ACE This:
Adverse Childhood Experiences, early childhood development and the potential lifelong impact of trauma

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Learning objectives

At the conclusion of the lecture, the learner will be able to:

- Define Adverse Childhood Experiences (ACEs)
- Contrast the impact of stress with toxic stress on the developing brain
- Recall ways that exposure to trauma may present in the clinic
- Identify ways to buffer the impact of trauma

The origins of the ACE study

ACEs are common

- Very common: 67% adults have at least one
- If you have one, there's a good chance you have another one
  - For any 1 ACE exposure, the chance of an additional exposure was 65-93%
  - 1 out of 8 people (13%) have 4 or more ACEs

What are ACEs?

The ACE study

Research Brief

Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults

The Adverse Childhood Experiences (ACE) Study

Victor J. DeWalt, MD, FACF; Robert F. Anda, MD, MS, MS, Michael A. Williamson, MD, MPH, Suba Nathanielsz, MD, David E. Williamson, MS, PhD, Almira M. Spitz, MA, MPH, Valerie Edwards, BA, Mary C. Koss, PhD, Jacques S. Marks, MD, MPH
Initial ACE data has proven consistent

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<tr>
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<tr>
<td>Household Dysfunction</td>
<td>17,337 adults</td>
<td>26,229 adults</td>
<td>6,861 adults</td>
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<tr>
<td>Substance Abuse</td>
<td>27%</td>
<td>29%</td>
<td>26%</td>
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<td>Parental Divorce/Separation</td>
<td>23%</td>
<td>27%</td>
<td>22%</td>
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<td>Mental Illness</td>
<td>17%</td>
<td>19%</td>
<td>18%</td>
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<td>Domestic Violence/Battered mother</td>
<td>13%</td>
<td>16%</td>
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<tr>
<td>Criminal Behavior (Incarceration)</td>
<td>6%</td>
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**Abuse**
- Psychological: 11% (2012-14: 28%)
- Physical: 26% (2012-14: 16%)
- Sexual: 21% (2012-14: 10%)

**Neglect**
- Emotional: 15% (2012-14: 10%)
- Physical: 30% (2012-14: 15%)

ACEs: Iowa 2012-14

ACEs and physical health

ACEs and life expectancy

People with 6 or more ACEs died nearly 20 years earlier on average than those without ACEs.

Revising the ACEs scale
Example of current ACEs categories


“The decade of the brain”

Corel, JP. “The postnatal development of the human cerebral cortex.”

Factors influencing early brain development and function

- Parent-child relationships
- Stress
- Sensory and motor experiences
- Peer relationships
- Diet
- Intestinal flora
- Psychoactive drugs
- Gonadal hormones

Parent-child relationships

General Principles of Parenting:
- Responsive care—matching caregiving with the child's needs
- Supportive of developing skills but allowing child to accomplish
- Provide affection, patience in a nurturing environment
- As the child becomes a toddler and older, additional roles include:
  - Helping children understand feelings
  - Help them learn to resolve conflict in appropriate ways
  - Help them share, take turns
  - Help them become more independent by making own decisions
Parenting to encourage development

Children feel safe and secure because they get lots of attention and affection from a parent and their days are predictable.

These children learn to trust that the parent will always be there for her. This trust gives children confidence.

Early Social Milestone

- Earliest milestone is bonding with the caregiver
  - Infants learn to discriminate caregiver voices during their first month
  - Infants cry to express distress—hunger, dirty diaper, tired
  - As caregiver learns to respond to these distress cues promptly and appropriately, the infant develops confidence in the caregiver promoting a positive parent-child relationship

Serve and Return

- Adult responses to a child's behaviors
- Absence poses a serious threat to a child's development

The Importance of Stress

- Triggers: social, environmental, biologic
- Learning how to respond to stress is critical to normal healthy child development
- Lasting impact of stress is related more closely to the child's response rather than the type or number of stressful events

Still Face Experiment

Types of stress

- POSITIVE STRESS: Mild/moderate and short-lived stressors necessary for healthy development
- TOLERABLE STRESS: More severe stressors necessary for healthy development which allows for recovery
- TOXIC STRESS: Extreme, frequent, or extended activation of the body's stress response which has lasting effects on the brain and behavior of a responsive adult

- Internal, prolonged, repeated and unresolved
- Social-emotional buffering, parental resilience, early detection, and effective intervention
The impact of stress on the brain

5 main brain structures negatively affected by stress:

1. **Hippocampus:** central for learning and memory
2. **Corpus Callosum:** responsible for inter-hemispheric communication
3. **Cerebellum:** coordinates motor behavior and executive function
4. **Amygdala:** regulates emotional responses
5. **Prefrontal Cortex:** “air traffic control system”—supports the development of a wide range of executive functions

Toxic stress on the developing brain

The impact of extreme neglect

[Image showing brain scans of 3 year old children under normal and extreme neglect conditions]

Eco-Bio-Developmental Model of Human Health and Disease

The Revised ACE pyramid
Significant adversity impairs development in the first 3 years

Impact of trauma on development and learning across the ages

- **Effect on working memory:**
  - Infant, Toddler, Preschool:
    - difficulty acquiring developmental milestones
  - School-aged Child:
    - Difficulty acquiring school skills
    - Losing details can lead to confabulation, which can be viewed by others as lying
  - Adolescent:
    - difficulty keeping up with academic pace
    - Losing details can lead to confabulation, which is often viewed by others as lying

