# UNDERSTANDING TRAUMA AND IT'S IMPACT ON THE BRAIN AND BODY

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# A TAD BIT ABOUT ME

- A clinical mental health therapist on White Earth Reservation
- A CTRI instructor for NDSU Bison Strides
- Completed Equine Assisted Mental Health certificate program through the University of Denver and include canine interactions in my daily psychotherapy work.

# CASE STUDY: SUSIE

- Susie is an 8-year-old girl who lives with her mother and her mother's boyfriend. Every night, Susie overhears her mom and her boyfriend fighting from her bedroom. One evening, they start to argue before Susie goes to bed and her mother's boyfriend gets very angry and slaps Susie's mother across the face and makes a life-threatening comment towards Susie.

- This becomes a common occurrence in the home.

# WHAT IS TRAUMA?

- **The clinical criterion:**
  - vicarious exposure (witness, heard, or perceived);
  - persistent re-experiencing (nightmares, flashbacks, upsetting memories);
  - avoidance of trauma-related stimuli; negative affect (self-blame, negative thoughts about world or self, suicidal ideation);
  - and increased arousal and reactivity (hypervigilance, impulsiveness, inability to concentrate).

Symptoms lasting over a month, causes distress or functional impairment, and may include dissociative symptoms.

# WHAT IS TRAUMA?

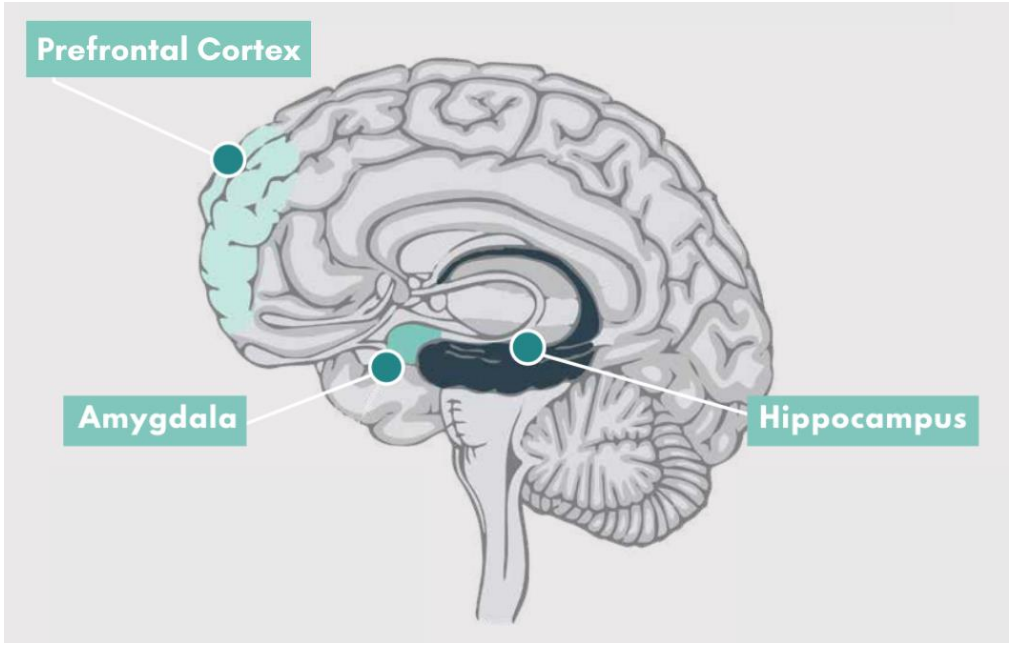
Trauma is an event that floods the nervous system and rewires the brain
- Bessel van der Kolk

# SUSIE GOES TO SCHOOL

- Susie's mom and her boyfriends physical and emotional altercations become a nightly occurrence.
- At school, it is noticed that Susie is dysregulated as evidenced by bullying other children, destroying classrooms, hides under her desk when the male principal assists the teacher with her behaviors, and then "shuts down" by staring at the wall while the principal calls home.

