

# Integrated Prenatal and Perinatal Dynamics Epigenetics and Polyvagal Theory in Private Practice



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# Orienting: Asking and Answering



- What are Epigenetics and Polyvagal Theory?
- Why is it important for maternity and trauma prevention/healing practices?
- How does it improve birth and health outcomes?
- What does it mean for the practitioner in daily practice?

# Key messages

- Latest research in understanding our gene expression and nervous system informs how we can improve health practices, including birth
- Midwifery or your practice as Safe Haven is the ideal container for helping families understand these principles
- Specific epigenetic and polyvagal practices can inform midwifery and improve birth and health outcomes





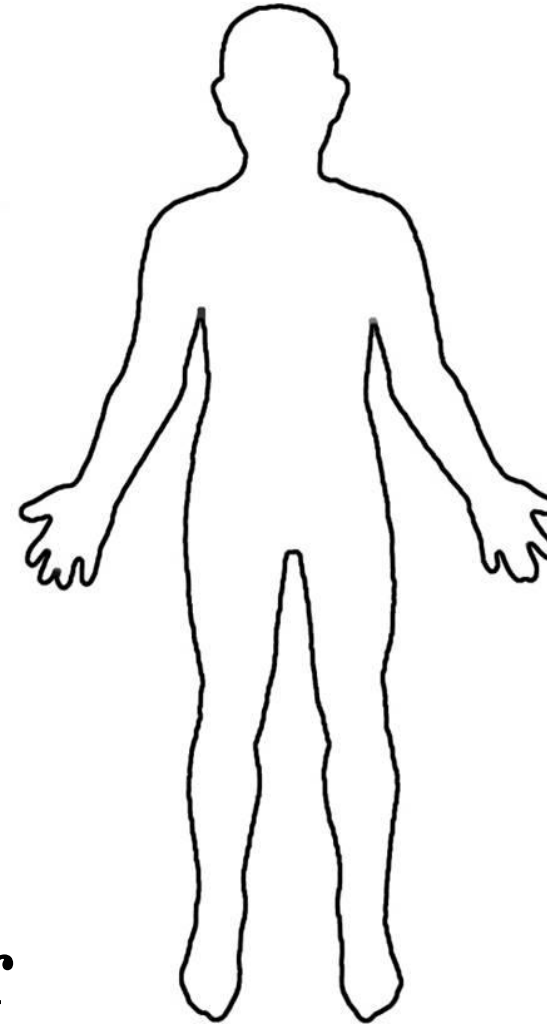
# Story of a labor

*What would you say if I told you that just how you are in your face, that is, your facial expression, could change the way a mother feels when she is in labor and improve birth outcomes? And it can change the way your clients feel when they are with you?*



# Consider . . .

- A tool for all people
- Detects your safety wherever you are.
- Available at all times.
- Easy to use.
- Free!
- There's a catch! You have to know how to program it.



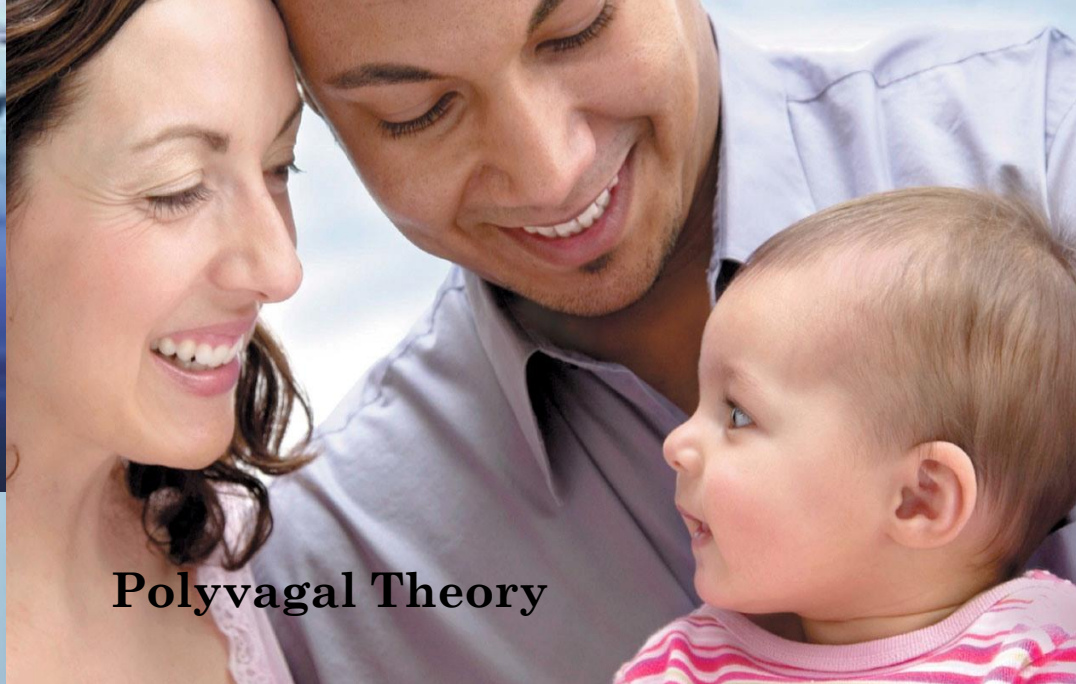
It's your  
**BODY**





*Many Branches of Science  
Converging*

Epigenetics



Polyvagal Theory

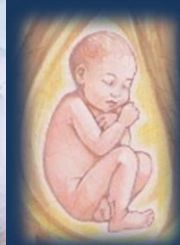


Attachment



Neuroscience

Slide from Marti Glenn, PhD





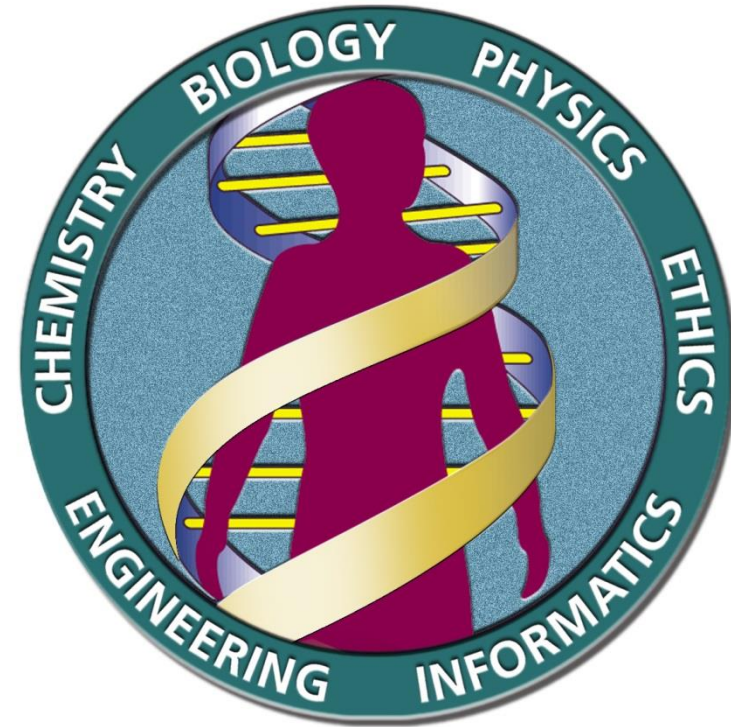


# Epigenetics

- **Concept:** Environment around our genes can influence how the gene is expressed through methylation and histone modification
- **Message:** We are not just our genetic inheritance, we are the expression of our genes.
- **Nature and nurture** work together to create who we are, and it can be transferred to future generations

# Epigenetic Contributions

- Human Genome project
- Map our genome,
- Expected 100,000 genes and it would change medicine
- Actually 20,000 – 30,000 genes.
- Therefore, what accounts for such variety in our human population?



