

To view an archived recording of this presentation please click the following link: https://youtu.be/bvtz3E\_xMNg

Please scroll down this file to view a copy of the slides from the session.



# THE NEUROBIOLOGY OF TRAUMA, ATTACHMENT AND SUBSTANCE USE

HOW RELATIONSHIPS BUILT DURING THE COVID-19 PANDEMIC OFFER HOPE AND HEALING

& Gallore c.

**JAN FERENCE** 

#### I WOULD LIKE TO ACKNOWLEDGE THE UNCEDED TERRITORIES OF THIS BEAUTIFUL COUNTRY. I HAVE GRATITUDE TO LIVE, WORK AND PLAY ON THE LAND OF THE K'OMOKS PEOPLE.





#### The Neurosequential Model Network <u>Neurosequential.com</u> <u>BDPerry.com</u>

<u>Handouts</u> www.bdperry.com/handouts

<u>Research</u> www.bdperry.com/research

www.neurosequential.com/covid-19-resources





All rights reserved © 2002-2020 Bruce D. Perry

#### LEARNING OBJECTIVES FOR THIS MORNING

- To review, enhance or better understand the impact of developmental trauma on the brain, and how this in turn impacts day to day functioning.
- To review brain development, the stress response system and attachment.
- To consider, even on the most challenging days, how the relationships we build are the medicine for us all.
- To gain a deeper understanding of the connection between early attachment disruption and substance use.
- To learn practical strategies to apply learning to your work.

WHO AM I? PATHWAYS TO HEALING PARTNERSHIP; VANCOUVER ISLAND DEMONSTRATION PROJECT & Funded by the Ministry of Health

Small caseload of complex families

Grounded in Dr. Bruce Perry's Neurosequential Model of Therapeutics and Touchpoints

Facilitate system change through the experiences of our clients

Working intensely, sometimes daily, with each family, building a therapeutic web of care.

Reduce stress, increase supports to expose caregiver strengths.

Maintain and support healthy dyads.

Educate community partners who are supporting family.

# Essentially, all models are wrong, but some are useful.

--- George E. P. Box, in Norman R. Draper (1987). Empirical Model-Building and Response Surfaces, p. 424, Wiley. ISBN 0471810339



# **NEUROSEQUENTIAL MODEL**

It is important to understand mechanisms underlying current functioning.

Your understanding determines your solution

Stuart Ablon (CPS, 2010)

All rights reserved © 2007-2016 Bruce D. Perry

# The Neurosequential Model

The brain mediates our thoughts, feelings, actions and connections to others and the world.

Understanding core principles of neuroscience, including neuroplasticity and neurodevelopment, can help us better understand ourselves and others.



#### The Neurosequential Model

Each person has a unique pathway to the present and deserves individualized care.

"One-size fits all" approaches rarely meet the needs of the individual – more often they meet a need of the provider (or system).



The human brain is not 'designed' for the modern world.

For thousands of generations we lived in small multigenerational, multifamily groups with dramatically higher ratios of caregiver to young child, roughly 4:1.

Today a ratio of 1:4 is considered 'enriched.'





# COVID-19



- We are STILL in the midst of an ongoing global health crisis.
- The impacts of this stress on families and communities are real, and far-reaching
- Understanding how our brains and bodies are reacting to this, can help support ourselves and each other

# The biological unit of survival for human beings is the clan.

Evolutionary pressure which resulted in our species was applied to the clan, not simply the individual.

We are unavoidably inter-dependent. And yet, the major predator – the major threat to humans – has been, and continues to be, other humans.



# Humans are social creatures

The neural networks mediating our stress responses, reward, social interaction, communication, empathy and the capacity to bond with others are intertwined – and all are shaped by the nature, quantity and timing of early life experiences (especially relationallymediated experiences).



### INTERACTIVE POLL NUMBER ONE...PLEASE TAKE A MINUTE TO ANSWER THE POLL





**NETWORK**<sup>™</sup>

#### Afferent Components: Modulation of Primary Regulatory Networks





All rights reserved © 2002-2020 Bruce D. Perry

## Flock, Freeze, Flight, Fight Continuum

Traditional Fight/Flight	Reflect	Flock	Freeze	Flight	Fight
Primary secondary Brain Areas	NEOCORTEX Subcortex	SUBCORTEX Limbic	<b>LIMBIC</b> Midbrain	<b>MIDBRAIN</b> Brainstem	<b>BRAINSTEM</b> Autonomic
Cognition	Abstract	Concrete	Emotional	Reactive	Reflexive
Mental State	CALM	ALERT	ALARM	FEAR	TERROR



#### State-dependence: Sense of Time

Sense of Time	Extended Future	Days Hours	Hours Minutes	Minutes Seconds	Loss of Sense of Time
Primary secondary Brain Areas	NEOCORTEX Subcortex	SUBCORTEX Limbic	<b>LIMBIC</b> Midbrain	<b>MIDBRAIN</b> Brainstem	<b>BRAINSTEM</b> Autonomic
Cognition	Abstract	Concrete	Emotional	Reactive	Reflexive
Mental State	CALM	ALERT	ALARM	FEAR	TERROR



