How Childhood Adversity Affects Health Across a Lifetime — and What We Can Do About It

Nadine Burke Harris, MD, MPH, FAAP
CEO/Founder, Center for Youth Wellness
February 28, 2018
Adverse Childhood Experiences

**ABUSE**
- Physical
- Emotional
- Sexual

**NEGLECT**
- Physical
- Emotional

**HOUSEHOLD DYSFUNCTION**
- Mental Illness
- Incarcerated Relative
- Mother treated violently
- Substance Abuse
- Divorce

Image courtesy of the Robert Wood Johnson Foundation
Nearly two-thirds of adults have at least one ACE

Source: CDC-Kaiser ACE Study (1998)
34.8M children in US impacted by ACEs
State ranking map of the proportion of children 0-17 with ≥ 2 ACEs

Prevalence of Adverse Child and family Experiences among US Children Age 0-17 years, 2011/2012
National Survey of Children’s Health
Source: Bethell, C 2016
ACEs across race and ethnicity

ACEs dramatically increase risk for 7 out of 10 leading causes of death

<table>
<thead>
<tr>
<th>Leading Causes of Death in US, 2015</th>
<th>Odds Ratio Associated with ≥ 4 ACEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Heart Disease</td>
<td>2.1</td>
</tr>
<tr>
<td>2 Cancer</td>
<td>2.3</td>
</tr>
<tr>
<td>3 Chronic Lower Respiratory Disease</td>
<td>3.0</td>
</tr>
<tr>
<td>4 Accidents</td>
<td></td>
</tr>
<tr>
<td>5 Stroke</td>
<td>2.4</td>
</tr>
<tr>
<td>6 Alzheimer’s</td>
<td>11.2*</td>
</tr>
<tr>
<td>7 Diabetes</td>
<td>1.5</td>
</tr>
<tr>
<td>8 Influenza and Pneumonia</td>
<td></td>
</tr>
<tr>
<td>9 Kidney Disease</td>
<td></td>
</tr>
<tr>
<td>10 Suicide</td>
<td>30.1</td>
</tr>
</tbody>
</table>

ACEs dramatically increase risk for 7 out of 10 leading causes of death

<table>
<thead>
<tr>
<th>Leading Causes of Death in US, 2015</th>
<th>Odds Ratio Associated with ≥ 4 ACEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Heart Disease</td>
<td>2.1</td>
</tr>
<tr>
<td>2 Cancer</td>
<td></td>
</tr>
<tr>
<td>3 Chronic Lower Respiratory Disease</td>
<td>3.0</td>
</tr>
<tr>
<td>4 Accidents</td>
<td></td>
</tr>
<tr>
<td>5 Stroke</td>
<td>2.4</td>
</tr>
<tr>
<td>6 Alzheimer’s</td>
<td>11.2*</td>
</tr>
<tr>
<td>7 Diabetes</td>
<td>1.5</td>
</tr>
<tr>
<td>8 Influenza and Pneumonia</td>
<td></td>
</tr>
<tr>
<td>9 Kidney Disease</td>
<td></td>
</tr>
<tr>
<td>10 Suicide</td>
<td>30.1</td>
</tr>
</tbody>
</table>

Without intervention, there can be a 20-year difference in life expectancy

DIAGNOSIS
Multi-systemic Alterations

Neurologic
- Long term changes to the fight or flight response
- Overactive fear response
- Changes to brain structure and function can interfere with learning
- Changes to brain biology lead to increase risk of addiction/high risk behavior

Immunologic
- Long term changes in the function of the immune system lead to increased risk of infections, inflammation and chronic diseases
Multi-systemic Alterations

Endocrine

• Long-term changes in hormones can lead to changes in growth, menstrual changes, risk of obesity, and changes to metabolism

Epigenetic

• Changes in the way DNA is read and expressed leads to changes in the way the brain and organ systems respond to stress.
• Premature cellular aging leads to increased risk of disease and cancer
Learning/Behavior Problems in Youth

Adapted from Burke et al, 2011
Health and behavioral outcomes in children

- Developmental delay
- Growth delay
- Failure to thrive
- Sleep disruption
- Asthma
- Pneumonia
- Viral infection
- Atopic disease
- Learning difficulties
- Behavioral problems
- Obesity
- Diabetes
- Headache
- Abdominal pain
- Teen pregnancy
- Hyperthyroidism
- Pubertal changes

Many children experience stressful life events that can affect their health and wellbeing. The results from this questionnaire will assist your child’s doctor in assessing their health and determining guidance. Please read the statements below. Count the number of statements that apply to your child and write the total number on the line provided.