Established 1990.  
Completed in 2003





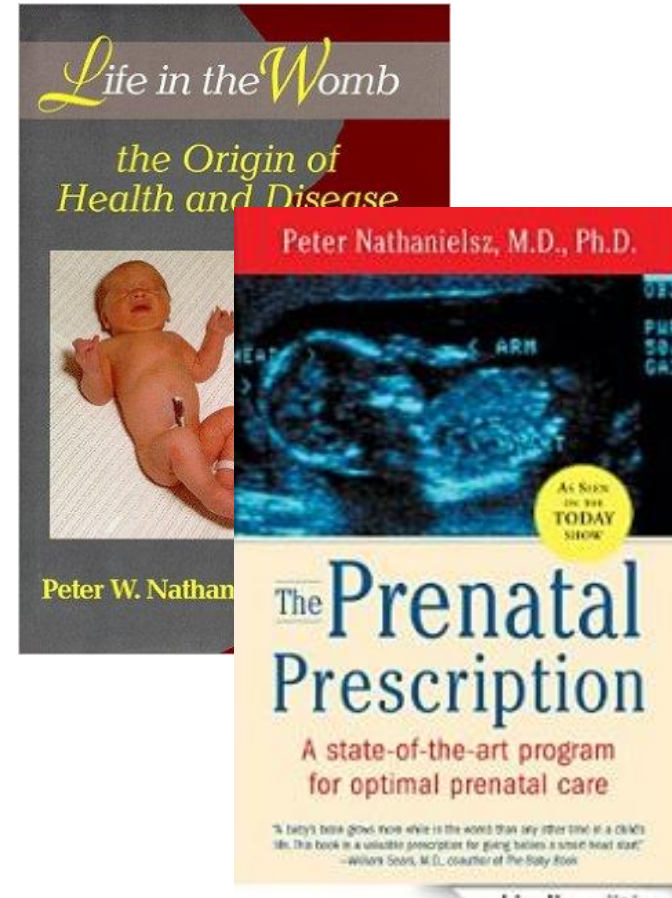
# Epigenetics Contributions



David Barker and  
Fetal Origins of Adult  
Disease



Peter  
Nathanielsz,  
MD, PhD.  
Fetal  
Programming



# Epigenetics Contributors

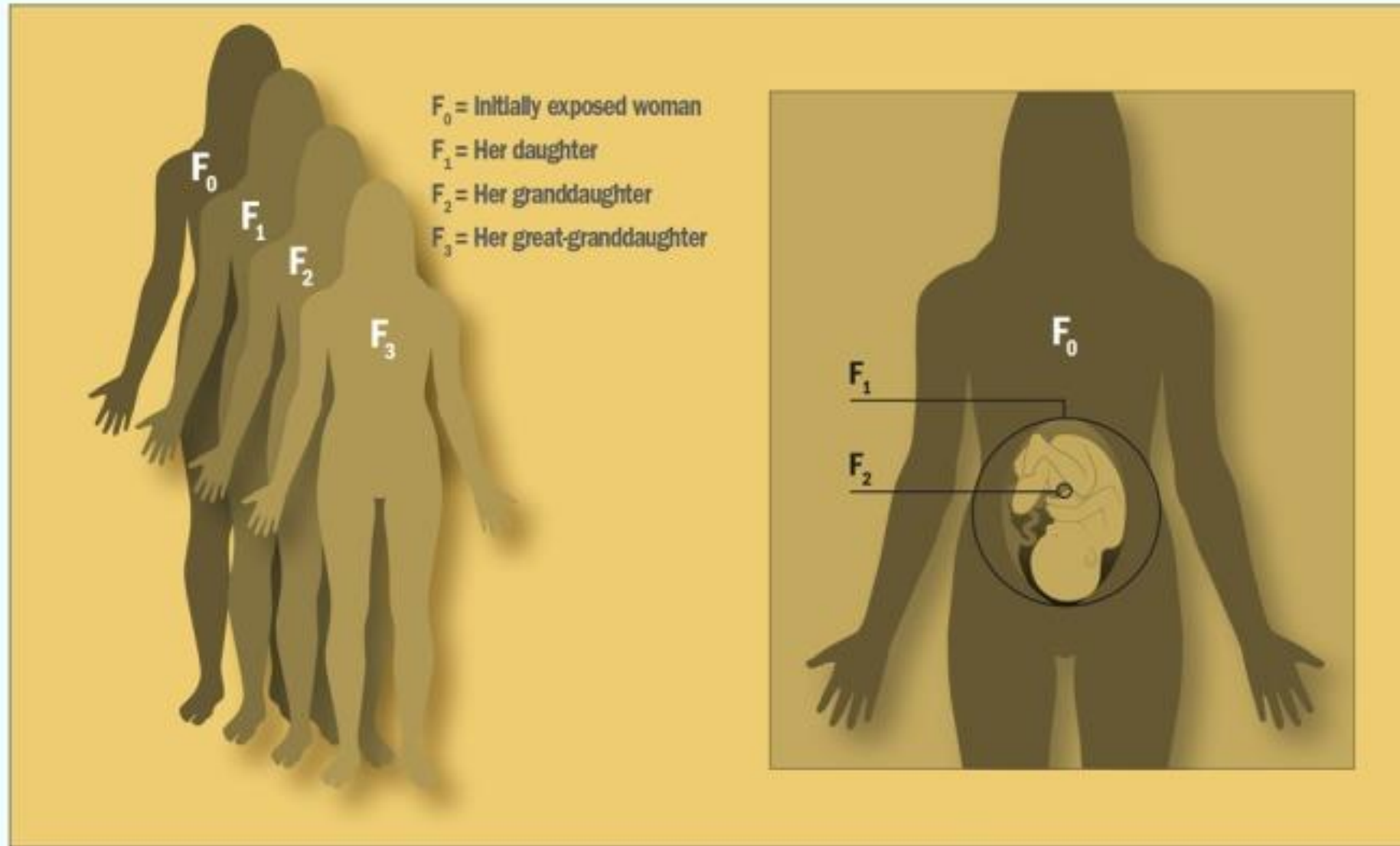


- Catherine Monk, PhD
- Fetal Origins of Adult Disease
- Effects of Maternal Stress
- Perinatal Pathways Laboratory at Columbia University



“So we can, as we’re doing in my lab right now, have an intervention, where we work with women before the baby’s born, providing tools that can really support them in their caregiving, so they can be the best caregiver possible.”

# Epigenetics



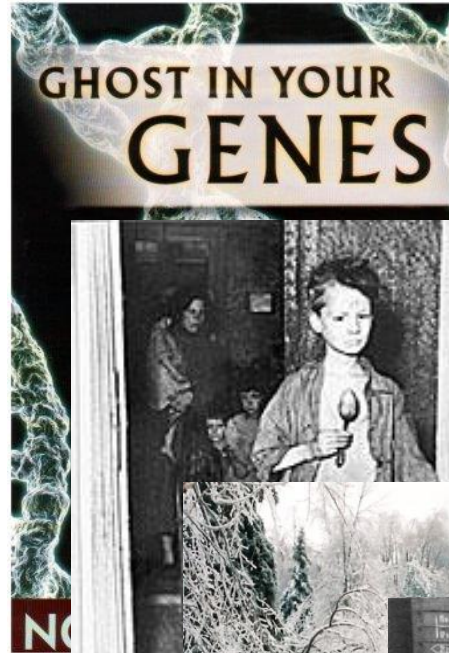


# Epigenetic research

- Ghosts in Your Genes
- Multiple research studies
  - Dutch Famine (Nathanielsz)
  - Quebec Ice Storm (Cao-Lei, et al)
  - Genocide, Holocaust (Yehuda)
  - 9-11 Tragedy (Yehuda)
- Stress
  - Research at the University of Lethbridge Canada



Dr. Gerlinde Metz



RACHEL YEHUDA

is Professor of Psychiatry and Neuroscience and the director of the Traumatic Stress Studies Division at the



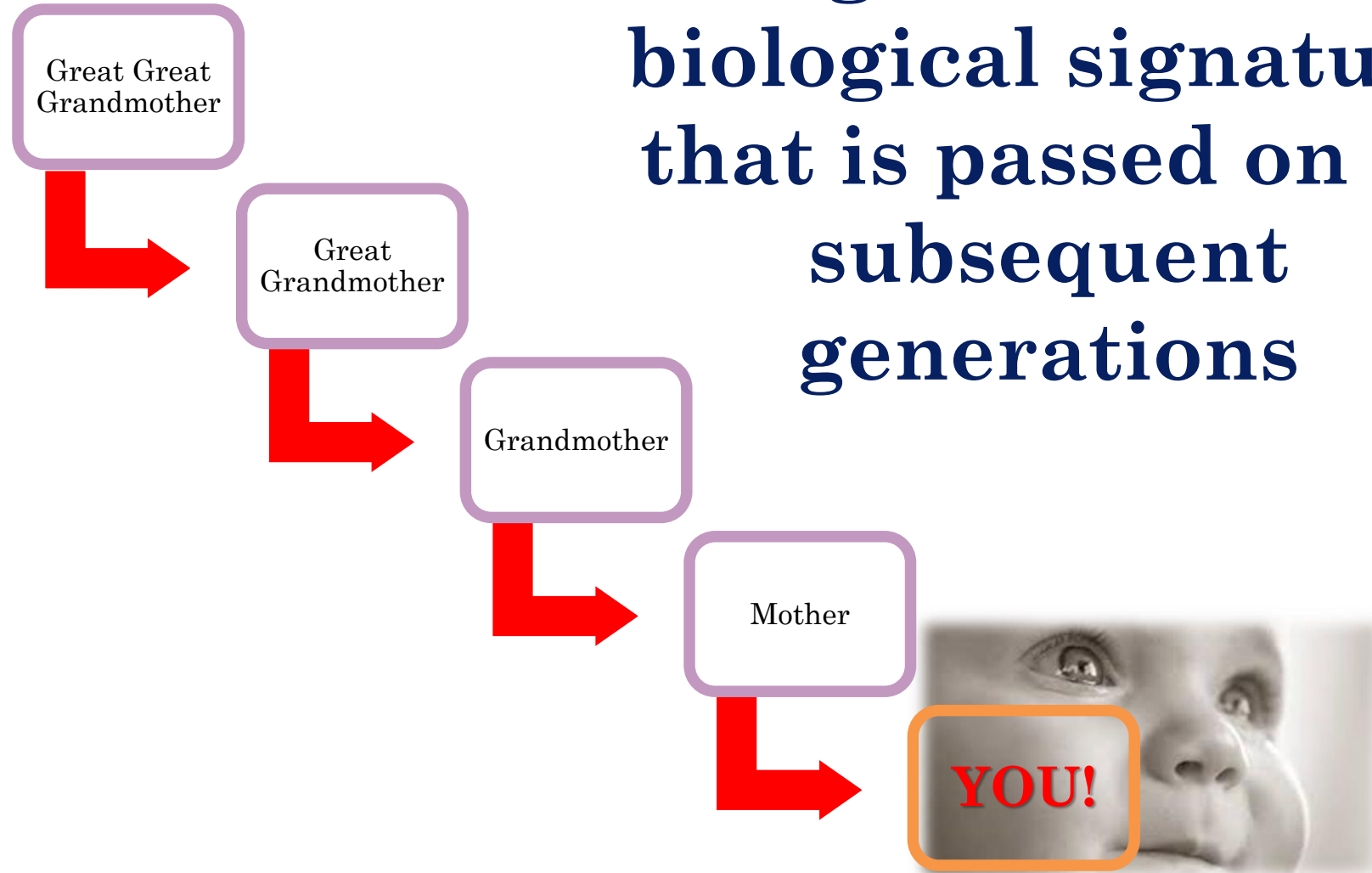
Source: National Institute for War Documentation, Amsterdam

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[https://upload.wikimedia.org/wikipedia/commons/e/e5/North\\_face\\_south\\_tower\\_after\\_plane\\_strike\\_9-11.jpg](https://upload.wikimedia.org/wikipedia/commons/e/e5/North_face_south_tower_after_plane_strike_9-11.jpg)



# Epigenetic research



**Experiences  
generate a  
biological signature  
that is passed on to  
subsequent  
generations**



# Stress crosses generations



- **Pregnancies in four generations of rats show that inherited epigenetic effects of stress could affect pregnancies for generations.**
- **Stress and preterm birth**
- **A first generation of rats were subjected to stress late in pregnancy.**
- **The following two generations were then split into two groups that were either stressed or not stressed.**
- **The daughters of stressed rats had shorter pregnancies than the daughters of those who had not been.**
- **Grand-daughters of stressed rats had shorter pregnancies, even if their mothers had not been stressed.**
- **The descendants of the stressed grandmothers had higher glucose levels. Their offspring were smaller and had delays in behavioral development.**
- **Stress was compounded, so grew more with each generation.**



# Behavioral Epigenetics



- Translates how nurture and cues in our environment affects our physiology
- Examines ways we feel safe, secure, connected, protected, or not
- Impacts our basic threat and survival physiology
- Absolutely impacts birth and birth outcomes

*“Could certain **experiences** — child neglect, drug abuse or other severe stresses — also set off epigenetic changes to the DNA inside the neurons of a person’s brain? ”*

# Behavioral Epigenetics



Michael Meaney

Moshe Szyf

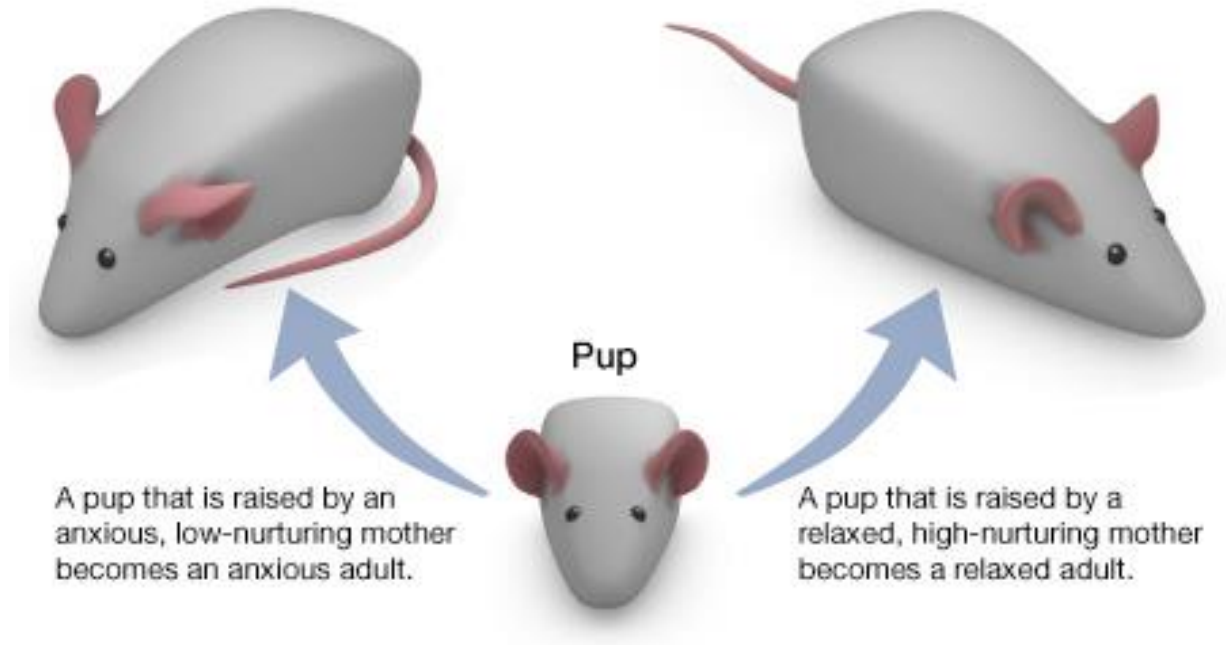
McGill University team that studied maternal behaviors in rats

**Epigenetic Programming by Maternal Behavior**

*Nature Neuroscience* 7, 847 - 854 (2004)

Image source: <http://discovermagazine.com/2013/may/13-grandmas-experiences-leave-epigenetic-mark-on-your-genes>

