

The Adverse Childhood Experiences Study:  
Effects of Child Maltreatment Now and Later

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Disclosure Statement

Alicia Pekarsky, MD, FAAP, has no financial relationships with any commercial interests.



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Objectives

- ▶ Define child maltreatment
- ▶ Review the scope of the problem and its consequences
  - ▶ Direct and indirect "costs" to society
  - ▶ The Adverse Childhood Experiences (ACE) Study
- ▶ Review prevention efforts
- ▶ Outline interventions that mitigate the effects of these negative experiences



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### Defining Child Maltreatment

- ▶ Definition varies among the different stakeholders
- ▶ The Child Abuse Prevention and Treatment Act (CAPTA) outlines minimum standards for states
  - ▶ "Any recent act or failure to act on the part of a parent or caretaker that results in death, serious physical or emotional harm, sexual abuse or exploitations"
  - ▶ "An act or failure to act that presents an imminent risk of serious harm"
- ▶ The definition applies specifically to parents and caregivers

U.S. Department of Health and Human Services, 2011



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### Forms of Child Maltreatment

- ▶ Physical abuse
- ▶ Sexual abuse
- ▶ Psychological abuse
- ▶ Neglect



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### The Scope of the Problem

- ▶ In 2011, 3.4 million reports were made in the US to CPS
  - ▶ 6.2 million children
  - ▶ 61% of the reports were screened in for investigation
- ▶ 57.6% of the reports came from professionals
- ▶ 18.5% of reports are substantiated/founded

U.S. Department of Health and Human Services, 2012



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**Onondaga County**

- ▶ Approximately 500,000 residents
- ▶ 26% of the population is < 18 years old
  - ▶ 125,000 children
- ▶ In 2011, 5,000 reports were made to CPS on behalf of children living in Onondaga County
  - ▶ 9,000 children
- ▶ 1 out of every 12 children in Onondaga County was named as a suspected victim of child maltreatment to CPS in 2011

New York State Office of Children and Family Services, 2011



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**Estimated Annual *Direct* Costs of Child Maltreatment in the US**

- ▶ Acute medical treatment - \$2.9 billion
- ▶ Mental health care system - \$1.1 billion
- ▶ Child Welfare System - \$29.2 billion
- ▶ Law enforcement - \$34 million

▶ **Total annual direct costs = \$33.3 billion**

Prevent Child Abuse America, 2012



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**Estimated Annual *Indirect* Costs of Child Maltreatment in the US**

- ▶ Special education - \$223 million
- ▶ Mental health and health care - \$4.6 billion\*\*\*
- ▶ Juvenile delinquency - \$8.8 billion
- ▶ Adult criminality - \$55 billion
- ▶ Lost productivity - \$656 million

▶ **Total annual indirect costs = \$69 billion**

Prevent Child Abuse America, 2012



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The Overall "Cost" of Child Maltreatment

- ▶ More than bruises left behind
  - ▶ Depression
  - ▶ Suicide
  - ▶ Eating disorders
  - ▶ Poor health
  - ▶ Anxiety
  - ▶ Anger
  - ▶ Dissociation



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Case A: 12 Year-Old Female Adolescent

- ▶ Discloses abuse by mother's boyfriend to mother and then later to stepmother but no action
- ▶ Five months later sees a new PCP for a WCC
  - ▶ Her grades in school had declined
  - ▶ She was experiencing insomnia/nightmares
  - ▶ She was being psychologically bullied at school
  - ▶ She has started to cut herself
  - ▶ Rest of HEADSFIRST is negative
- ▶ Discloses abuse to PCP on a follow-up visit

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Family/Psychosocial History

- ▶ No history of sexual abuse.
- ▶ Brother has a history of being burned with cigarettes by mom.
- ▶ Mom likely has an undiagnosed/untreated mental health illness.
- ▶ MGM died from a heroin overdose and mom used marijuana and cocaine in the past.
- ▶ Mom has been in relationships with domestic violence and was exposed to family violence as a child.
- ▶ Mom leaves girl and her brother with father and stepmom.



