

# The Adverse Childhood Experiences Study What does it tell us? Now what?

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McMaster University  
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Fellow Child Trauma Academy

@drjeanforkids

Best Start Conference February 9 2017

# The ACEs Study



- Vincent J. Felitti, MD and Robert J. Anda, MD, MS
- Asked 26,000 adults at Kaiser, San Diego's Dept of Preventive Medicine.
- 17,421 participated in the study.
- Participants completed a questionnaire.

## ACEs Criteria...Before the age of 18

1. Recurrent physical abuse
2. Recurrent emotional abuse
3. Contact sexual abuse
4. An alcohol or drug abuser in the household
5. An incarcerated household member
6. Someone who was chronically depressed, institutionalized, or suicidal
7. Mother treated violently
8. One or no parents, or parents divorced.
9. Emotional or physical neglect

## The three types of ACEs include

### ABUSE



Physical



Emotional



Sexual

### NEGLECT



Physical

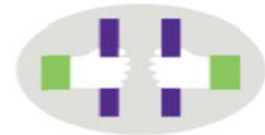


Emotional

### HOUSEHOLD DYSFUNCTION



Mental Illness



Incarcerated Relative



Mother treated violently



Substance Abuse



Divorce

Types of Adverse Childhood Experiences

Image courtesy of the Robert Wood Johnson Foundation

# Adverse Childhood Experiences Are Common

## Household dysfunction:

Substance abuse	27%
Parental sep/divorce	23%
Mental illness	17%
Battered mother	13%
Criminal behavior	6%

## Abuse:

Psychological	11%
Physical	28%
Sexual	21%

## Neglect:

Emotional	15%
Physical	10%

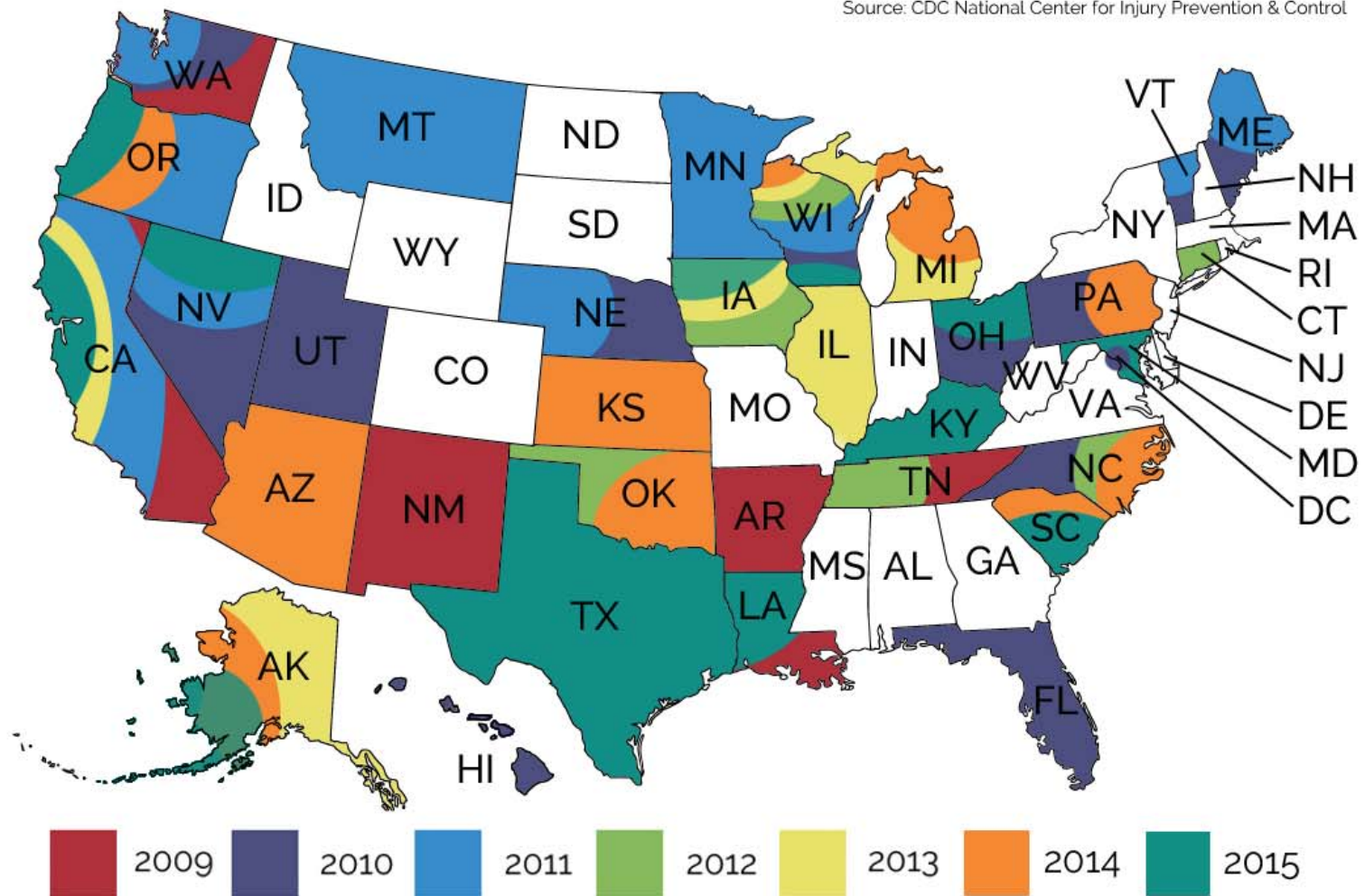
## **Adverse Childhood Experiences Score Complex Trauma--Trauma “Dose”**