# Behavioral Epigenetics



“If diet and chemicals can cause epigenetic changes, could certain **experiences** — child neglect, drug abuse or other severe stresses — also set off epigenetic changes to the DNA inside the neurons of a person’s brain? That question turned out to be the basis of a new field, behavioral epigenetics.” (Hurley, 2015)





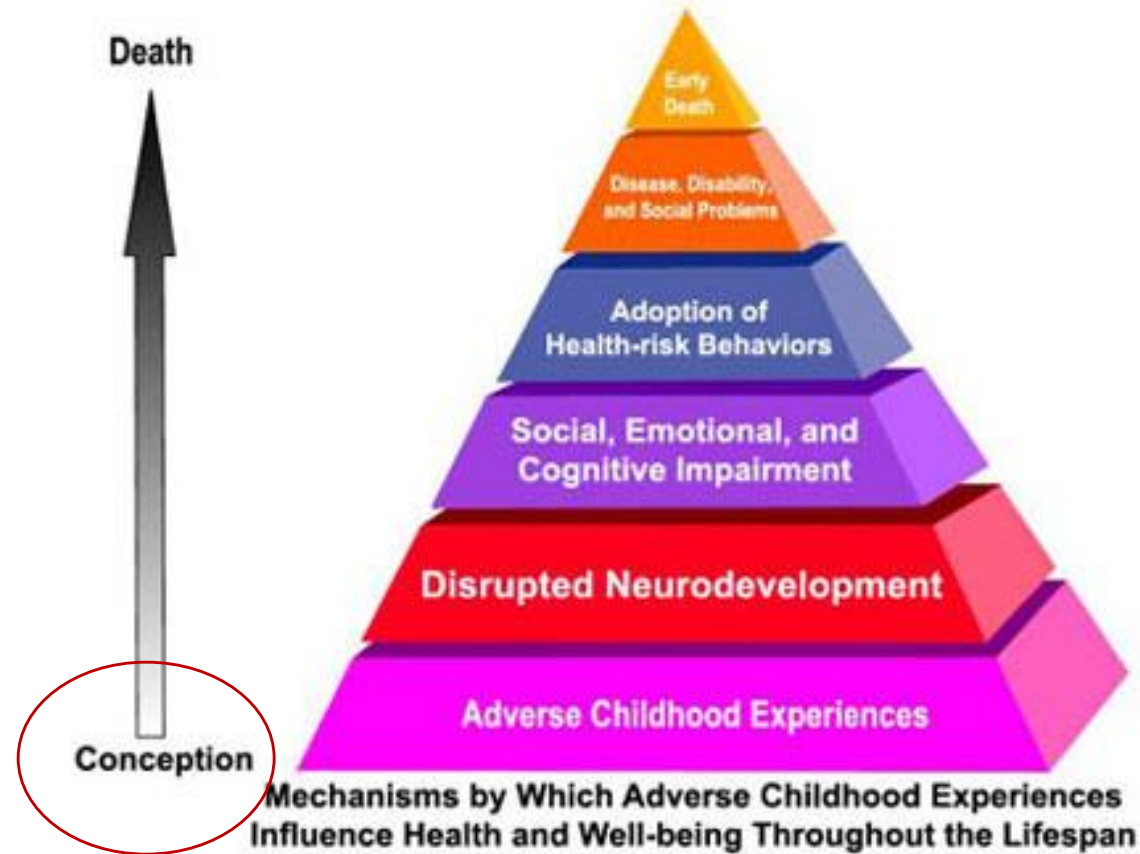


# Bonding and Attachment

- Foundation for health and well-being on many levels
- Bio-psycho-social-spiritual aspects
- Can start before conception, and especially during pregnancy
- Parents can explore their attachment styles and consciously conceiving

# Adverse Childhood Experiences

- Kaiser Permanente study
- N=17,000
- Vincent Felitti, Robert Anda
- Identified 10 Adverse Childhood Experiences
- Resiliency is also measured
- See [acestoohigh.com](http://acestoohigh.com)

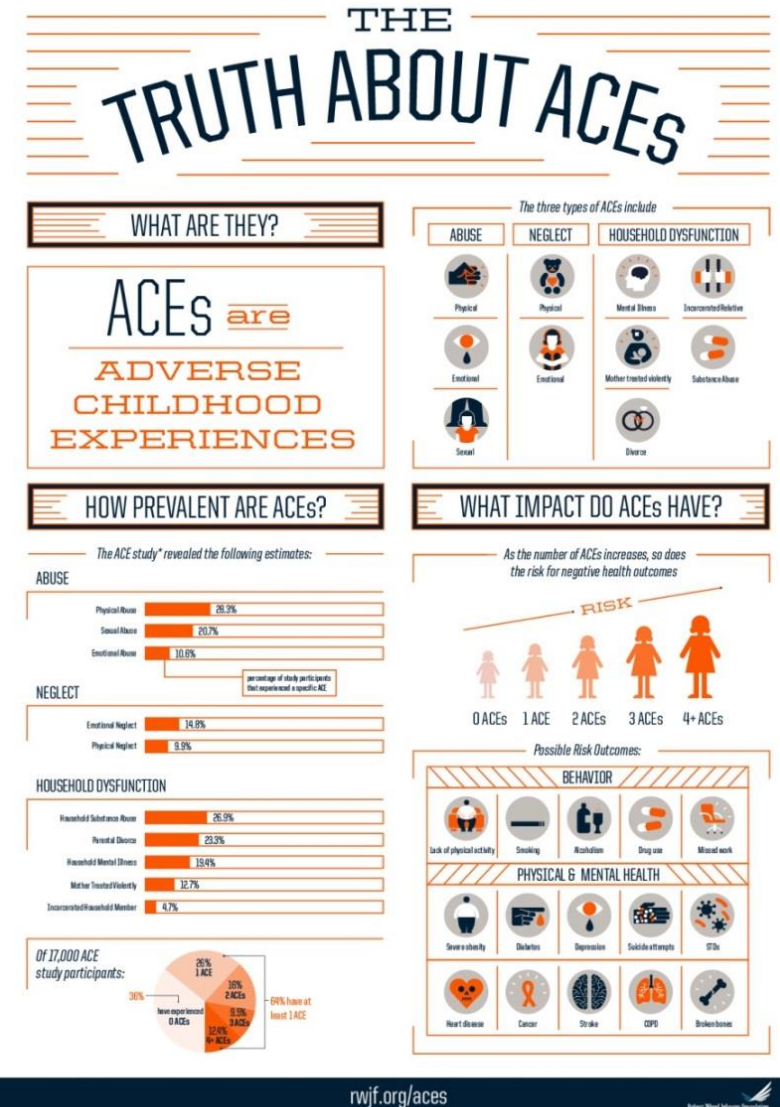




# Adverse Childhood Experiences

- Abuse
- Neglect
- Household Dysfunction
- Impact on Behavior, Physical and Mental Health
  - Less physical activity
  - Smoking
  - Addiction
  - Missed work
  - Obesity
  - Diabetes
  - Depression
  - Suicide attempts
  - STDs
  - Heart Disease
  - Cancer
  - Strokes
  - COPD
  - Broken bones

Acestoohigh.com  
n=17,000





# Impact of Poverty and Race

- Racism and poverty have transgenerational intergenerational impact on the health of women and their pregnancies
- Current trends include discussing adverse experiences during prenatal visits
- Early life lasts a lifetime

"It is easier to build strong children than repair broken men."  
~ Frederick Douglas



# First Thousand Days



Commonly, I hear stories such as “my mother was working at a stressful, low-paying job until she went into labor and I arrived at a low birth weight. Then she had to go back to work two weeks later, and I was raised by others.” ~ Stephen Bezruchka, PhD, University of Washington.

During this earliest period of life—called the first thousand days—roughly half of our health as adults is programmed.



Prenatal Development  
and Parents' Lived  
Experiences

*How Early Events Shape Our Psychophysiology  
and Relationships*



Ann Diamond Weinstein  
Foreword by Michael Shea

# Parents' Lived Experience and The Prenate

“When women and girls are pregnant, their perceptions and beliefs shape their physiology, which impacts their internal environment within which their developing babies grow and influences the lifelong programming of their babies’ systems.”~ Ann Weinstein, p. 23



# Redefining childhood

- Adverse Childhood Experiences and the Resiliency score is being integrated into many practices including prenatal care
- Parenting begins before conception
- A baby experiences what the mother experiences





# Adverse Early Experiences and Resiliency Questionnaires

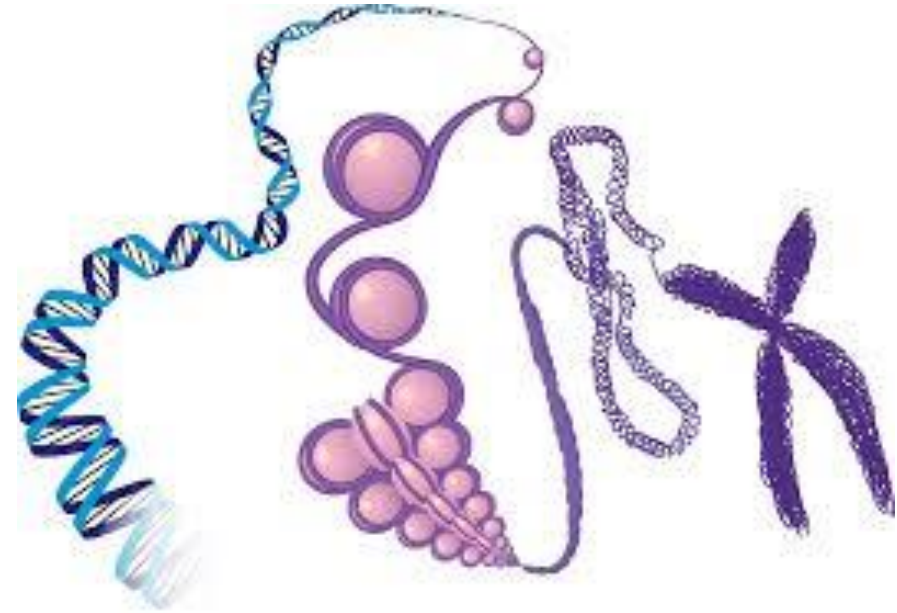


- Adverse Experiences
  - Being unwanted? Abortion ideation or attempt?
  - Conceived via ART?
  - Survivor of twin or other multiples loss?
  - Was mother depressed or anxious?
  - Cigarettes or alcohol consumed?
  - Domestic violence?
  - Loss during pregnancy?
  - Traumatic birth or NICU experience?
  - Separation from mom, surgeries, circumcision, hospitalization?
- Resilience
  - Someone wanted me, welcomed me
  - Seen, heard
  - Sense of belonging
  - Safe, secure
  - Protection
  - Understood, someone gets me
  - Loved
  - Curious, engaged
  - Support, purpose, gratitude
  - Home
  - Coherent story

# Epigenetics Summary



- Epigenetics
  - Human Genome: only 20,000-30,000 genes in human DNA (not what was anticipated).
  - Environment around a cell influences genetic expression.
  - Stress can alter gene expression to ensure the survival of the organism (Nathanielsz, Monk, Weinstein)
  - Mother's material (neurochemical) content has impact on developing baby, especially emotions such as fear, love, and hope. (Weinstein)





# What does this mean for the practitioner

- Support for the mother /birthing parent, client in your quality of care
- Knowledge of stress relief
- How do you help settle someone who is nervous, scared or stressed?
- How do you settle yourself when you are nervous, scared or stressed?
- Use of current tools like ACEs and listening to mothers' experiences
- Quality of attending to someone
- Recognition of early trauma patterns as a tool to improve the feelings of safety and security





Pause





# Polyvagal Theory

- Published by Stephen Porges in 1994
- Revolution in healthcare, how the regulation of our autonomic state affects overall health, and what to do about
- Neuroception (scanning for danger and safety)
- Interoception (innately knowing if safe or not)
- Working with different states in the body



