What are we about today?
• Science influencing practice = trauma informed
• Our focus is “what do you do with the science”?
• Knowledge isn’t enough - we have to know how to apply it!

To be trauma informed:
• My definition: allowing science to inform/influence your practice
• Assume everyone has a trauma history
• Understand that trauma is an experience that continues to evolve, not something that happens one time
• Be informational not intentional
  - stay curious about the experience
  - what might this mean
  - Intentional = Asking as an expression of “stop what you’re doing”

The brain and meaning
• The role of the left prefrontal cortex
  - logic, language, and the story of our lives
• Children are egocentric (and they should be!)
• Gestalt theory (we fill in the blanks)
• Influence of the environment

Be aware of the role you play (for better or for worse) in the meaning making process of a child!

Understanding bias
• Anchor Bias: every decision you make is “anchored” in your existing beliefs
  1. what are your IMPLICIT beliefs about children who act out?
  2. what might children begin to believe about themselves?
• Confirmation Bias: once we’ve made a decision, we ignore data that contradicts our decision. How easy is it for a child to believe s/he has worth once s/he starts to believe s/he has no worth?
• Availability Bias: we make decisions based on data that often represents recent or impressionable memory. How much of an impression does being abused or neglected leave on a child?

Note how easy it is for a child to reinforce the unhelpful messages of victimization without even recognizing that this is what’s being done.
BRAIN BASICS

Defining Trauma
- Extreme fear/terror/horror + lack of control/perceived lack of control
- These two conditions = very real changes in the brain at the time of the incident AND after the incident

Circuits
- Our circuitry is “baked in” to assist us in dealing with survival
- Our attachment circuitry allows us to exist in groups, rest, and digest
  - related to our parasympathetic nervous system - think parachute - it slows us down
  - it allows us to connect by slowing our heart rate down, etc
  - it allows us to sleep, digest our food, and heal from wounds
- Our defense circuitry allows us to directly deal with threat in two ways:
  - related to our sympathetic nervous system - it revs us up to mobilize
  - BUT it can also immobilize (shut us down) if conditions are right
- A single trauma can permanently alter our defense circuitry
- You can’t logically think away or wish away conditioned defense circuitry

According to world renowned trauma expert Bruce Perry, the children who survived the Branch Davidian conflict had resting heart rates above 120bpm.

Neural Networks
- Our neural networks are the result of our experience (think driving)
- The neurons that fire together wire together
- The more often/more intense = more robust neural networks
- A single trauma may result in neural networks that you can’t just think or wish away - often these are cognitive, emotional, and behavioral patterns that are used to cope with the impact of the trauma.

Small group exercise: Come up with a list of behaviors or patterns of responding to themselves, the environment or other people that children develop as a result of their victimization

Prefrontal cortex (the thinking part of the brain) plays a role in:
- Top-down processes: regulation of affect, cognition, and behavior
- Integration of memory data (memory is the integration of sights, sounds, smells, etc, the PFC turns all those bits of memory data into the “what happened”
- Logical decision making

Mid-brain/Limbic System plays a role in:
- Defense circuitry: your response to threat involves very little logical planning
- Memory encoding and consolidating: the memory data points (sights, smells,
sounds) must be “labeled” (encoded) and associated with each other (consolidated) to be integrated

• Emotion

THE BRAIN AND THREAT

Defense circuitry

1 - Your defense circuitry starts with neuroception: subcortical intelligence gathering!

• Neuroceptive mapping: The brain’s ability to map the environment to either safety or threat, which in turn influences our level of awareness (called vigilance - to be discussed in a moment)

• Remember the brain maps in generalities.

HOW WILL YOU MAP TO SAFETY?