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### Physical Exam

- ▶ 2 cm linear scar on the ventro/lateral aspect of her right wrist (mom cut her with a knife)
- ▶ 2 cm x 1 cm scar on her right elbow (mom cut her with a knife)
- ▶ Three looped marks on the lateral aspect of the right lower thigh extending distally to just below the knee and one looped mark on the dorsal aspect of her right calf ("whipped" with a phone cord by mom)
- ▶ Hyperpigmented macule (16 mm x 12 mm) on the dorsal aspect of right calf with two small hypopigmented circular macules within the hyperpigmented macule (imprint from a cigarette lighter)



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### Assessment

"The patient's overall normal genital exam is consistent with her history of **sexual abuse** by an adult male. She is also a victim of **physical abuse** (looped cord marks and lighter scar on her legs), **psychological bullying** at school and likely **PTSD**. This situation is complicated by the psycho-social/family history which includes mom being 13-years-old when she delivered this patient and subsequently having significant drug/alcohol problems."



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### The Consequences of Child Maltreatment

- ▶ Health and physical effects
- ▶ Intellectual and cognitive development
- ▶ Behavioral, emotional and psychological effects



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### Adverse Childhood Experience (ACE) Study Pyramid



Over the last several decades, it has become clear that certain risk factors for common diseases (smoking, alcohol abuse and sexual promiscuity) are not randomly distributed in the population

The ACE study was designed to address the scientific gaps between risky behaviors and their origins (represented by the arrows)

Examines life from conception to death

Centers for Disease Control and Prevention, 2013




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### ACE Study

- ▶ The largest investigation ever conducted to look at associations between child maltreatment and health later in life.
- ▶ Collaboration between Centers for Disease Control and Kaiser Permanente.
- ▶ Initial phase conducted at a Kaiser Permanente Office in San Diego from 1995-1997.
- ▶ 17,000 participants enrolled when they went for routine health maintenance visits.

Centers for Disease Control and Prevention, 2013




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### ACE Study

- ▶ Participants completed a confidential survey containing questions about history of child maltreatment and family dysfunction.
- ▶ Baseline health status was obtained by report and the results of the participants' physical exams.




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### Definition of an ACE

A potentially traumatic event occurring before the age of 18 that can have negative, lasting effects on health and well being



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### Ten Key Adverse Childhood Experiences

- ▶ **Abuse**
  - ▶ Emotional
  - ▶ Physical
  - ▶ Sexual
- ▶ **Neglect**
  - ▶ Emotional
  - ▶ Physical
- ▶ **Household challenges**
  - ▶ Mother treated violently
  - ▶ Household substance abuse (drugs/alcohol)
  - ▶ Mental illness in household
  - ▶ Parental separation or divorce
  - ▶ Criminal household member

\*All ACE questions refer to the respondent's first 18 years of life



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### ACE Study

- ▶ Patients were followed over time.
- ▶ Investigators used the data to assess the relationship between adverse childhood experiences, health care utilization and causes of death.
- ▶ To date, more than 50 scientific articles have been published using data from this study.



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### ACE Score

► Calculated from the number of "yes" responses to questions about each of the **ten** ACE categories:

- **Three** types of abuse
- **Two** types of neglect
- **Five** types of household dysfunction



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### How Common Are ACEs?

► What percentage of individuals have experienced

- 0 ACEs?
- 1 ACE?
- 2, 3, 4 or more ACEs?



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### How Common are ACEs?

ACE Study

- 0 36%
- ONE 26%
- TWO 16%
- THREE 9.5%
- FOUR OR MORE 12.5%



Centers for Disease Control and Prevention, 2016



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### What Do These Numbers Mean?

- ▶ ACEs are common.
- ▶ Each of us is likely to encounter several individuals with high ACE scores both professionally and personally every day.
  - ▶ These are our "difficult" patients, clients, colleagues, family members, friends, etc.



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### How Many **Known** ACEs Has Case A Had by the Age of 12?

- ▶ Abuse
  - ▶ Emotional
  - ▶ Physical
- ▶ Sexual
- ▶ Neglect
  - ▶ Emotional
  - ▶ Physical
- ▶ Household challenges
  - ▶ Mother treated violently
  - ▶ Household substance abuse (drugs/alcohol)
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  - ▶ Criminal household member



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### Case A ACEs

- ▶ Physical abuse by mom
- ▶ Sexual abuse by mom's boyfriend
- ▶ Exposed to domestic violence between mom and her boyfriends
- ▶ Mom used marijuana and cocaine
- ▶ Mom likely has an undiagnosed mental health illness
- ▶ Parents are separated

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### ACE Study Findings

As the number of ACEs increases, an individual's risk for the following health problems increases

▶ Alcoholism and alcohol abuse	▶ Liver disease
▶ Autoimmune disease	▶ Obesity
▶ Chronic obstructive pulmonary disease	▶ Risk for intimate partner violence
▶ Depression	▶ Multiple sexual partners & STIs
▶ Fetal death	▶ Smoking
▶ Illicit drug use	▶ Suicide attempts
▶ Ischemic heart disease	▶ Unintended pregnancies

**Leading Causes of Death in the US**

Centers for Disease Control and Prevention, 2013




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### And There's More...

