


## Childhood Trauma, Addiction, and PTSD: *Treatment Strategies and Interventions*

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<https://www.jennifersweeton.com/childhood-trauma-addiction>



Materials that are included in this course may include interventions and modalities that are beyond the authorized practice of mental health professionals. As a licensed professional, you are responsible for reviewing the scope of practice, including activities that are defined in law as beyond the boundaries of practice in accordance with and in compliance with your profession's standards.

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## Objectives

- *Identify six key brain structures involved in addiction and PTSD.*
- *Name two ways childhood trauma changes the brain.*
- *State two ways therapy can change the brain for better mental health.*
- *Learn three brain-changing techniques that can reduce trauma and addiction symptoms.*

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## Single Event vs. Complex

**Complex trauma:** Prolonged trauma or trauma that happens at developmentally vulnerable times. According to Curtis and Ford, 2009:

1. Repetitive or prolonged actions or inaction, that
2. Involve direct harm and/or neglect by caregivers, that
3. Occur during developmentally vulnerable times in the victim's life, such as early childhood, and
4. Have potential to severely compromise a child's development.

*(Bessel van der Kolk (2005) refers to this as “developmental trauma.”)*

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## Complex Trauma

- Complex trauma = repeated/ongoing threats of violation or violence between a child and another person. Ex: bullying; emotional, physical or sexual abuse; child maltreatment or neglect; or witnessing domestic violence. Complex trauma that disrupts the development of secure attachment to a parent or primary caregiver has the potential to have profound developmental consequences for a child (De Bellis, 2001), and is the most stressful trauma that a child can experience (Van Horn, 2011).
- Complex trauma is associated with risk for developing PTSD (Alisic et al., 2014; McLaughlin et al., 2013), anxiety, and earlier onset and longer duration of depression (Cook et al., 2005). Also associated with increased risk of autism, ADHD, conduct disorder, ODD, problem drug use, aggression, self-harm, and suicide (Kilpatrick & Saunders, 1999; van der Kolk, 2003).

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## Adverse Childhood Experiences (ACEs) study

- 17,421 people examined over the lifespan
- Looked at adverse childhood experiences, including:
  - Childhood abuse and neglect
  - Domestic violence
  - Substance abuse
  - Parental discord
  - Parent is in jail
  - Crime
  - Mental illness in the home, etc...

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## ACES Findings

**ACEs study found that the higher the score, especially if you have 4+... (Developmental/Complex Trauma!)**

- Attempted suicide
- Chronic pain
- Chronic disease
- Depression
- Smoking and lung disease
- Coronary heart disease
- Die 20 years sooner
- **Drug addiction**
- **Alcohol misuse**

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## Part I: Neuroscience of Complex Trauma and Addiction



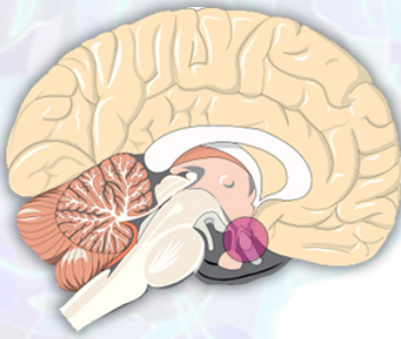
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## Limbic System

### Amygdala

- “Fear brain” or “smoke alarm”
- Asks “Is this dangerous?”
- Involved in fear/threat detection
- Involved in implicit memory
- Begins stress response through activation of the HPA axis




Complex trauma = overactivation, High baseline, reduced neuronal Pruning...

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## Limbic System

### Hippocampus

- Involved in learning and memory
- Explicit, declarative, autobiographical memory
- Impaired functioning when under stress



Complex trauma = underactive, atrophied. Never developed Well in the first place!

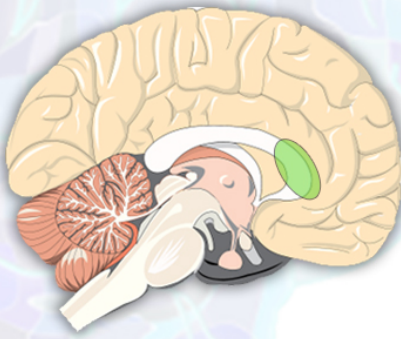
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## Limbic System

### Insula

- Site of proprioception and interoception
- Allows us to be aware of internal experiences and states
- Critical for emotional awareness

Complex trauma = under AND overactive, in different contexts.  
Sensations get paired with emotions/interpretations that make it  
So that caregivers may be experienced as painful.




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## Limbic System

### Nucleus Accumbens

- “Addiction Center”
- Involved in reward, laughter, pleasure, addiction
- Important component of the reward pathways of the brain

Addiction = floods with dopamine when using/drinking, otherwise turns off.