Stephen Porges



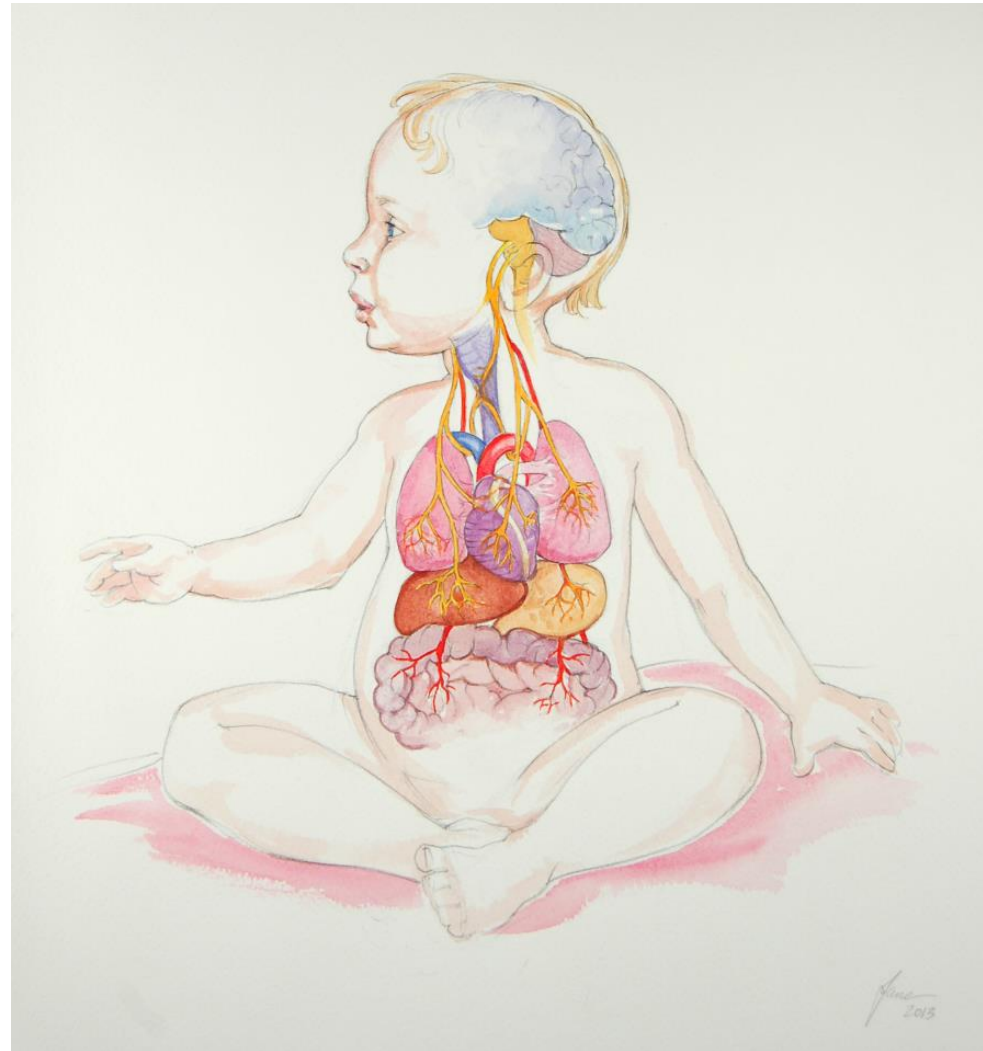


# Implicit memory

- Implicit memories are “‘hot’ and powerfully compelling” . . . . “They arise as a **collage** of sensations, emotions, and behaviors” – Peter Levine, PhD from *Trauma and Memory*, emphasis mine
- One of the biggest questions that we unconsciously, and consciously ask is, Am I Safe?

# Polyvagal Theory

- Three Nervous Systems
  - Social Engagement
  - Fight Flight
  - Freeze
- Functional and stress responses in each
- Anatomical, hardwired
- All related to the vagus nerve



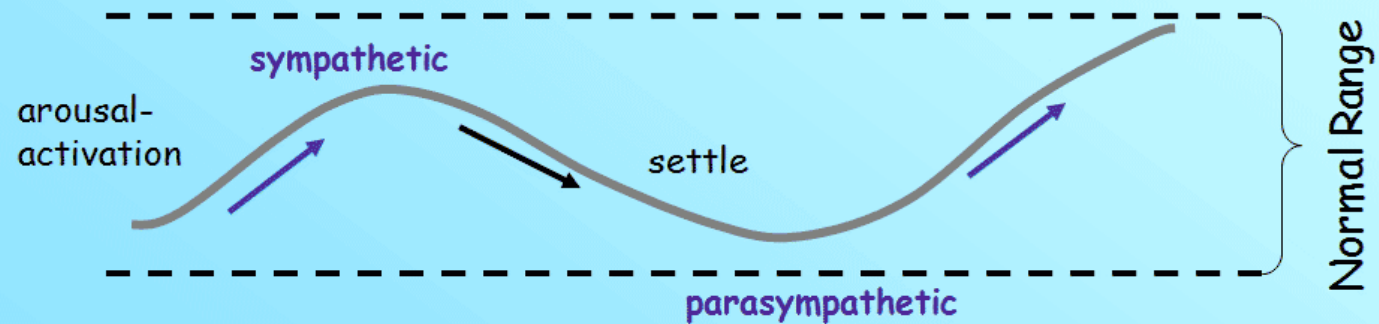
Social Engagement System: Cranial nerves, V, VII, IX, X, XI



# Autonomic Nervous System



## A Healthy Nervous System



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<http://www.traumahealing.org>



# Within the Functional Range



**When my Nervous System is balanced  
and my activation is low  
I feel:**

**Open, curious**

**Embodied**

**Available for connection**

**Fluid, resilient**

**Competent - a sense of mastery**

**Relaxed yet alert**

**Appropriately reactive**

**Able to be present**

**Emotionally stable**

**Healthy - symptoms are manageable**

***I have choices and options***

**I recognize when I am moving out of my functional range  
and have tools to return to stability and stabilization**

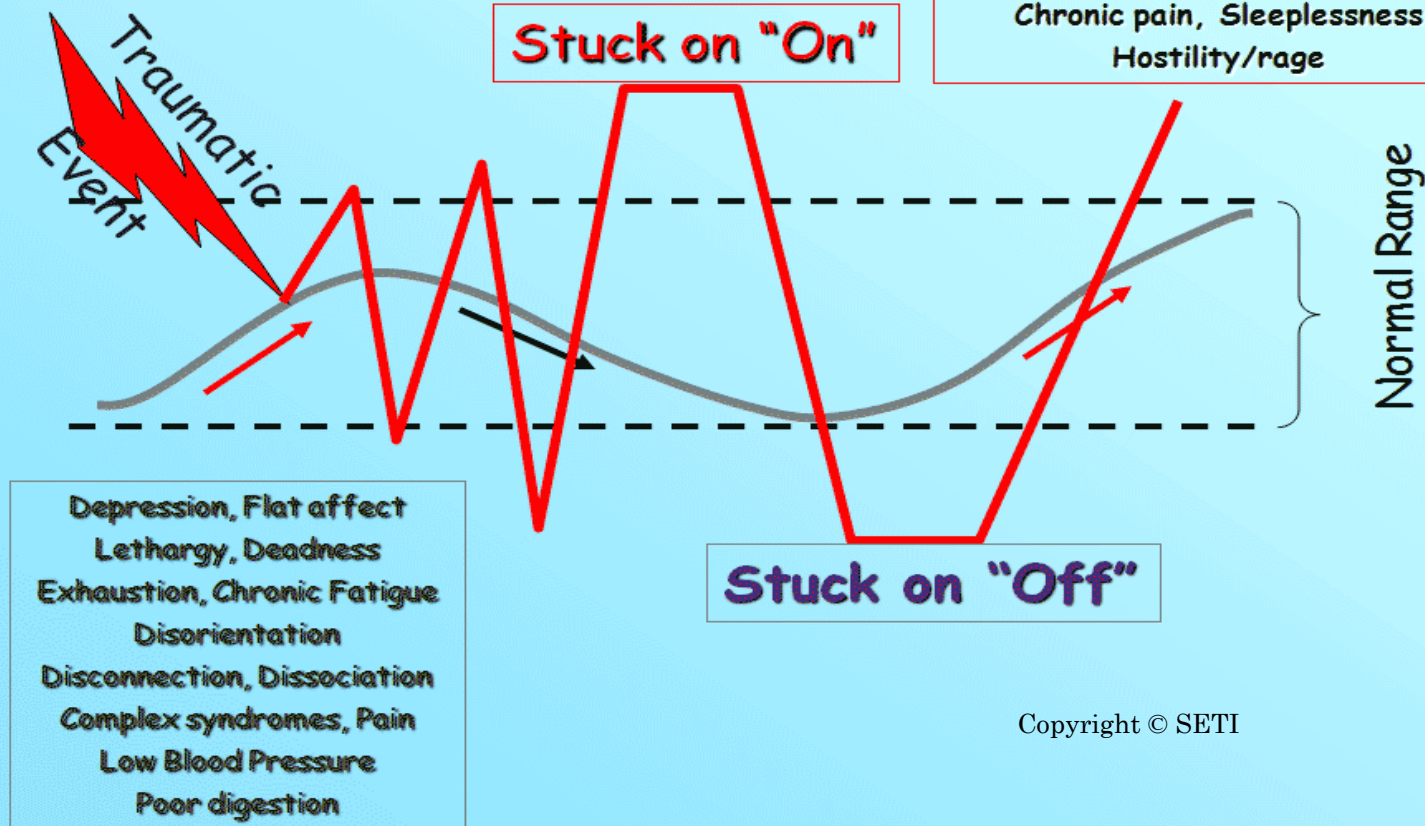
**I know when to reach out for support  
when I can't do it on my own**

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# When Activated



## Symptoms of Un-Discharged Traumatic Stress



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<http://www.traumahealing.org>



# Functional Range

Above my functional range I am reactive, maybe fearful, mobilized for fight and flight



## Sympathetic range



I am highly active, mobilized, maybe ready to play, interact with others, action

I am socially engaged, connected, curious, interested, appropriately reactive, capable



I would like to rest, eat, poop, sleep, meditative, down time

## Parasympathetic range



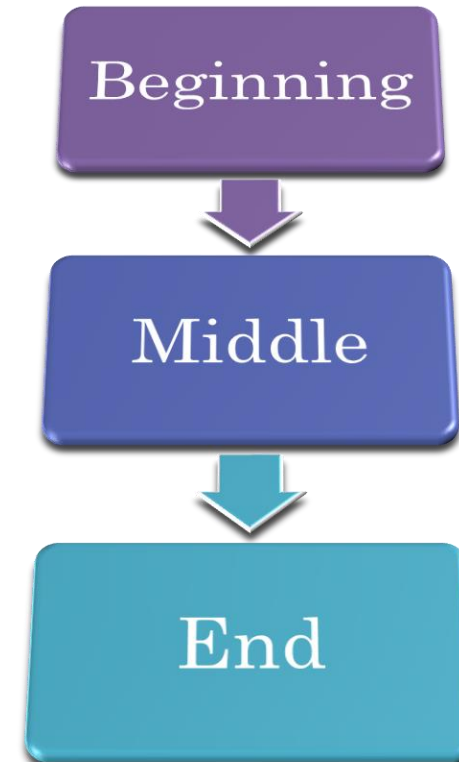
Beneath the range I am frozen, shut down, numb, low energy, stuck

ANS Map Design: Brigit Viksnins



# Sequencing

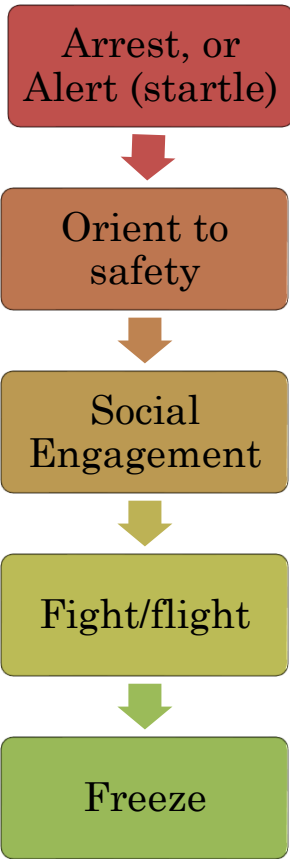
- **Everything we do, we do in a sequence**
  - Beginning, middle and end
  - Preparation, action, follow through
- **Defensive, protective gestures arise naturally**
- **With overwhelming events these natural gestures get interrupted**
- **We can find these places if we slow down and pay attention, ground, resource, stay present, complete**