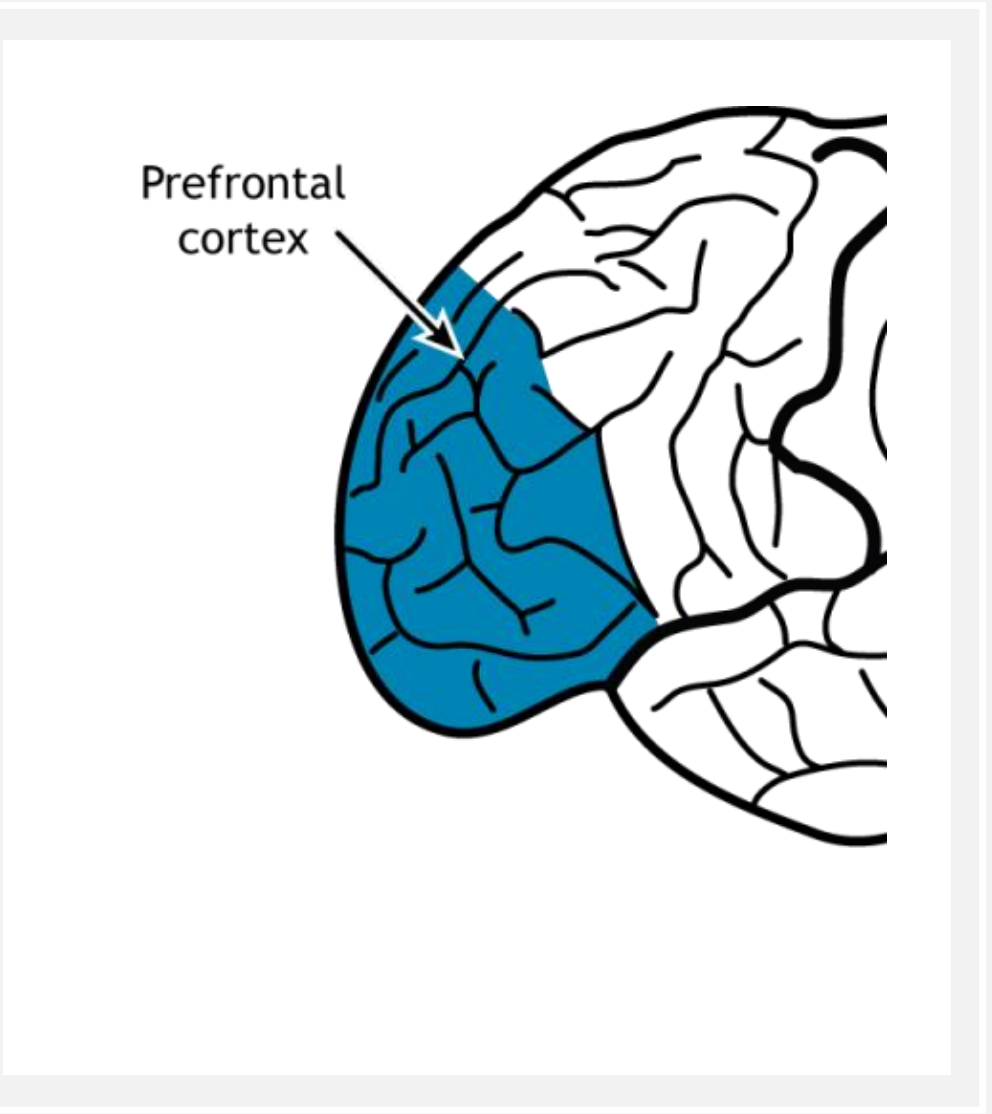
# LOOKING AT THE BRAIN

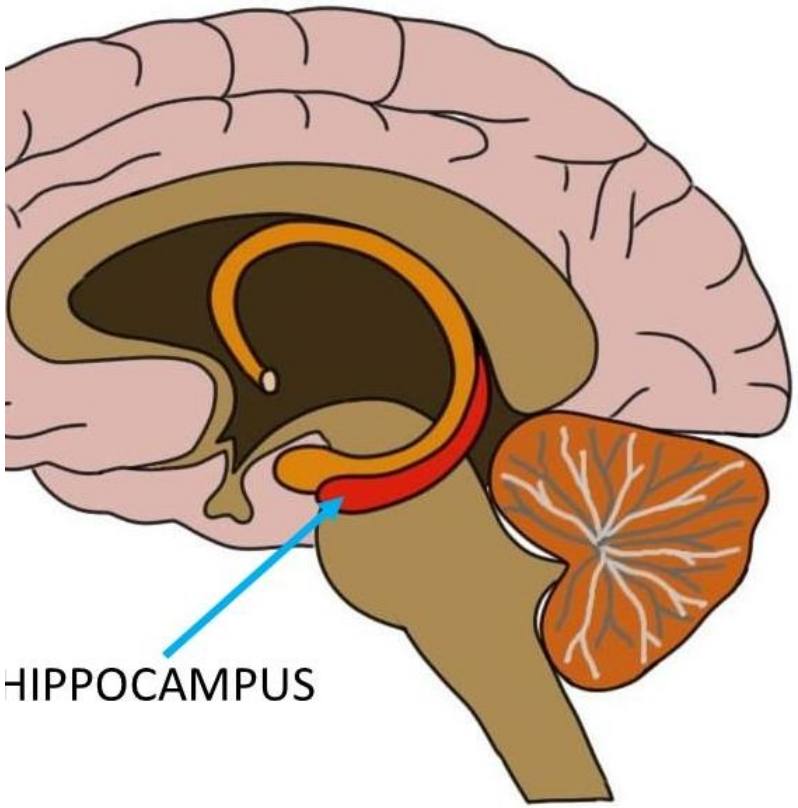
- Prefrontal Cortex: responsible for processing; abstract thinking; judgement; decision-making; attention and focusing.
- Hippocampus: involved in memory, learning and emotions; hold short-term memories and transfer them to long-term memory storage
- Amygdala: fear and threat detection and storing emotional memories
- Brain stem: involved in the autonomic processes such as breathing and digestion



# THE PREFRONTAL CORTEX

- The very front of your brain.
- Responsible for: judgment, decision making, moral reasoning, planning, impulse control, cause & effect thinking, comprehension skills, information processing, self awareness and self esteem, delay of gratification, and many other functions that involve rational thinking.
- One of the last places in your brain to develop.