ACEs & Iowa Youth

- **Lack of inhibitory control:**
  - Infant, Toddler, Preschool:
    - frequent severe tantrums, aggression with others
  - School-aged Child:
    - frequently disruptive, fights with peers
  - Adolescent:
    - frequently disruptive, fights with peers
    - impulsivity can threaten health and well-being

Impact of trauma on development and learning across the ages

- **Lack of cognitive flexibility:**
  - Infant, Toddler, Preschool:
    - easily frustrated, difficulty with transitions
  - School-aged Child:
    - organizational difficulty, can look like learning disorder and/or ADHD
  - Adolescent:
    - organizational difficulty, can look like learning disorder and/or ADHD
    - difficulty with tasks of young adulthood requiring rapid interpretation of information, ex: driving, job demands

ACEs & Iowa Youth

- 26.5% ~ 1 in 4 students

Taken from the ACEs 360 Iowa Executive Summary of Iowa ACEs Data 2012-2014
Common chief complaints associated with trauma exposure

- Headaches
- Abdominal pain
- Eating disturbances
  - ex: lack of appetite, over-eating, hoarding
- Sleep disturbances
- Toileting concerns
  - ex: new-onset enuresis, encopresis
- Anxiety, fears, avoidance behaviors
- Behavior concerns, regression in functioning
  - difficulty with self-regulation
  - ex: strong, inappropriate emotions; low tolerance for stress; easily frustrated
  - irritable or aggressive behaviors

Responding to the symptomatic child

- Rule out other causes
- Targeted guidance for families to handle symptoms
  - ex: sleep hygiene tips for sleep disturbance
- Identification of family strengths
- Referral to therapy, community supports
- Medications?
  - often sought, if applicable, typically only used as a crutch until real healing begins
- Ongoing monitoring & encouragement

Resiliency

- Resiliency: adaptive response to serious hardship
  - Requires supportive adult-child relationship
  - Provides opportunities for skill-building
- Internal predispositions + External Factors
- Best to create when young but always able to enhance

Resiliency: Protective Factors

- Factors that can optimize resilience in multiple contexts:
  1. Providing supportive adult-child relationships
  2. Scaffolding learning so the child builds a sense of self-efficacy and control
  3. Helping strengthen adaptive skills and self-regulatory capacities
  4. Using faith and cultural traditions as a foundation for hope and stability

You can only see what you look for

- Universal ACE and resiliency screening – being studied
  - Pros:
    - Brings about awareness, understanding
    - Allows for opportunity to address past traumas if still painful or support ongoing exposures
  - Cons:
    - Need systems in place to support positive responses BEFORE screening implemented
    - No universal tool or recommendations on where/whom to screen
- Practically:
  - Awareness of ACEs on community, national level
  - Cross-sector collaboration
    - ex: screening for food insecurity as part of EA evaluation
  - ex: basic needs survey at our general pediatrics clinic
  - Early identification of developmental delays—1st Five
Further reading and viewing

- “The Adverse Childhood Experiences Study—the largest, most important public health study you never heard of—began in an obesity clinic”
- TED talk by Nadine Burke-Harris, MD
  - https://www.ted.com/speakers/nadine_burke_harris_1
- CDC.gov site on ACEs
- Includes links to ACE papers by subject
- The Film “Paper Tigers- One High School’s Unlikely Success Story”
  - http://leoyfilms.co/paper-tigers/

References

- The Center for Disease Control: www.cdc.gov/violenceprevention/acestudy/index.html
- Iowa ACEs 360: www.iowaaces360.org
- “Adverse Childhood Experiences in Iowa: A New Way of Understanding Lifelong Health: Findings from the 2012 Behavioral Risk Factor Surveillance System”
- Executive Summary of Iowa ACEs Data 2012-2014
- “Beyond ACEs: Building Hope & Resiliency in Iowa”
- Health: Findings from the 2012 Behavioral Risk Factor Surveillance System
- Executive Summary of Iowa ACEs Data 2012-2014
- “Data Report: A HIDDEN CRISIS: Findings on Adverse Childhood Experiences in California” 2014:
- “Beyond ACEs: Building Hope & Resiliency in Iowa”
- AAP: Eco-Bio Developmental Model of Human Health and Disease:
  - http://www.nscdc.org/resources/key-concepts/toxic-stress

Questions?

- Harvard Center for the Developing Child
  - In Brief: The Science of Resilience:
  - In Brief: The Science of Early Childhood Development:
    - http://developingchild.harvard.edu/resources/inbrief-science-of-ecd/
  - Key Concepts: Toxic Stress: developingchild.harvard.edu/resources/key-concepts/toxic-stress

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- Substance Abuse and Mental Health Services Administration: http://www.samhsa.gov/nctic/trauma
- Stevens, JE. “Lincoln High School in Walla Walla, WA, tries new approach to school discipline—suspensions drop 85%” ACEs Too High April 2012:
- AAP Trauma Guide Toolkit: “The Medical Home Approach to Identifying and Responding to Exposure to Trauma”:
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- [Reach out and Read: http://www.reachoutandread.org](http://www.reachoutandread.org)
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