# Sequence



Mobilization UP



LOOK





# Natural Instincts (Polyvagal Theory)

Recognizing, Restoring, Creating Capacity  
for Living Fully

Or

Reclaiming Our Natural Instincts

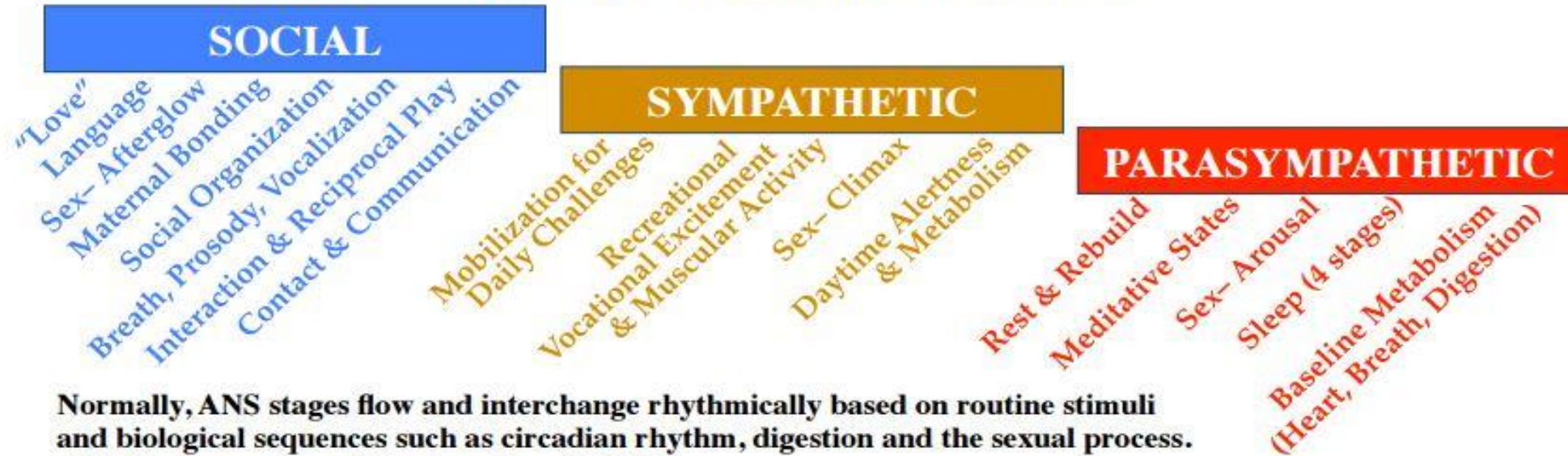


# Polyvagal Theory



*A high percentage of health conditions center on the Autonomic Nervous System, including immune system disorders, attention deficit conditions, psychosomatic issues, post-traumatic stress effects and others.*

## Normal Functions of the ANS



Normally, ANS stages flow and interchange rhythmically based on routine stimuli and biological sequences such as circadian rhythm, digestion and the sexual process. ANS fixation or loss of flow is a sign of PTSD.

***Voluntary and involuntary functions overlap significantly– most of the actions listed here could be either– but they can be identified by close observation. Autonomic responses are immediate and universal across differences of age, gender, education and culture. The conscious mind cannot fully control face and body expressions; the ANS itself seems to be mainly incapable of inauthenticity or deception (Paul Ekman, 2009).***

# Natural Instincts

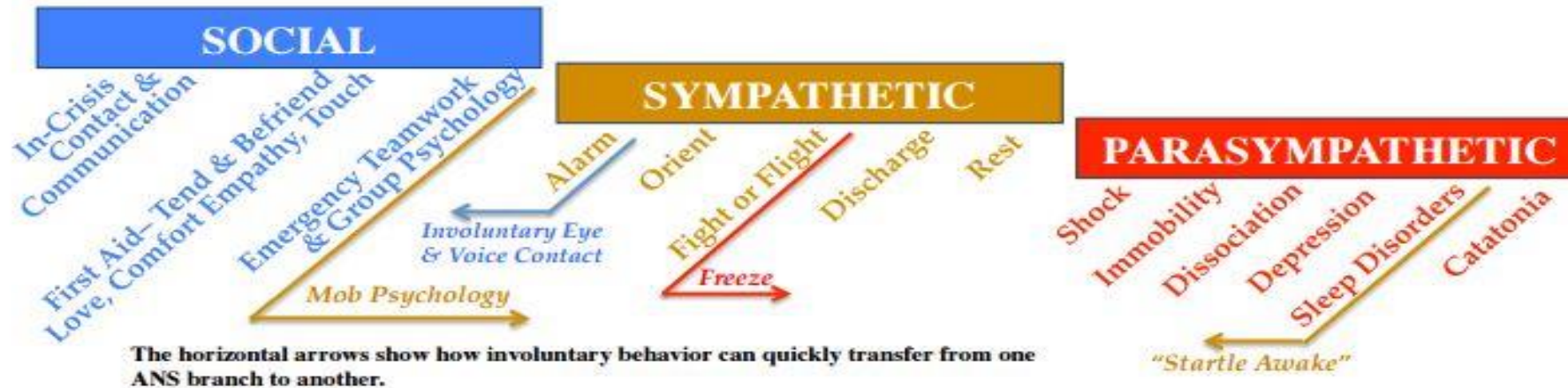


## Differentiating Normal ANS Functions from Stress Responses

Although commonly used, "Fight or Flight vs. Rest and Rebuild" is a confusing characterization of Sympathetic and Parasympathetic Branches; Fight/Flight is a stress response whereas Rest/Rebuild is a normal function

*The higher nervous system arrangements inhibit (or control) the lower, and thus, when the higher are suddenly rendered functionless, the lower rise in activity. — John Hughlings Jackson (1835-1911), Neurology Pioneer*

## Stress Responses of the ANS



*In the presence of novelty or threat, we try our phylogenically newest, best strategy (Social) first. If that does not work or has not worked in the past, we try our older, second strategy (Sympathetic). If that does not work, we try our most primitive, last strategy (Parasympathetic). If that does not work we are in danger, appearing as immobilization, deep depression or parasympathetic shock.*



# The way in . . .Portals

- Face
- Voice
- Heart
- Breath
- Body (touch, posture, movement, play)
- Interpersonal neurobiology or
- How we *are* with each other

The work of Stephen Porges





# Story of a labor

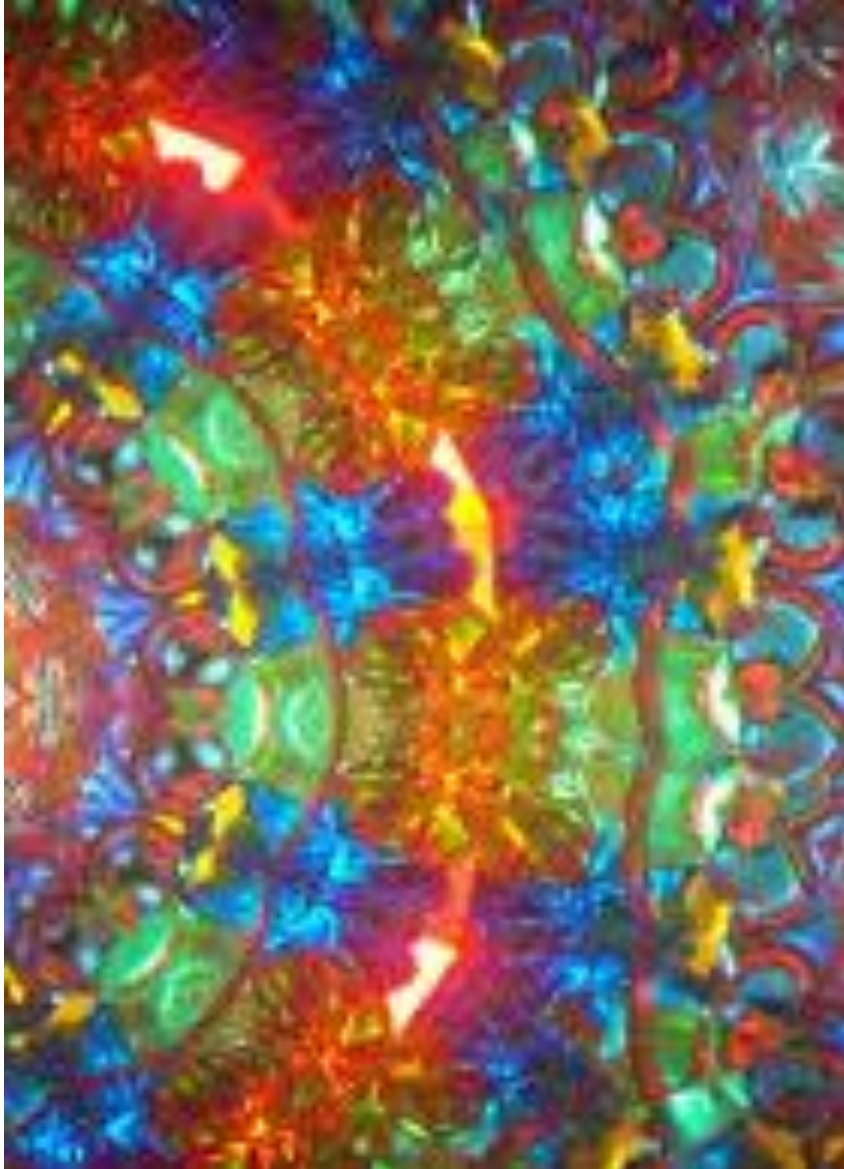
*Remember the story from the beginning of the presentation, how one woman's face helped the woman in labor?*





# How we are with each other

- We each have a set point for feeling safe
- Sometimes we quest for safety (neuroception)
- Sometimes we innately feel safe (interoception)
- The environment plays a role (exteroception)
- Therapies, people, places, behaviors, chemicals, trauma, awareness, culture influence these feelings
- Becomes part of our biology
- Patterns coming together, like a kaleidoscope
- Inside and Outside together





# What does this mean for your practice?

- Fear, safety and labor
- Previous trauma
- Support for the laboring couple
- How do we help women/birthing parents feel safe?
- How do you help your clients feel safe?
- Imagine a layer of support for parent of your client as a tool







# Midwifery Care

- Not hierarchical
- Mutually respectful
- Interested in families
- Continuity of care
- Best if small team as opposed to large
  - Creates feeling of safety
- Spacious, attentive





# Pause







# Tools for Practice

- Felt sense of safety can improve birth outcomes
  - The JJ Way
- Understanding the impact of your presence as a caregiver from a polyvagal and behavioral epigenetic perspective
- Tools for support and nervous system settling for yourself, your team and the families you serve



# JJ Way: An Evidence Based Model of Care

- For pregnancies to reach a gestation of 37 weeks or greater.
- For newborns to have a birth weight of 5 lbs. 8 oz or greater.
- For women (and their families) to bond well to their babies.
- To start and succeed at breastfeeding.

Because *every* woman wants a healthy baby!