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## Limbic System

### Cingulate Cortex

- Considered a limbic AND cortical structure
- Involved in monitoring conflict, emotion regulation, pain expectancy
- Contains the Anterior Cingulate Cortex, the "Emotion Regulation Center"



Complex trauma = never fully Develops

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## Cortex: Frontal Lobe

### Prefrontal Cortex:

- Rational thought
- Goal-making
- Decision-making
- Sense of others
- Personality
- OFC

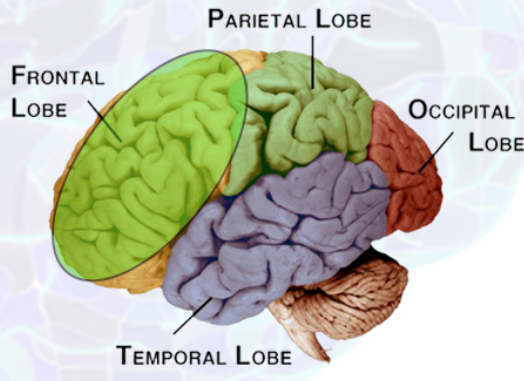
### Primary Motor Cortex

- Movement

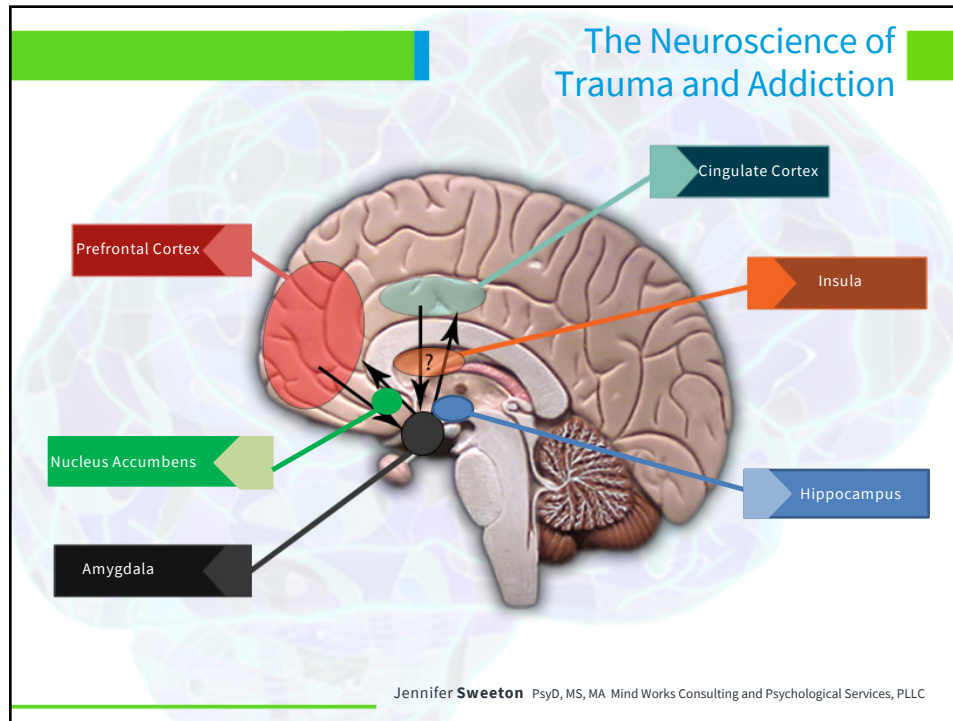
### Cingulate Cortex

- Emotion regulation
- Expectation of pain
- Conflict monitoring

Complex trauma = lower activation and atrophy  
Due to too many glucocorticoid receptors.



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## Complex Trauma in the Brain

- The prefrontal cortex is a region with protracted development and has high density of glucocorticoid receptors (Gunnar & Quevedo, 2007), making it more vulnerable to trauma exposure. Structural changes associated with problems with memory, emotional regulation and self-regulatory capacities (Cook et al., 2005).
- Increased cortisol, impaired OFC (Kuhn & Schanberg, 1998).
- Underdeveloped LH and left hippocampus (Bremner et al., 1997).
- Accelerated loss of neurons/aging (Simantov, et. al., 1996)
- Inhibition of neurogenesis/regeneration of neurons (Gould, et. al., 1997)
- Abnormalities in developmentally appropriate pruning of neurons (Todd, 1992)
- Damage to the neuroreceptors that control the stress response, increase of receptors for cortisol, with the result that it is easier to be triggered.
- Prolonged exposure to certain types of glucocorticoids have also been associated with impaired neural plasticity (Glaser, 2000), which is the brain's ability to reorganise itself in response to the environment.
- In children from six to 13 years of age, the corpus callosum develops significantly in relation to language and memory (Pechtel & Pizzagalli, 2011), which may underlie observed language impairments in some traumatised children (Zilberstein, 2014).

