Adverse Childhood Experiences: A Driver of the Opioid Epidemic

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What would it take...
Adverse Childhood Experiences Study (ACE Study)

- Maybe the most important study of which most Americans are unaware
- What is unrecognized in the pediatric exam room shows up in the internal medicine exam room decades later
- Measures 10 categories of childhood abuse and neglect
  - Abuse (3): Emotional, physical, or sexual
  - Neglect (2): Emotional or physical
  - Dysfunction (5):
    - One or both biological parents missing from the household
    - Domestic violence specifically toward the mother
    - Mental illness in the household
    - Substance use in the household
    - Incarcerated members in the household
- http://www.cdc.gov/violenceprevention/acestudy

ACE Study Findings

ACE Scores Linked to Physical & Mental Health Problems

Compared with people with no ACEs, those with 4 or more ACEs were:

- 2x more likely to smoke
- 2x more likely to have cancer or heart disease
- 6x more likely to have had sex before age 15
- 7x more likely to be depressed
- 7x more likely to have had sex before age 15
- 7x more likely to be alcoholics
- 10x more likely to inject drugs
- 12x more likely to have attempted suicide

Men with 6 or more ACEs were 46 times more likely to have injected drugs than men with no history of adverse childhood experiences.

ACE Questions (1-3)

- During your first 18 years of life

1. Did a parent or other adult in the household often... Swear at you, insult you, put you down, or humiliate you? or Act in a way that made you afraid that you might be physically hurt? or

2. Did a parent or other adult in the household often... Push, grab, slap, or throw something at you? or

3. Did an adult or person at least 5 years older than you... Touch or fondle you or have you touch their body in a sexual way? or Try to or actually have oral, anal, or vaginal sex with you?
ACE Questions (4-6)

4. Did you often feel that...
    No one in your family loved you or thought you were important or special? or Your family didn’t look out for each other, feel close to each other, or support each other?

5. Did you often feel that...
    You didn’t have enough to eat, had to wear dirty clothes, and had no one to protect you? or Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?

6. Were your parents ever separated or divorced?

ACE Questions (7-10)

7. Was your mother or stepmother:
    • Often pushed, grabbed, slapped, or had something thrown at her? or Sometimes or often kicked, bitten, hit with a fist, or hit with something hard? or Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?

9. Was a household member depressed or mentally ill or did a household member attempt suicide?

10. Did a household member go to prison?
Information from the original ACE Study

ACE Score and Indicators of Impaired Worker Performance

Economic Burden

- The lifetime costs associated with child maltreatment alone have been estimated at $210,012 to $1.8 million per child due to associated health, behavioral health, educational impairments, increased involvement in criminal justice, child welfare, social welfare systems, and lost work productivity.


Reduction in Annual Earnings from Selected Health Events (2009 Dollars)
Traumatic Stress and Brain Alterations

- Traumatic stress is associated with increased cortisol and norepinephrine responses to subsequent stressors.

- Traumatic stress, particularly at sensitive periods of development, can be associated with lasting changes in certain brain areas.

- These brain alterations can predispose to addiction.
Disruptions in three areas of the brain are particularly important in the onset, development, and maintenance of substance use disorders:

- the basal ganglia
- the extended amygdala
- the prefrontal cortex

Key Findings: The Neurobiology of Substance Use, Misuse, and Addiction

Traumatic Stress Impact on Brain

- Stress activates the Amygdala
- HPA Axis
- Release of Cortisol
- Heart rate increases
- Blood goes to muscles
- Digestion shuts down
- Memory impacted

Neurophysiology of Trauma

- Involved in:
  - Learning
  - Memory
  - Reward
  - Reinforcement
- Regulates:
  - Hormones
  - Mood
  - Heartbeat
  - Sexual Behavior

Slides courtesy of Michelle Hoersch
Limbic System

- Hippocampus and Amygdala:
  - Panic and Fear
  - Attention
  - Memory
  - Social Cues

- Cerebellar Vermis:
  - Emotion Perception
  - Attention
  - Addiction
  - Mental Health

- Corpus Callosum:
  - Multiple Processing and Integration Functions

Exposure to childhood trauma can have negative and lasting impact on the limbic system, predisposing to substance abuse and addiction.

