

# **The Science of Adversity – the lifelong implications for mental and physical wellbeing**

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# Discussion

What do you know about how we respond physiologically to excessive or toxic stress?



Why are the first two years of life so important?



How can partnership agencies work together to embed this science into communities?

# Adverse Childhood Experience

- Toxic stress occurring during childhood can cause serious problems later in life. **The experience of toxic stress is sometimes called Adverse Childhood Experience (ACE).**
- [ACE Aware Wales](#) – sharing learning to break the cycle of intergenerational adversity
- [Early Action Together](#) is a multi-agency partnership between public health and policing in Wales, funded by the Home Office Police Transformation Fund. It addresses the root causes of criminal behaviour to enable police and criminal justice staff to take preventative measures when dealing with vulnerable people.

## ACE – Adverse Childhood Experiences



Verbal abuse



Physical abuse



Domestic violence



Incarceration



Parental separation



Mental illness



Sexual abuse



Alcohol abuse



Drug use

[Resource provided by Early Action Together](#)

[Further information on ACEs](#)

# ACE Study 1998 Anda and Felitti

In the ACE study , in comparison with those reporting no ACEs, individuals with 4+ ACEs were many times more likely to report :

• Ischaemic Heart Disease	2.2 x as likely
• Any Cancer	1.9
• Chronic Bronchitis or emphysema (COPD)	3.9
• Stroke	2.4
• Diabetes	1.6
• Ever attempted suicide	12.2
• Severe obesity	1.6
• Two or more weeks of depressed mood in the past year	4.6
• Ever used illicit drugs	4.7
• Ever injected drugs	10.3
• Current smoker	2.2
• Ever had sexually transmitted disease	2.5

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*'Moving science toward looking at Early Years in terms of lifelong mental and physical health'*. Professor Jack Shonkoff, CDC, Harvard University

Excessive stress undermines the healthy development of biological systems

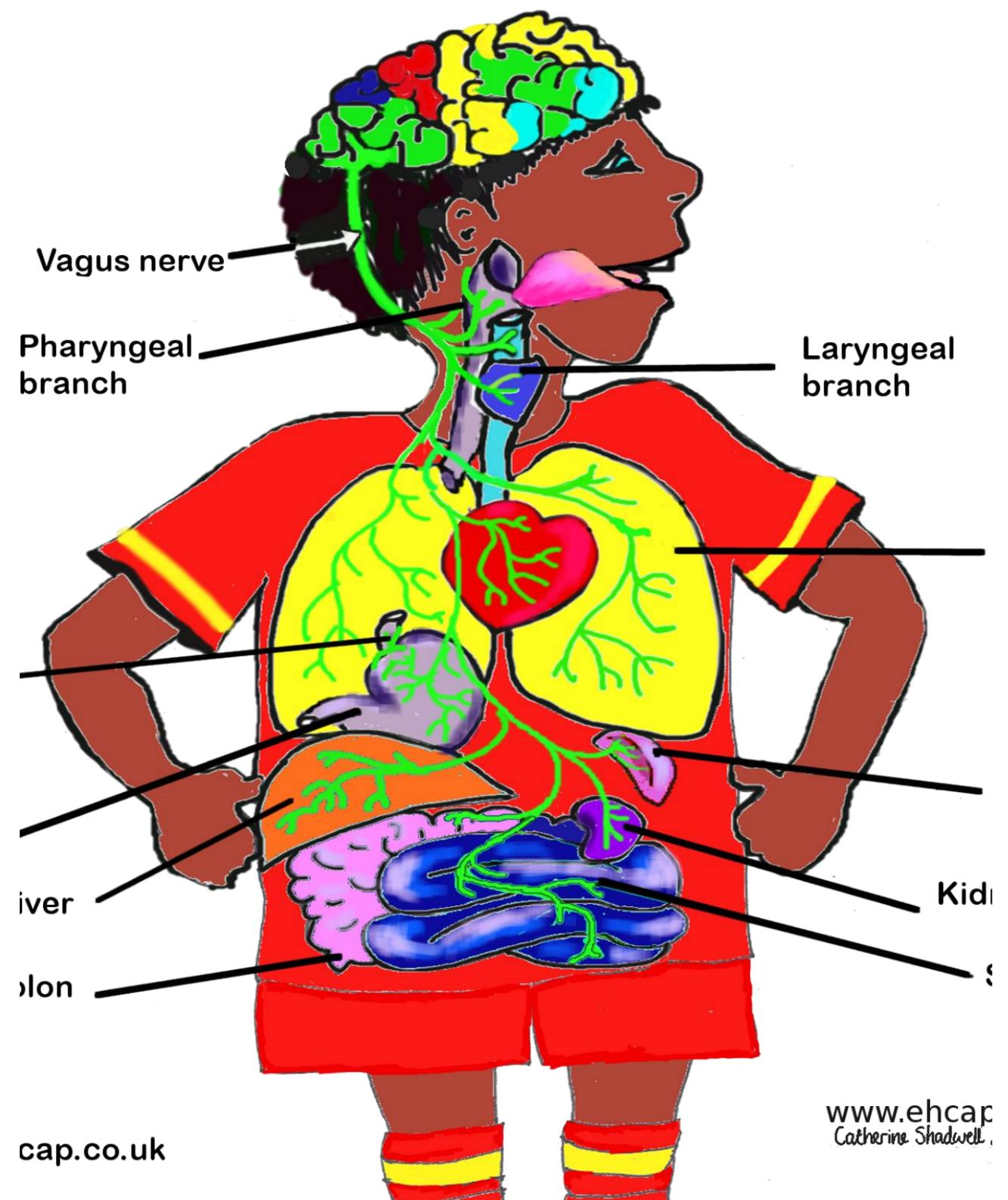
Human development is particularly susceptible to the effects of excessive stress in pregnancy and the first 3 years of life