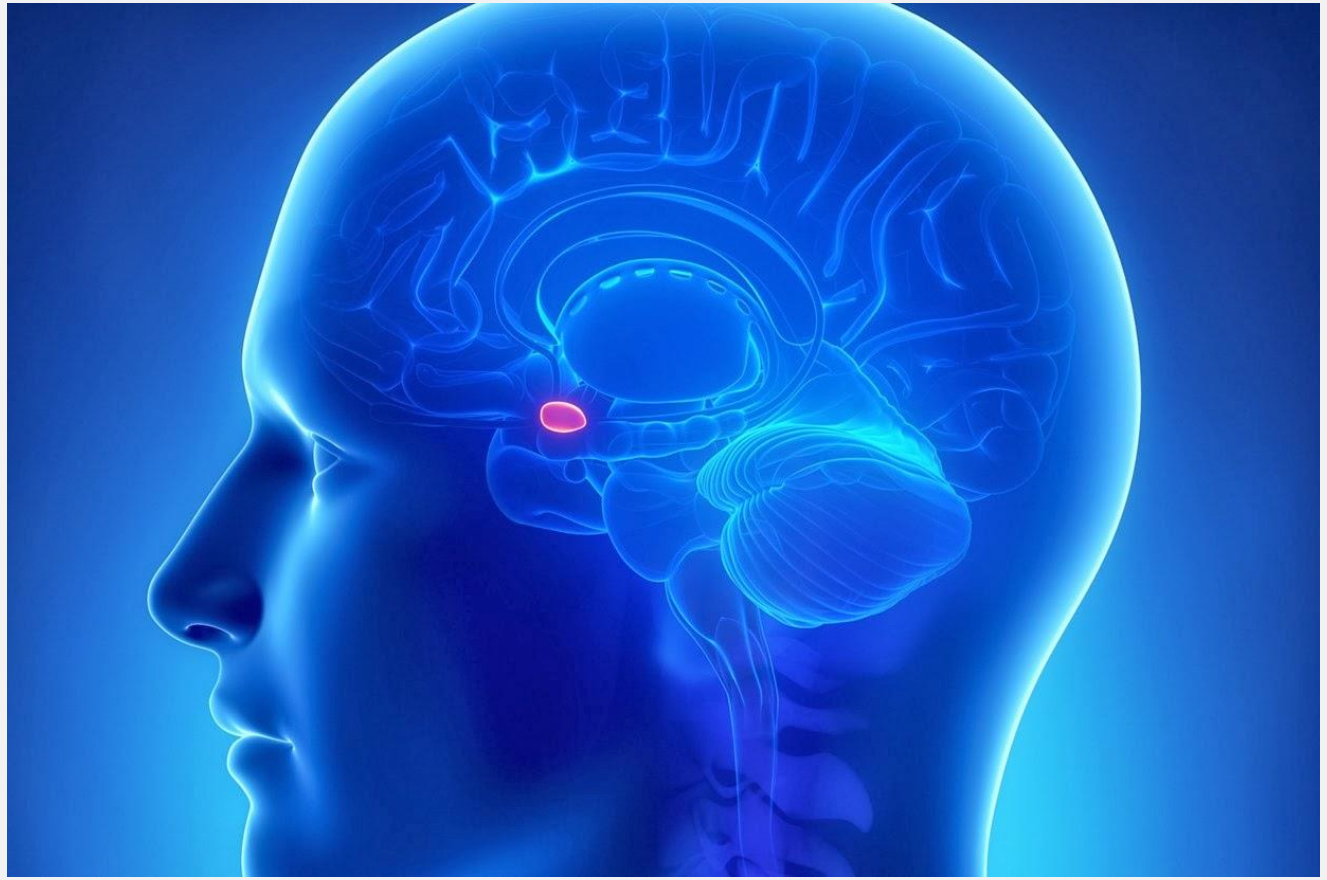


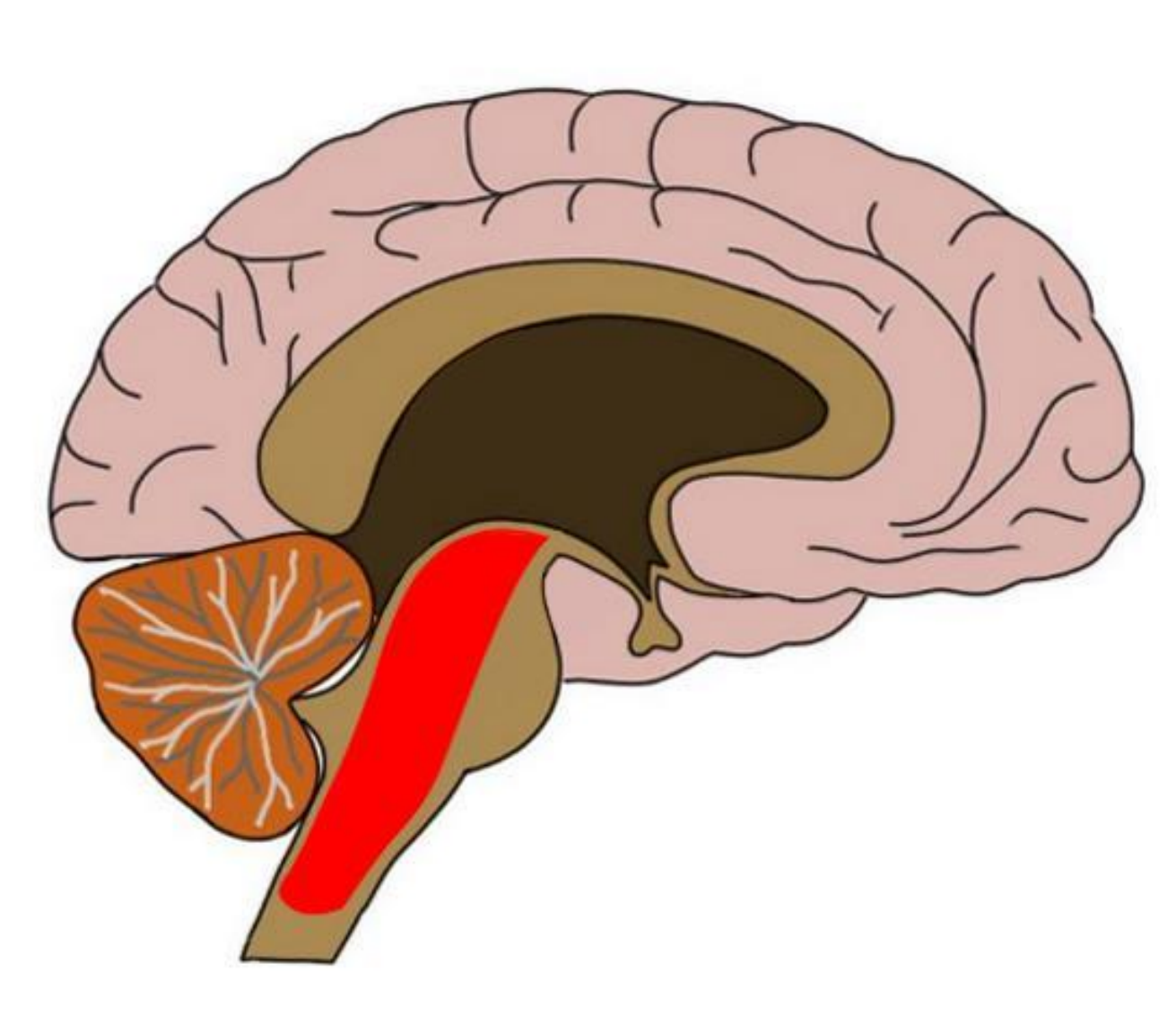

# THE HIPPOCAMPUS

- Hidden deep in the middle part of the brain
- Part of the limbic system or emotional brain
- Involved in memory, learning and emotions; hold short-term memories and transfer them to long-term memory storage

