ADVERSE CHILDHOOD EXPERIENCES

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The ACE Study
Adverse Childhood Experiences

• Lead Authors: Dr.s Vincent Felitti and Robert Anda. Initial publication May 1998 in AJPM

• Ongoing study examining the health and social effects of ACEs throughout the lifespan among 17,421 members of the Kaiser Health Plan in San Diego County

• Identified an association between amount of childhood trauma, behavioral risk factors, increased chronic disease morbidity, and early death.
ACE study factors

**ABUSE**
- Physical
- Emotional
- Sexual

**NEGLECT**
- Physical
- Emotional

**FAMILY DYSFUNCTION**
- Mental illness, depression, suicidality/attempt
- Substance abuse/addiction
- Parental discord – divorce, separation, abandonment
- Observing domestic violence
- Incarceration of any family member

**Poverty, Homelessness, Racism**

("ACE Score" = Number of the original 10 categories to which a person reports significant exposure)

ACE SCORING

- One point is given for each type of trauma.
- The higher the ACE score, the higher the risk of health and social problems.
- ACE score of ≥4 correlates with serious adverse health outcomes and an increased risk for:
  - Chronic Obstructive Pulmonary Disease Increases 390%
  - Hepatitis 240%
  - Depression 460%
  - Suicide 1,220%

http://aces toohigh.com/got-your-ace-score/
Adverse Childhood Experiences are common.

Looking at seven primary types of ACEs reported in 1998 study:
- Almost 2/3 (63.9%) of patients have at least one ACE
- More than 1/5 (22%) have 3+ ACEs

ACE STUDY FINDINGS
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There is a DOSE RESPONSE with ACEs: the more a person experiences, the greater their odds of the following health behaviors and chronic diseases:

- Alcoholism and alcohol abuse
- Chronic obstructive pulmonary disease (COPD)
- Depression
- Fetal death
- Health-related quality of life
- Illicit drug use
- Ischemic heart disease (IHD)
- Liver disease
- Risk for intimate partner violence
- Multiple sexual partners
- Sexually transmitted diseases (STDs)
- Smoking
- Suicide attempts
- Unintended pregnancies
- Early initiation of smoking
- Early initiation of sexual activity
- Adolescent pregnancy

http://www.cdc.gov/ace/about.htm

A.C.E. AND ASSOCIATED HEALTH PROBLEMS

- COPD
- Depression
- Fetal Death
- Ischemic Heart Disease
- Liver Disease
- Unintended pregnancies
- Risk for Intimate Partner Violence
- Alcohol Abuse and Addiction
- Illicit Drug Use
- Multiple Sex Partners
- Sexually Transmitted Diseases
- Smoking
- Suicide Attempts

http://www.cdc.gov/ace/about.htm
As ACEs scores increase...

**Zero ACEs**
- 1 in 16 smokes
- 1 in 69 is alcoholic
- 1 in 480 uses IV drugs
- 1 in 14 has heart disease
- 1 in 96 attempts suicide

**With Three ACEs**
- 1 in 9 smokes
- 1 in 9 is alcoholic
- 1 in 49 uses IV drugs
- 1 in 7 has heart disease
- 1 in 10 attempts suicide

**With Seven or More ACEs**
- 1 in 6 smokes
- 1 in 6 is alcoholic
- 1 in 30 uses IV drugs
- 1 in 6 has heart disease
- 1 in 5 attempts suicide

(Odds ratios adjusted for: age, sex, race, educational attainment)
**ACES SCORE**

Number of individual adverse childhood experiences are summed.

<table>
<thead>
<tr>
<th>ACE Score</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>36.4%</td>
</tr>
<tr>
<td>1</td>
<td>26.2%</td>
</tr>
<tr>
<td>2</td>
<td>15.8%</td>
</tr>
<tr>
<td>3</td>
<td>9.5%</td>
</tr>
<tr>
<td>4</td>
<td>6.0%</td>
</tr>
<tr>
<td>5</td>
<td>3.5%</td>
</tr>
<tr>
<td>6</td>
<td>1.6%</td>
</tr>
<tr>
<td>7 or more</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

64% reported experiencing one or more

37% reported experiencing two or more

http://www.cdc.gov/ace/about.htm

- Major adversity in childhood is **strongly** associated with **unhealthy** lifestyles and poor health **decades** later.

