



A courageous life

Understanding and treating adverse childhood experiences.
By Tona Gillen

The African-American statesman Frederick Douglass (1818–95) wrote that “it is easier to build strong children than to repair broken men”. Although he was referring to the abhorrent slave trade (he had been a slave himself), it is a pertinent statement that resonates today, particularly when we consider the lasting impact of adverse childhood experiences (ACEs).

The 10 most common ACEs are listed below (Felitti et al, 2006):

- Physical abuse
- Emotional abuse
- Sexual abuse
- Physical neglect
- Emotional neglect
- Exposure to domestic violence or where the mother was treated violently
- Parental substance abuse
- Parental mental illness (depression or suicidality)
- Household member incarcerated
- Parental discord (separated/divorced).

The Queensland Children’s Hospital (QCH) admits children who have sustained injuries secondary to physical abuse. This is sometimes referred to as intentional or inflicted injury. The paediatric trauma service database captures all injured children who are admitted to QCH for more than 24 hours.

Over a 10-year period (2008–18), this data revealed that approximately two children were admitted per month with unexplained physical injuries.

Children who had self-harmed (e.g. intentional hanging injuries, burns from home-made devices) and children who reported they had been assaulted at school were excluded from this data.

Patients included were those with subdural haemorrhages, rib fractures, retinal haemorrhages, as well as those with long bone fractures or extensive bruising (usually on the torso, ears and neck) with no clear mechanism of injury. There was no plausible explanation for these injuries. Ninety-seven per cent of these children were younger than two years of age.

Another more detailed study of trauma patients admitted to the QCH intensive care unit over a seven-year period (2008–15) analysed 542 injured patients aged 0–15 years. Overall mortality rates were 11.1 per cent. The mechanisms of injury with the greatest mortality were intentional inflicted injury (also referred to as physical abuse) and drownings in young children aged 0–4 years (Coulthard et al, 2019).

In addition to the broad term ‘emotional abuse’, there are other ACEs, which may include bereavement, bullying, poverty or community adversities such as living in an at-risk area or a neighbourhood where violence or high levels of crime prevail.

To compound the child’s emotional vulnerability, there is usually no-one the child can turn to for support. Their

caregivers and their safety network, the people they should be able to turn to in times of crisis or stress, are either absent or are often the people who violate and betray them.

Any of the listed ACEs can have a negative impact on the child and can be stressful. One’s capacity to deal with stress is said to be influenced by one’s family of origin, genetics, age, experience and support networks. The Yerkes-Dodson Law implies that some stress improves performance but too much stress has a negative impact. This is graphically represented as a stress bell curve, which increases initially but decreases with prolonged levels of stress.

There are three recognised forms of stress (Gino, 2016):

- A positive stress
- A tolerable stress
- A complex or toxic stress.

Positive stress is perhaps best understood as a personal challenge that you can deal with, perhaps an exam. This can be a positive and motivating form of stress.

Tolerable stress is a more difficult situation, such as the loss of a loved one or sustaining a severe injury. This stress can continue for prolonged periods of time depending on the situation but usually lessens over time.

Complex stress – more recently referred to as ‘toxic stress’ – is the result of exaggerated and prolonged fear, perhaps from repeated exposure to ACEs or from personal violation or violence.

Without conscious direction or awareness, the autonomic nervous system, made up of the sympathetic nervous system and the parasympathetic nervous system, regulates the heart rate, blood pressure, pupil dilation, body temperature and digestion.

A stressful or dangerous situation activates the sympathetic nervous system, which increases the body’s heart rate, sending extra blood to the muscles. Breathing becomes faster and oxygen is delivered to the brain; an infusion of glucose is directed into the bloodstream for a quick energy boost. This response prepares us to either fight or flee the situation. The greater oxygen demand from the heart may result in vasoconstriction and secondary ischaemia, which in turn may lead to cardiovascular disease.

On the other hand, there is the vagus nerve – the nerve that stimulates the parasympathetic nervous system which allows the body to calm and to slow down and enables time to ‘rest and digest’.

Blood pressure, breathing and glucose levels return to normal as the body settles into equilibrium. Biologically, the vagus nerve inhibits stress, inflammation and sympathetic activity. This relentless and chronic stress associated with ACEs is pervasive and allows excessive stimulation of the sympathetic nervous system, which may ultimately result in vagal withdrawal, which effectively turns off the parasympathetic nervous system.

Psychological injuries or toxic stress recalibrates the arousal system of the child leaving it switched on all the time. Vagal withdrawal allows sympathetic stimulation to continue and the child's body to act as if they are in a constant state of alarm and their brains are endlessly vigilant. This leads to increase inflammatory markers, and chronic inflammation has been linked to atherosclerosis, including heart disease and strokes, as well as some cancers.

