The Adverse Childhood Experiences (ACE) Study
Learning Objectives

Participants of this training will:
• Recognize and identify adverse childhood events
• Describe three results of the ACE Study
• Explain three events the Adverse Childhood Events can predict
• Define how obesity in adults relates to Adverse Childhood Events
• Explain how Sexually Transmitted Infections relate to Adverse Childhood Events
The Adverse Childhood Experiences (ACE) Study

The largest study of its kind ever done to examine the health and social effects of adverse childhood experiences over the lifespan (18,000 participants)

The ACE study is ongoing collaborative research between the Centers for Disease Control and Prevention in Atlanta, GA and Kaiser Permanente in San Diego, CA
Background

The Co-principal Investigators of the Study are Robert F. Anda, MD, MS with the CDC; and Vincent J. Felitti, MD, with Kaiser Permanente

Over 17,000 Kaiser patients participating in routine health screening volunteered to participate in The Study

Data resulting from their participation continues to be analyzed; it reveals staggering proof of the health, social, and economic risks that result from childhood trauma
What do we mean by Adverse Childhood Experiences?

Experiences that represent medical and social problems of national importance

- Childhood abuse and neglect
- Growing up with domestic violence
- Substance use or mental illness in the home
- Parental loss
- Crime
ACE Study Design

Survey Wave 1 - complete
71% response (9,508/13,454)
n=15,000 | 71% response
All medical evaluations abstracted

vs.

Present Health Status

Survey Wave II
n=15,000
All medical evaluations abstracted

- Mortality
- National Death Index
- Morbidity
- Hospital Discharge
- Outpatient Visits
- Emergency Room Visits
- Pharmacy Utilization

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The Adverse Childhood Experiences (ACE) Study

Summary of Findings:

- Adverse Childhood Experiences (ACEs) are very common
- ACES are strong predictors of later health risks and disease
- This combination makes ACEs the leading determinant of the health and social well-being of our nation

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Early Death Disease, Disability, and Social Problems Adoption of Health-risk Behaviors Social, Emotional, and Cognitive Impairment Disrupted Neurodevelopment Adverse Childhood Experiences

Mechanisms by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan
## Categories of Adverse Childhood Experiences

<table>
<thead>
<tr>
<th>Category</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abuse, by Category</strong></td>
<td></td>
</tr>
<tr>
<td>Psychological (by parents)</td>
<td>11%</td>
</tr>
<tr>
<td>Physical (by parents)</td>
<td>11%</td>
</tr>
<tr>
<td>Sexual (anyone)</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Household Dysfunction, by Category</strong></td>
<td></td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>26%</td>
</tr>
<tr>
<td>Mental Illness</td>
<td>19%</td>
</tr>
<tr>
<td>Mother Treated Violently</td>
<td>13%</td>
</tr>
<tr>
<td>Imprisoned Household Member</td>
<td>3%</td>
</tr>
</tbody>
</table>

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Abuse

• Emotional Abuse
   Did a parent or other adult in the household often or very 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?

• Physical Abuse
   Did a parent or other adult in the household often or very 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?

• Sexual Abuse
   Did an adult or person at least 5 years older than you ever... Touch or fondle you or have you touch their body in a sexual way? or Attempt or actually have oral, anal, or vaginal intercourse with you?
Neglect

- **Emotional Neglect**
  Did you often or very 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?

- **Physical Neglect**
  Did you often or very 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?
Household Dysfunction

- **Mother Treated Violently**
  Was your mother or stepmother:
  Often or very often pushed, grabbed, slapped, or had something thrown at her? or Sometimes, often, or very 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?

- **Household Substance Abuse**
  Did you live with anyone who was a problem drinker or alcoholic, or who used street drugs?

- **Household Mental Illness**
  Was a household member depressed or mentally ill, or did a household member attempt suicide?

- **Parental Separation or Divorce**
  Was a biological parent ever lost to you through divorce, abandonment, or other reason?