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## Complex Trauma in the Brain

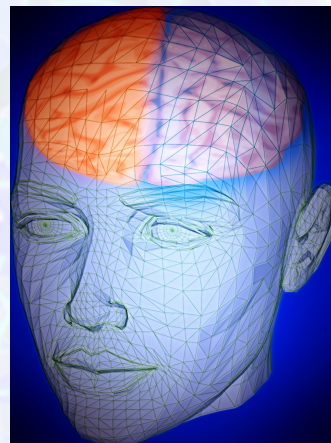
- Disrupted functioning of the sympathetic nervous system, and may have higher baseline adrenaline and heart-rate levels (van der Kolk, 2003).
- The HPA axis helps activate or deactivate glucocorticoid hormones (e.g. cortisol) in response to stress. Impaired functioning of the HPA axis has been identified as a key pathway between trauma exposure and later developmental outcomes (Kearney et al., 2010). Frequent activation of the HPA axis may lead to overloading the body's stress-response systems (Bradley & Corwyn, 2002) thereby damaging the body's central nervous system and organs.
- Irregular levels of glucocorticoid hormones in children with histories of trauma (Kearney et al., 2010), which has also been associated with reduced school engagement and academic achievement (Perkins & Graham-Bermann, 2012).
- Neuroimaging studies consistently find evidence of reduced hippocampal volume in adults who have experienced childhood trauma (Van Horn, 2011).
- Decreased cerebellum volume in children with histories of trauma exposure (Hart & Rubia, 2012). Reduction in cerebellum volume may be related to observed disturbances in language, working memory and cognitive abilities such as planning (Pechtel & Pizzagalli, 2011; Teicher et al., 2003).

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## Attachment...

### Attachment ruptures = root of complex trauma

- Attachment ruptures affect the right hemisphere primarily.
- Right hemisphere that doesn't develop on time leads to other deficits.
- Depending on age, critical period, different deficits may be experienced.



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## Outcomes of Secure Attachment

Include...

- Amygdalar pruning
- Full development of LH
- Full development of corpus callosum
- Good functioning of cerebellum
- No interruptions of ACC development
- Basal ganglia develops on time

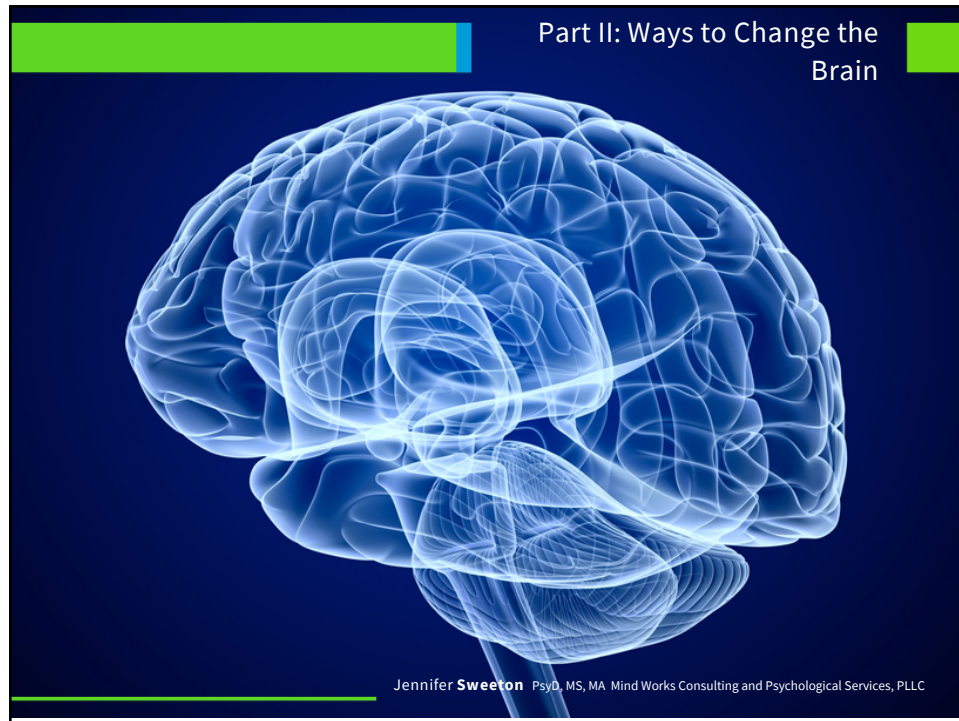
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## Healing Attachment

### How to promote and heal attachment??

Help clients interact with other healthy brains:  
“All this talk therapy is just an excuse to hang out long enough for the relationship to do the healing.” - SEPI conference on Attachment and Relationships, 2002.