- Some of the **worst** health and social problems in our nation can arise as a **consequence of adverse childhood experiences**.
EMOTIONAL PROBLEMS

Childhood Experiences Underlie Chronic Depression

[Bar chart showing the percentage of individuals with a lifetime history of depression based on ACE score, with separate bars for women and men.]
**Childhood Experiences Underlie Suicide**

- **ACE Score**
  - 0
  - 1
  - 2
  - 3
  - 4+

- **% Attempting Suicide**
  - 0
  - 1
  - 2
  - 3
  - 4

**Childhood Sexual Abuse and the Number of Unexplained Symptoms**

- **History of Childhood Sexual Abuse**
  - 0
  - 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8

- **Number of Symptoms**
  - 0
  - 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8

- **Percent Abused (%)**
  - 0
  - 5
  - 10
  - 15
  - 20
  - 25
  - 30
  - 35
  - 40
  - 45
HEALTH RISK BEHAVIORS

Adverse Childhood Experiences and Current Smoking
Childhood Experiences and Adult Alcoholism

SERIOUS SOCIAL PROBLEMS
- Trauma is the top predictor of school suspensions
- 90% of youth in juvenile custody have experienced trauma
- Half of all incarcerated people have mental illness
- 65% of people behind bars are substance abusers or addicts

**CHILDHOOD EXPERIENCES UNDERLIE RAPE**

![Bar chart showing the percentage of reporting rape by ACE Score]

- 0% with 0 ACE scores
- 1% with 1 ACE score
- 2% with 2 ACE scores
- 3% with 3 ACE scores
- 4+% with 4+ ACE scores
Adverse Childhood Experiences and Likelihood of > 50 Sexual Partners

ACE Score and Indicators of Impaired Worker Performance
ADULT DISEASE AND DISABILITY

ACEs Increase Likelihood of Heart Disease*

- Emotional abuse 1.7x
- Physical abuse 1.5x
- Sexual abuse 1.4x
- Domestic violence 1.4x
- Mental illness 1.4x
- Substance abuse 1.3x
- Household criminal 1.7x
- Emotional neglect 1.3x
- Physical neglect 1.4x
BRAIN SCIENCE HELPS EXPLAIN WHY

- Nurturing, responsive, and individualized interactions from birth build healthy brain structure.

- Healthy brain architecture is the foundation required for future learning, behavior, and health.

HOW STRESS CHANGES A CHILD’S BRAIN

3-YEAR-OLD CHILDREN

- Prolonged exposure to trauma triggers physiological changes in the brain.
- Neural circuits are disrupted, causing changes in the hippocampus, the brain's memory, and emotional centre.
- This can cause brain shrinkage, problems with memory, learning, and behaviour.
- A child does not learn to regulate emotions when living in a state of constant stress.
- Associated with greater risk of chronic disease and mental health problems in adulthood.
THE BRAIN IS WIRED FOR SURVIVAL, FIRST AND FOREMOST

- Cortisol and adrenaline flood the brain, leading to “fight, flight or freeze” response.
- “Rational” brain goes offline

Being Chased by the Bear…

Result of all of this? You’re ready for fight or flight.
Increased available glucose, increased respiratory rate and heart rate, and nonessential systems are shut down (GI, immune systems)

Your Neocortex?
Switched OFF
All good if you are in the forest, being chased by a bear…

But, what if the bear lives in your home?

With significant threats to safety and well-being in childhood our brain development is different, especially when these threats occur between 3-6y/o. We are subsequently quicker to activate the HPA. This may manifest as withdrawn OR hyper-aroused children.

Increased activation of the HPA leads to decreased ability to absorb new information, not just in schools, but in our clinic patients.

This ingrained response from childhood also changes a person’s inherent ability to regulate behaviors in stressful situations when what they instinctually crave is stability and safety.
High ACE scores may impact long-term expression of norepinephrine, serotonin, dopamine and subsequent regulation of mood, behavior and sleep.

High ACE scores may also lead to upregulation of inflammatory markers (interleukins, C-reactive protein).

OTHER BIOCHEMICAL IMPACTS OF ACES

THE IMPACT OF CHILDHOOD TRAUMA IS INHERITABLE (EPIGENETICS)

- **Methylation Model of Heritability:** As a consequence of maternal environmental and health factors, methyl groups attach differently to DNA and can cause future DNA expression to be repressed or augmented.

- **Histone Modification Model:** As a consequence of environmental factors, DNA is wound differently around histones, causing future repressed or augmented expression.
Telomere Shortening Model:
Adults with high ACE scores have been found to have shortened telomeres compared to those with an ACE score of zero.*
Additional studies have found increased telomerase activity in patients with high ACE scores and depression.

Telomere shortening is causally associated with premature aging processes.

THE IMPACT OF CHILDHOOD TRAUMA IS INHERITABLE


THE CASE FOR ROUTINE ENQUIRY IN HEALTH AND SOCIAL CARE

Waiting to be told doesn’t work...