Please DO NOT mark or indicate which specific statements apply to your child.

1) Of the statements in Section 1, HOW MANY apply to your child? Write the total number in the box.

<table>
<thead>
<tr>
<th>Section 1. At any point since your child was born...</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Your child’s parents or guardians were separated or divorced</td>
</tr>
<tr>
<td>▪ Your child lived with a household member who served time in jail or prison</td>
</tr>
<tr>
<td>▪ Your child lived with a household member who was depressed, mentally ill or attempted suicide</td>
</tr>
<tr>
<td>▪ Your child saw or heard household members hurt or threaten to hurt each other</td>
</tr>
<tr>
<td>▪ A household member swore at, insulted, humiliated, or put down your child in a way that scared your child OR a household member acted in a way that made your child afraid that s/he might be physically hurt</td>
</tr>
<tr>
<td>▪ Someone touched your child’s private parts or asked your child to touch their private parts in a sexual way</td>
</tr>
<tr>
<td>▪ More than once, your child went without food, clothing, a place to live, or had no one to protect her/him</td>
</tr>
<tr>
<td>▪ Someone pushed, grabbed, slapped or threw something at your child OR your child was hit so hard that your child was injured or had marks</td>
</tr>
<tr>
<td>▪ Your child lived with someone who had a problem with drinking or using drugs</td>
</tr>
<tr>
<td>▪ Your child often felt unsupported, unloved and/or unprotected</td>
</tr>
</tbody>
</table>

2) Of the statements in Section 2, HOW MANY apply to your child? Write the total number in the box.

<table>
<thead>
<tr>
<th>Section 2. At any point since your child was born...</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Your child was in foster care</td>
</tr>
<tr>
<td>▪ Your child experienced harassment or bullying at school</td>
</tr>
<tr>
<td>▪ Your child lived with a parent or guardian who died</td>
</tr>
<tr>
<td>▪ Your child was separated from her/his primary caregiver through deportation or immigration</td>
</tr>
<tr>
<td>▪ Your child had a serious medical procedure or life threatening illness</td>
</tr>
<tr>
<td>▪ Your child often saw or heard violence in the neighborhood or in her/his school neighborhood</td>
</tr>
<tr>
<td>▪ Your child was often treated badly because of race, sexual orientation, place of birth, disability or religion</td>
</tr>
</tbody>
</table>
Clinical Presentation

2 year 9 mo female presents for Well Child Exam

Presenting concern: Growth – Patient is “small”. Previously had diarrhea when she started on cow’s milk. Symptoms went away when mom changed to almond milk.

Otherwise well. No other complaints.
History

BHx: Full term, NSVD, BW: 6lb 8oz (25%)


Growth Hx: Went from 25% height and weight to progressively decreasing until until she was consistently below the 3rd percentile for height, weight and BMI.

Previous doctor said that they need to offer her more foods and recommended PediaSure but it didn’t seem to help.

Mom’s height is at 30%, dad’s height is at 20%
Evaluation:

Normal physical exam, initial labs. Delayed skeletal maturity (chronological age 3y 7m, bone age 2y 6m)

ASQ: WNL

MCHAT: WNL

ACE Score – 7+0
Assessment:

2 yr 9 month female with failure to thrive. Likely due to toxic stress physiology.

Plan:

Sleep, Exercise, Nutrition, Mindfulness, Mental Health, Healthy Relationships
Pediasure, 1 can BID
Referred to WIC
Referred to CYW for Child Parent Psychotherapy (CPP)
Corollary:

9 month-old brother, who was not the index patient, also had 4 ear infections and 2 pneumonias in his first year of life. Seemed like he was “always sick”, per mom. Referred to ENT for evaluation of frequent ear infection. After CPP intervention started, patient had many fewer URI’s and no more ear infections or pneumonias in the subsequent year.
Using the science to inform school practices and policies

**Systems of support:** Installing mental health professionals and social workers into schools

**Universal training:** Training every adult in the school, from guidance staff to every single teacher

**Rethinking discipline:** From reactive and punitive to working *with* a student’s biology instead of against it
BUILDING BLOCKS FOR LEARNING