▶ As the number of ACEs increase, the risk for the following additional problems increase:

- ▶ Sleep disturbances
- ▶ Poor academic achievement
- ▶ Poor work performance
- ▶ Financial stress

Centers for Disease Control and Prevention, 2013




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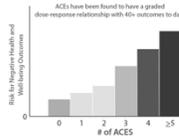
### ACEs can have lasting effects on ...

**Health** (obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones)

**Behaviors** (smoking, alcoholism, drug use)

**Life Potential** (graduation rates, academic achievement, lost time from work)

ACEs have been found to have a graded dose response relationship with 40+ outcomes to date.



\*The pattern holds for the 40+ outcomes, but the exact risk varies depending on the outcome.

A dose related response describes the change in an outcome (e.g. alcoholism) associated with differing levels of exposure (or doses) to a stressor (e.g. ACEs).

That is, as the number of ACEs increases, the risk of a given negative outcome (e.g. alcoholism) also increases.

Centers for Disease Control and Prevention, 2013




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### Exposure to Five or More ACEs is a **BIG** Problem

- ▶ Compared to Individuals who have 0 ACEs, those with 5 or more ACEs are **10-fold more likely** to report:
  - ▶ Illicit drug use, addiction to illicit drugs and parenteral drug use
  - ▶ Alcoholism
  - ▶ Depression
  - ▶ Suicide attempt

Felitti, et al., 1998



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### Exposure to Six or More ACEs

- ▶ Those individuals have on average a 20-year reduction in their lifespan.
  - ▶ Average life expectancy of a woman in the US is 81 years.
  - ▶ Average life expectancy of a man in the US is 76 years.
- ▶ Case A has already experienced 6 ACEs in the first 12 years of her life.
  - ▶ She has 10x the risk of drug abuse, alcoholism and depression.
  - ▶ Her life expectancy is now predicted to be 61 years or less.

Price, 2013



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### Back to the Pyramid



Centers for Disease Control and Prevention, 2013



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### Investigating the Scientific Gaps

- ▶ Toxic stress, including child maltreatment, can have a variety of negative effects on the brain.
  
- ▶ Individuals who were maltreated may have:
  - ▶ Reduced volume in several areas of the brain
  - ▶ Abnormal cortisol levels
  - ▶ Decreased electrical activity
  - ▶ Direct structural damage to the brain (in cases of abusive head trauma)
  - ▶ Tearing of nerve cells and blood vessels



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### Investigating the Scientific Gaps

- ▶ Child maltreatment can also impact a child's behavioral, social and emotional functioning
  - ▶ Persistent fear response
  - ▶ Hyperarousal
  - ▶ Increased internalizing symptoms
    - ▶ Withdrawal, somatic complaints, depression/anxiety
  - ▶ Diminished executive functioning
  - ▶ Delayed developmental milestones
  - ▶ Weakened response to positive feedback
  - ▶ Complicated social interactions



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### Prevention

- ▶ Primary
  - ▶ Prevention of child maltreatment
- ▶ Secondary
  - ▶ Detecting early signs/symptoms of child maltreatment
  - ▶ Prevent it from continuing
- ▶ Tertiary
  - ▶ Treatment to reduce additional complications

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**Preventing ACEs**

**What *can* Be Done About ACEs?**

These wide-ranging health and social consequences underscore the importance of preventing ACEs before they happen. **Safe, stable, and nurturing relationships and environments (SSEs)** can have a positive impact on a broad range of health problems and on the development of skills that will help children reach their full potential. Strategies that address the needs of children and their families include:

Industry-based training programs can help families by strengthening relationships between parents, but training should include both parents and children to support positive home environments.

Home visiting to pregnant women and families with newborns

Parenting training programs

Intimate partner violence prevention

Social support for parents

Parent support programs for maternal and perinatal loss and bereavement

Mental illness and substance abuse treatment

ABC High-quality child care

Sufficient income support for lower income families

Centers for Disease Control and Prevention, 2016




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**Prevention Efforts Should Target Young Children**

► Six protective factors:

- Nurturing and attachment
- Knowledge of parenting and of child development
- Parental resilience
- Social connections
- Concrete supports for parents
- Social and emotional competence for children

CDC, 2016




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**Evidence-Based Programs**

► Parent-Child Interaction Therapy (PCIT)

- Parents learn specific skills to
  - Build nurturing relationships with their children
  - Increase their children's desirable behavior and decrease negative behavior
- Coaches work directly with parent-child/children pairs to help with these skills.