### State-dependence: 'Regression'





#### State Dependence of Cognition

Functional IQ	120-100	110-80	90-60	70-50
PRIMARY Secondary Brain Area	NEOCORTEX <i>Cortex</i>	CORTEX <i>Limbic</i>	LIMBIC <i>Diencephalon</i>	DIENCEPHALON <i>Brainstem</i>
Cognition	Abstract Reflective	Concrete Routine	Emotional Reactive	Reactive Reflexive
Mental State	CALM	ALERT	ALARM	FEAR



Hyperarousal Continuum	Rest (M > F: A>C)	Vigilance	Resistance	Defiance	Aggression
Dissociative Continuum	Rest (F > M: C>A)	Avoidance	Compliance	Dissociation	Fainting
Primary secondary Brain Areas	NEOCORTEX Subcortex	SUBCORTEX Limbic	<b>LIMBIC</b> <i>Midbrain</i>	<b>MIDBRAIN</b> Brainstem	<b>BRAINSTEM</b> <i>Autonomic</i>
Cognition	Abstract	Concrete	Emotional	Reactive	Reflexive
Mental State	CALM	ALERT	ALARM	FEAR	TERROR



# DISSOCIATION

- Disengaging from the "external" world cues
  - Attending to elements of the "inner" world
  - Daydreaming, mind-wandering, reflective cognition



#### **USE-DEPENDENT DEVELOPMENT**

The more a neural network is "activated" the more that network changes as a reflection of the pattern of stimulation

<u>This is the basis for development,</u> <u>memory and learning</u>





# States become Traits

Persisting or 'sensitizing' patterns of activation of the neurophysiology of threat "re-sets" homeostats *Persisting hyperarousal = altered noradrenergic systems (among others) Persisting dissociation = altered vagal, opioid and dopaminergic systems (among others)* 

Perry, B.D., Pollard, R., Blakely, T., Baker, W., & Vigilante, D. (1995) Childhood trauma, the neurobiology of adaptation and 'use-dependent' development of the brain: How "states" become "traits'". Infant Mental Health J, 16 (4): 271-291

# Prolonged Stress Activation

Understanding Chronic Duress

Activation of our body's stress response systems requires emotional and physical energy.

A key consequence of prolonged stress is exhaustion.

Expect more fatigue; expect everyone to be less capable of focus; expect more irritability from yourself and others.

#### Be gentle with yourself and others.









All rights reserved © 2002-2020 Bruce D. Perry

NEUROSEQUENTIAL





NETWORK<sup>®</sup>



All rights reserved © 2002-2020 Bruce D. Perry

#### COVID-19 Related Stress will Shift Our Regulatory Capacities



#### COVID-19 Related Stress will Shift Our Regulatory Capacities



NEUROSEQUENTIAL

NETWORK

### INTERACTIVE POLL NUMBER TWO...PLEASE TAKE A MINUTE TO ANSWER THE POLL



# State-dependence

All functioning of the brain is state dependent.

The dynamic activity of all networks in the brain shifts with various diurnal (and other) patterns, and in response to internal and external stimuli.

Therefore the "capability" of a person in any given moment is fluid; your cognitive, emotional, social, motor, and regulatory capabilities shift – with your internal state.

Fear mobilizes some networks and capabilities, while shutting down others (e.g., abstract cognition).



All rights reserved © 2002-2020 Bruce D. Perry

IMPACT OF TRAUMA ON THE DEVELOPING BRAIN...HOW THIS TRANSLATES INTO DAY TO DAY INTERACTIONS

- Distorted effect of incoming sensory input like sights and sounds. Misinterpret other's cues or intentions.
- Interference of the capacity to store incoming input or retrieve stored information (working memory, and long term memory).
  Difficulty accessing higher parts of the brain.
- Primary Brain-Mediated adaptations to stress will interfere with learning. For example: Physiology, bio-chemistry.
- Potential for constant evocative cues, causing dysregulation.

# WHAT THIS LOOKS LIKE......

- A chronically activated person, may be in a fight or flight state all the time. They look non-compliant, aggressive, unfocussed, and hyper vigilant about faces, voice tones, and noise.
- Many traumatized people exhibit a mixed pattern. They can shift from being hyper aroused to dissociative multiple times in an hour. Neither of these states are optimal for learning or communication.
- The dissociative person will seem "checked out", or have a blank stare. Their eye blink is slow and they look like they are day dreaming. This person is often overly compliant and controlling of other's and their environment.