- **Incarcerated Household Member**
  Did a household member go to prison?
## Adverse Childhood Experiences Score

<table>
<thead>
<tr>
<th>ACE score</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>48%</td>
</tr>
<tr>
<td>1</td>
<td>25%</td>
</tr>
<tr>
<td>2</td>
<td>13%</td>
</tr>
<tr>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td>4 or more</td>
<td>7%</td>
</tr>
</tbody>
</table>
Healthy Brain vs Abused Brain

This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.

This PET scan of the brain of a Romanian orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.
Health risks Associated with High ACE Scores

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

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ACE and Top Ten Health Risks in U.S.

- Smoking
- Severe Obesity
- Physical Inactivity
- Depression
- Suicide Attempt
- Alcoholism
- Illicit Drug Use
- Injected Drug Use
- 50+ Sexual Partners
- History of STDs
ACE Scores and Ischemic Heart Disease

The ACE Score and the Prevalence Ischemic Heart Disease

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ACE Scores and Smoking Rates

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ACE Scores, Smoking and COPD

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ACE and Depression

• Is depression genetic
• Is depression is due to a chemical imbalance
• Might depression be a normal response to abnormal life experiences
ACE and The Weight Program

- The Weight Program - exploring reasons underlying the high prevalence of patients inexplicably fleeing their own success
- Recognizing that weight loss is often sexually or physically threatening
- More public health problems like obesity were also unconscious, or occasionally conscious, compensatory behaviors
- Put in place as solutions to problems dating back to the earliest years but hidden by time, by shame, secrecy, and social taboos
ACE Score and Chronic Depression

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ACE Scores and Suicide Attempts

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ACE Score, Sexual Partners, STIs, and Unplanned Pregnancy

Felitti and Anda
ACE Score, Sexual Partners, Marriage History and Unplanned Pregnancy

<table>
<thead>
<tr>
<th>ACE Score</th>
<th>Multiple Sexual Partners*</th>
<th>3 or More Marriages*</th>
<th>Had Unwanted Pregnancy* (abortion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>1</td>
<td>1.6</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>2</td>
<td>1.9</td>
<td>1.6</td>
<td>1.7</td>
</tr>
<tr>
<td>3</td>
<td>3.4</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>4</td>
<td>4.4</td>
<td>2.9</td>
<td>2.1</td>
</tr>
<tr>
<td>≥5</td>
<td>5.8</td>
<td>3.8</td>
<td>2.9</td>
</tr>
</tbody>
</table>

*Adjusted Odds Ratio
ACE Score and Sexual Partners

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ACE Score and STIs

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ACE Score and Occurrence of Rape
### ACE Score, Intimate Partner Violence, and Rape

<table>
<thead>
<tr>
<th>ACE Score</th>
<th>Intimate Partner Violence*</th>
<th>Being Raped*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>1</td>
<td>1.9</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>2.1</td>
<td>2.8</td>
</tr>
<tr>
<td>3</td>
<td>2.7</td>
<td>4.2</td>
</tr>
<tr>
<td>4</td>
<td>4.5</td>
<td>5.3</td>
</tr>
<tr>
<td>≥5</td>
<td>5.1</td>
<td>8.9</td>
</tr>
</tbody>
</table>

*Adjusted Odds Ratio
ACE Score and Addiction

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## ACE Score, Alcoholism, Drug Abuse, and Suicide

<table>
<thead>
<tr>
<th>ACE Score</th>
<th>Alcoholism*</th>
<th>Parenteral Drug Abuse*</th>
<th>Attempted Suicide*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>1</td>
<td>1.9</td>
<td>1.0</td>
<td>1.8</td>
</tr>
<tr>
<td>2</td>
<td>2.1</td>
<td>2.5</td>
<td>4.0</td>
</tr>
<tr>
<td>3</td>
<td>2.7</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>4</td>
<td>4.5</td>
<td>3.8</td>
<td>7.2</td>
</tr>
<tr>
<td>≥5</td>
<td>5.1</td>
<td>9.2</td>
<td>16.8</td>
</tr>
</tbody>
</table>

*Adjusted Odds Ratio
ACE Score and Adult Alcoholism

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ACE Score and Intravenous Drug Use

N = 8,022  p<0.001
ACE Score and Hallucinations

ACE Score

*Adjusted for age, sex, race, and education.

