disconnected from their own bodies, feeling completely numbed-out, really having learned, as we talked earlier, that emotions are futile, so they’ve disconnected themselves from all their emotions.

“Emotional awareness is one of the first steps that we help people to develop.”

One thing we do very carefully to help people reengage with their body is the body scan, and this has been outlined by Jon Kabat-Zinn, for example, in his book Full Catastrophe Living.

It’s important to be aware of the fact that they need to be adapted to the use of traumatized individuals.

The dosing needs to be done much more carefully because, as we know, the body is a scary place and a lot of very scary emotions are situated in the body.

I always like to think about the title of Bessel van der Kolk’s paper, The Body Keeps the Score.

We have to be aware that becoming aware of physical sensations in the body can be very frightening for people – we need to go at a pace that feels comfortable and safe for an individual.

That pace is going to vary across individuals, so we carefully do these body scans – they’re very carefully dosed – until someone is able to become aware more and more of their physical sensations.

We then teach them to figure out what physical sensations are associated with certain feelings or emotions.

“Creating a body map of feelings and emotions is going to be different for each person.”

For example, in one person, anger may be related to the hand tensing up and forming a fist and their chest getting tight; in another person, anger may be associated with feeling heat in their body and their neck becoming tight.

Creating a body map of feelings and emotions is going to be different for each person. That is usually one of the first steps we teach in people with high levels of dissociation.

Dr. Buczynski: What about anhedonia – are people that are dissociated more prone to anhedonia?

Dr. Lanius: They are, and anhedonia is also a very important part of chronic, early-life trauma, but we need to think about it in terms of two broad ways.
Anhedonia is this inability to experience pleasure. It’s a bit more complex in people with chronic, early-life trauma.

When we think back to this whole neurobiology of play and curiosity, that is, in my opinion, not really developed in people with chronic, early-life trauma. They were preoccupied with fear – there was not opportunity for play, pleasure, or curiosity.

Often what we see in our patients is that they have an inability to experience any positive emotion.

They can’t even bring up positive emotion. Often, they feel they don't deserve it, so it can be very, very difficult and take a long time in therapy to bring that online.

Then, the second problem is often that when they do bring positive emotion online, they have this negative interference of negative emotional states.

We teach them to feel a little bit positive – and then they’re flooded with negative emotion.

So again, Psychoeducation is really important here – to explain to people that this is normal. The dosing of positive emotions has to be done very carefully depending on the level of difficulty the client has with positive emotional experiences.

Some clients are only able to tolerate positive emotions for a millisecond or so. Then over time, we increase that – but we always want people to let go with positive emotion; we don’t want them to be flooded by negative emotions.

Debbie Korn and Andrew Leeds have done a lot of work on this – what they call “resource installation,” or installation of the capacity to experience positive emotion.

It is one of the key ideas we need to address in psychotherapy.

Often, we’re so trained to focus on the negative and when somebody comes in to see us and says, “You know, I’ve had a great week and things have gone so much better,” we’re taught to ask, “But how about your flashbacks?”

This whole concept of positive emotion and this inability to feel that you deserve to experience the positive – this incapacity to experience pleasure and joy and curiosity and triumph – all this is so important in
the treatment of PTSD.

Without bringing that online, therapy really hasn’t been successful.

**Dr. Buczynski:** I want to catch the names of those two people who were working on resource installation. What is their work called again?

**Dr. Lanius:** That’s Debbie Korn and Andrew Leeds and their work is called “resource installation.” They have a couple of papers that have been published on this. If you go on the internet, you can find them.
About the speakers . . .

**Ruth Lanius, MD, PhD** is an Associate 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.

Her research interests focus on studying the neurobiology of PTSD and treatment outcome research, examining various pharmacological and psychotherapeutic methods. 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 recently published *The Impact of Early Life Trauma on Health and Disease* with Eric Vermetten and Clare Pain.

**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