INDEPENDENCE AND SUSTAINABILITY

PERSEVERANCE

MINDSETS FOR SELF AND SCHOOL

SCHOOL READINESS

HEALTHY DEVELOPMENT

Source: Turnaround for Children Building Blocks for Learning: A Framework for Comprehensive Student Development
QUIET TIME

During Quiet Time, the students have the option to meditate or do another quiet, relaxing activity like sustained silent reading. All students and teachers are offered the opportunity to receive training in an evidenced-based relaxation and self-development technique called Transcendental Meditation® or TM. Most students practice this in Quiet Time.

Faculty and staff also have the opportunity to learn and practice meditation as a stress management tool to reduce burn-out and improve teacher-student relationships.
Change in Quality of Sleep

Source: School Data based on Pittsburg Sleep Quality Index for 92 Students
Improvement in Psychological State
Meditating High-School Students, 2010-2011

Profile of Mood States

- Anxiety
- Depression
- Anger
- Fatigue

Source: Psychological tests
Reduction in School Violence
John O’Connell High School

Source: School Data
Substantial Drop in Suspension Rate compared to SF Middle School Average

- **Visitacion Valley Middle School** (Quiet Time in 2007)
- **Average of other SF Middle Schools** (control)

86% drop in suspensions over 2 years

*Suspension calculated as total number of incidents divided by total school enrollment

**Source:** SFUSD Middle School Accountability Report Cards published 2010-11
Increase in GPA after Quiet Time Launch

**Everett Middle School**

**Visitacion Valley Middle School**

Quiet Time Program Introduced

Source: SFUSD
Increase in GPA
Fall 2007-2009

Source: SFUSD
Achievement Gap Reduced within First Year of Quiet Time Program

% Increase in GPA*

All students
p = .034

Low-GPA students
p = .037

Matched Control**  Meditation

* Between Oct 2010 (before Quiet Time) and Spring 2011 at O’Connell High School
** Control group was matched to meditation group for GPA at the end of the 1st grading period and grade level
Source: SFUSD
African American Achievement Gap Reduced after First Year of Quiet Time Program

% Increase in GPA*

- School Average
  - p=0.001
- African American students**
  - p=0.00001

African American GPA increased more than twice as much as school-wide average

* Between Fall 2007 & 2008 at Visitacion Valley Middle School
** African American GPA started 30% lower than school average in Fall 2007

Source: SFUSD
Increased Composite STAR Test Scores
2006-2007, in First Year of Implementation of Quiet Time for Below Basic and Far Below Basic Students

Change in Composite Scale Scores on California STAR at Visitation Valley Middle School

p = .019

Decreased Psychological Distress in Administrators and Teachers, over 4 Month Period

Source: Psychological tests – randomized control study
Integrated Brain Functioning in Administrators and Teachers, over 4 Month Period

Source: Randomized control study
Building a public health movement

Sound the alarm on a public health crisis

Package the message

Engage strategic champions

Build Networks

NPPCaces.org
Raising awareness

Academic publications on ACEs and health outcomes

News articles mentioning adverse childhood experiences (ACEs) in US newspapers and newswires, 2005-2015 (n=1046)

Note: 2015 is projected based on first six months of coverage

Source: CYW ACEs Literature Systemic Review, 2018

Source: Berkeley Media Studies Group, with support from The California Endowment
Lick your pups!
We can create change!

If you’re a pediatric clinician…
Join the National Pediatric Practice Community on ACEs

If you’re a parent or caregiver…
Learn about the signs of toxic stress, whether a child is at risk, and what you can do to help prevent or reverse the effects

If you’re a passionate advocate…
Join your voice with others to raise awareness and promote solutions that support all communities.

NPPCACES.org
Stress-Health.org
CenterforYouthWellness.org
Advocating for change

1. Advocate for routine screening in primary care and evidence-based interventions.

2. Support best practices including home visiting, mental health, social work, and two-generation interventions.

3. Support basic science, clinical and translational research to advance detection and treatment of toxic stress.

4. Work to enact ACE-informed policies and practices in health care, housing, education, child welfare, mental health, the justice system, workplaces and every sector of our communities.
Center For Youth Wellness

health begins with hope

CenterForYouthWellness.org