Cumulatively, chronic exposure to stress affects the biochemistry of the neuroendocrine system, which contributes to allostatic overload, which is 'wear and tear' on the body and brain, and accordingly this may substantially speed up the processes of disease and ageing.

Duke's long-term study of mental health outcomes after an unintentional physical injury specifically looks at burn injuries in children (0–18 years) and the association with significant long-term physical and psychological consequences.

This study of over 11,000 children noted that children who had sustained burns had a 1.6 times greater rate of long-term mortality, compared to a similar cohort of children with no injury. Burn injuries are associated with decreased immunity at a cellular level and with sustained levels of oxidative stress (including the release of cytokines and neuropeptides). Negative immunoregulatory cytokines are found in mental health disorders such as mania and bipolar disorder. Duke's study noted that rates of post-burn admissions for

mental health conditions occurred at a rate 2.6 times higher than the comparison uninjured cohort (Duke et al, 2018).

Activation of the stress response in the child from physical or psychological injuries can disrupt the brain architecture and cognitive development.

The first part of the brain to develop is the brain stem. It develops while babies are in utero from pre-birth until the infant is approximately eight months. It is responsible for controlling bodily functions such as heart rate, temperature and blood pressure.

The limbic system is known as the emotional centre, and it stores or forgets our memories and evaluates the significance of sensory input. It is most active from age one to four years. The amygdala is part of the limbic system, located at the end of the hippocampus in the temporal side of the brain, and is thought to be responsible for emotions, especially fear and anxiety, survival instincts, and memory. It is also involved in impulse control, anger management and aggression.

There is considerable growth within the first few years of structural development in both male and female amygdalae.

The prefrontal cortex is in the frontal lobe of the brain and is involved in motor function, problem solving, attention span, memory, spontaneity, inhibition, language, judgement, impulse control, and social and sexual behaviour.

MRI scans have revealed that children exposed to ACEs have neural connections between the left and right hemispheres that are smaller and slower. Children can be impacted differently by the effects of ACEs depending on which hemisphere is more active in its development stage at the time of exposure to the ACE (Shonkoff et al).

Brains exposed to ACEs seem to slow down to conserve energy and resources for survival. The brain can revert to previous routines that are activated without variation.

This behaviour is often displayed as regression in milestones. Young children may regress from being toilet trained to bed-wetting again or have sleep disorders such as night terrors or sleepwalking. They may display behaviours such as tantrums, anger or aggression. Eating disorders such as feeding difficulties, anorexia nervosa, over-eating (often associated with sexual abuse) may ensue. School issues such as change in performance or loss of concentration have been reported.

There may be social problems including poor relationships, antisocial behaviour, acting out with peers, or indeed criminal

behaviour. These children may be labelled as disruptive or defiant. Additionally, this rebellious behaviour may challenge the patience of their caregivers who may respond negatively or aggressively in an attempt to curb the difficult behaviour, thus perpetuating the cycle of abuse.

Kenardy (2011) and his team recommend routine screening for traumatic stress symptoms if a child presents with new onset disruptive behavioural problems following an accidental injury, such as broken bones or a burn injury.

If there is an increased risk of developing post-traumatic stress disorder as well as a range of emotional and behavioural difficulties following a one-time event, then let's consider the risk for children exposed to chronic ACEs.

Negative emotional experiences have been linked with changes in the brain structure and function; it affects the person's emotions, behaviour, memory and learning

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capacity but also results in organic diseases like cancer and cardiac or respiratory disease later in life (Felitti et al, 2006).

The knowledge we have about neurobiology, relationships and trauma has begun to revolutionise the way we understand children's behaviour due to their experienced trauma with exposure to ACEs, which affects their ability to learn and to relate to others.

A landmark study conducted by Vincent Felitti and Robert Anda assessed the consequences of prolonged exposure to ACEs. Anda worked at the Centers for Disease Control and Prevention, and Felitti at Kaiser Permanente in San Diego. Remarkably, the origins of this study came from a public health study done in an obesity clinic in San Diego. In 1985, Felitti could not figure out why, each year for the preceding five years, more than half of the clients in his obesity clinic dropped out. Unravelling the potential reasons for the high dropout rate turned into a 25-year quest involving many researchers and more than 17,000 participants who were recruited over a two-year period (1995–97).