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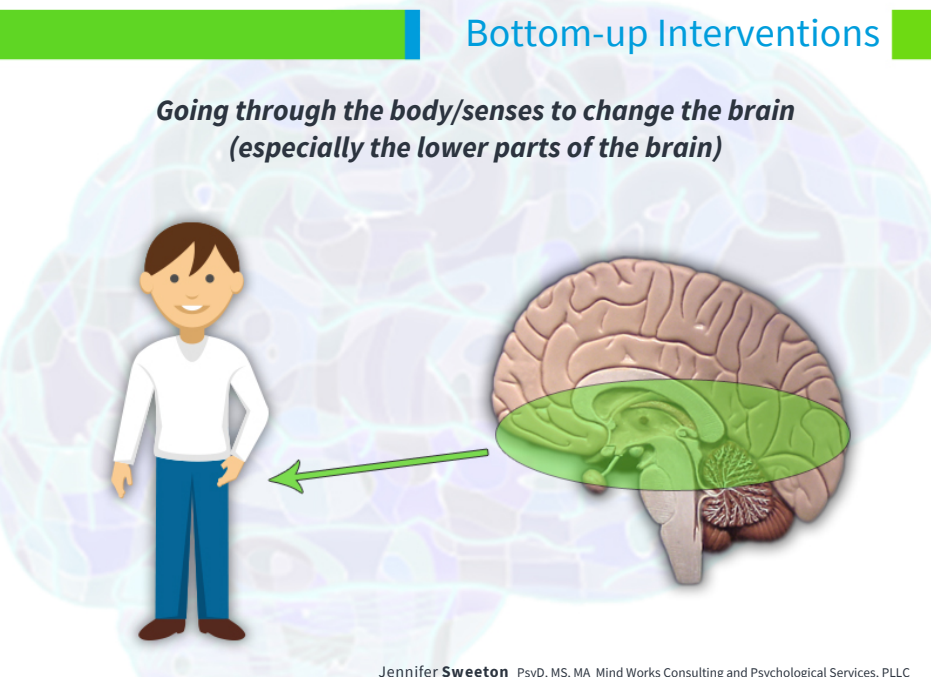
Ways to Change the Brain:  
Three Options

- 1 Bottom-up interventions:**  
Working with the body/going through the body to change the brain
- 2 Top-down processing:**  
Working with the mind/going through the mind to change the brain
- 3 Horizontal processing:**  
Working across hemispheres or across sensory modalities

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## Bottom-up Interventions

*Going through the body/senses to change the brain  
(especially the lower parts of the brain)*



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## Bottom-up Interventions

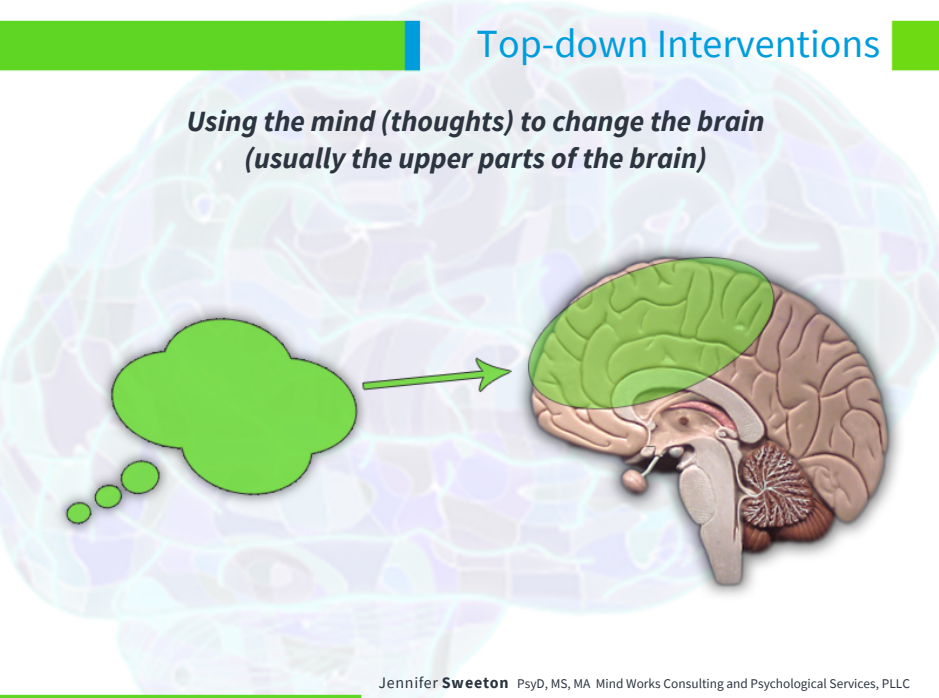
- 01 Sensory awareness or exposure techniques
- 02 Havening techniques
- 03 Sensorimotor techniques
- 04 Yoga
- 05 Qigong
- 06 Diaphragmatic breathing
- 07 Body scan
- 08 Progressive muscle relaxation
- 09 Autogenic training (both bottom-up and top-down)
- 10 Exercise

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## Top-down Interventions

*Using the mind (thoughts) to change the brain  
(usually the upper parts of the brain)*



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## Top-down Interventions

- Cognitive restructuring/reappraisal
- Autogenic training (both bottom-up and top-down)
- Acceptance and Commitment Therapy cognitive exercises
- Empty chair technique
- Transcendental meditation
- Assertiveness training, communication techniques
- Focus meditations
- Talk therapy

