

# Adverse Childhood Experiences: A Driver of the Opioid Epidemic

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School of Public Health

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What would it take...



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**60 MINUTES**

**TREATING CHILDHOOD TRAUMA**

60 Minutes explores not how trauma plays a role in childhood development and what new methods are being used to help kids who have experienced it.

**WATCH NOW**

**RECENT SEGMENTS**

**THE DUMPY**  
Dumpy, the world's largest dog, is making a name for himself in the world of social media.

**THE GREAT PEAK**  
The world's largest mountain range is being studied for its potential to help us understand the future of our planet.



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### 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>




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### 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 be depressed
- 6x 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

Source: Adverse Childhood Experiences (ACE) Study. Information available at <http://www.cdc.gov/ace/index.htm>




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### 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?
  2. Did a parent or other adult in the household **often** ... Push, grab, slap, or throw something at you? or **Ever** hit you so hard that you had marks or were injured?
  3. 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 Try to or actually have oral, anal, or vaginal sex with you?




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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?

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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?

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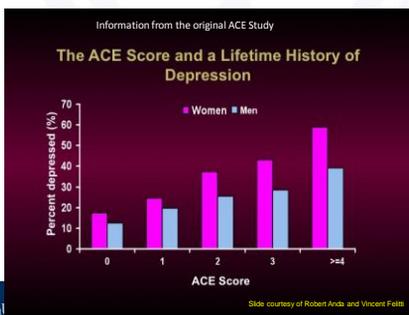
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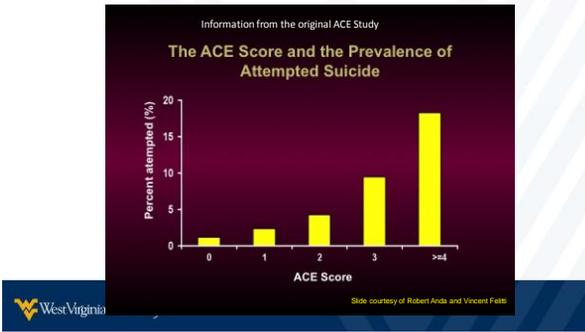
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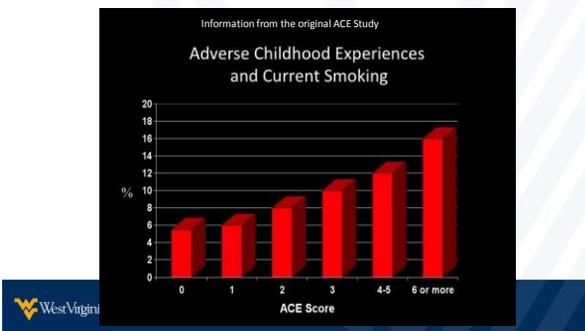
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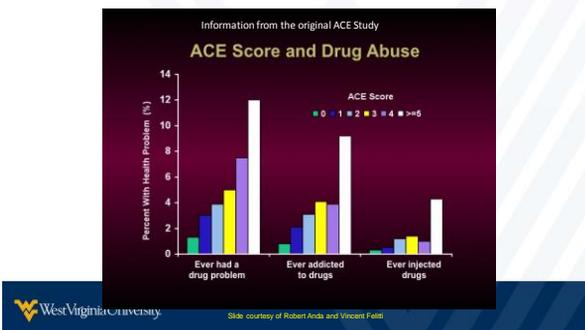
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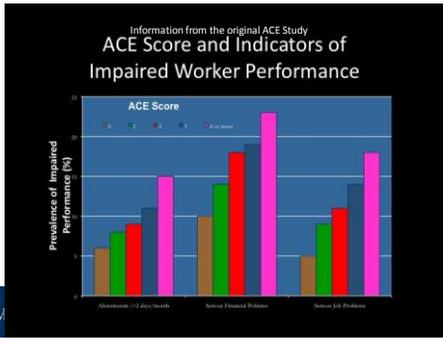
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**Economic Burden**

- 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.

• Finkelhor, D., Browne, K. S., & Browne, K. S. (1992). The economic burden of child maltreatment on the United States and implications for prevention. *Child Abuse and Neglect*, 16(2), 156-165. doi:10.1016/0145-2134(92)90006-6.  
 • Group, T. P. (2014). *An Assessment of the Economic Cost of Child Maltreatment*. Waco, TX: The Perinatal Group.

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**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.

Clin Neurosci. 2006;Dec: Traumatic stress: effects on the brain. [Douglas Bremner](#)

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FACING ADDICTION IN AMERICA

The Surgeon General's Report on Alcohol, Drugs, and Health

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




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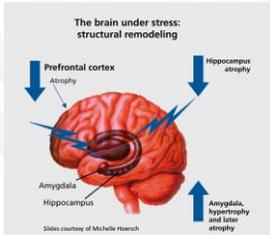
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Traumatic Stress Impact on Brain




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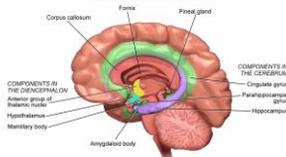
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Neurophysiology of Trauma

The Limbic System



Fight – Flight – Freeze

- Involved in:
- Learning
  - Memory
  - Reward
  - Reinforcement

- Regulates:
- Hormones
  - Mood
  - Heartbeat
  - Sexual Behavior

Slides courtesy of Michelle Hoersch




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# 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.