**Number of individual types of adverse  
childhood experiences were summed...**

<b><u>ACE score</u></b>	<b><u>Prevalence</u></b>
<b>0</b>	<b>33%</b>
<b>1</b>	<b>26%</b>
<b>2</b>	<b>16%</b>
<b>3</b>	<b>10%</b>
<b>4 or more</b>	<b>16%</b>

# States Collecting ACEs Data 2009 - 2015

Source: CDC National Center for Injury Prevention & Control



# PREVALENCE OF ACES IN ADULTS

- ACE Study<sup>1</sup>
  - 63.5% of adults had at least one ACE category
  - 12% had four or more
- Behavioral Risk Factor Surveillance Survey (BRFSS) in 10 states<sup>2</sup>
  - 59.4% reported at least one early life adversity
  - 15.3% had four or more
- California BRFSS data from 2008, 2009, 2011, and 2013<sup>3</sup>
  - 61.7% of surveyed adults reported experiencing at least one ACE
  - 16.7% reported having experienced four or more ACEs

1. Felitti et al., 1998

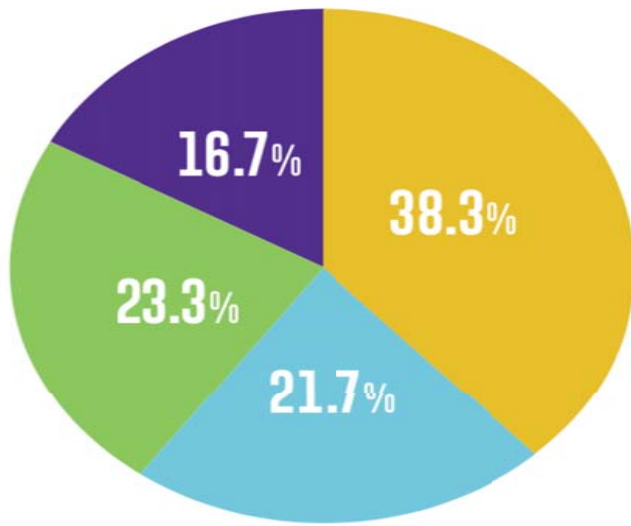
2. Gilbert LK, Breiding MJ, Merrick MT, et al. Childhood adversity and adult chronic disease: an update from ten states and the District of Columbia, 2010. *Am J Prev Med* 2015;48(3):345–9.