1. Themes of choice/transparency
2. Soft eyes/compassion/empathy

Let’s take a quick detour on the underlying neuroscience that explains empathy

The Science of Mirror Neurons:

• When you see a behavior you’ve done before or are familiar with in some way, your mirror neurons fire more strongly (because they are motor neurons)

• When you see a facial expression, your mirror neurons send a signal down to your LIMBIC SYSTEM (because every facial expression is a function of muscle/motor activity and we are all familiar with every facial expression)

• Your Limbic System is involved in the experience of emotion and this is why it’s so easy for us to make sense of facial expressions!

• This is the science that supports the conclusion that to be trauma informed means to use soft eyes throughout interactions with children

Trauma informed communication starts with empathy not rapport. IF you don’t map to safety, how can you expect anyone to feel comfortable sharing the experience? How can you expect a child to respond to your questions, directions, suggestions, words?

Defense circuitry continued:

2 - Neuroceptive mapping conditions vigilance

• Vigilance: your awareness of the environment

• Environment and history (context and subjectivity) affect your level of vigilance. You will be more vigilant in certain environments, and based on your history, what I map to safety, you may map to threat (thus increasing your vigilance).

Keep in mind: it may be hard for an adult to understand what threatens a child who has a trauma history. It could be as simple as tone of voice, lack of structure, or a change in the plan for the day (lack of predictability).
3 - Threat Detection: involves the amygdala (Danger Will Robinson!)
   • Remember: the detection of threat is SUB-CORTICAL!
   • When the amygdala fires it cues the brain to assess the possible threat
   • The amygdala is active at birth

Keep in mind: the child who has been affected by trauma, as we will learn later in the day in more depth, likely has an overly sensitive amygdala that may fire consistently, making it hard for the child to sit calmly, concentrate throughout the day, or maintain “composure” or “maturity” that you’d expect as “age appropriate”

4 - Assessment of the threat
   • Assessment is very simply the immediate and limbic based assessment of the threat (using same maps of safety/danger thanks to hippocampus)
   • During this assessment of the threat, we become still
   • It’s important to understand that if the brain is overwhelmed by the threat during this assessment, the child may feel (and look) frozen - while this is not technically an immobility response, children will experience feeling frozen and sometimes report not having any thoughts or a repetitive single though
   • Note: the hippocampus appears to develop over the first five years of life and we appear to consistently develop maps of safety and threat. What implications might this have for a child who experiences trauma before developing that parents/family are indeed “map of safety?”

If threat is Not Traumatic:
   • You will most likely remember the details of what happened IN ORDER, and in quite a bit of detail - memory of intensely emotional experience appears to be more strongly encoded (but as we will learn, trauma negatively affects the brain’s ability to effectively encode)

THE BRAIN AND PROLONGED THREAT
Defense Circuitry Taking Over
When the defense circuitry takes over there are FIVE consequences you have to understand. Three relate to our reaction to the threat, two relate to our memory.

We need to understand these five consequences in order to:
1. Help normalize them for children
2. So that we are not at all surprised if a child disclosing having a trauma response
3. To help us understand the importance of reasonable expectations for memory

Related to our reaction:
• 1: Impaired prefrontal cortex
• 2: Survival reflexes/reactions
• 3: Self-protection habits
Related to our memory:
• 4: Bottom-up attention
• 5: Altered memory encoding and consolidation

Related to our reaction:

1: Impaired PreFrontal Cortex

• Stress challenges the pre-frontal cortex, but a stress reduction technique can help you quickly regain the function of that part of the brain.
• If you add threat or fear (and lack of control) to the stress, your prefrontal cortex is literally impaired, meaning you can just do a stress reduction technique and get it back (because that exercise won’t account for the threat/fear that can’t be controlled).
• We are therefore left with only our reflexive reactions and habitual behavior when we react/respond to the threat.
• Perhaps most importantly, a child will have his/her impaired ability to mediate cognition, emotion, and behavior BOTH during the trauma and in the aftermath, sometimes for years.