# The JJ Way

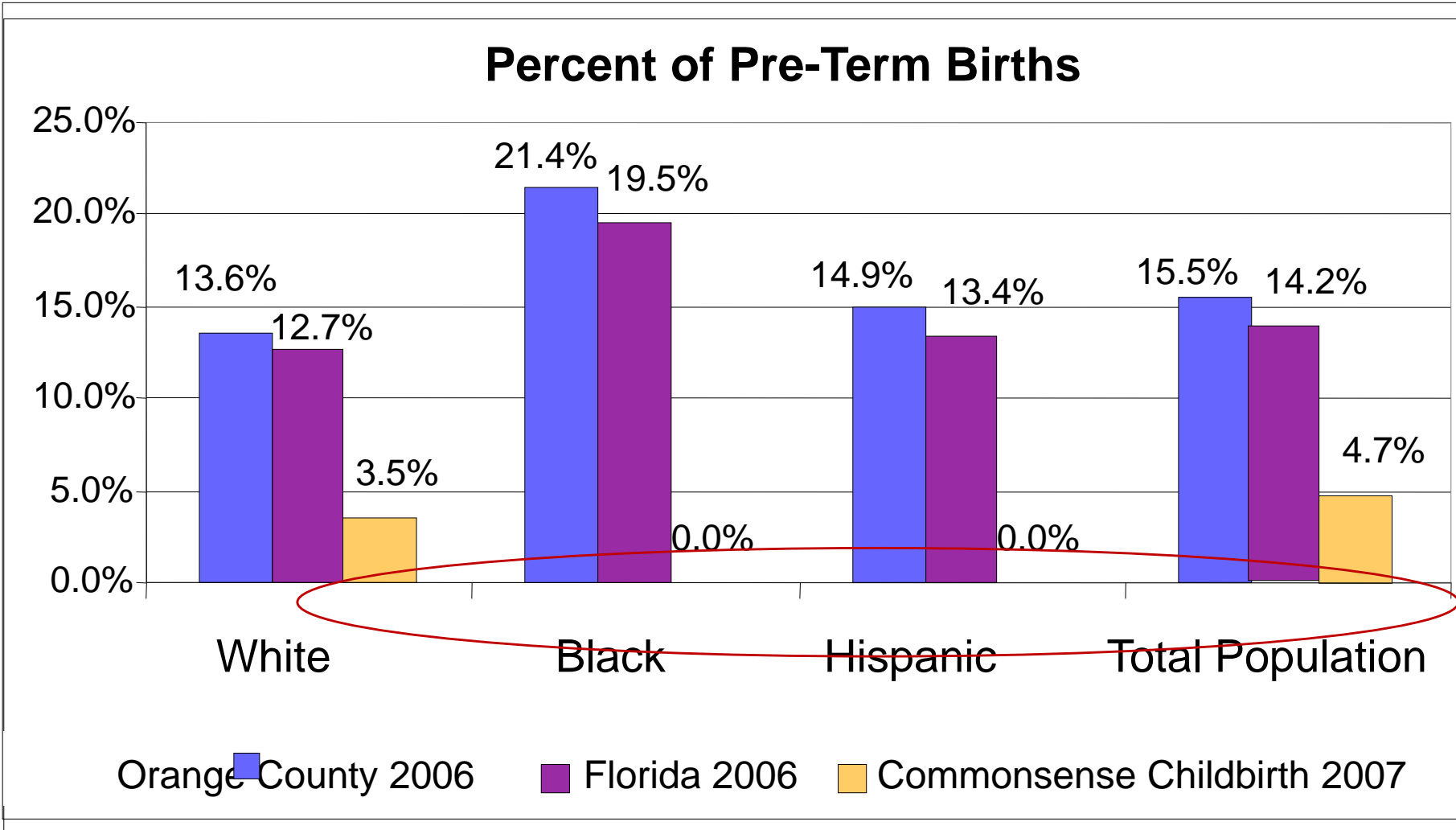


- Free Access Clinic in Winter Garden, FL
- 2007 Clinical Study conducted at The Birth Place clinic in Winter Garden
- 100 women enrolled
- 95% of babies weighed an average 7lbs 7ozs
- 95% of women delivered at 39 weeks
- **NO low birth weight or premature infants born to African American or Hispanic women**

<http://www.commonsensechildbirth.org/jjway/>



# Jennie's Statistics and the JJ Way



Source: presentation at APPPAH regional conference Bastyr University, WA 2016

# How?

- Free access to services, in combination with a for profit clinic
- Supported the mother/family where they were in themselves
- At the family's pace
- Greeting them, knowing them
- Home like setting
- Kindness
- Grace
- Flexibility
- The best of the Social Nervous System with no barriers
- Culturally sensitive
- Promoted a Team approach
- Prenatal Bonding for the whole family





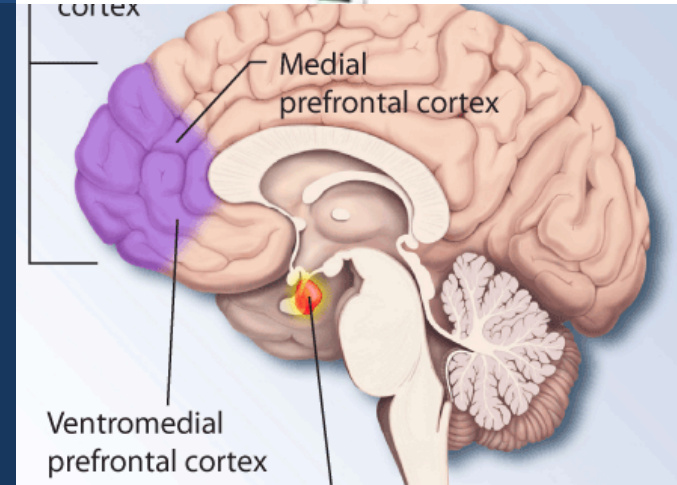
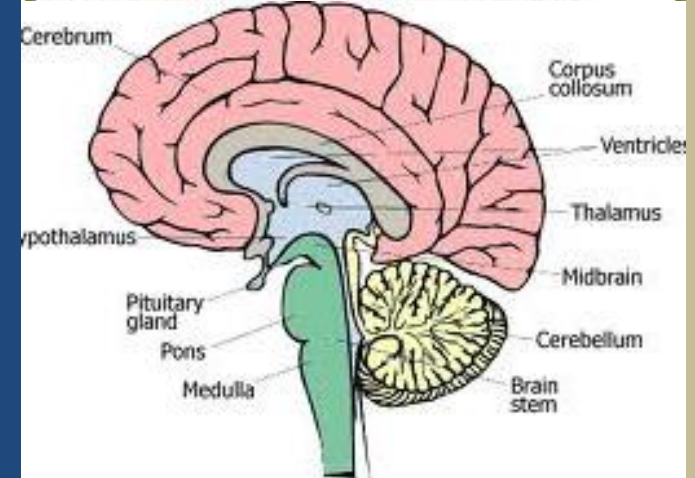
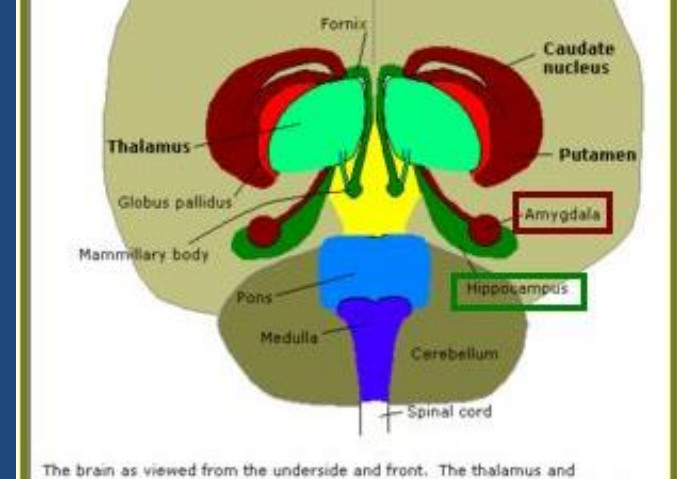


# Midwifery, Epigenetics, and Polyvagal Theory

- How we create safety in our body?
  - Starts in utero
  - Continues with mother-baby bonding
  - Secure attachment is biological, as is insecure attachment
- What are the conditions in our history that influence how we feel?
  - Ancestral patterns
  - Prenatal experience in utero
  - Birth experience
  - Attachment patterns/family experience
  - Societal and cultural conditions

*We are shaped*

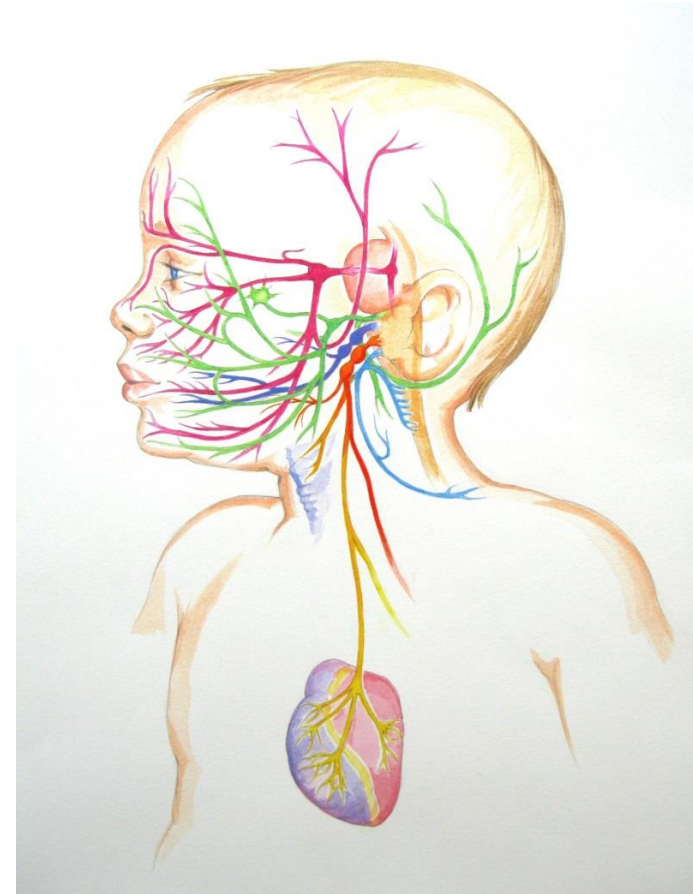
- Eyes
- Head turning
- Body felt sense
- Scanning the horizon for danger
  - Amygdala
  - Limbic brain
    - Hypothalamas, organ of perception
  - Memory
    - Am I safe?



## Quest for Safety: Anatomy

# Social Engagement: A Unique Face, Voice, Heart Connection

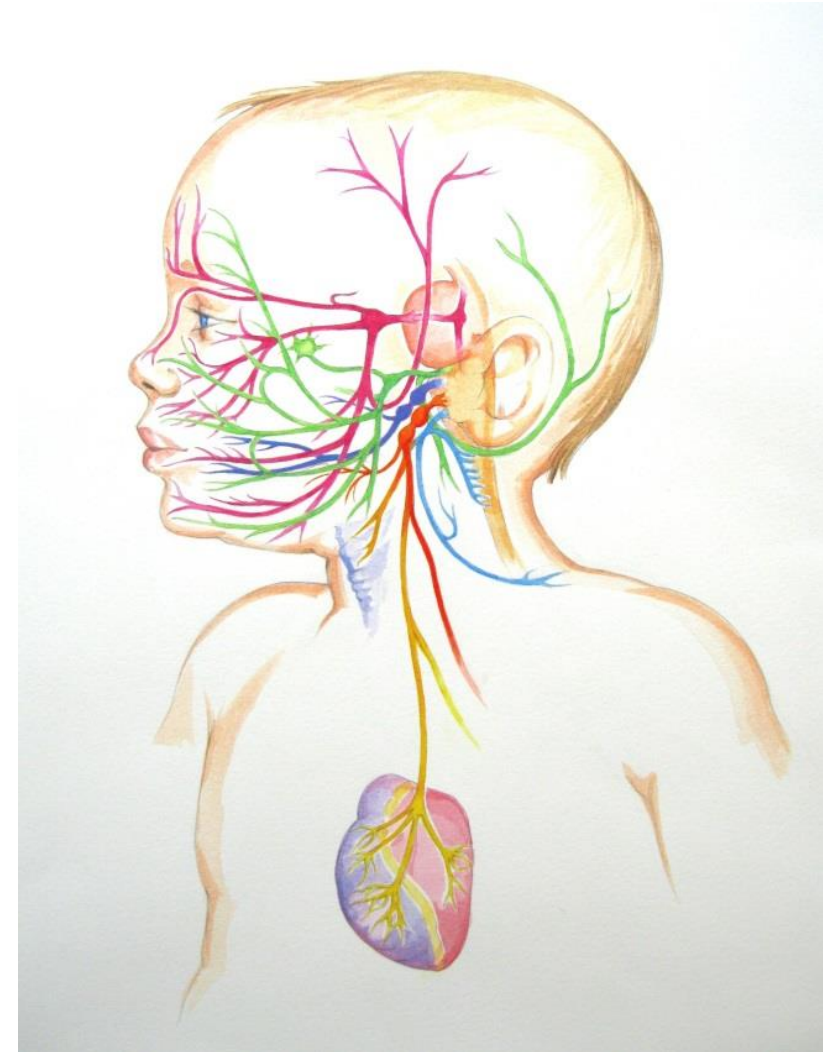
- It's how we are together, from the start
- Responsible for Bonding
- Every baby seeks to socially engage, it is part of survival and hardwired for connection