3. Center for Youth Wellness in partnership with Public Health Institute. 2014. Available at: <http://www.centerforyouthwellness.org>



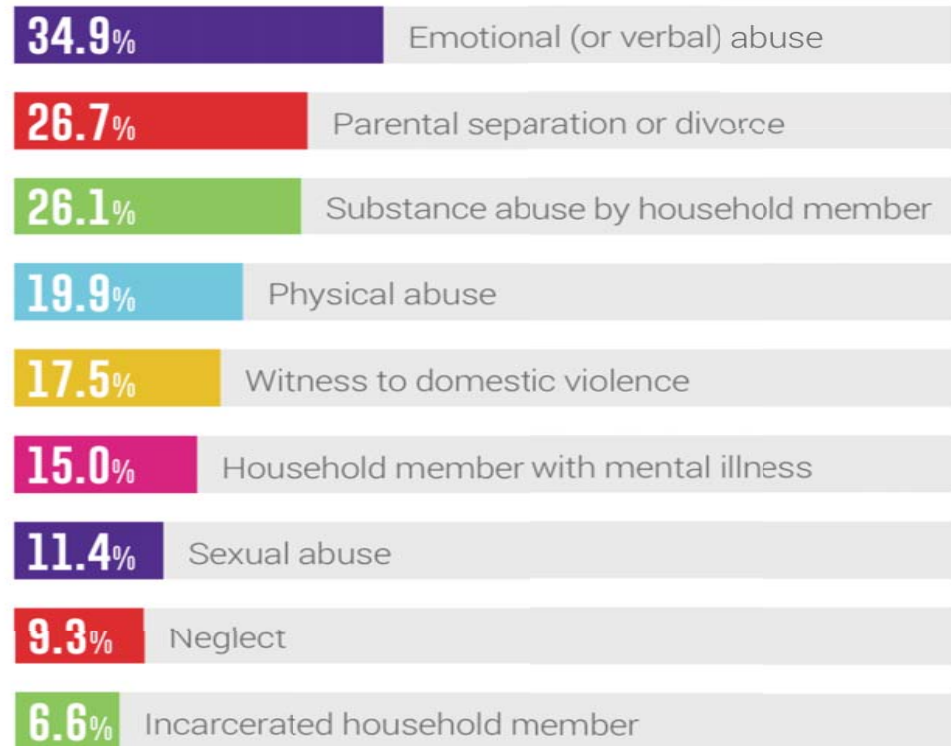
# KEY FINDINGS

In California, **61.7%** of adults have experienced at least one ACE and **one in six**, or 16.7%, have experienced four or more ACEs. The most common ACE among California adults is emotional (or verbal) abuse.



Prevalence of number of ACEs among California adults

## Most common ACEs among California Adults



Most common ACEs among California adults

# PREVALENCE OF ACES IN CHILDREN

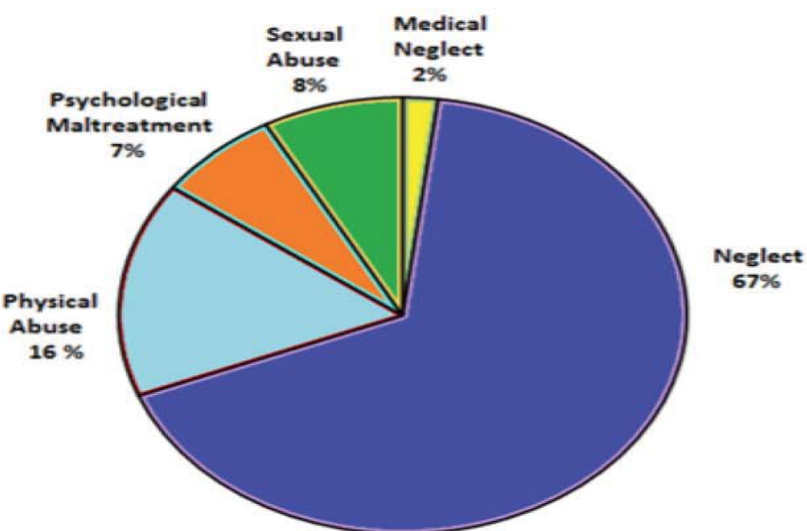
- Nationally representative studies show that nearly 50% of children have experienced at least one early life adversity<sup>1-5</sup>
- At a community-based primary care clinic in San Francisco, 67.2% of children had experienced one or more ACE and 12% experienced four or more ACEs<sup>4</sup>
- Among children at high-risk for maltreatment, the rate of having experienced at least one early adversity was found to reach as high as 91%<sup>5</sup>