# THE AMYGDALA

- Amygdala = almond; located right in front of the hippocampus
- Also, part of the limbic system
- a primary role in the processing of memory, decision making, and emotional responses
- Also control autonomic and endocrine functions



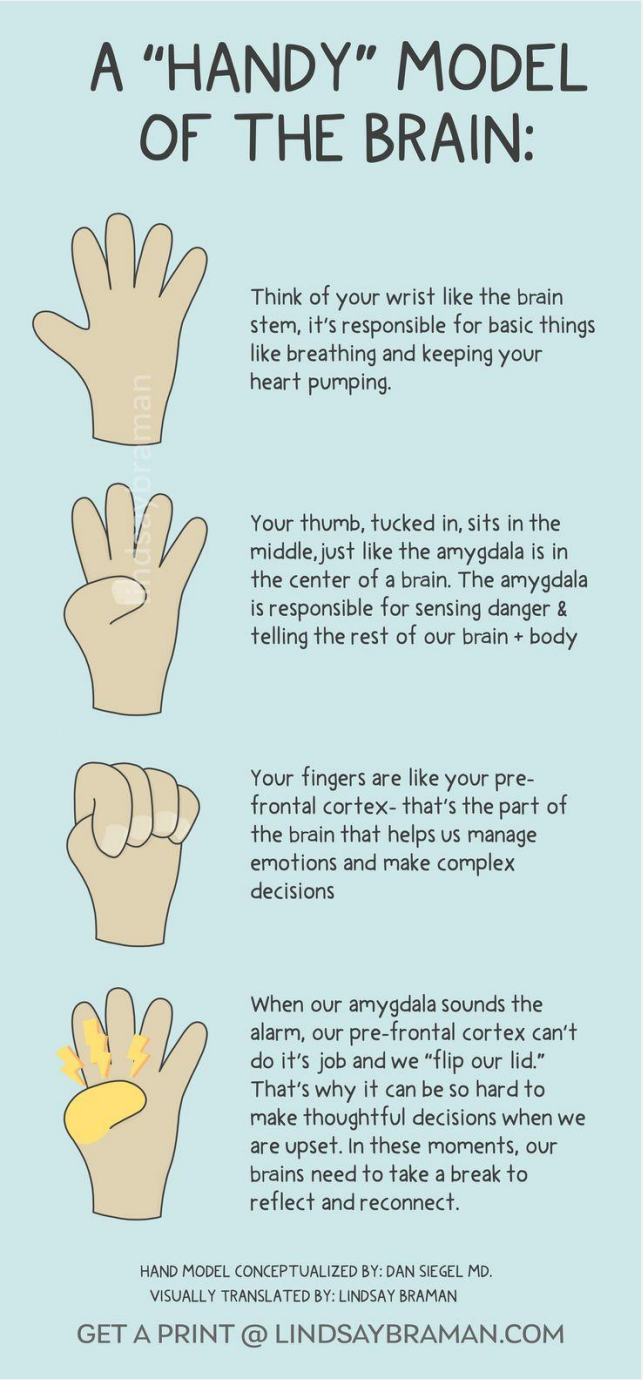


# THE BRAIN STEM

- Connects your brain to the spinal cord and sends messages to the rest of the body.
- It is responsible for many important functions of life, such as heart rate, breathing, consciousness, sleep, and blood pressure.