Parent Child Interaction Therapy, 2016




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### Onondaga County NFP

Healthy Families through Onondaga County



UPSTATE

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### Promising Programs

- ▶ No evidence yet of changing child maltreatment outcomes, but do demonstrate improvements in parenting behavior and child behavior problems:
  - ▶ Early Head Start
  - ▶ Incredible Years
  - ▶ Strengthening Families for Parents and Youth
  - ▶ Hospital based Abusive Head Trauma Prevention Programs

UPSTATE

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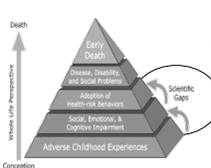
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### But What About Case A?

▶ After children have endured ACEs (**tertiary prevention**)



Centers for Disease Control and Prevention, 2013

UPSTATE

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### Plan

- ▶ Colposcope used/digital photos obtained.
- ▶ STI testing: OP culture for GC, vaginal NAAT for GC/CT, anal cultures for GC/CT and blood work for HIV, RPR, Hep B/C as well as Bhcg.
- ▶ I recommend counseling specific to this issue. An advocate scheduled an intake appointment for dad and stepmom at McMahon/Ryan CAC.
- ▶ LMSW called a report to CP§ (SCR) which was accepted.
- ▶ No unsupervised contact with the suspected perpetrators.
- ▶ Follow up with PCP for routine medical care and with the CARE Program for concerns related to abuse.




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### Therapeutic Approaches

- ▶ Exposure therapy
  - ▶ Works best when the abuse resulted in a specific fear
- ▶ Cognitive behavioral therapy (CBT)
  - ▶ Helps uncover the automatic thoughts that cause certain behaviors
- ▶ Eye movement desensitization and reprocessing therapy (EMDR)
  - ▶ Uses subtle eye movements to help "rewire" the brain and change the way the survivor processes the abuse




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### What Will DSS Do for Case A and Her Family?

- ▶ Contact DSS in the other state.
- ▶ Their unit will investigate with our county's unit.
  - ▶ Interview alleged perpetrators
  - ▶ Speak with collaterals
  - ▶ Contact DSS to try to locate mom
    - ▶ Young brother living with mom should be evaluated
- ▶ Work with the County Attorney's office to petition the court for the children to be removed permanently from mom.
- ▶ Provide services for dad and stepmom.




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### The First Couple of Weeks After Her Disclosure

- ▶ CPS interviewed both her and her brother.
  - ▶ She disclosed physical and emotional abuse by mom and sexual abuse by mom's last boyfriend.
  - ▶ Her brother disclosed physical and emotional abuse.
- ▶ A CPS supervisor contacted CPS where mom now lives.
  - ▶ Mom and young sibling living with her hadn't been located yet.
- ▶ CPS working with the County Attorney's Office to file a petition to permanently place her and her brother with their dad and stepmom.



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### More Follow-Up

- ▶ Her lab tests for STIs were negative.
- ▶ Dad and stepmom had an intake appointment for therapy the following week.
- ▶ She and her brother started counseling.



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### Supporting Brain Development of Traumatized Children

- ▶ Maximize the child's sense of safety.
- ▶ Organize tasks and set priorities.
- ▶ Adopt healthy lifestyles and allow time for adequate sleep.
- ▶ Assist the children in reducing overwhelming emotion.
- ▶ Provide support and guidance to the child's family and caregivers.
- ▶ Address the impact of trauma and subsequent changes in the child's behavior, development and relationships.

Child Welfare Information Gateway, 2011



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Recovery

- ▶ Research indicates that the 2 most important predictors of recovery are:
  - ▶ Having at least 1 supportive caregiver
  - ▶ Positive relationship between a therapist and client



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What Happens to People When ACEs Aren't Addressed?