1. Bethell CD, Newacheck P, Hawes E, et al. Health Aff 2014;33(12):2106–15.
2. Bright MA, Alford SM, Hinojosa MS, et al. Community Dent Oral Epidemiol 2015;43(3):193–9.
3. Wing R, Gjelsvik A, Nocera M, et al. Ann Allergy Asthma Immunol 2015;114(5):379–84.
4. Burke NJ, Hellman JL, Scott BG, et al. Child Abuse Negl 2011;35(6): 408–13.
5. Flaherty EG, Thompson R, Dubowitz H, et al. JAMA Pediatr 2013;167(7):622–9.

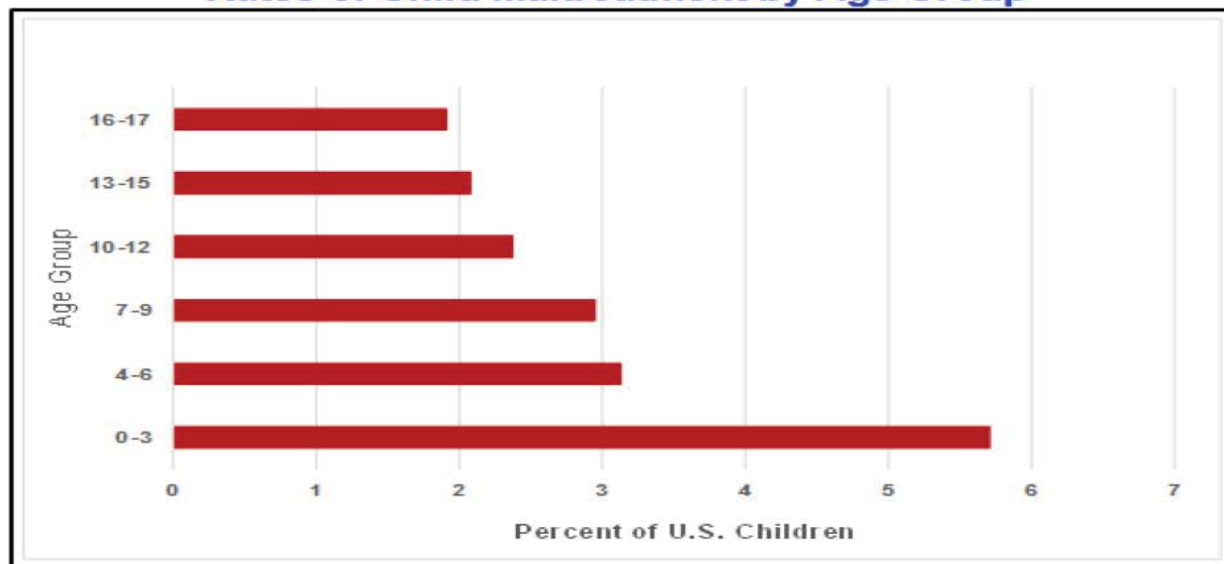
# Rates of Maltreatment by Age<sup>1</sup>

- Most maltreatment happens to younger children.
- Maltreatment has greater negative effects at younger ages.