2: Our survival reflexes

Pause (called freeze in the past)
• You’ve already learned about this response - it has three main functions:
  1: to camouflage the prey (because the predator can’t kill/eat what it can’t see)
  2: to quiet the body so we can see/hear/assess more accurately
  3: to put us in a position of being ready to suddenly burst into action
• While we are very still during this phase, we are not frozen but, children may experience this as feeling frozen (in part due to power differentials)

The defense cascade (formerly known as “fight or flight”)
• The notion of “fight or flight” is a bit misleading - it is more often a “cascade’ and it’s definitely not a choice.
• Our brains are designed for us to flee when possible. As Dr. Jim Hopper says, “even fighting is in the service of fleeing.”
• So, it’s pause then flee, and if necessary/possible fight in an attempt to flee

But for so many children, fighting nor fleeing is an option due to two factors:

The power differential may result in the perception of inescapability and overwhelming fear which can trigger the THREE responses we’re about to study.

Circuitry conflict (brought on by grooming behavior by the perpetrator) can also lead to any of the three responses.
Mental Defeat
• We have to integrate the fact that most children are abused or neglected by those known to them (and in many cases by folks the child should reasonably expect to be able to map to safety)
• This means there has likely been intentional and unintentional grooming behavior.
• This behavior activates our attachment circuitry, which involves slowing down the heart rate, not releasing adrenaline, and allowing us to connect with others. This attachment circuitry dampens our defense circuitry, so that we won’t signal danger inappropriately while attachment circuitry is active.
• So what does the brain do if the person maps to safety but their perceived behavior is consistent with/maps to threat?
• Unfortunately, it takes the brain time to map the behavior accurately and if one perceives loss of control or experiences fear as the brain maps the threat, it can lead to mental defeat

Keep in mind - mental defeat is not necessary for the following 3 extreme responses to threat! One can simply experience overwhelming fear.

Dissociation/Immobility:
If the brain is overwhelmed by the threat, (which is sometimes in the form of circuitry conflict combined with the perception of loss of control) the brain’s other circuit of defense may kick in: this is the immobility/dissociative circuitry

Dissociation:
• When folks dissociate, the interoceptive circuitry (which about our awareness of our inner experience) is greatly dampened. Why would you want to be aware of being abuse, or seeing someone your parent or sibling abused?
• We are “spaced out”, lose track of time and even space; sometimes folks report being in the upper corner of the room, watching themselves.
• This is all in the service of survival and coping. It is an adaptive response.

Tonic Immobility
• Note that during the pause response we are alert and not moving, but ABLE to move if we chose to
• Tonic immobility = Paralysis, can’t move or speak and you have “waxy flexibility”
• Caused by extreme fear, physical contact with perpetrator, restraint, perception of inescapability

Collapsed Immobility
• Is very similar to tonic immobility: You can’t move or speak
• Same basic causes = extreme fear, physical contact with perpetrator, restraint, perceived inescapability
• Sudden onset (but more gradual offset)
• Key differences from tonic immobility:
  o Extreme decrease in heart rate and blood pressure
o Faintness, “sleepiness” or loss of consciousness
o Loss of muscle tone – Collapsed, limp, etc.

Tend and befriend

- Tend to the offender’s needs: this is based on the innate awareness that if the offender’s needs are met, the offense will end sooner
- Befriend the offender: this is based on the innate awareness that we are less likely to be harmed if we build a relationship with the offender
  - 2017 study with rats indicates that this response is likely related to the release of oxytocin

3. Self Protection Habits:

- Our self protection habits are essentially neural networks that map to dealing with conflict. If you are a child, what kind of self protection habits do you have? What do you have to rely on if you’re being abused in other ways?
- How can you use your self protection habits (for example, to tell an adult) if you’ve been threatened, and don’t have a fully developed prefrontal cortex?