All learning, behaviour and health are influenced by interactions between genetic variation, different stressors in the environment and developmental time

The  
science  
behind  
ACEs

# Biology of adversity and resilience

- What actually happens with the toxic stress response?
  - Stress hormone levels rise
  - Heart Rate and BP rise
  - Inflammatory phase of the immune response is activated
  - Metabolic regulation is affected
  - Epigenetics – molecular turning on and off of genes
  - Accelerated ageing
  - Impact on brain circuits



# Biology of adversity and resilience

- **Stress Hormones**
  - In the immediate acute phase cortisol release makes us more alert and able to respond to threat but when prolonged can disrupt circuits in the developing brain especially those areas related to learning, memory, fear circuits, emotion regulation and executive function

# Biology of adversity and resilience

- Inflammation
  - we now know that inflammation underpins many of the commonest diseases throughout life. A prolonged inflammatory response early in life can accelerate atherosclerosis (heart disease), depression later in life, arthritis and other chronic illnesses. We know from the science that inflammation is elevated in the stress response in early life.

# Biology of adversity and resilience

- **Metabolic regulation**
  - cells work overtime in the face of threat or hardship – known as oxidative stress this relates to cell wear and tear, insulin resistance, and increased risk of obesity, metabolic syndrome and type 2 diabetes

# Biology of adversity and resilience

- Epigenetics and genetic pre disposition
  - The DNA that makes up our genes accumulates chemical marks that determine how much or little of the genes is expressed. Experiences, relationships and stressful life circumstances during development and especially very early in life rearrange the epigenetic marks that govern gene expression and influence whether, when and how genes release their instructions. This unique epigenetic 'signature' on the genes may be temporary or permanent.
  - Children whose epigenetic make up is highly sensitive to stress are often also the children who thrive in nurturing serve and return environments