Types of Child Maltreatment



Rates of Child Maltreatment by Age Group

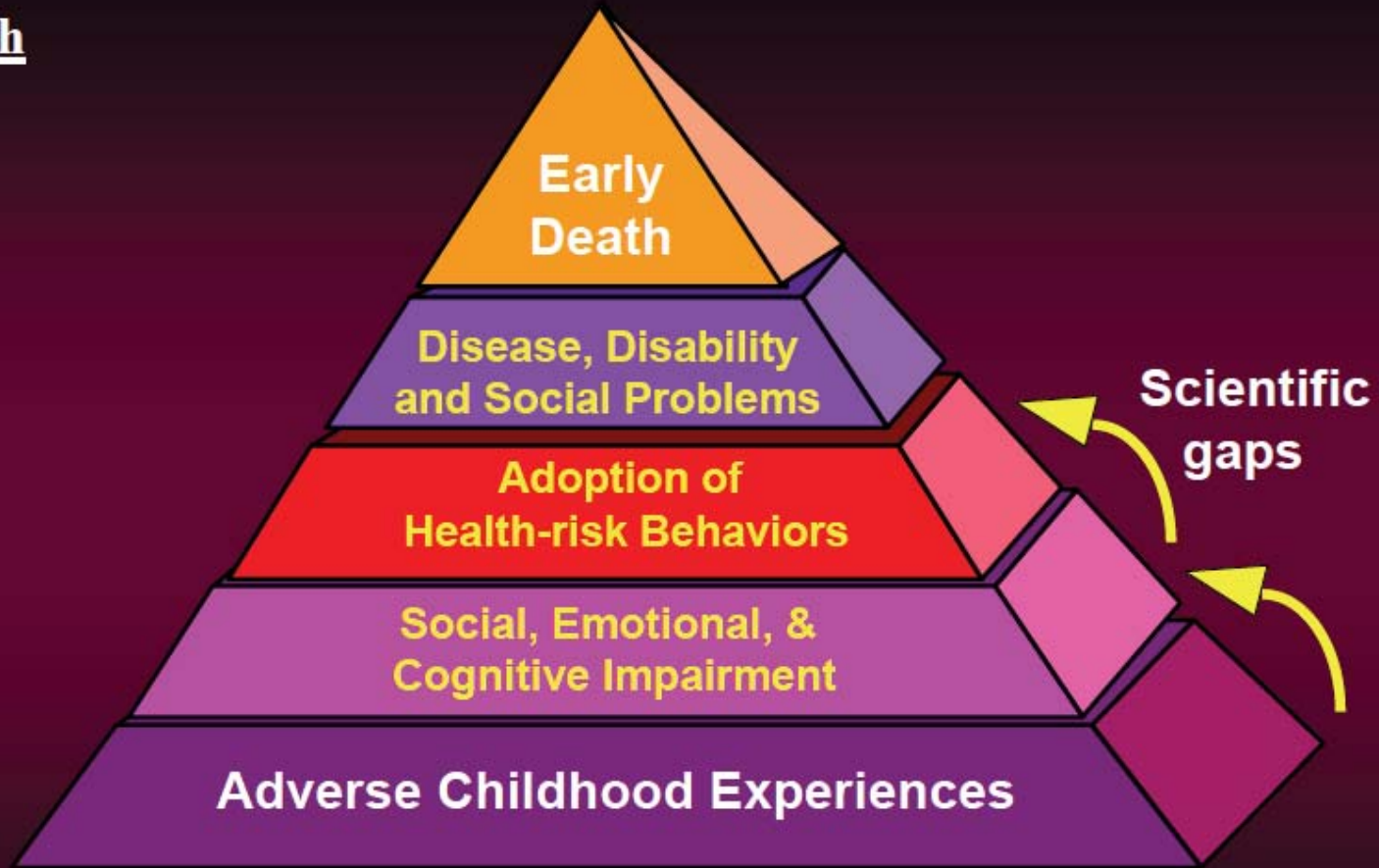


<sup>1</sup>Child Maltreatment 2012. Washington, DC: US Department of Health and Human Services; 2014.