Correlation: Opioid/Heroin Use and ACEs

- 1998 ACE study Kaiser Permanente and CDC
  - People with ACE ≥ 3: much greater likelihood of engaging in substance abuse, domestic violence and other risk behaviors, and of hospitalization due to events associated with childhood trauma. ACE ≥ 6: 4600% more likely to use intravenous drugs relative to ACE of zero.

- 2016 study
  - People with ACE ≥ 5, were 3x more likely to misuse prescription pain medication and 5x more likely to engage in injection drug use.

- 2009 study
  - Over 80% of patients seeking treatment for opioid addiction had at least one form of childhood trauma, with almost 1/3 reporting having witnessed violence in childhood.

KCHD Survey

- Distributed via press (newspaper, television, radio, web) and e-mail.
- Conducted via web-based tool from November 12-28, 2015.
- Purpose: to open a discussion on the role of adverse childhood experiences (ACEs) on our major public health problems through a snapshot survey. Not intended to be a full community cross-section.
Important Points

- Relevance of ACEs to public health problems. What this means and what it doesn’t mean.
- Think of ACE score the social equivalent of cholesterol level
  - Drug and alcohol use can happen in families with an ACE score of zero.
  - We do not want people to blame or shame parents for these issues.
- On a population level, there is a clear correlation and biological connection between ACEs and health outcomes in adults.

Results from the KCHD Informal Survey

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<th>Respondents: N=506</th>
<th>Female 76%</th>
<th>Male 24%</th>
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<tr>
<td>White</td>
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<tr>
<td>African American</td>
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<tr>
<td>Native American</td>
<td>1.4%</td>
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<tr>
<td>Asian/PI</td>
<td>1.2%</td>
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<td>Other states:</td>
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<td>KY, TN, OK, IA, CA, MI</td>
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What is your age?

Answered: 501 | Skipped: 4
Summary statistics from ACE

<table>
<thead>
<tr>
<th>Number of Adverse Childhood Experiences (ACE Score)</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
<th>KCHD</th>
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<tr>
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<td>4 or more</td>
<td>5.2</td>
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<td>12.5</td>
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- 72% of patients reported at least one ACE event
- Over 1 in 4 patients had a score of 4 or more
- ACEs are extremely common and relevant to the public health problems

Comparison between the original ACE study and our survey results

https://www.cdc.gov/violenceprevention/acestudy/index.html
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- 66% of patients reported at least one ACE event
- 39% patients had a score of 4 or more
- ACEs are more common and severe among patients in the Harm Reduction Clinic than in the referent population.

Evidenced-based Interventions

Effective preventive interventions reduce exposure to adversity and strengthen resilience to adverse circumstances.

- Home Visiting Programs effective at reducing child abuse, neglect, and domestic violence and improving health outcomes for children and parents
- Nurse Family Partnership (NFP)
  - 48% reduction in rates of abuse and neglect
  - 56% reduction in emergency room visits
  - 79% reduction in children days hospitalized with injuries and ingestions during first two years of life

References:

Why aren't we asking the questions?
Evidenced-based Interventions

The Positive Parenting Program (Triple P)

- Intervention provides parents with tools to raise healthier children and deal with stressors
- Demonstrated to reduce rates of child maltreatment by over 20%
- Decreased out of home placements and childhood injuries


Slides courtesy of Michelle Hoersch

Evidenced-based Interventions

Parent Child Interaction Therapy

- Tool to assist parents improve quality of parent-child interaction and relationship
- Shown to reduce child abuse in participants (19% reported abuse) versus individuals in the control conditions (49% reported abuse) at a median follow-up of up to 850 days


Slides courtesy of Michelle Hoersch

Non-pharmacologic practices: Children and Adults

- Exercise
  - Regulation of HR and BP
  - Regulation of the hypothalamic-pituitary axis (HPA)
  - Decrease depression and anxiety
  - Regulation of cerebral neurotransmitters including dopamine and serotonin
  - Endorphin release
- Mindfulness-based awareness training
  - Regulation of HR, BP, and HPA
  - Anti-inflammatory effects
  - Decreases depression and anxiety
  - Decrease post-traumatic symptoms

Dr. Nadine Burke-Harris, The Center for Youth Wellness, October 23, 2015
Bottom lines

• ACEs are common but often completely overlooked.

• What is overlooked in the exam room, the classroom, and other places shows up in courts, emergency departments, and on the streets.

• Shifting the dialogue from “What’s wrong with them?” to “What happened to them?”

• Shifting the perspective from judgment to compassion.

Questions:

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