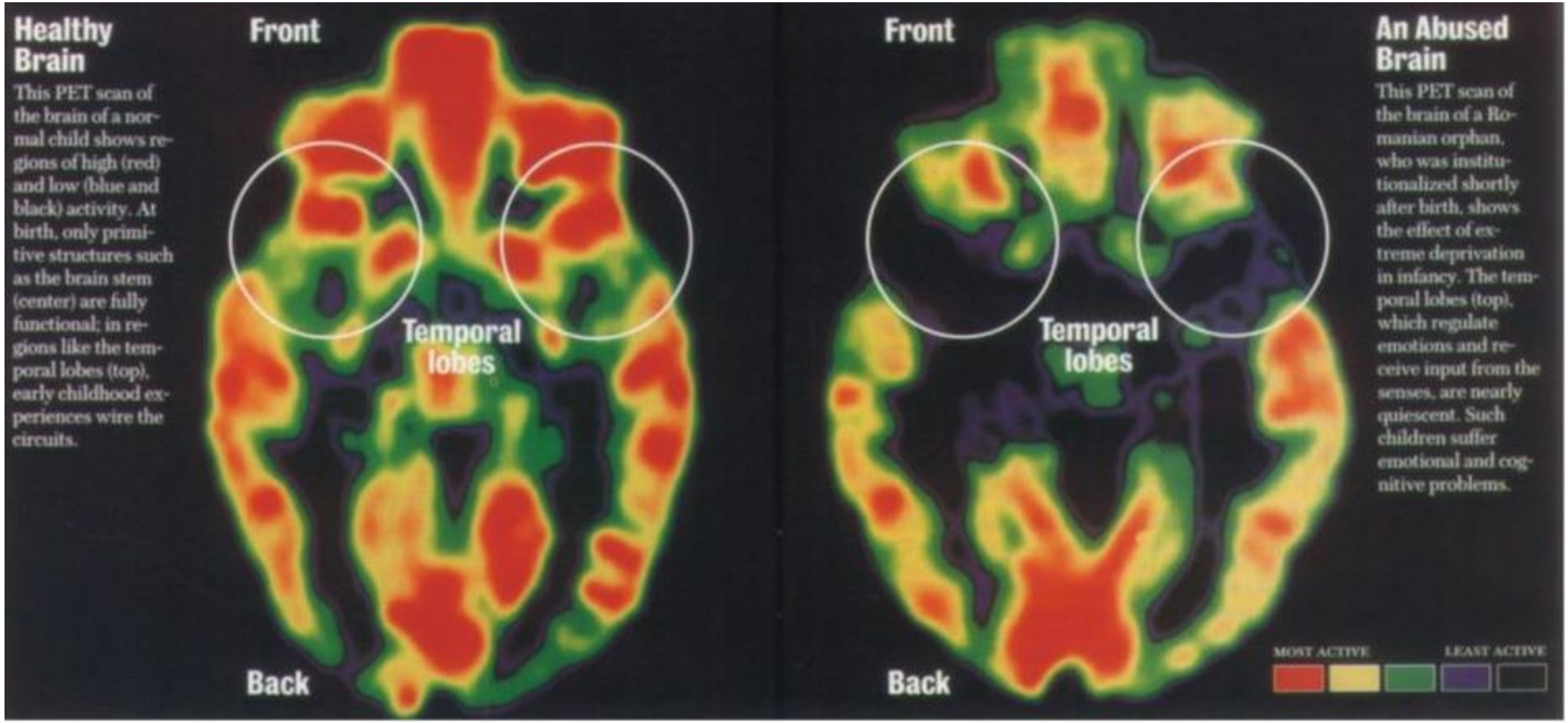
# THE BRAIN DURING A SINGULAR TRAUMATIC EVENT