# How we are together

- **JJ Way**
  - **How it feels to come in to the clinic**
    - Implicitly
  - **Greeting (Hey Sugar!)**
  - **Where are you at? (meeting in the waiting room)**
    - Feeling seen, heard, met, understood = feeling loved
    - Oxytocin
    - Safety
  - **Livingroom type feel**
    - We're home
    - Whole family included





# It's about the relationship

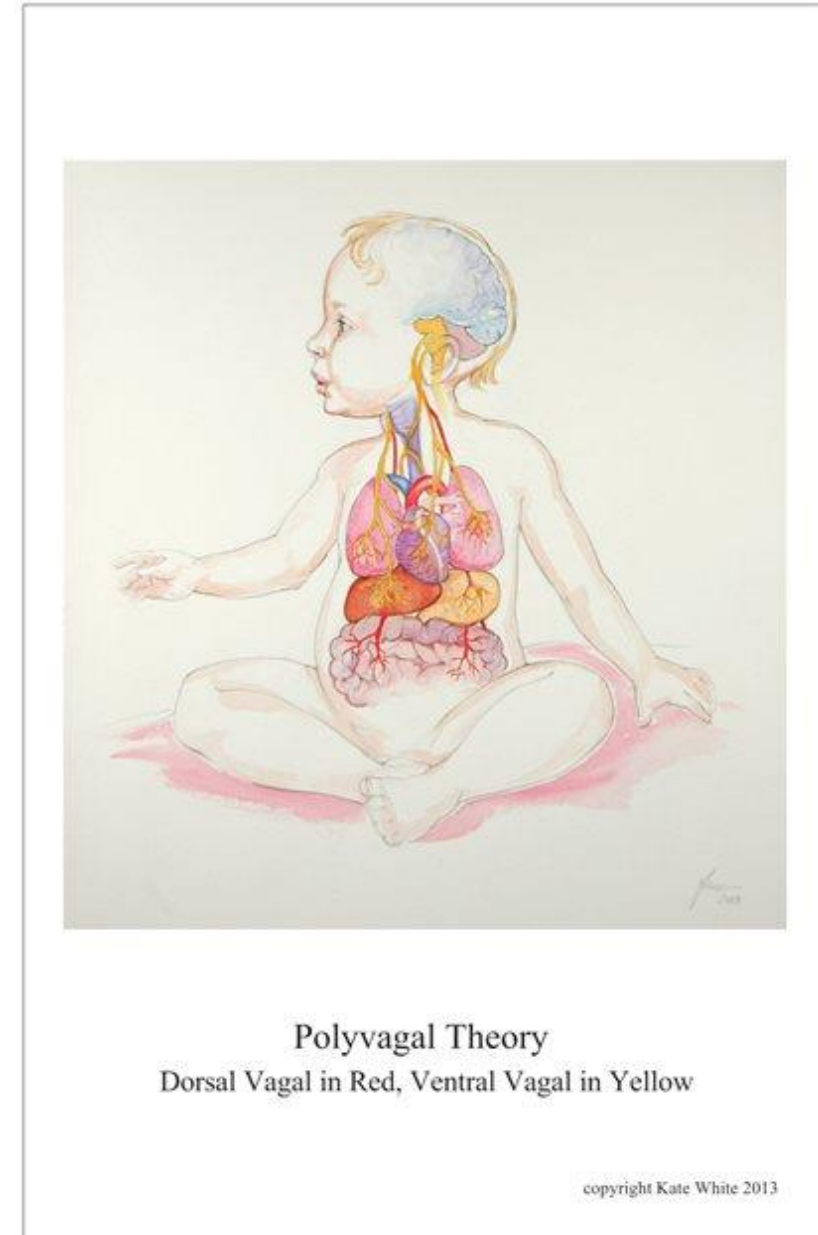
## Resiliency

- Someone wanted me, welcomed me
- Seen, heard
- Sense of belonging
- Safe, secure
- Protection
- Understood, someone gets me
- Loved
- Curious, engaged
- Support, purpose, gratitude
- Home
- Coherent story

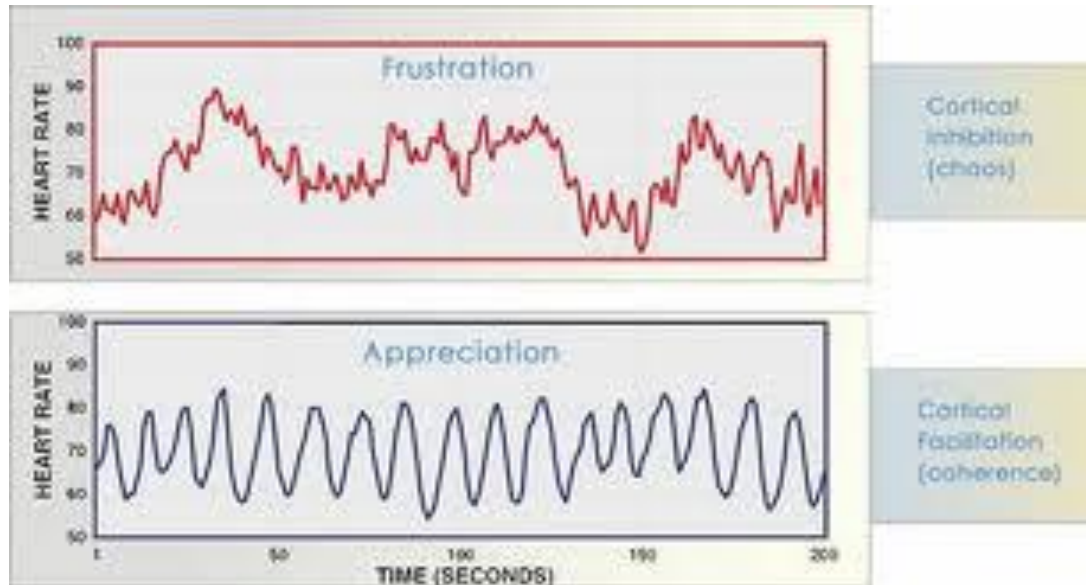


# And It's In Our BODY

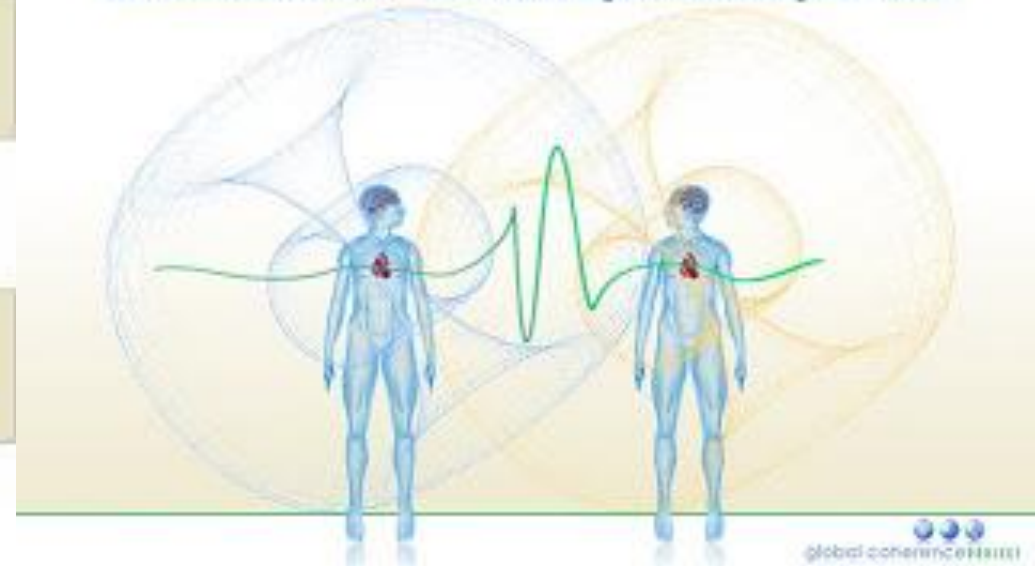
- How do we know if we are safe?
  - Interoception
  - Our body tells us so
- Our questing on the outside, and where that leads us, informs us on the inside.
- Sometimes it is from the ancestors
- We can be more conscious in the present
- Our environment is key (The JJ Way)



# Our Face and Voice Reflect Our Heart



The electromagnetic waves produced by the heart transmit information into the external environment, interacting and resonating with others

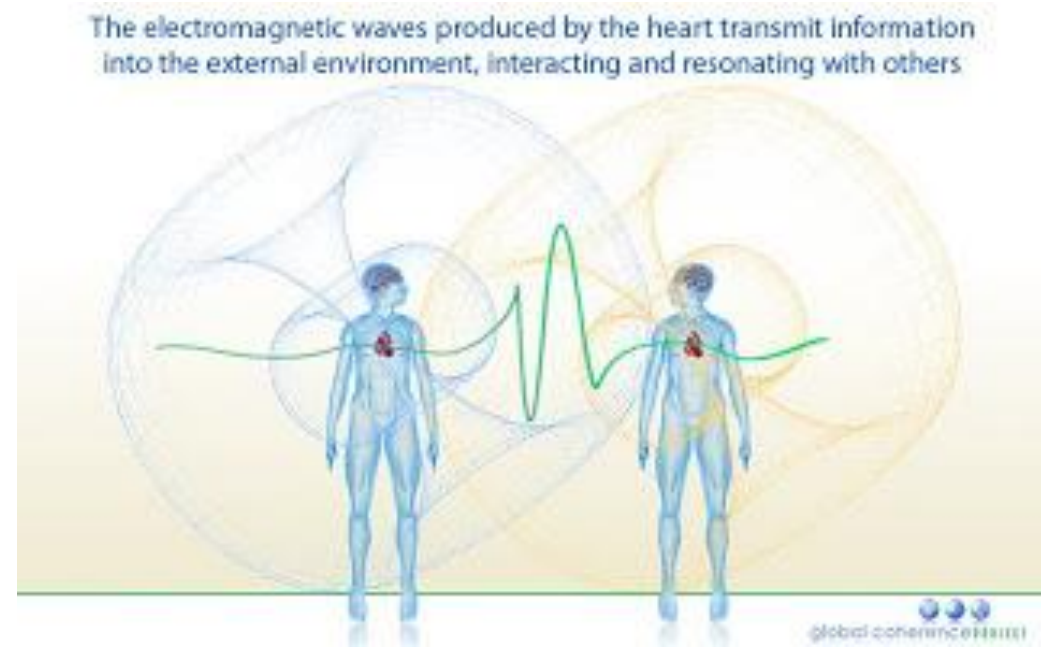


How we are together affects our physiology, face to face, heart to heart  
HeartMath.org



# How we feel in our bodies

- Let's help people feel safe
- Especially people of color



“In environments perceived as safe, our ANS and endocrine system release the hormones that evoke a sense of calm and connection and support social engagement behaviors.” ~ Ann Weinstein p. 91





# Early Positive Imprints

- Am I wanted?
- Am I welcome?
- Am I safe?
- Am I protected?
- Do I belong?
- Am I seen, heard, felt?





