The importance of early experience for later health, behaviour and learning

Dr Sarah Mares
The early years, a time of “not yet being the subject of our own stories…”

Charles Fernyhough (2008)
*The Child in the Mirror*
Why pregnancy and the early years?

There are sensitive periods in brain development

Early adversity and stress alter physiology with life long effects on health and wellbeing

Developmental opportunity for early prevention and intervention

- Infants are vulnerable - over represented in exposure to DV and maltreatment
- Trans-generational effects - adversity can be passed on through
  - epigenetic changes
  - the way a child is brought up and parented
Socioeconomic adversity

Associated with
- Delays in language development
- Altered pre-frontal brain activity and selective attention

Mediated through increased exposure to

Biological factors
- ? Genetic /epigenetic vulnerabilities
- Peri-natal brain injury or toxic exposure (AOD, nicotine)
- Quality of diet/nutrition - Vit A, omega 3, zinc, iron

Social and relational factors
- Quality of the social and cognitive environment
- Poor parental care
- Prolonged stress exposure
- Maltreatment – neglect and abuse in all forms
Nature/nurture

- Environmental factors moderate the link between genetic risk and maladaptive outcomes
- Good parenting is protective
- Secure attachment acts as a buffer against risk otherwise conferred by the child’s genotype
Adversity and trauma

**Adversity** - a state, condition, or instance of serious or continued difficulty or unfavorable fortune

**Trauma**

1. A serious injury or shock to the body, as from violence or an accident
2. An emotional wound or shock that creates substantial, lasting damage to the psychological development of a person, often leading to neurosis
3. An event or situation that causes great distress and disruption.

- PTSD/ Complex relational trauma/ Complex PTSD
- Impact of cumulative risk
Traumatic Experience

What happened
- How bad, how often, how long, who was there?
- How did I feel and what did it mean to me?

What had happened before?
- Did I feel safe and loved?
- how many other bad things

What happened afterwards?
- was someone there who comforted me, made me feel OK, settled me down, cared for me and helped to make sense of it, or not?
Adverse Childhood Experiences (ACE) study

Household dysfunction
1. Substance Abuse
2. Parental separation/divorce
3. Mental illness
4. Battered mother (DV)
5. Criminal behaviour

Abuse
6. Psychological
7. Physical
8. Sexual

Neglect
9. Emotional
10. Physical

Adverse Childhood Experiences (ACE) study
Early brain development

1. BRAIN BALLOONS

1. Brain development
DVD - Ngala WA
www.ngala.com.au
The brain organizes through a "use it or lose it" process, eliminating and strengthening connections to become more efficient.

- Repetition makes strong connections

- Connections that are not used often are eliminated - Pruning
Brain development

- **Experience dependent** – specific experiences are required
- **Experience expectant** – specific experiences at a specific time - timing is crucial
- There are **Sensitive periods** for the development of:
  - Selective attention
  - Speech
  - Emotion recognition and regulation
Bottom-up Brain Development

Cortex
Reasoning/judging centre
3–6 years

Limbic System
Emotional centre
1–4 years

Cerebellum
Motor centre
Birth–2 years

Brain Stem
Basic survival functions
Pre-birth–8 months

Australian Childhood Foundation
Lateral Brain Development

- **2–4 YEARS**
- **6–8 YEARS**
- **BIRTH–2 YEARS**
- **4–6 YEARS**

**LEFT**
- ABC
  - **8–10 YEARS**

**RIGHT**
- Creative activities
- Music

Australian Childhood Foundation
Bucharest Early Intervention Project (Zeanah et al 2009)

- Cognitive development – substantial gains if placed < 2 years old,
- Language < 15 mths, full recovery; after 2 yrs no response
- Attachment < 24 mths more likely secure

*Early deprivation caused significant damage, placement in families is effective if early enough. Complete recovery was rare*
Early relationships

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Hello Dad film

Some smile, early-infant communication...

Oi Dad!

Infant Communication for Fathers
Stress in infancy

- Infants do not have adult stress adaptation mechanisms
- They are vulnerable to extremes of arousal and cannot regulate themselves
- They cannot escape stressful interactions
- Flight/Flight/Freeze
- When carer or violence at home are source of fear/pain/stress the infant is trapped
Neurobiology of early adversity

![Diagram of the brain with labeled regions: Basal forebrain, Mediodorsal nucleus, Prefrontal cortex, Amygdala, Rhinal cortex (not visible, on medial surface of temporal lobe), Hippocampus, Inferotemporal cortex, Cerebellum.]

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Neurobiology of early adversity

Excessive arousal and exposure to stress related hormones during rapid periods of brain growth (pregnancy & early years)
- altered reactivity of HPA axis
- altered cortisol secretion and daily rhythms
- altered response to stress

There are neuro-toxic effects of stress hormones on brain and nerve growth
- Attention, concentration and emotional regulation

• Physical changes
  - eg in the way the body metabolises insulin and glucose
Maltreatment - impact on structure and function of the “social brain”

- Decreased cortical volumes
- Decreased thickness of corpus callosum
  - information processing
- Decreased hippocampus volume
  - memory
- Increased volume of the amygdala
  - increased threat reactivity and vigilance
  - enhanced processing of angry affect and reduced recognition of happy/pro-social cues
Different kinds of stress

Positive
Brief increases in heart rate, mild elevations in stress hormone levels.

