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Understanding Neurobiology of Complex Trauma KWY Kinship Carers 2023

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The Australian Childhood Foundation acknowledges Aboriginal and Torres Strait Islander people as the traditional custodians of this land and we pay our respect to their Elders past, present and future.

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The importance of you

- Relationships are the most important factor in our development and in healing from experiences of trauma
- **Secure relationships are central to how a child experiences themselves and others**

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Take care of you today….

The content of this training can evoke strong emotions and may trigger **personal experiences of trauma**.

Please be mindful of your own wellbeing during this training and if you need support please do what you need to do to feel safe. We are happy for you to talk to the facilitator if you need to.

Image: Hellovector.com

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Our journey today….

- Importance of relationships and culture
- Brain development
- Understanding the impacts of trauma
- Creating Safety
- 5 Parenting Systems
- Repairing the impacts of trauma all the way through today

Image: Aboriginal Art Store

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Importance of relationship and culture

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I need connection to my CULTURE

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The Importance of Culture

A protective factor

Safety: Belonging
Relationships: Connection
Meaning making: identity

Our culture influences our brain development.
How has it influenced yours? Think about:

- Sense of safety
- Relationships
- Meaning making

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Living in two worlds

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Understanding the impacts of trauma

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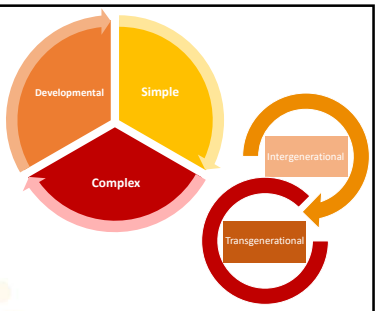
Defining trauma

Any single, ongoing or cumulative experience which:

- is a response to a **perceived threat**, usually to survival
- **overwhelms** our capacity to cope
- feels/is **outside our control**
- often evokes a **physiological** and **psychological** set of responses based on fear or avoidance



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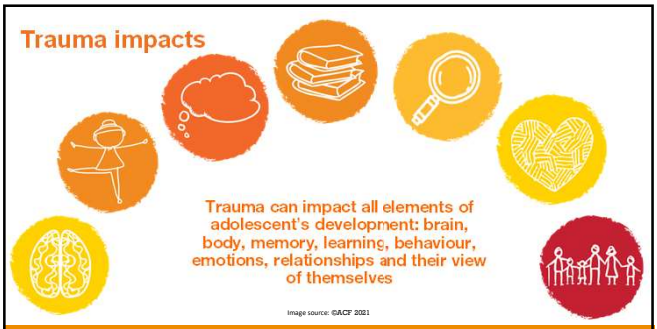
Trauma impacts



Trauma can impact all elements of adolescent's development: brain, body, memory, learning, behaviour, emotions, relationships and their view of themselves

Image source: ©ACF 2021

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Brain Development

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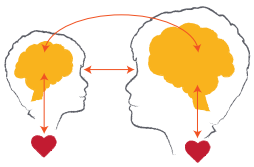
Brain development

- The brain develops through a mix of genetics and environmental factors.
- Key to this development are relationships
- The brain develops sequentially from the bottom up



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Neuroplasticity is hope

- The brain is at its most plastic in early childhood
- In early childhood, the brain is most vulnerable to harm, but also has the greatest potential for healing
- Neuroplasticity gives us hope

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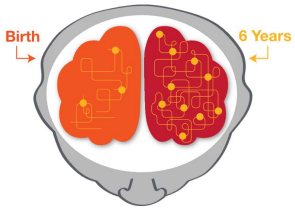
Neuronal connections

- The neural system has the ability for one neuron to communicate with up to 10,000 other neurons
- The newborn brain has approximately 100 billion neurons



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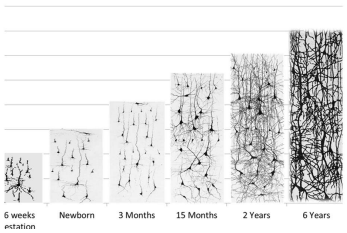
Neuronal development



- Rapid growth occurs from birth to 6 years
- **Critical period** of development
- Healthy neuronal development occurs through **relationships, regulation, repetition**

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Sequential brain development – building blocks

The Thinking brain
3-5 Years

The Emotions and Memory
Brain - Birth to 4 years

The Movement Brain
Birth – 2 years

The survival brain
Pre birth to 8 months

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Brainstem - basic life functions