- Dr. Dan Seigel's hand model of "Flipping a Lid"
  - https://youtu.be/Kx7PCzg0CGE?si=PslLEeevBvGarcxC
- During a traumatic event, our brain takes precautionary methods to protect itself.
  - The prefrontal cortex goes offline.
  - The hippocampus gets stuck on a loop and replays traumatic memory
  - The amygdala sirens the body that it needs to go into survival mode.
  - The brain stem reacts using fight, flight freeze, fawn



# SO, WHAT HAPPENS WHEN TRAUMA REMAINS PERSISTENT AND/OR COMPLEX

- When exposed to consistent trauma, or multiple traumas – the alarm stays activated, the distressing memories stay on a loop, and the thinking brain remains impaired.
- Just like a muscle, the more a brain system like the stress response network gets "exercised," the more it changes and the more risk there is of altered functioning. At the same time, the less the cortical regions, which usually control and modulate stress, are used, the smaller and weaker they get.


Healthy Brain
This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.
Front
Temporal lobes
Back
Front
Temporal lobes
Back
An Abused Brain
This PET scan of the brain of a Romanian orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.
MOST ACTIVE
LEAST ACTIVE

# SUSIE, 15 YEARS LATER

- Susie is now 23 years old.  Her mother's boyfriend is in prison. Her mom uses drugs to cope.
- She has been in multiple abusive relationships and was sexually abused at 18.
- Can't hold a job and has no plans for the future.
- She experiences high blood pressure, stomach pain from ulcers, tingling arms and back pain.