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Case B

- ▶ 6 year-old male child
- ▶ Admitted to the hospital after he presented with an altered level of consciousness.
- ▶ History offered by mom was that his sister threw a plastic truck at his head.
- ▶ His PE was normal *except for altered mental status and a cast on his left arm.*
- ▶ Labs/Imaging normal *except for his urine drug screen.*
  - ▶ Positive for tricyclic anti-depressants and benzodiazepines



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### Trauma Surgery Team Contacted Our Team

- ▶ Our team recognized his name.
- ▶ I had evaluated this patient and his twin sister when they were 6 weeks old because she had a fracture of her arm.
  - ▶ Mom provided a history that she tripped over a toy while carrying the baby.
  - ▶ Mom stated that her 3 year-old daughter had thrown the toy at her.
- ▶ I also evaluated these twins when they were 4 months old when the boy presented with petechiae and bruising on his face and trunk.
- ▶ I gave each of the twins the medical diagnosis of "victim of child abuse" at that time.




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### In the Past Six Years

- ▶ The mother gave birth to 3 more children.
  - ▶ She now has 6 children aged 9 and under.
- ▶ Family has moved 5 times.
- ▶ Mom has had 3 other intimate relationships.
  - ▶ Each relationship involved significant domestic violence.




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### In the Past Six Years

- ▶ Case B has been to the Pediatric ED five other times
  - ▶ Poor appetite, normal PE, discharged to home.
  - ▶ Head trauma while playing with his brother, history of bruise on his forehead. Discharged to home.
  - ▶ Scabies.
  - ▶ Headache, no specific diagnosis was made.
  - ▶ Fell off monkey bars, sustained a supracondylar fracture of his humerus.
    - ▶ He was not brought to his follow up orthopedic appointment 1 week later.
    - ▶ Office called mom twice to reschedule, but she never called back.




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### The Most Recent Hospitalization

- ▶ Initial PE was significant for him "oscillating between agitated and lethargic" and a 0.5 cm area of redness on his forehead.
- ▶ Cast still present on his arm from over two months ago.
- ▶ He was given a dose of an anti-epileptic.
- ▶ MRI of his brain and basic bloodwork were normal.
- ▶ Cast removed by orthopedics team.
  - ▶ He had developed a contracture at his elbow.



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### Medical Neglect

- ▶ CPS was called given the concern about medical neglect.
  - ▶ Children repeatedly exposed to domestic violence.
  - ▶ Lack of follow up with orthopedics that led to contracture.
  - ▶ Ingestion of psychotropic medications that led to altered mental status.
    - ▶ Older sister told grandmother that she saw pills on the couch the same day that he was hospitalized.
- ▶ Mom voluntarily placed her children with their grandmother.
- ▶ Case B was discharged from the hospital to his grandmother the following day.



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### Our Team Follow-Up

- ▶ Grandmother brought the patient to our CAC and provided additional psychosocial/family history.
  - ▶ Mom's first child was the product of a rape.
  - ▶ Mom had post-partum depression after each of her pregnancies
  - ▶ A television fell on his twin sister several months ago.
  - ▶ Siblings have also had numerous visits to the ED for additional injuries.
  - ▶ His 18-month-old siblings were pushed in a stroller across a parking lot by mom's current boyfriend. He then assaulted mom.



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Case B ACEs

- ▶ Physical abuse
- ▶ Medical neglect
- ▶ Maternal history of mental health illness
- ▶ Exposure to domestic violence
- ▶ Absence of a parent

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What do (his) ACEs have in common?



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ACEs Occur Within Families/Homes



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Looking at the Mother's ACEs

- ▶ Sexual abuse
- ▶ Absence of one parent
- ▶ Likely others that we don't know about



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### Is My Patient Sample Biased?

- ▶ Unfortunately not
  - ▶ Similar prevalence of ACEs in the general pediatric population
- ▶ ACE Study participants were from middle to upper middle income families
  - ▶ 10% of these individuals had 5+ ACEs




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### What Could Have Been Done for the Mother Many Years Ago?

#### What *can* Be Done About ACEs?

These wide-ranging health and social consequences underscore the importance of preventing ACEs before they happen. Safe, stable, and nurturing relationships and environments (SSEs) can have a positive impact on a broad range of health problems and on the development of skills that will help children reach their full potential. Strategies that address the needs of children and their families include:



Centers for Disease Control and Prevention, 2016




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### Summary

- ▶ ACEs are common and occur within families.
- ▶ ACEs have a graded, dose response relationship with health outcomes, high risk behaviors and life potential.
- ▶ Annual "cost" of child maltreatment in the US is \$100 billion.
- ▶ Public health teams have developed programs to prevent ACEs.
- ▶ Scientists are investigating the links between ACEs and impairment/adoption of high risk behaviors.

Child maltreatment is this country's # 1 health problem.




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