- Basic life functions
- First part of our brain to develop
- This is the most developed brain part at birth
- Responsible for our heart beat, breathing, sucking, temperature control, blood pressure

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The brain stem under stress and trauma

- may experience fast or slower heart rate
- shortness of breath or breathing difficulties
- sleep disturbances and unsettledness
- sucking and swallowing and digestion difficulties
- may feel hot or cold or not notice changes in temperature

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Cerebellum- movement and balance

- Helps us to know where our body is in space
- Helps us with our posture and balance
- Helps us not to fall over and to control our movements
- Has its own connective pathways between the 2 halves- cerebellar vermis

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The cerebellum under stress and trauma

- Difficulties coordinating cognitive processes such as planning & working memory
- difficulty in maintaining posture & balance
- difficulty in undertaking tasks that require balance
- lack of awareness of their body in space
- difficulty with voluntary movement tasks – walking or writing

Image source: Shutterstock

What do you notice and what can you do?

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The Rhythm of life- Capacity building

HEART BEAT RHYTHM RHYME INTONATION BREATH

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Emotional centre

Limbic Lobe
Amygdala
Hippocampus

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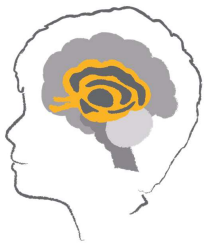
Limbic lobe- emotional gateway

- The part of the brain that helps us attach an emotion to an experience or memory
- This part of the brain is particularly involved with the emotions of fear and anger
- Also heavily involved in attachment processes
- This area develops mainly after birth



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Limbic Lobe- Building Capacity

Relies upon attunement

What is attunement to you?

The carer being the investigator: the connector, the nurturer, the container.

We look at emotional regulation more deeply in connection later..

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Reflection

- What are some things that you do to support your childs emotional development?

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Limbic lobe- Building Capacity

- Co-regulation
- Body awareness
- Emotional literacy
- Play
- Praise

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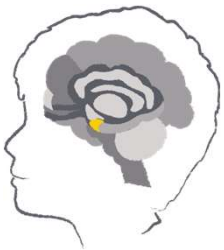
Amygdala – smoke alarm

- Detects threat
- Develops from birth
- Learns by association
- Involved in implicit memory processes



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The amygdala under stress and trauma

- can be over active or under active
- can evoke reminders and flashbacks of the trauma (awakenings)
- will have difficulty in emotional regulation
- will have difficulty in reading facial expressions
- Constantly 'firing' – can hijack the cortex (thinking goes offline)

Image source: Shutterstock

What do you notice and what can you do?

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Hippocampus – Brain's historian

- Explicit memory system
- Develops approximately 2-3 years of age
- Provides context to memory and embeds long term memory

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Strategies for transforming – Hippocampus

- Repetition
- Visual Reminders
- Review
- Reinforce

- *Calming the brainstem, quietening the amygdala and boosting the cerebellum will all help the hippocampus to function more effectively*

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Cerebral cortex- complex thinking

- The largest part of the brain
- Associated with higher brain function such as thought and action
- Examples of functions:
  - Reasoning
  - Logic
  - Judgement
  - Voluntary movement

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The prefrontal cortex- executive function

- Responsible for executive functions, such as judgement, reasoning, and self-awareness
- Final part of the brain to reach maturity in one's mid 20s
- Under reconstruction in adolescents from the age of approximately 12 years

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Strategies for building healthy brain development

Brainstem & Diencephalon	Basic survival & sensory processing	Pacification or stimulation. Activities in the child's preferred sensory modality
Cerebellum	Coordination of movement	Using music, rhyme and movement activities
Limbic	Emotional processing	Building relational connection through plays, animals, games
Cortex	Thinking processes	Linking experiences and sensations to words and descriptions
Prefrontal cortex	Analytical and abstract thinking	Challenges and safe risk taking activities

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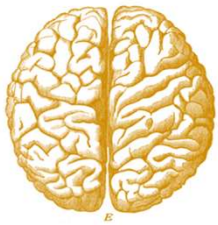
Lateral brain development

Left Hemisphere

- Evaluates language content
- Optimistic hemisphere
- Understands beginning, middle and end
- Learns from the past and expects the future
- Looks for patterns



Right Hemisphere

- In the present moment
- Eye contact
- Facial expression
- Tone of voice
- Posture
- Gesture
- Intensity
- Is mute
- Grasps the whole