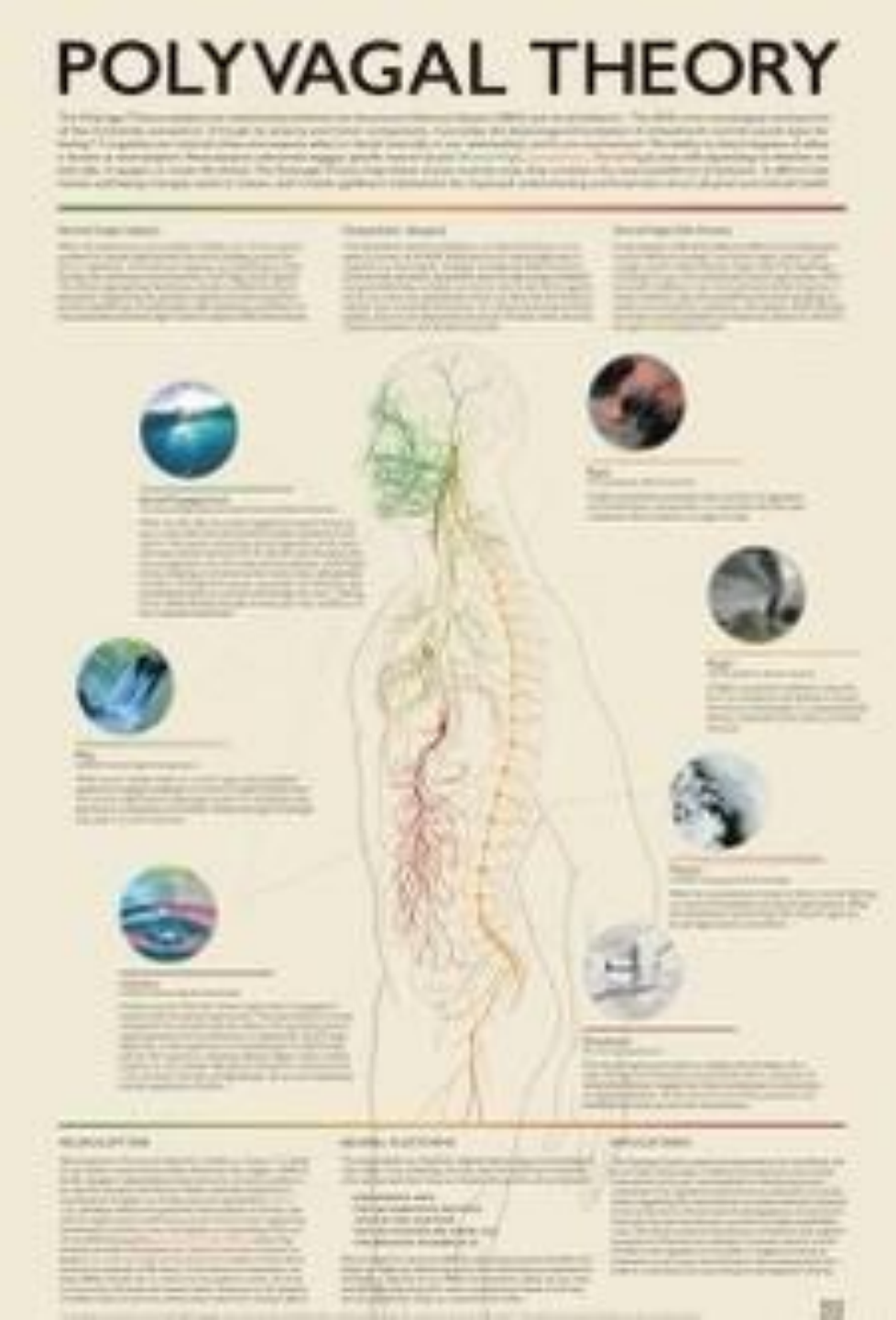

# TRAUMA IN THE BODY

- Physiologically when our trauma responses are active (fight, flight, freeze, fawn): our heart beats faster, our blood pressure increases, and adrenaline and cortisol (the stress hormone) surge through our system to prepare us for means to survive.

  - But – the stress response is only effective if used in short bursts so when someone is in a chronically stressful environment – the body experiences constant surges of chemicals, high heart rate, and high blood pressure. This is when the body and brain can be damaged.

# TRAUMA IN THE BODY: THE NERVOUS SYSTEM

- The nervous system is made up of the brain and spinal cord, as well as nerves that connect these two parts.
- Nerves carry electrical signals from brain to your body, and the The nervous system is made of sympathetic (fight, flight..etc) and parasympathetic (rest and digest).
- Polyvagal theory: suggests there is 3 different states of the nervous system
  - Ventral vagus: social engagement system – calm and in control state
  - Dorsal vagus: the freeze and fawn state
  - Sympathetic: fight and flight state



# TRAUMA IN THE BODY: CORTISOL

- Cortisol = the stress hormone
  - Used to energize us to protect ourselves when our survival instincts are engaged
    - Suppose to be used in short bursts -- less than 20 mins.
- When the body is secreting cortisol, the immune system shuts down. Over time it causes:
    - infections, autoimmune diseases, heart and blood vessel diseases, cancer, harm blood vessels, raise blood pressure, and increase the risk of heart disease, difficulties in learning and concentration and emotional regulation.

# SUSIE, IN A MUCH BETTER PLACE

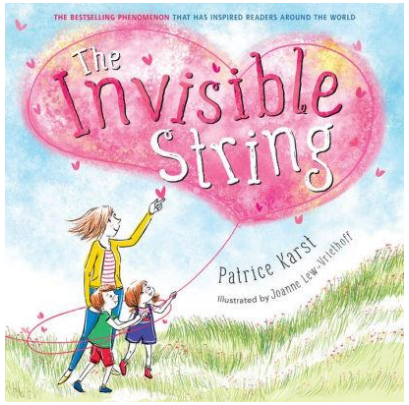
- At 26, Susie has completed 2 years of mental health therapy.
- Has maintained a healthy relationship for 1 year and is focusing on going to college.
- She has maintained a job for 1.5 years.

# HOW TO COPE WITH TRAUMA THAT HAS AFFECTED SOMEONE'S BRAIN AND BODY

- Therapy – trauma-informed care, Eye Movement Desensitization and Reprocessing (EMDR), somatic based therapy, cognitive-behavior therapy
- Occupational therapy - regain a sense of personal safety, competence, and pleasurable connection
- Yoga, swimming, body-based activities – nervous system regulating activities
- Time – the brain is a muscle and needs time to recalibrate

# RESOURCES FOR KIDS

- The Responsive Counselor – Flip your Lid book.
- The Little Spot…books
- The Invisible String book
- The Child Mind
- The National Child Traumatic Stress Network


# RESOURCES FOR ADULTS