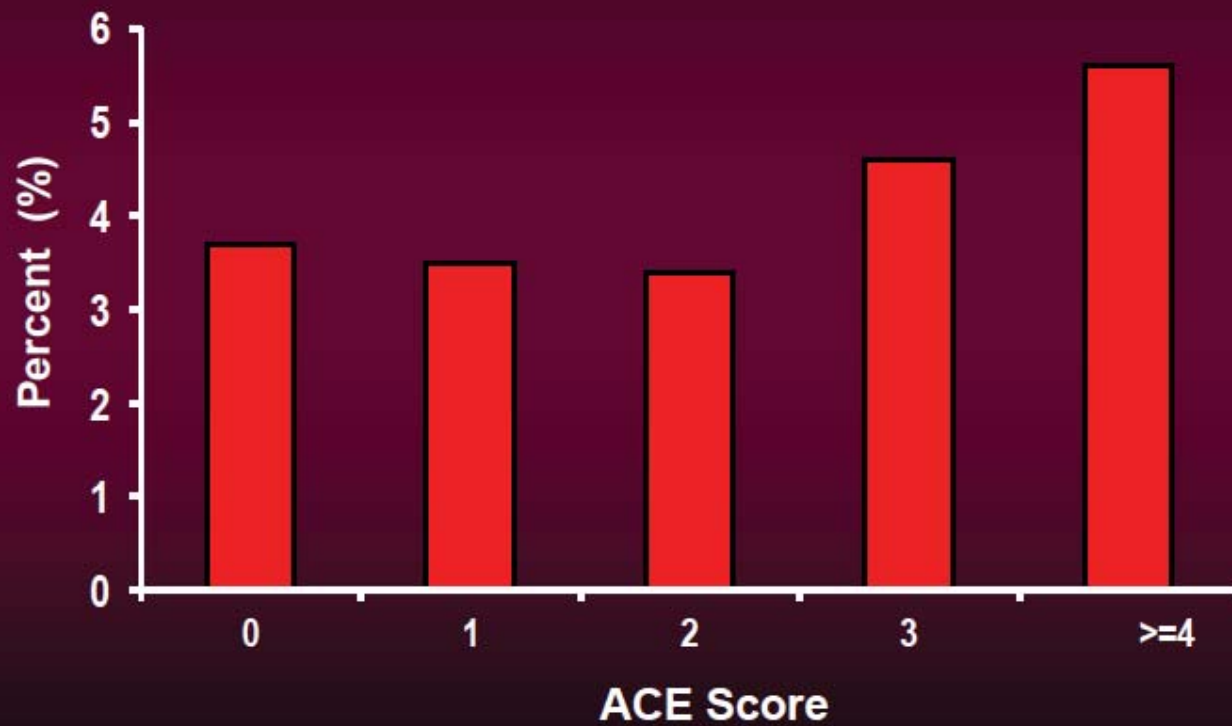
Death



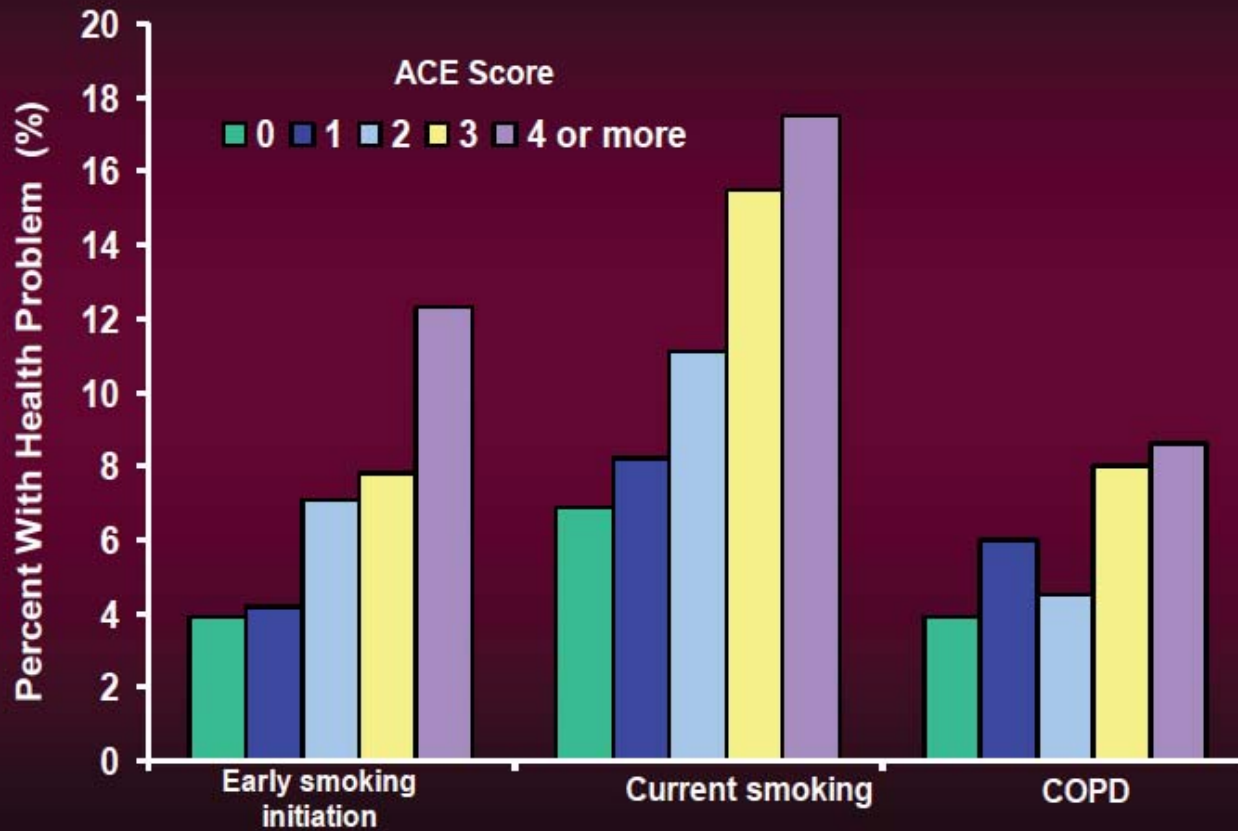
Conception