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Creating Safety

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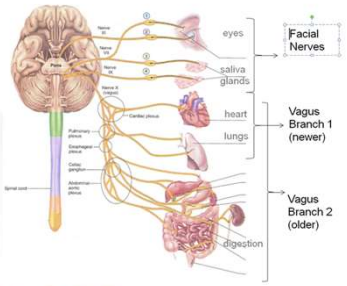
The Vagus Nerve



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Polyvagal theory and Protective Responses

by Stephen Porges

Behavioural Functions	Body Functions
Social Engagement Soothing and calming Indicates safety	• Lowers or raises vocalisation pitch • Regulates middle ear muscles to perceive human voice • Changes facial expressivity • Head turning • Tears and eyelids • Slows or speeds heart rate
Mobilisation Fight or Flight Active Freeze Moderate or extreme danger	**Hyper arousal** • Increases heart rate • Sweat increases • Inhibits gastrointestinal function • Narrowing blood vessels - to slowblood flow to extremities • Release of adrenaline
Immobilisation Collapse or submission Death feigning Increased pain threshold Conserves metabolic resources Life threatening situations	**Hypo - arousal** • Slows heart rate • Constricts bronchi • Stimulates gastrointestinal function

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When I am terrified

- Containment- help me feel back in my body
- Grounded- Help me feel present in the Here and Now.
- Present- Stay with me, help me know I am not alone in my distress

Notice and name

5 things you can see
4 things you can hear
3 things you touch/sense
2 things you can smell
1 thing you can taste

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Creating Safety

A young person's corticol capacity is impaired by trauma-as a result subcortical functioning becomes dysregulated

In order to regain cortical capacity, essential for learning, we must restore emotional regulation.

How do we create:

- Regulation (calm)
- Engagement
- Connection
- Control

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Working with nervous systems

Increase Resources – Regulatory Capabilities

Social Engagement

Offer...
- Heat snap pack
- Something weighted
- Something rhythmic
- Reduction in stimulus
- Physical task

Offer...
- Punching bag
- Screwed up paper to kick / throw
- Change environment
- Pool noodle

Mobilising

Immobilising

Offer...
- Heat snap pack
- Gentle sensory/ spine engagement
- Chewing on a sweet or sour lolly, drinking cold or sweet

Offer...
- Drip cold water on the skin i.e. palm initially
- Music, hum
- Voice of safe person
- Seek small movement

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Polyvagal Theory

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	I am showing you....	On the inside.....	I need you to....
SOCIAL ENGAGEMENT	Feeling safe, staying in relationship, connection oriented You might say I am: • Making eye contact • Listening • Engaging in play and exploration	I am feeling: • Safe, Calm, Happy, Sad, Annoyed, Reflective, Playful, Curious My body says: • Approach others • Sit still • Breathe deeply	Help me to stay engaged • Play and have fun with me • Role-model positive relationships • Set boundaries and natural consequences • Use reflective and problem solving skills so I can learn them too • Notice and acknowledge my strengths and my skills
MOBILISATION	Fight, flight, active freeze, action oriented You might say I am: • Aggressive • Loud • Fighting • Running away • Hyperactive	I am feeling: • Anxious, Frightened, Lonely, Hurt Confused, Overwhelmed My body says: • Run away • I'm hot • I can't sit still • I need to move	Help me to down regulate • Keep me safe • Co-regulate – be safe, attuned and responsive to me • Use movement – big then smaller, jumping, hanging, swinging, climbing, star jumps • Create a safe space near you where I can retreat to until I calm down • Model deep breathing • Repair our relationship – 'we are ok and our relationship is strong'
IMMOBILISATION	Withdrawal, collapse, submission, dissociation, avoidant oriented You might say I am: • Withdrawn • Avoiding contact • Distant • Compliant • Hiding	I am feeling: • Disconnected, Unfocused, Flat, Withdrawn, I'm disappearing My body says: • Avoid others • I'm not in my body • I want to hide • Curl up in a ball	Help me to up regulate • Co-regulate – be safe, attuned and responsive with me • Tell me I am safe and demonstrate it with your actions, gestures and tone of voice • Help me to orient to the room we are in by looking for specific things like something green, something on the roof or something on the floor • Help me to feel my body by noticing different parts, such as my feet on the floor and my bottom on the chair • Repair our relationship – 'we are ok and our relationship is strong'

Grounded in the work of Dr Dan Siegel, Dr Stephen Porges and Dr Bruce Perry

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Hand to Hand Attunement

Let's work together to hold an object up between our hands or fingers and not let it fall.