# Connecting the brain with the rest of the body

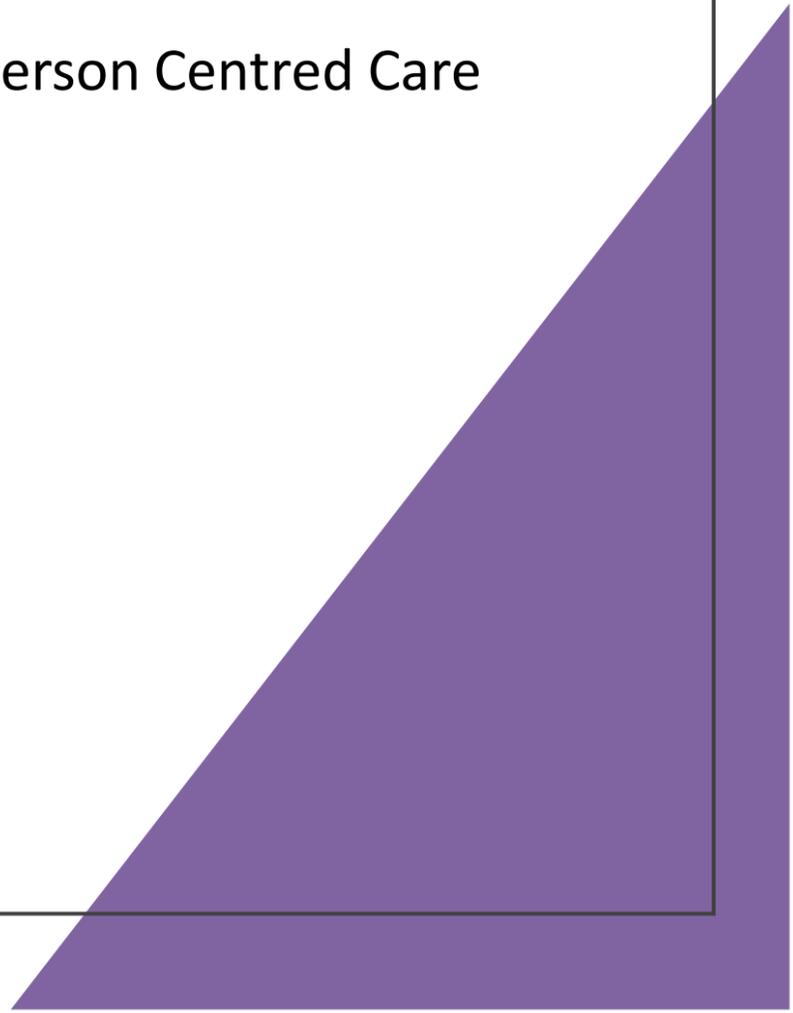
- **Early experiences shape brain architecture**
  - healthy relationships with serve and return interactions protect from adversity and promote healthy brain circuits. Toxic stress disrupts brain architecture- fear circuits, memory, executive function, emotion regulation
- **Genetic predisposition**
  - we are not all in the same place in terms of sensitivity to the environment
- **Timing and critical periods**
  - there is a critical period for laying down of brain architecture, immune system, metabolic system and genetic expression from conception through to age 3.
  - the younger the organism the more sensitive to environmental influence

# Connecting the brain with the rest of the body



‘What works for whom?’

The science behind Person Centred Care



# Responding to the science

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- *Family wellness and school readiness*
- [www.mindfulemotioncoaching.co.uk](http://www.mindfulemotioncoaching.co.uk)
  - Education about positive, tolerable toxic stress responses
  - Developing emotion literacy in adult caregivers and their families- The Hand Model, River of Wellbeing
  - Value of Mindful Exercises including knitting, crocheting, Lego, juggling, uni cycling, swimming, colouring, meditating, gardening
  - Time In eg Mindful Breathing / Mindful Lean
  - Play – laughing and having fun e.g. dance
  - Diet
  - Exercise and Physical Time
  - Sleep Time
  - Connecting - we are built to connect and collaborate
  - Coaching/ Counselling/ EMDR/ Therapy



# Our work in Somerset

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- [www.emotioncoachingsomerset.co.uk](http://www.emotioncoachingsomerset.co.uk)
- *Early Years*
- [www.ehcap.co.uk/early-years](http://www.ehcap.co.uk/early-years)
- *Learning community*
- [www.alpiri.co.uk](http://www.alpiri.co.uk)



# Responding to the science

- [www.emotionintelligence.co.uk](http://www.emotionintelligence.co.uk)
  - evidence base
- [www.maceapproach.co.uk](http://www.maceapproach.co.uk)
  - mindful emotion coaching and ACE awareness
- [Harvard - Center on the Developing Child](http://Harvard - Center on the Developing Child)
- [Podcast Dec 2020 Prof Jack Shonkoff](#)
- [What can we do about toxic stress?](#)
  - CDC infographic