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## Trauma Treatment Roadmap

1. **Build the alliance** (bottom-up, reduces cortisol)
2. **Safely enter the body** (increase insula activation)
3. **Practice bottom-up techniques** (decrease amygdala activation, increase hippocampal activation/volume)
4. **Incorporate top-down techniques** (strengthen PFC and cingulate)
5. **Consider trauma-focused/exposure/memory reconsolidation techniques** (imaginal exposure, neuromodulation, etc.; strengthens hippocampus/changes how memories are stored)
6. **Integrate behavioral techniques** (help amygdala self-regulate; bottom-up and top-down)

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## Trauma Treatment Roadmap

In complex trauma, a LOT of the work you do will be bottom—up and experiential, and will aim to:

- Balance/integrate functioning of both hemispheres of the brain,
- Regulate the stress response system (brain AND body work), and
- Integrate “protection” with “connection”

Cognitive work is great too, but be careful about entering this too early, or focusing on this as opposed to more somatic and attachment-based work. Logic won't change these clients' experience; they need a reparative experience where they safely connect with themselves and others.

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## Treating Addiction

*Addiction doc says: It's not the drugs. It's the ACEs...adverse childhood experiences.*

Addiction shouldn't be called "addiction". It should be called "ritualized compulsive comfort-seeking."

Ritualized compulsive comfort-seeking (what traditionalists call addiction) is a *normal* response to the adversity experienced in childhood, just like bleeding is a normal response to being stabbed.

The solution to changing the illegal or unhealthy ritualized compulsive comfort-seeking behavior of opioid addiction is to address a person's adverse childhood experiences (ACEs) individually and in group therapy; treat people with respect; provide medication assistance in the form of buprenorphine, an opioid used to treat opioid addiction; and help them find a ritualized compulsive comfort-seeking behavior that won't kill them or put them in jail.

~ **Dr. Daniel Sumrok, director of the Center for Addiction Sciences at the University of Tennessee Health Science Center's College of Medicine**

<https://acestoohigh.com/2017/05/02/addiction-doc-says-stop-chasing-the-drug-focus-on-aces-people-can-recover/>

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## Build the Alliance



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## Neuroscience of the Therapeutic Alliance

- Therapeutic alliance = Bottom-up approach to therapy
- The therapeutic alliance accounts for between 15-50% of the outcome variance (depending on which studies you believe).
- Various bodies of research indicate that *brains can interact with and influence other brains...*
  - Brain waves align when people make eye contact and “attune”
  - Mothers can soothe infants and reduce their cortisol by focusing on them using their PFC (through eye contact and touch)

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## Implications of Mirror Neurons

- Mirror neurons are the neural mechanism of the therapeutic alliance.
- They allow clients to have a different, (hopefully) reparative *experience* in therapy.
- The mirror neuron system is the foundational building block for empathy, led to new theory of empathy.
- Clients can, through this alliance, re-learn and heal attachment.

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## Social Medicine is Real!

- Connection with others – “social medicine”:
- Reduces cardiovascular reactivity (Lepore, et al, 1993)
- Reduces blood pressure (Spitzer, et al, 1992)
- Reduces vulnerability to catching a cold (Cohen, et al, 2003)
- Reduces anxiety (Cohen, 2004)
- Slows cognitive decline (Bassuk, et al 1999)
- Improves sleep (Cohen, 2004)
- Improves depression (Russell & Cutrona, 1991)
- Reduces cortisol levels (Kiecolt-Glaser, et al, 1984)

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## Build Connection

*“The opposite of addiction isn’t sobriety, it’s connection.”*

~ Johann Hari

[https://www.ted.com/talks/johann\\_hari\\_everything\\_you\\_think\\_you\\_know\\_about\\_addiction\\_is\\_wrong?language=en](https://www.ted.com/talks/johann_hari_everything_you_think_you_know_about_addiction_is_wrong?language=en)

1. Mirroring/following
2. Co-regulation
3. Embedded relational mindfulness (Ogden & Fisher)
4. Intentional attention
5. Motivational Interviewing (also could go in “top down” category)

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## Mirroring Exercise



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## Following Exercise



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## How To Attune

### Co-regulation:

- Watch for breathing changes
- Relax muscles in neck/shoulders/back
- Produce in yourself the sensations/physiology you want the client to experience
- Notice somatic countertransference, which may indicate something about what the client is feeling

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## How To Attune

**Embedded relational mindfulness** (Ogden & Fisher): Part of Sensorimotor Psychotherapy where you focus on internal processes client is experiencing in the here-and-now, and put words to the somatic experiences. It's mindfulness occurring between the client and therapist, in relationship with one another.

- "I noticed that when you mentioned your father, your shoulders tensed..."
- "What's happening right now in your hands?"
- "Where is the anger in your body?"
- Consider a body scan, developing a physical profile of different emotions or beliefs.