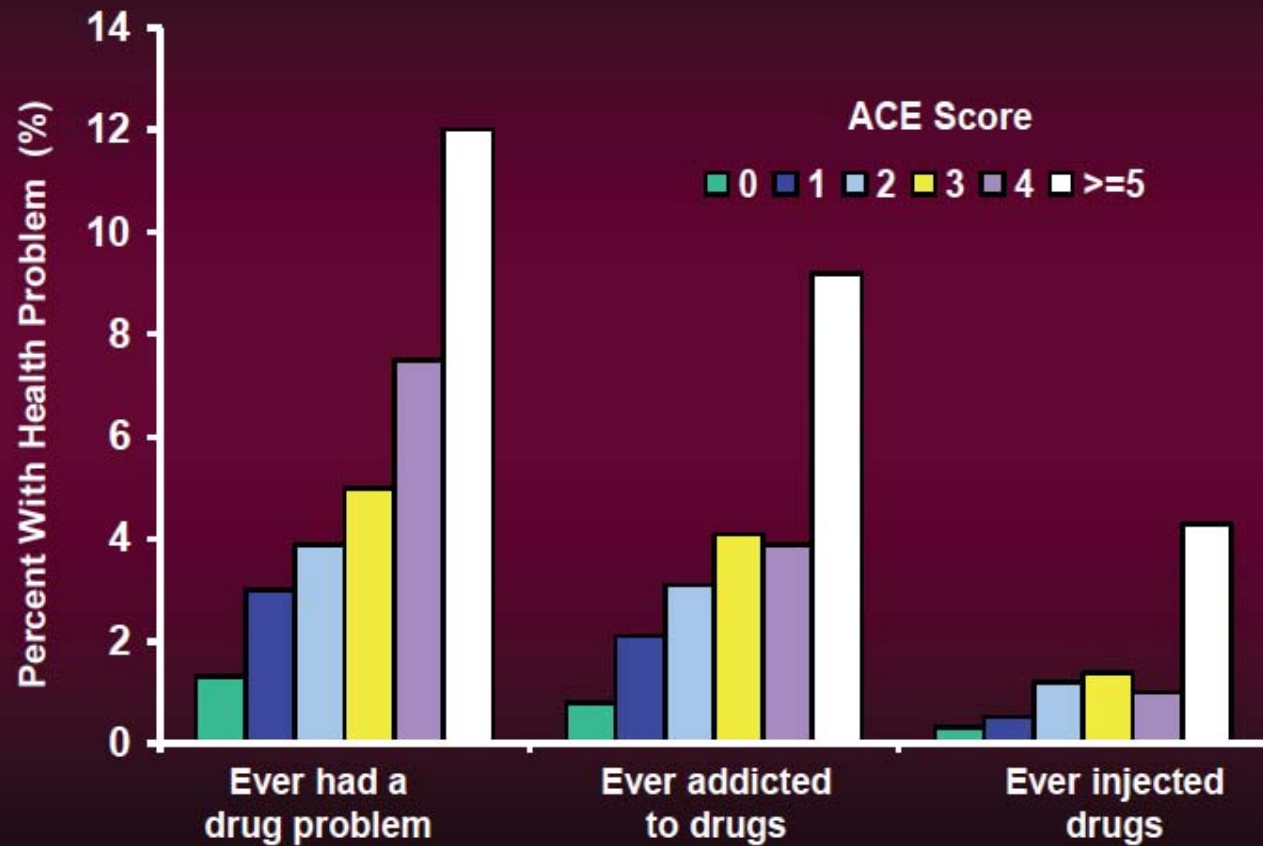
## The ACE Score and the Prevalence Ischemic Heart Disease