Tolerable
Serious, temporary stress responses, buffered by supportive relationships.

Toxic
Prolonged activation of stress response systems in the absence of protective relationships.

Neglect can have severe developmental consequences

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http://www.stress-management-for-health.com/images/img_10_how_does_stress_affect_your_body.jpg
Stress and trauma in pregnancy

• Experiences and exposure in-utero can change the way our bodies function later

• Maternal stress hormones -> placenta -> developing fetal brain -> infant hormone and stress system

• Epigenetic changes in fetal genetic material
Attachment Theory

Basic Propositions

• Attachment has a biological and regulatory function
• There is a reciprocal relationship between attachment and exploratory systems
• Attachment bonds are affectional bonds
• The child develops internal working models of the attachment relationship
• Early attachment quality impacts on functioning throughout life

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Attachment
CIRCLE OF SECURITY

Parent attending to the child’s needs

SECURE BASE

SAFE HAVEN

Support My Exploration

I need you to

- Watch over me
- Delight in me
- Help me
- Enjoy with me

Welcome My Coming To You

- Protect me
- Comfort me
- Delight in me
- Organize my feelings

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Infants are interested in and aware of not only more than one person but what happens between important people in their lives.
Infant motivations

• Can be concerned with internal states and feelings that arise from the body
• Infants can act and anticipate the consequences of attending to and acting upon objects
• Can look and listen to what will happen from communicating with another person
Early conversations

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Infant parent conversations have many of the qualities of adult conversations

- turn taking, non verbal signaling, mirroring, anticipation etc
- some aspects are different – parental voice pitch, intonation, etc
- “motherese” – a particular prosody
- altered in perinatal depression
Speech to infants

- Higher pitch, smooth gliding, modulated amplitude
- Musical elements exaggerated
- More repetition
- Timing is slower, utterances are spaced, short utterances
- Songs to infants show cross cultural similarities in structure, rhythm, melody and tempo
- Infants match adult vocal pitch from 2 months
- Precise rhythmic timing in alternation of utterances

- Trevarthen “communicative musicality”
Until 12 weeks old infants are more attracted to contingent (matching) responses.

After that they respond more socially to maternal responses that have high but not perfect contingency,

“nearly but clearly not me”, shifting the focus from self to other.
The parent attempts “to share the infant’s subjective experience not his actions…. (she) matches the dynamic features of how the baby acted. …..it is not an imitation she “put it into her own words” – it carries her signature. It is something she felt too. She wants a matching of inner states..”

• (Stern, 2010, p114)
Interactive errors and repairs

- Communication only “right” or matched about 30% of the time
- Repairs occur every 3 to 5 seconds in interactions with 6/12 olds

- Reparation is fundamentally dyadic

- Regardless of age, developmental task the child is motivated to maintain internal regulation in the service of communicating and connecting with others and acting on the world
Infant sensitivity and agency

- **Still face** (Murray & Trevarthen, Tronick)
  Infant withdrawal and distress indicated that the infant had expectations of affectionate or friendly responses and their absence was disturbing

**Double video** (Murray)
Distress in infant and parent indicated the importance of **contingency** and rhythmic timing of responses in parent infant communication in 2 month old infants
Still face procedure
Experience and memory

Explicit

• symbolic, verbalizable, declarative, capable of being narrated and reflectively conscious (Stern p 113)

Implicit

• nonverbal, non-symbolised, un-narrated and non conscious. Motor procedures, affects, expectations, shifts in activation and motivation
  (Stern 2010 p114)
The majority of all we know about how to be with others resides in implicit (relational) knowing and will remain there.

Scared baby film from utube
Sensitive early parenting

• Regulating infant arousal
  – helping the baby to feed, settle and sleep, introducing the baby to the world

• Being sensitive to infant signals

• Recognising and labeling infant feelings

• Supporting developing self-regulation

• Seeing the baby as having an experience – a person not a thing (reflective capacity)

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Implications for practice

Don’t forget the baby even when the family and community story is BIG

Policy
– Reduce social adversity
– Improve early childhood and family services
– Sustainably fund and evaluate evidence based programs

Services – prevention and intervention, training
– Better and earlier identification of families and infants facing adversity
– Better service integration and cooperation
– Increase EC workforce capacity

Clinical interventions
– Intervene to support families in pregnancy and with infants and carers
– Have a relational focus to support resilience in families and little ones
Intervention principles

- Focus on and support relationships
- Don’t forget the baby
- Promote development and secure attachment though parental interest and sensitivity
- Use observable interactions and their meaning
- Be with parent they way you want them to be with their child
Resources and references

- Harvard Centre on the Developing Child
  http://developingchild.harvard.edu/
- NSW Institute of Psychiatry - Getting to Know You and Hello Dad films
  www.nswiop.nsw.edu.au