**Putting language to experience integrates the hemispheres!!**

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## How to Attune: Intentional Attention

"As you talk about that, look over to your right..."  
(distraction/disruption)

"Remembering that event, notice that sensation in your chest..." (exposure)

"What's one area of the body that does NOT feel any distress right now? Feel into that..." (resourcing).

Therapist can also strategically direct the client's attention to different somatic experiences or eye placements, for the purpose of exposure, distraction, or resourcing (Ogden & Fisher).

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## How To Attune

**Motivational Interviewing (Miller and Rollnick)**

[https://www.amazon.com/Motivational-Interviewing-Helping-People-Applications/dp/1609182278/ref=sr\\_1\\_2?dchild=1&keywords=motivational+interviewing&qid=1592791100&s=books&sr=1-2](https://www.amazon.com/Motivational-Interviewing-Helping-People-Applications/dp/1609182278/ref=sr_1_2?dchild=1&keywords=motivational+interviewing&qid=1592791100&s=books&sr=1-2)

- Helps clients move through the stages of change.
- Reduces stigma of addiction, normalizes desire to use, cravings
- Nonconfrontational and collaborative, meant to increase motivation for change
- Person-centered, strengthens the therapeutic alliance
- Follows Self-Determination Theory, which says people change when:
  - They have autonomy in decision-making
  - They have a sense of mastery and competence
  - They are connected to others and feel supported by key people

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## How To Attune

**Motivational Interviewing**

- OARS:
  - Open-ended questions
  - Affirming\*\*\* (Acknowledge the upsides of using/drinking)
  - Reflective listening
  - Summarizing
- Goal is to elicit change talk through helping clients identify ambivalence
- Elicit change talk:
  - What do you value?
  - What would you like in your life?
  - How does your behavior support your goals, or get in the way of them?
  - What gets in the way of you accomplishing this goal?

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## Safely Work with the Body