4. Bottom-up attention

- Whatever you focus on is what gets in encoded, consolidated, and stored.
- When we are faced with a threat, the defense circuitry impairs the prefrontal cortex which means we no longer get to control what we focus on.
- Instead of “top-down” attention, we engage in “bottom-up” attention, which means we focus on that which is related to survival or coping with the experience. If a weapon is present, we will focus on the weapon and most investigators have noticed that witnesses to violent crimes with a weapon involved with have an excellent description of the weapon, sometimes at the expense of being able to describe the perpetrator.
- So, in the absence of a weapon, what does the individual focus on? Usually it will relate to simply trying to survive the experience, which may have nothing to do with the actual experience.
- The details focused on by the individual are called central details. They get encoded and consolidated (labeled and associated with each other).
- The details not focused on by the individual are called peripheral details. They have a lower rate of getting encoded and consolidated.
- Remember weapon focus! And if there is no weapon, there is no way of knowing what a child will remember.
- The child may focus on the threat, but the child may also completely ignore the threat - this does not mean it didn’t happen!
5: Altered memory encoding and consolidation

- The hippocampus has to do with memory. Remember the phrase, "if you saw a hippo on campus, you'd remember!"
- The hippocampus adds context to the data points that make up our memories. For our purposes, we will think of this as "date stamping".
- During a traumatic event the hippocampus goes through two phases: flashbulb and fragmented.
- This can result in "memories" that are fragments of experiences, as well as "foggy" memory or disjointed memory

Sensory based Memory:
- Encoded with support from the amygdala
- The amygdala often encodes mainly with sensory data so cues for recall are going to be sensory based!
- Trigger or cue may have no apparent relationship to the abuse
- Children may tap into sensory based memory in the context of therapy as they learn to pay closer attention to their body felt sensations.

LONG TERM IMPACT OF TRAUMA
- We often have a hypersensitive amygdala that is trying to protect you so it fires even when there is no threat present. This is because the amygdala is generalizing and trauma blocks differentiation (due, in part, to cortisol).
- We are also then hyper-vigilant, which means very aware of the environment around us…which unfortunately feeds the hypersensitive amygdala.
- When the amygdala fires intensely we lose access to our maps of safety and threat. We can’t just “realize we are safe” without some help. This is likely due to the impaired prefrontal cortex, which is heavily involved in “noticing” things like the fact that it’s 2019 and not the past.
- This means children of all ages can become dissociative at any point throughout the day, in any activity, during any class, and even during therapy.

What can you do to assist a child who may be triggered? Answer is below…

More long term impact in a few minutes…

Mindfulness
- It’s non a religious practice – it’s a human practice!
- Think of it as brain training
- Davidson (2012) has shown that being mindful soothes the sub-cortical regions of your brain that get activated by trauma!
- TEACH CHILDREN MINDFULNESS IN THE SAME WAY WE TEACH THEM TO EXERCISE AND EAT WELL!
Grounding

- Grounding someone soothes the amygdala and “jumpstarts” the hippocampus – it’s the first step of mindfulness
- Can you count the tiles in the ceiling for me?
- Can you count the pencils on the desk for me?
- Can you feel your feet in your shoes?
- Can you notice your breath?
- TEACH CHILDREN ABOUT GROUNDING SO THEY WILL KNOW WHAT YOU’RE DOING!

Other long term consequences of trauma:

- Children may have intrusive thoughts/memories of the trauma, which can be triggered by a hypersensitive amygdala, or a sensory based memory. This can result in dissociation, seeing a child “freeze” or disconnect. The intrusive thoughts or flashbacks can also result in a child who suddenly has a tantrum/outburst (based on the fight response).

*Keep in mind: it can be very easily to wonder what you did, why the child is “doing this to me,” or get otherwise caught up in thinking that the reaction is about you and not about the trauma. This is particularly challenging if the child is acting out.*

- Children may engage in avoidance behavior that is essentially the attempt to “flee” from the trauma after the fact, from the perspective that the amygdala is firing in response to anything that reminds it of the original trauma. Kids are responding to the fact that the amygdala has become hyper sensitive, so often will avoid activities, not want to go to school, get out of bed, interact with other children, or spend time with certain family members. What are some of the avoidance behaviors you’ve seen in children who’ve experienced trauma?