Seven categories of ACEs were studied, including psychological, physical or sexual



abuse, violence against mother, or living with household members who were substance abusers, mentally ill or suicidal, or with a family member that had been imprisoned. A questionnaire about ACEs was mailed to 13,494 adults who had completed a standard medical evaluation, and surprisingly 70.5 per cent responded (over 9000 patients).

Their study revealed that exposure to adverse experiences in childhood has a powerful effect on both the physical and mental health of adults. The researchers found a strong correlation between the duration of exposure to ACEs and multiple risk factors for several of the leading causes of death in adults.

A striking finding from this study showed that ACEs were more common than had been previously recognised or acknowledged. More importantly, this study also identified a graded relationship between the number of ACEs and adult

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chronic illness across the lifespan. The more ACEs a child is exposed to, the greater the chance of poor health later in life, including diseases such as ischaemic heart disease, cancer, chronic lung disease, skeletal fractures and liver disease.

If a child is exposed to four or more of the 10 listed ACEs, the health risks increase accordingly. In fact, the life expectancy of an individual with exposure to six or more ACEs may be reduced by up to 20 years.

Healthcare professionals are aware of the factors that shape an adult's life – such as their genetics, home and education. The psychological consequences and physiological residue from traumatic experiences such as child abuse, violence and life-challenging events are well documented.

These may manifest as acute traumatic response or post-traumatic stress disorder, and these disorders may be associated with feelings of worthlessness and shame, and this can result in self-harming or risk-taking behaviours. In the absence of any supportive or positive relationships, the child's feelings of isolation and fear may be reinforced.

The damage inflicted on the developing brain makes it difficult for these traumatised children to adapt and change to their environment. The environment (i.e. local communities) needs to adjust to help children exposed to ACEs.

Fortunately, the paradigm is shifting, from punishment and blame to a deeper commitment and understanding of the underlying causes of aberrant behaviour. Much of this can be attributed to the work of Felitti, Anda and their research teams.

As healthcare professionals in the 21st century, we can advocate to integrate trauma-informed and resilience-building practices in public health departments, education, social services, faith-based organisations and the criminal justice system. Interventions can be put in place to help address the causes of childhood toxic stress.

As healthcare professionals, we should be willing to influence services that fall outside the traditional realm of clinical practice and engage with community resources to support and buffer these families.

Three overarching principles worth considering to support families that have experienced ACEs are (Traub et al, Nadine Burke Harris):

- To help support families to reduce the sources of stress that can lead to adverse experiences.
- To enable children to develop essential life skills that are necessary to successfully navigate the complexities of life's challenges.
- To support positive relationships between children and their caregivers. According to Brown (2018), parental stress can influence a child negatively, based on their own psychological distress. Conversely, children thrive when their parents thrive.

Families that have known adverse childhood experience need intergenerational support for parents, families and children to prevent further ACEs.

They need support networks that are working together in a coordinated way to target the child's specific needs. Patients and parents need to be linked to therapy and comprehensive community services so they are no longer isolated.

This may include an early intervention 'toolkit' not limited to the following practical supports (Burke Harris):

- Home visits – develop positive supportive relationships
- Housing aid – insecure housing is a source of daily stress

- Legal assistance – legal advice, rights and entitlements
- Nutritional advice – including food vouchers
- Addiction programs – alcohol or drug treatment programs
- Financial advice – household budgets and financial management
- Workplace skills – assistance with finding employment
- Assistance with transport – to attend appointments, therapy, interviews
- Counselling and self-regulation – perhaps anger management
- Mindfulness, meditation – grounding, self-regulation
- Education around ACEs and guidance to help their children manage their anxiety (Garner AS et al).

ACEs disrupt the developing nervous, cardiovascular, immune and metabolic systems, and there is now clear evidence that these disruptions can lead to lifelong impairments in learning and behaviour, as well as to both physical and mental health, and this should be fully incorporated into the training of all healthcare professionals.

Our aim should be to promote post-traumatic growth, the ability to bounce back after traumatic events as a result of reprioritising important things in life (O'Leary et al). According to Danylchuk, there are five widely accepted areas of post-traumatic growth:

- Appreciation of life
- Positive, supportive relationships
- New possibilities in life
- Personal strength
- Spiritual change.

Optimistic personalities tend to have feelings of gratefulness, hope and humour, and this plays a large part in the child's overall recovery. Intervention strategies that allow self-compassion and promote positivity will help children manage the repercussions of ACEs. This may ultimately change the child's life from a negative trajectory.

Compassion and support can offer traumatised children hope and opportunity for their future. These children deserve consistent and validating responses, secure relationships and encouragement to help them grow, develop and live a courageous life. ■

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*** For a complete list of references, go to nursingreview.com.au**