# Your practice as container

- It is a surround, sensory, relational and helpful
- Continuity of care
- Trustworthy
- “Someone is there”
- Mutually respectful





# Self Care for You

- Two layers of support
- Connection in your birthing team/layers of support
- Self and co-regulation as tools for the team



# PPN Somatic Tools

“It’s not just what you  
do that matters  
**but rather**  
how you are on  
the inside”



Karen Strange



# Somatic Tools

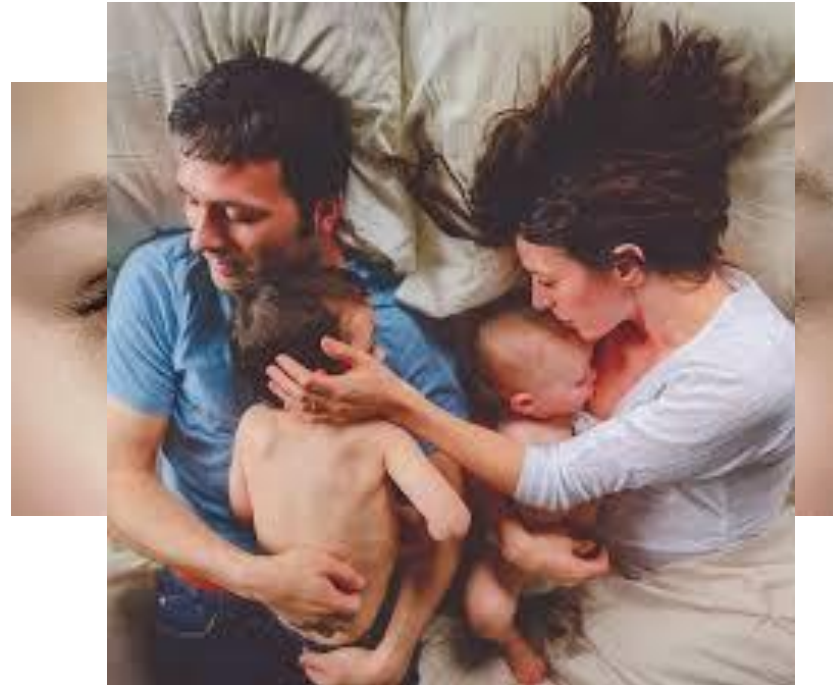
- Grounding
- Settling
- Orienting
- Naming
- Modeling
- Resourcing
- Pacing
- Tempo
- Sensation
- Eye Contact
- Differentiation
- Self and Co Regulation
- Sequencing
- Reflection
- Two Layers of Support
- Tracking Self and Other





# Story of a labor

*Its how we are together around a birthing family/parent/person, and with them prenatally (even in your own felt sense). It is the quality of care midwifery/your practice can offer. Families and people feel seen, heard, understood.*

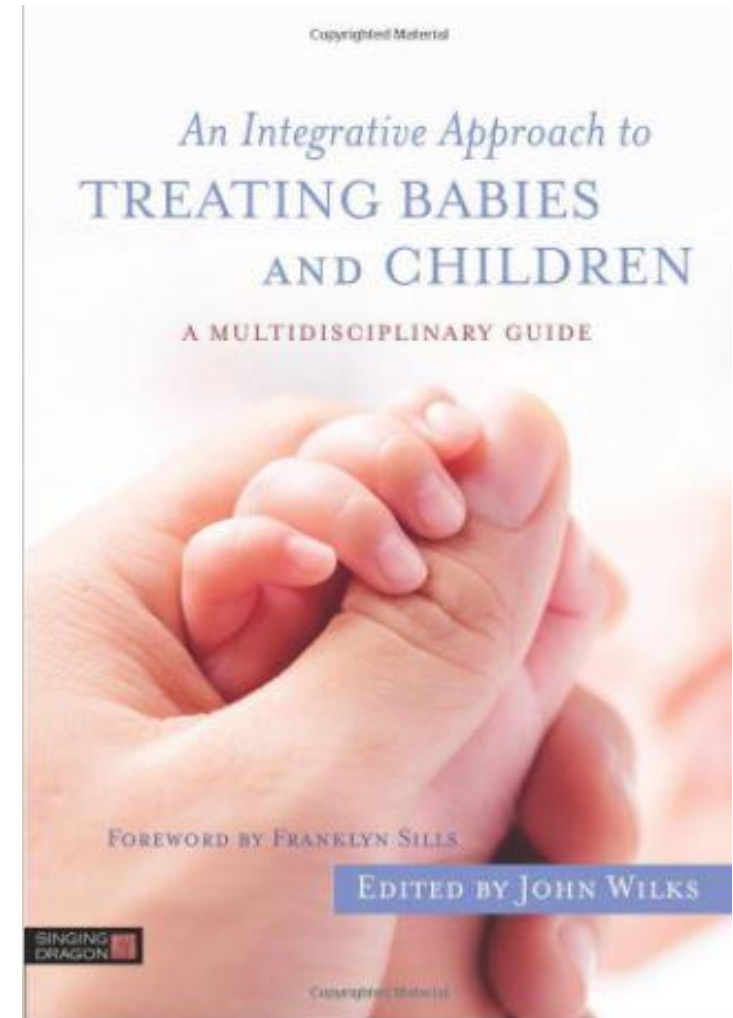
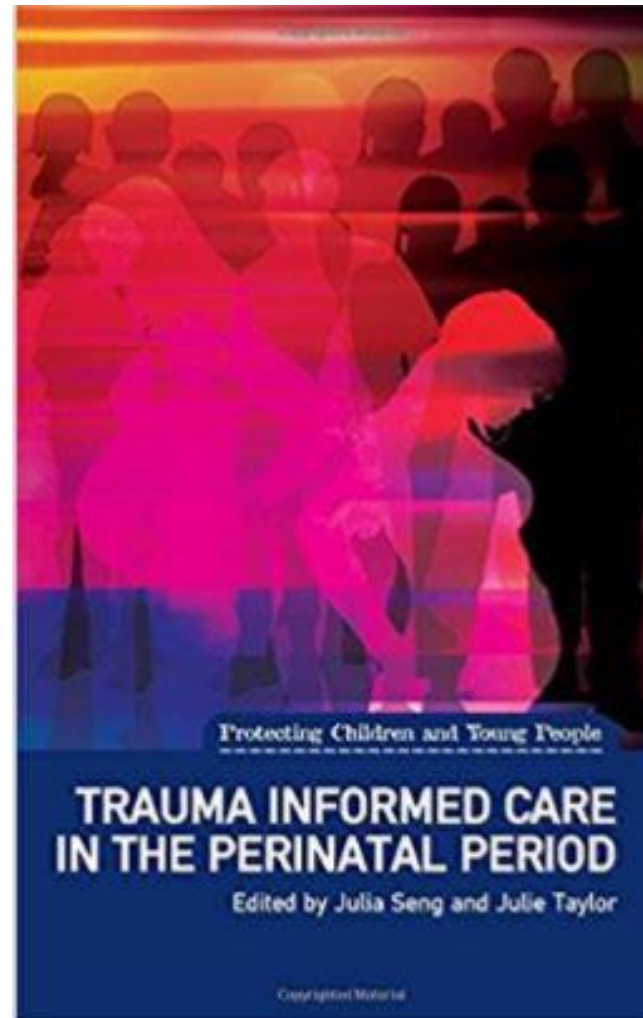
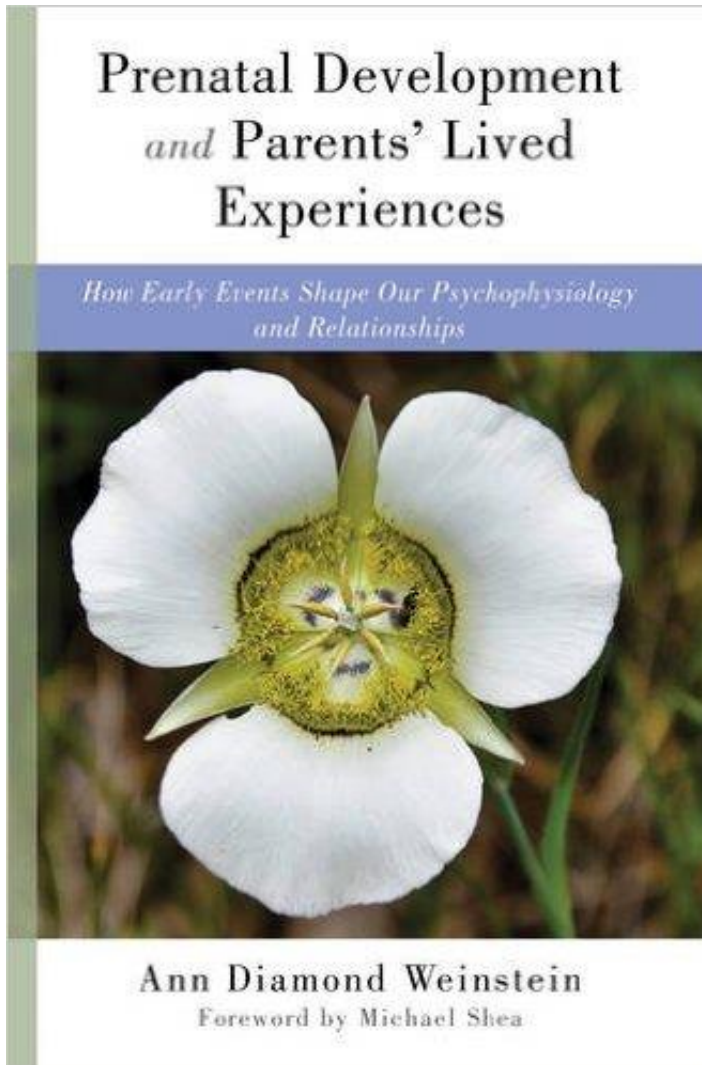


# Conclusion

- You can offer care informed by epigenetics (ACES and previous experience, knowing it is in the body), and polyvagal theory, (how we are together.)
- Creating and supporting safety is a quality of being as well as what is done to support families.
- You need support, too. Nurturing support from administration and your layers of support, so they can “feel it to give it.”

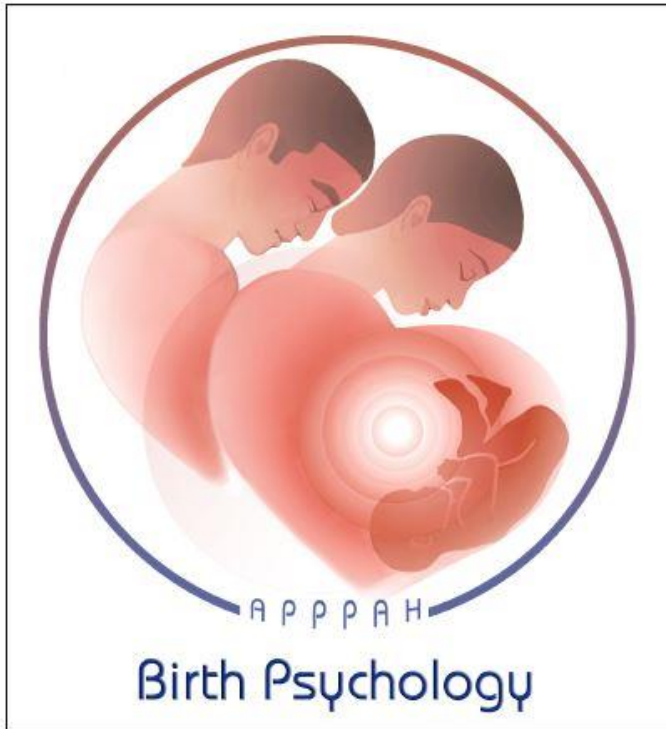


# New Resources





# Organizations



[Birthpsychology.com](http://Birthpsychology.com)



Prevention and Treatment  
of Traumatic Childbirth

[patch.org](http://patch.org)



[Traumahealing.com](http://Traumahealing.com)

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