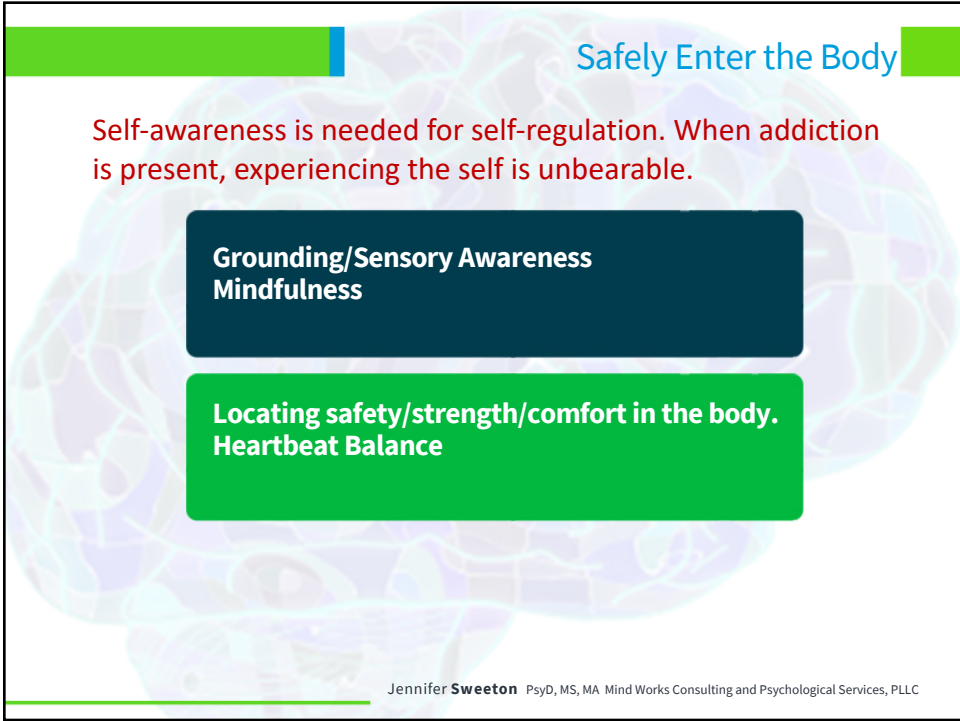


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## Trauma Treatment Roadmap

1. **Build the alliance** (bottom-up, reduces cortisol)
2. **Safely enter the body** (increase insula activation)
3. **Practice bottom-up techniques** (decrease amygdala activation, activate hippocampus)
4. **Incorporate top-down techniques** (strengthen PFC and cingulate)
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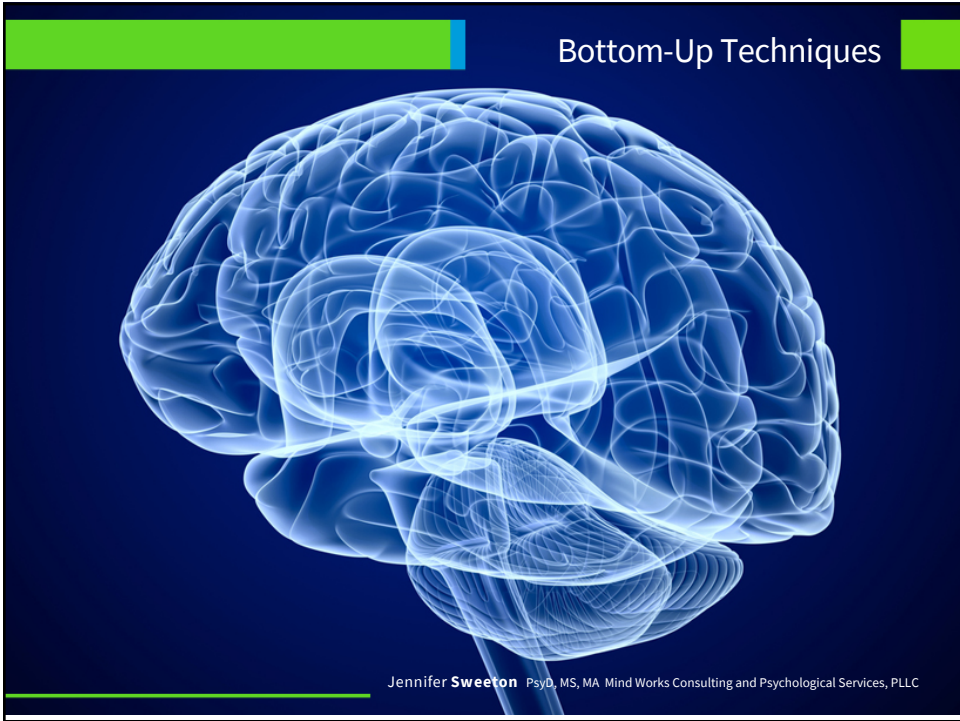
## Safely Enter the Body

Self-awareness is needed for self-regulation. When addiction is present, experiencing the self is unbearable.

**Grounding/Sensory Awareness  
Mindfulness**

**Locating safety/strength/comfort in the body.  
Heartbeat Balance**

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## Bottom-Up Techniques

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## Bottom-Up Techniques: Body-Based Tools

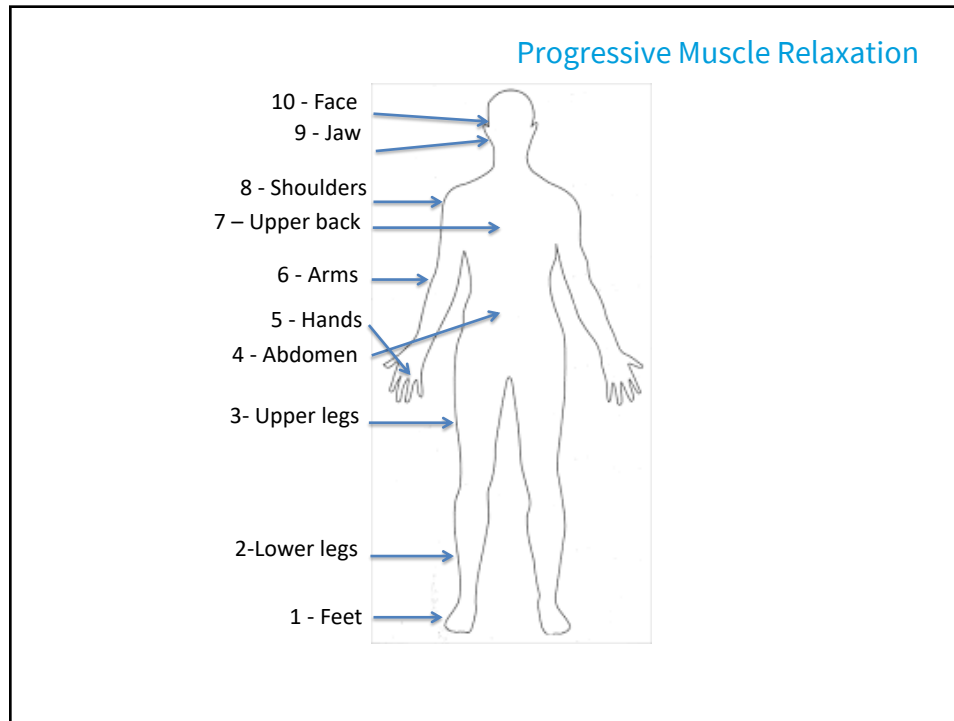
**\*\*Increases insula, decreases amygdala activation!\*\***

- Tense & Release
- Conditioned Relaxation

- Tense/limp spaghetti
- Color-Your-Life

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**Progressive Muscle Relaxation For Children**

This exercise will help us learn the difference between being tense and being relaxed and teach an easy way to relax.