Victims of childhood abuse have been found to wait from between nine to sixteen years before disclosing trauma with many never disclosing (Frenken & Van Stolk, 1990; Anderson, Martin, Mullen, Romans & Herbison, 1993; Read, McGregor, Coggan & Thomas, 2006).

Read and Fraser (1998) found that 82% of psychiatric inpatients disclosed trauma when they were asked, compared to only 8% volunteering their disclosure without being asked.

Felitti & Anda (2014) report a 35% reduction in doctor’s office visits & 11% reduction in ER visits in a cohort of 140,000 patients asked about ACEs as part of standard medical assessment in the Kaiser Health Plan.
FINALLY, SOME GOOD NEWS..

- The effects of trauma can last a lifetime, but they don't have to.
- There are ways to buffer the effects of trauma and build resilience.
- Nurturing relationships are crucial.

WHY ARE SOME PEOPLE AFFECTED BY ACE'S MORE THAN OTHERS?
RESILIENCE

Keys to Resilience

CAPABILITY
- Skills
- Knowledge
- Self-regulation
- Mindfulness
- Focus
- Discipline

ATTACHMENT AND BELONGING
- Family bonds
- Caring adults
- Relationships
- Inclusion
- Intrinsic and extrinsic value

COMMUNITY CULTURE FAITH
- Faith
- Hope
- Meaning
- Traditions
- Network of services
- Belonging
Resilience is common and... arises from ...normal rather than extraordinary human capabilities, relationships, and resources.

In other words, resilience emerges from ordinary magic.

— Ann Masten, 2009

TO PREVENT TRAUMA, WE MUST START EARLY

- Pre-natal and early childhood:
  - Screen moms-to-be
  - Awareness building among pediatricians
  - Parent education
  - Home visitation
  - Quality child care and pre-school
TRAUMA INFORMED CARE

• “…each adult working with any child or adolescent (should) presume that the child has been trauma exposed…providing unconditional respect to the child and being careful not to challenge him/her in ways that produce shame and humiliation.

• “Such an approach has no down side, since children who have been exposed to trauma require it, and other, more fortunate children deserve and can also benefit from this fundamentally humanistic commitment.”

– Gordon R. Hodas MD . Pennsylvania Office of Mental Health and Substance Abuse Services , February 2006
Screen prenatal patients, give education about generational aspect of ACEs to encourage early engagement with visiting home nurses, early connection with parenting support groups.

Screen at well baby checks: screen new parents for ACEs and interest in related resources, connect families with home nurses and peer support.

Screen in early adolescence. Resiliency counseling and training for ACEs already experienced has higher yield the younger we are.

Screen everyone to better understand their chronic disease risks. Also to understand health behaviors, and help people understand why they respond the way they do to perceived threats to well-being. Might refer for behavioral health, or customize their chronic disease management.

Identify a portion of ACE’s through existing means: social and sexual histories on intake and at well visits; substance use screening; routine prenatal screening questionnaires; behavioral health visits; WIC screening, opioid risk tools

Modify health screening and care as appropriate

Refer for appropriate services (BH for acute trauma, active mood disorder, or to address unresolved/toxic stress from childhood issues)
PROBLEM WITH REACTIVE APPROACH?

- **You miss a lot.** Can’t judge ACE score by someone’s appearance, substance use or mental health history, employment history, or insurance status.

- There is still higher risk for heart disease, cancer, early death even if you have screened patients well for behavioral risk factors.

- Will identify individuals who despite “success” in life still live with toxic stress and might benefit from behavioral health referral.

SO WHAT DO WE DO ABOUT ACES?

- **Talk with your staff, QI teams, and patient advisory boards** about whether/how your clinic can implement ACEs screening.

- **Identify local resources** for families and patients affected by high ACE scores.

- **Consider trauma-informed care training** for your organization.

- **Keep ACEs in mind** with challenging interactions with patients and coworkers.

- Be aware of the impact of your own experiences on how you deal with stressful situations. Practice self-care.

- **Foster resilience** and healthy relationships in the children in your practice, your community, and your family.
SO WHAT DO WE DO ABOUT ACES?

- **Raise awareness** in patients and staff around ACEs and their effects.
- **Advocate for reimbursement** for time spent on ACEs screening and counseling.
- **Advocate for funding** for programs and resources supporting individuals with high ACE scores.
- ** Advocate for an updated USPSTF recommendation** for ACEs (childhood maltreatment) screening.
- **Advocate for policies that support families** - parental leave, support for breastfeeding, flexible work hours to attend well child checks.