*Keep in mind: avoidance isn’t necessarily a negative or ineffective coping mechanism for a child who is easily overwhelmed by the environment. Time outs or breaks are ways to help the child remove him/herself from the environment as way of intentionally avoiding being triggered - if you schedule time outs or breaks for everyone, you may avoid the traumatized child feeling spotlighted.*

- Kids may engage in tension reducing behavior that is also a response to the fact that with a hyper-sensitive amygdala that is constantly being triggered, the child may feel constant tension in his/her body. Tension reducing behavior can be increased use of alcohol, drugs, or increased sexual activity.

*So what’s the use of video games? Tension reducing or avoidance? Does it matter how we categorize it? I suggest it’s most important to recognize that it may be an*
attempt to avoid or soothe and if removed, needs to be replace with something else that will assist in either helping the child avoid in healthy ways or soothe in healthy ways.

• Children with the cognitive capacity to do so, may also engage in normalizing behavior; they may defend their abuser and claim that “everything is fine” or try to act like there is no abuse happening. They may text or spend time with the individual who the child or others report(s) is being abusive.

So what can you do (in addition to what we’ve already covered)?

Sensory Integration
• It’s as simple as playing catch, drawing, playing on a swing, doing yoga, etc
• We need to rebuild our neural networks for sensory integration and this is done with practice!
• Mindfulness and sensory integration go hand in hand
• Sensory integration can also serve to take the child’s mind off the trauma or the pressure associated with talking about the trauma. Many of my mom’s “best sessions” with kids were spent playing catch, playing basketball, drawing or doing some other activity.

Keep in mind: the younger the child, the less developed the capacity for verbalization. Play can be a valuable way of communicating, in addition to taking the pressure of the child to communicate or talk about trauma directly.

Assist in labeling emotion
• A popular phrase with parents and educators is “use your words.” But, to a child who’s prefrontal cortex is impaired, this just may not be possible.
• It’s important to recognize that the overwhelmed child may also not be able to identify his or her emotions, so “using words” may be unhelpful.
• The teacher/therapist/parent/mentor can help a traumatized kiddo immensely by simply identifying the emotion for the child: “I can see that you’re very upset/hurt/angry/etc”
• If the child denies the emotion, point out what you see that led you to that conclusion and do it in a matter of fact style.

Be informational! (We discussed this earlier, but it bears repeating)
• Take nothing personally!
• Stay genuinely curious!
• Seek first to understand, then to be understood!

Provide structure!
• Have signs or posters with the plan for each day
• If possible, “sign post” transitions: “in five minutes we have to clean up”
• Don’t be shy about providing reminders for an entire class or group of children; it comes under the notion that being trauma informed won’t harm the other kids!

Look for opportunities to reinforce competence
• Remember the meaning making? An effective way to counter a child who has no sense of competence or effectiveness is to point out the child’s strengths.
• Trauma isn’t a cognitive experience, it’s felt and sensed. It’s not enough to label after the fact, label in the moment (this means we have to be observant!).

Set compassionate boundaries
• Boundaries are best when the child be involved in designing them and agreeing to them
• Be transparent and collaborative about consequences to violations of any boundaries you set up with the child
• The “compassionate” part of boundary setting is to be mindful, informational, and have soft eyes when setting the boundary (which can often include having to enforce the consequence).

Try to understand the experience the child is having, don’t worry about figuring out what happened to the child, worry about understanding the experience. Remember, trauma isn’t a single event, it’s an ongoing experience.

Based on what you’ve learned today, what are three things you can do to be trauma informed (maybe you’ve already been doing them, but if possible pick at least one thing you’ve learned today that would be new to you)?

If you have any questions please feel free to reach out to me:

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