Now imagine that you are piece of cooked spaghetti. Tighten both your fists and arms, squeeze your legs and stomach and make your whole body as stiff as possible, so that you can't bend. Keep your whole body tense until you count to five.

Now relax. Pretend that you are now a piece of cooked spaghetti. Let your whole body become loose and floppy. Let go of all of the tension in your body. Relax your shoulders and stomach, take a deep breath, and let your body be as loose and floppy as cooked spaghetti.

Which feels better, being cooked or uncooked spaghetti?

Now become raw spaghetti again. Squeeze all the muscles in your body until you are as stiff as raw spaghetti. Even make your face tense – squeeze all the muscles in your mouth and forehead. Squeeze your shoulders up to your ears. Make fists with your hands. Squeeze your eyes shut and push your feet into the floor. Hold your body stiff like raw spaghetti until the count of five. Now relax your whole body. Go floppy like raw spaghetti. Relax your face, your shoulders, your stomach, your arms and your legs.

Now which felt better, being cooked or uncooked spaghetti?

<https://www.enloveu.com/content/dam/centene/cenpatico-u/pdfs/Child-Relaxation-Techniques.pdf>

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## Color Your Life

- Match feelings to colors...
  - When you think of xxx, what feeling goes with it?
  - Blue - Sad
  - Gray - Lonely
  - Red – Angry
  - Green - Jealous
  - Purple – Rage
  - Yellow – Happy
  - Brown – Bored
  - Black – Very sad
- 
- “Color the paper with any color of a feeling you’ve ever felt.”
  - “Color where you feel different feelings...”
  - Then can imagine different colors in different areas: “Imagine yellow in your tummy...”
  - <https://www.youtube.com/watch?v=PAIwIAMieV8>

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## Strengthen Hippocampus!

- **BDNF = brain derived neurotrophic factor**
  - Consolidates connections between neurons
  - Promotes growth of myelin to make neurons fire more efficiently
  - Acts on stem cells in the hippocampus and PFC to grow into **BRAND NEW NEURONS!**
- **Increase your neurogenesis by...**
  - Exercise / novel movement / dance
  - Meditation
  - Incorporating Omega-3s into your diet
- **Decrease your neurogenesis by...**
  - Aging (sorry!)
  - Experiencing chronic stress
  - Marijuana use / too much alcohol use

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### Mindful Craving Check-In

## HALT and check in!

- H** Hunger
- A** Anger
- L** Loneliness
- T** Tiredness

Mindful Check-In recommended to assess for these and engage in a mindfulness practice.

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### Concentration Meditation

- Known as transcendental meditation
- Concentration-based practice where participants focus on a sensation, object, sound, or other single stimulus (Delmonte, 1985; Smith, 1975)
- Mantras or affirmations commonly used in this practice
- Trains individuals to prevent distracting thoughts by restricting their attention to one stimulus. This help participants reduce anxiety

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## Evidence-based treatments

- **Developmental Trauma:** Attachment-based work, DBT, ACT, CBT, TF-CBT, Trauma-focused interventions
- **PTSD:** Prolonged Exposure, Cognitive Processing Therapy, EMDR, Stress Inoculation Therapy, Trauma Focused Cognitive Behavioral Therapy
- **Addiction:** Seeking Safety, Integrated Dual Disorder Treatment, behavioral/CBT, DBT, Motivational Interviewing, pharmacological therapies, Family Therapy

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## Behavioral Techniques



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## Behavioral Ideas

“Help them find a ritualized compulsive comfort-seeking behavior that won’t kill them or put them in jail.” ~ **Dr. Daniel Sumrok**

- Using substances is self-neglect – set aside protected time for self-care behaviors
- Engage in drug-free friendships
- Get a change in scenery
- Engage with pets/animals
- Participate in recreational/pleasurable activities
- Connect with spiritual practices/pray
- Exercise and the incorporation of other movements
- Adopt a repetitive hobby (knitting, swimming, running, etc.)

*See examples Seeking Safety-type exercises in the materials!*

It may take several months (up to 2 years) to FEEL the benefit of these behaviors due to the nucleus accumbens needing to learn how to activate again in response to things other than drugs/alcohol!

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Thank you!

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## Limitations of Neuroscience Research

- fMRI imaging measures blood flow, and cannot directly measure neuronal activity. Neuronal signaling occurs approximately 1,000 faster than blood flow, meaning that what we observe in fMRI research is much slower than actual neuronal activity, and may not correspond directly to this activity.
- Due to the high cost of conducting neuroscience research, many studies have a relatively small sample size compared to other types of psychological research. This can compromise validity.
- fMRI research identifies brain activations through the measurement of blood flow. However, some research has shown that it is possible for mental tasks to produce *less* activation in specific brain areas compared to brain activity at rest. Thus, looking solely at brain activations, not deactivations, may produce an incomplete picture of brain functioning.
- Some neuroscience research has been conducted on animals, and may not be directly applicable to humans.

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