We will need to synchronise our movements and attune to one another. What object feels right to hold between us? A big gym ball? A sports ball? A cushion? A balloon? A pencil? Let's try moving the object around. What is that like for you? As you move together, notice if one person is leading or if the movement initiation is swapping between you. Play around with this. When you become accomplished, add another object so you are using both of your hands to hold up two objects between you. What does it feel like to be in synch with another person?

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Reflection

- What do you need to feel safe and secure with your KWY worker?
- What are the things that make you feel at ease?

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Activity

How can we create safety for the children, young people we are caring for?

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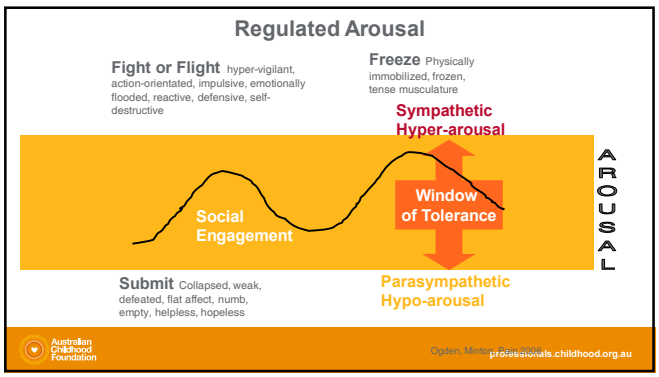
Regulated Arousal
Fight or Flight hyper-vigilant, action-orientated, impulsive, emotionally flooded, reactive, defensive, self-destructive
Freeze Physically immobilized, frozen, tense musculature
Sympathetic Hyper-arousal
Window of Tolerance
Social Engagement
AROUSAL
Submit Collapsed, weak, defeated, flat affect, numb, empty, helpless, hopeless
Parasympathetic Hypo-arousal
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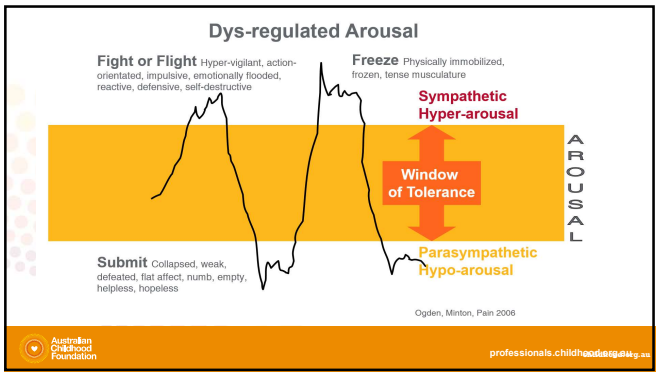
Dys-regulated Arousal
Fight or Flight Hyper-vigilant, action-orientated, impulsive, emotionally flooded, reactive, defensive, self-destructive
Freeze Physically immobilized, frozen, tense musculature
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Ogden, Minton, Pain 2006
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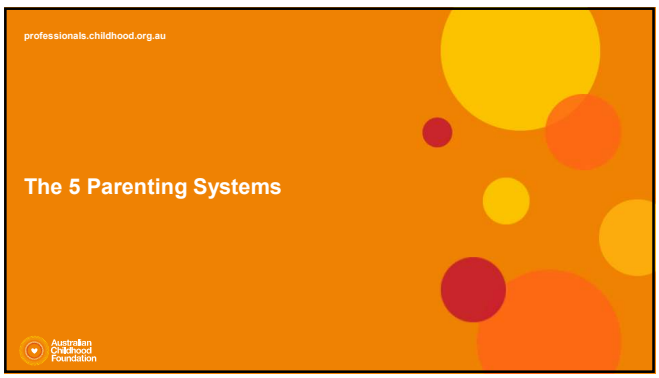
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The 5 Parenting Systems

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Relationship is the key! ……Brain systems that support parenting

Parental Approach System

- Get close to the child without becoming defensive.

Parental Reward System

- Enjoy interacting with the child.

Parental Child Reading System

- Understand the mind of the child.

Parental Meaning Making System

- Make sense of our experiences with the child and our social life.

Parental Executive System

- Regulate interpersonal conflicts between approach and avoidance, pro-social and defensive reactions.