Slides courtesy of Michelle Hoersuch




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# 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 suicidal attempts, were more likely to be obese, to have dropped out of school, be divorced and to have diabetes, cancer and heart disease. ACE ≥ 5: 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 2/3 reporting having witnessed violence in childhood.

Fabrizi, V.A. (2005) The origins of addiction: Evidence from the Adverse Childhood Experiences study. *Focus: the American Journal of Psychiatry*, 162, 547-550.

Quinn, K., Boone, L., Schwab, J.D., Mahoney-Gibson, P., McGhee, S. St., Behar, N., Geller, L.B. and Kahn, M.R. (2016) The relationship of childhood trauma and adult prescription pain reliever misuse and injection drug use. *Drug and Alcohol Dependence*, 165, 190-198.

Sansone, R.A., Wilshire, P., and Westerman, M.W. (2009) The prevalence of childhood trauma among those seeking buprenorphine treatment. *Journal of Addiction Research*, 28(1), 64-67.




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# 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.




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### 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.

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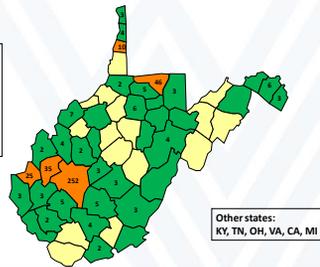
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### Results from the KCHD Informal Survey

Respondents: N= 506
Female 76%
Male 24%
White 95%
African American 1.6%
Native American 1.4%
Asian/PI 1.2%



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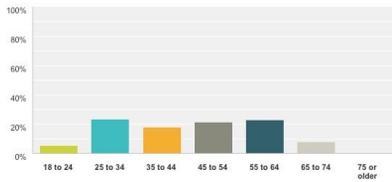
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### What is your age?

Answered: 502 Skipped: 4



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Summary statistics from ACE

Number of Adverse Childhood Experiences (ACE Score)	Women	Men	Total	KCHD
0	34.5	38.0	36.1	27.8
1	24.5	27.9	26.0	18.5
2	15.5	16.4	15.9	12.4
3	10.3	8.6	9.5	13.1
4 or more	15.2	9.2	12.5	28.2

- 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




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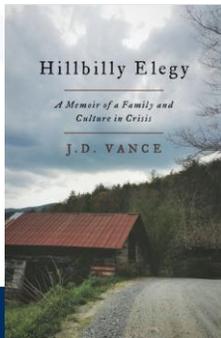
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ACE Category*	Women (n = 3,367)	Men (n = 1,371)	Total (n = 4,738)	HRC N = 139
<b>Abuse</b>				
Emotional Abuse	13.1	7.6	10.6	34
Physical Abuse	27.0	28.8	28.3	30
Sexual Abuse	24.7	16.0	20.7	20
<b>Neglect</b>				
Emotional Neglect†	16.7	12.4	14.8	36
Physical Neglect†	9.2	10.7	9.9	19
<b>Household Dysfunction</b>				
Mother Treated Violently	13.7	11.5	12.7	26
Household Substance Abuse	29.5	23.8	26.9	53
Household Mental Illness	23.3	14.8	19.4	31
Parental Separation or Divorce	24.5	21.8	23.3	39
Homelessness	5.2	4.1	4.7	28

Comparison between the original ACE study and our survey results

<https://www.cdc.gov/violenceprevention/acesstudy/index.html>




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Summary statistics from ACE

Number of Adverse Childhood Experiences (ACE Score)	Women	Men	Total	HRC N=199
0	34.5	38.0	36.1	33.7
1	24.5	27.9	26.0	12.6
2	15.5	16.4	15.9	6.5
3	10.3	8.6	9.5	8.0
4 or more	15.2	9.2	12.5	<b>39.2</b>

- 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.




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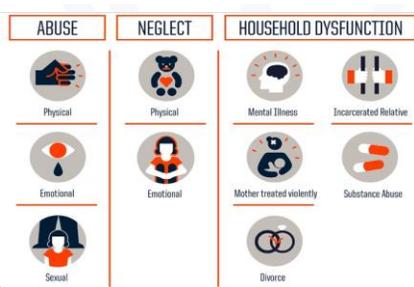
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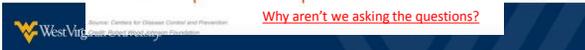
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Why aren't we asking the questions?




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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

• Olin D, Etkovitch J, Henderson C, Kitzman H, Powers L, Clair R, Sidora K, Morris K, Pettitt L, Luckey D. (2007)  
 • Olin DL, Henderson CP Jr., Chamberlin R, Talbot BA. (2008)  
 • Kitzman H, Olin DL, Henderson CP Jr., Horst C, Gay R, Talbot BA. (2007)

Slides courtesy of Michelle Hoersch




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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

Prinz, R.J., Sanders, M.R., Shapiro, C.J., Whitaker, D.J. & Lutzker, J.R. (2009)

Slides courtesy of Michelle Hoensch




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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 of 850 days

Chaffin, M., Shvach, J.F., Funderburk, B., Valle, L.A., Brantley, E.K., Baskin-Hesse, T., Jackson, S., Longmaid, J., & Boney, R.L. (2004)

Slides courtesy of Michelle Hoensch




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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




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## 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.



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## Questions:

Contact: Michael.Brumage@wv.gov



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