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Estimates of the Population Attributable Risk* of ACEs for Selected Outcomes in Women

<table>
<thead>
<tr>
<th>Drug Abuse</th>
<th>PAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholism</td>
<td>65%</td>
</tr>
<tr>
<td>Drug abuse</td>
<td>50%</td>
</tr>
<tr>
<td>IV drug use</td>
<td>78%</td>
</tr>
</tbody>
</table>

*That portion of a condition attributable to specific risk factors
### Estimates of the Population Attributable Risk* of ACEs for Selected Outcomes in Women

<table>
<thead>
<tr>
<th>Outcome</th>
<th>PAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression and Suicide</td>
<td>48%</td>
</tr>
<tr>
<td>Crime Victim</td>
<td></td>
</tr>
<tr>
<td>Sexual Assault</td>
<td>62%</td>
</tr>
<tr>
<td>Domestic Violence</td>
<td>52%</td>
</tr>
</tbody>
</table>

*That portion of a condition attributable to specific risk factors.*
Estimates of the Population Attributable Risk* of ACEs for Selected Outcomes in Women

**Mental Health**

<table>
<thead>
<tr>
<th>Condition</th>
<th>PAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current depression</td>
<td>54%</td>
</tr>
<tr>
<td>Chronic depression</td>
<td>41%</td>
</tr>
<tr>
<td>Suicide attempt</td>
<td>58%</td>
</tr>
</tbody>
</table>

*That portion of a condition attributable to specific risk factors*
ACE and Serious Job Problems

![Bar chart showing the relationship between ACE Score and % with Job Problems.](chart.png)
Finding Your ACE Score

Let’s Look

At Our Handout
Bridging The Chasm

Child health as it stands today

- Breakthroughs in molecular genetics and biology:
  - Mental illness
  - Substance abuse
  - Violence
  - Improved recognition and treatment of:
    - Mental illness
    - Substance abuse
    - Domestic violence
    - Child abuse

Mass education about child development and parenting:
- Media
- Schools

Documenting the societal burden of child health as it stands today

New directions in prevention and treatment

Child health as it could be

Felitti and Anda
Bridging The Chasm

Involving those who don’t yet realize that they are working on issues that represent the “downstream” wreckage of child abuse and neglect—and other adverse childhood experiences—in the effort to bridge the chasm.

Routine screening for trauma is needed

Child health as it stands today

Child health as it could be

Felitti and Anda
Summary

Adverse childhood experiences are the most basic cause of health risk behaviors, morbidity, disability, mortality, and healthcare costs.

The findings from the ACE study provide a remarkable insight into how we become what we are as individuals and as a nation.

They are important medically, socially, and economically. Indeed, they have given us reason to reconsider the very structure of medical, public health, and social services in America.
Summary

The influence of childhood experience, including often-unrecognized traumatic events, is as powerful as Freud and his colleagues originally described it to be.

In spite of these findings, the bio-psychosocial model and the bio-medical model of psychiatry remain at odds rather than taking advantage of the new discoveries.
What Can We Do Now

- Routinely seek history of adverse childhood experiences from all patients

- Acknowledge their reality by asking, “How has this affected you later in life”

- Arrange a return appointment to discuss possibilities for helping them
References


Anda RF, Felitti VJ. The Relationship of Adverse Childhood Experiences to Adult Health Status. Retrieved from https://www.childwelfare.gov/calendar/cbconference/fourteenth/presentations/ahdc/index.cfm#toc


References Cont.


Hillis SD, Anda RF, Felitti VJ, Marchbanks PA. Adverse childhood experiences and sexual risk behaviors in women: a retrospective cohort study. Family Planning Perspectives. 2001;33:206-211.