Image source: Dreamtime

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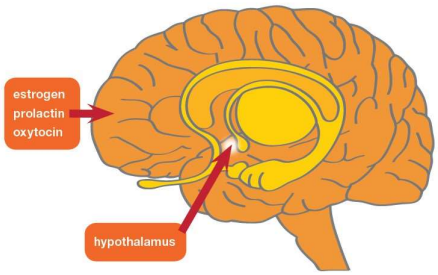
Approach System



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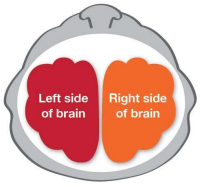
Early Adversity impacts our Parenting ability

The environment we grow up in can shape how we use our right and left brain systems of avoidance and approach. If we begin life exposed to insensitive caregiving our right brained harm avoidance system is likely to be used a lot. Instead of feeling protected and connected with our caregiver, we are more likely to need to shift into a defensive state of protest or collapse in order to try to protect ourselves.



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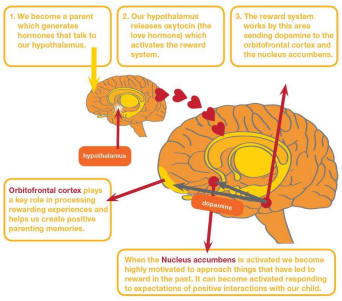
Reward System



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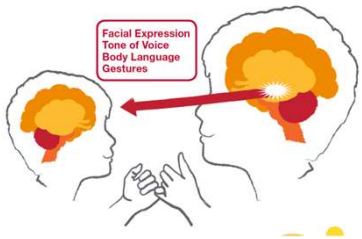
Child Reading System



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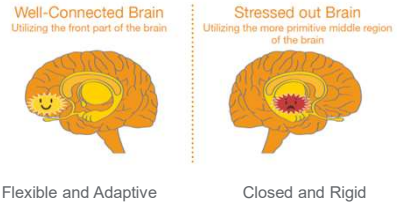
Meaning Making System



Open Flexible and Adaptive

Closed and Rigid

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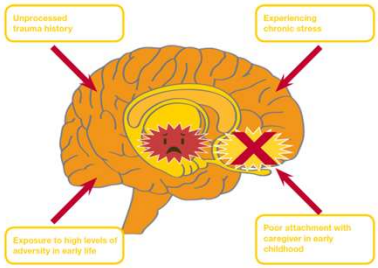
Blocked Executive System



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Repairing the impacts of trauma

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Repairing the impacts of trauma

Relational (safe)
Relevant (developmentally-matched to the individual)
Repetitive (patterned)
Rewarding (pleasurable)
Rhythmic (resonant with neural patterns)
Respectful (of the child, family, and culture)

Bruce Perry, as cited by https://attachmentdisorderhealing.com/developmental-trauma-3

Image: hellovector.com

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Safety and listening the child

- Model attunement
- Ensure that the child is seen and kept in focus throughout the assessment and that account is always taken of the child's perspective
- Are they ready-how long can you sit and wait
- Validate what the child is feeling
- Check meaning
- Make sense of what is happening for the child
- What will have meaning

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PACE

- Playfulness
- Accepting
- Curious
- Empathetic

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PACE Helps

- The social engagement system come online
- Connect the prefrontal cortex (thinking brain) to the lower regions of the brain (emotional and survival brain)
- Calm the threat sensing amygdala by sending a message of safety.
- Connect children and their caregivers
- Aid the growth of regulation skills.
- Build the ability to reflect
- Develops the child make meaning of themselves, their stories and their behaviour.

PACE uses all 5 parent brain systems (approach, reward, child reading, meaning making and executive)

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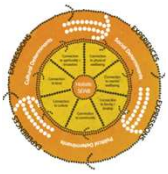
Key considerations

- There is no magic wand!
- It takes time and patience: persistence and repetition is a must
- You matter in this work!
- Your relationship with the child is key
- Each child is individual which adds to the complexity
- Trial and error is common
- A titrated approach is important



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Respect diversity in cultures and child rearing practices while keeping child safety paramount

Respecting diversity should be taken to mean 'having the same aims for people's wellbeing and safety but findings different ways to achieve them' that are more appropriate to the person's different perspective.

Being child-safe respects cultural difference:

- thinks about safety and wellbeing concepts from a cultural perspective
- takes steps to develop cultural competence to respond in a culturally appropriate manner
- takes guidance from experienced others (for example, seek advice from recognised Aboriginal or Torres Strait Islander organisations in regards to the needs of children from these backgrounds), and
- approach family cultural contexts with sensitivity.

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