#### **Relational Contagion**

A regulated, calm adult can regulate a dysregulated, anxious child



#### BUT A <u>dysregulated</u> adult can <u>never</u> regulate a dysregulated child



All rights reserved © 2002-2020 Bruce D. Perry

#### **Co-regulation**

Reactive child and well-regulated adult (e.g. teacher)



**NETWORK** 

All rights reserved © 2002-2020 Bruce D. Perry

#### Relational Contagion A dysregulated adult will dysregulate a calm, regulated child Neocortex Neocortex mbic Limbic Qie<mark>ncepha</mark>lor⁄r Diencephalon Brainster Brainstem

#### This will increased the probability of.... A mutually <u>co-dysregulating escalation</u> between the adult and the child



#### <u>Co-dysregulation</u>

Reactive child and overwhelmed adult (e.g. teacher)



Time



All rights reserved © 2002-2020 Bruce D. Perry

#### The Power Differential Friend or foe, hurt or help, ally or enemy?

Our brain has networks that continuously assess our status in any social interaction; our position in a social 'milieu' - "Do I belong?"

Key in this are cues that determine 'safety' within the social interaction; am I safe, vulnerable? Dominant? Many include neural mechanisms that function independently, <u>outside of 'consciousness'</u> (e.g., upward gaze, size, status)

A power differential is created during this process; the power differential is yoked to our stress response.



# Sequence of Engagement





All rights reserved © 2002-2020 Bruce D. Perry

#### Sequential Engagement & Processing



# Association

- The brain makes associations between sensory signals co-occurring in any given moment in time
- This capacity allows humans to learn, create images of the future and survive.
- This capacity can also make humans vulnerable to false associations - creating fears of nonthreatening objects.



#### Complexities of Communication From Cortex to Cortex



#### **Distorted** Perceptions Child with history of relational rejection



#### Distorted Perceptions

History of relational rejection & frustrated/triggered adult



**NETWORK**<sup>™</sup>

#### Sequential Processing of Experience **Evocative Cues**



Creating the Relational 'Space' for Optimal Development, Learning & Healing (or How do you like those P's?)

> Present, Parallel, Patient &

# Persistent *in Providing* Patterned, Predictable, Positive doses of Protected (safe) experience



# Know the Stage & Watch the State

- Effective relational interactions to communicate, teach, enrich or heal come when the developmental stage and present state of the child/adult are respected
- Attunement becomes the key
- Exposure to the core principles of development should be mandatory training for caregivers, educators and therapists



# Connectedness is the key.

Your history of connectedness is a better predictor of your health than your history of adversity.

Be with each other. Celebrate diversity. Listen and learn from others. Share time, food, work.

The 'super-power' of humankind is our capacity to connect; it is regulating, rewarding and the major "route" by which we can teach, coach, parent, heal and learn.



All rights reserved © 2008-2019 Bruce D. Perry

#### ATTACHMENT: THE FOUNDATION FOR EVERYTHING

13

"Yes, Piglet ?"

Piglet sidled up to Pooh from behind. "Pooh!" he whispered.

-----

30

"Nothing," said Piglet, taking Pooh's paw. "I just wanted to be sure of you."

#### If a community values its children, it must cherish its mothers.

John Bowlby

JAROFQUOTES.COM

#### WHERE IT ALL STARTS?

- Maternal post-partum behavior is the mechanism upon which the cross generation transmission attachment bond is built.
- Oxytocin is a bio-feedback loop: more touch and attunement causes oxytocin release and vise versa.
- Maternal Behavior shapes infants oxytocin system=the ability to connect
- Maternal Behavior shapes the cortisol system=the ability to handle stress



#### WHY EARLY INTERVENTION IS SO IMPORTANT....

- Toxic stress damages brain architecture.
- Resilience is not an internal character strength, but is built through combined impact of genes and experiences.
- For many functions, the brain's capacity for change decreases over time, not all functions are impacted equally.

#### A NEWBORN BABY'S WORLD IN ONE MONTH.....

- Feeding 300 times....slowly reduced to 180 times
- Diaper Changing 140 or more
- Changing clothes 90 times
- Face to face interaction or gaze 120 times
- Toy play 180 times
- Social Games 90 times
- Cuddling 150 times
- Wake up and soothed 150 times
- Cries and soothed 140 times

#### The Magical Moments

Weaving Together the Neurobiology of Relationship, Reward and Regulation





# Bonding Behaviors Decrease when the Caregiver is Overwhelmed or in Distress

With increasing threat and distress, an individual's capacity to "give" to others is diminished.





# The best time to influence a child is 100 years before they are born.

W.R. Inge

#### HOW CAN WE BETTER UNDERSTAND HOW ATTACHMENT AND SUBSTANCE USE MIGHT BE CONNECTED?



#### Overwhelming Experiences



**Prolonged or** chaotic patterns Of **Alarm or** Dissociative activation Altered Neural Networks



All rights reserved © 2006-2011 Bruce D. Perry and The ChildTrauma Academy





#### Stimulation of "Reward" Neural Systems in the Human Brain: *Multiple Mediators*



The more healthy relationships a child has, the more likely he will be to recover from trauma and thrive. Relationships are the agents of change and the most powerful therapy is human love.

Bruce D. Perry

a quotefancy

# **QUESTIONS? REFLECTIONS?**



Fine Art America Parent And Child Paintings | Fine Art America