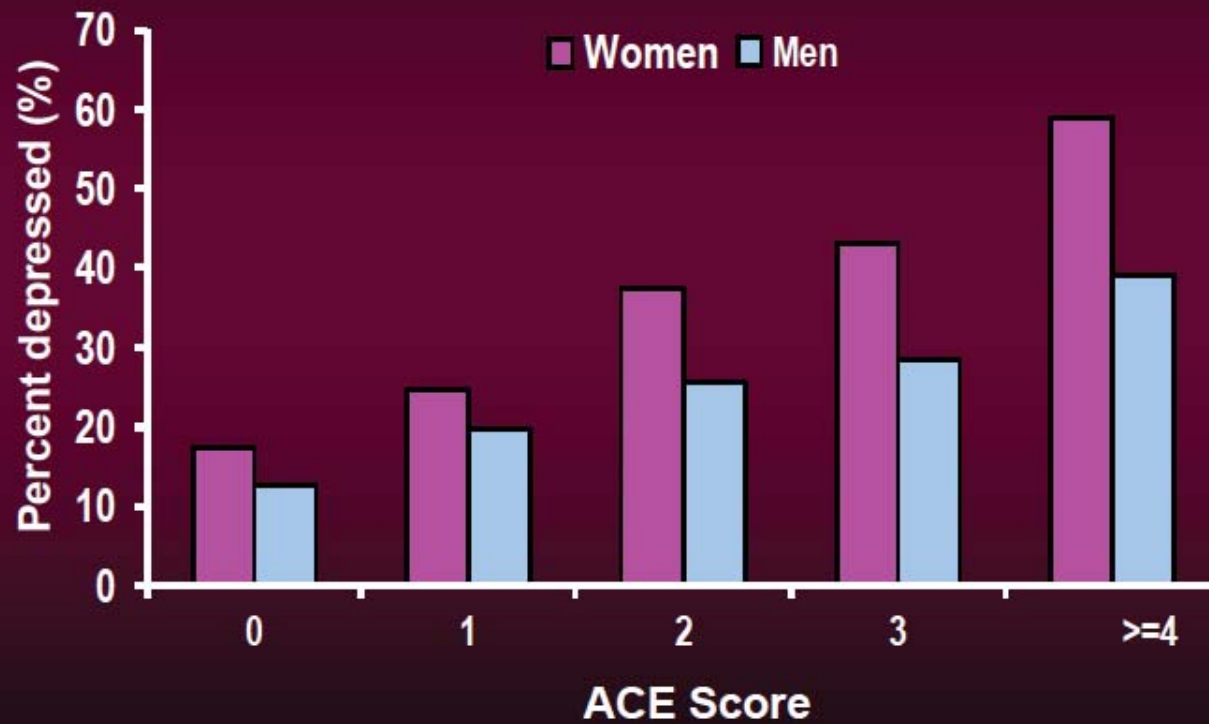
## ACEs, Smoking, and Lung Disease



## ACE Score and Drug Abuse

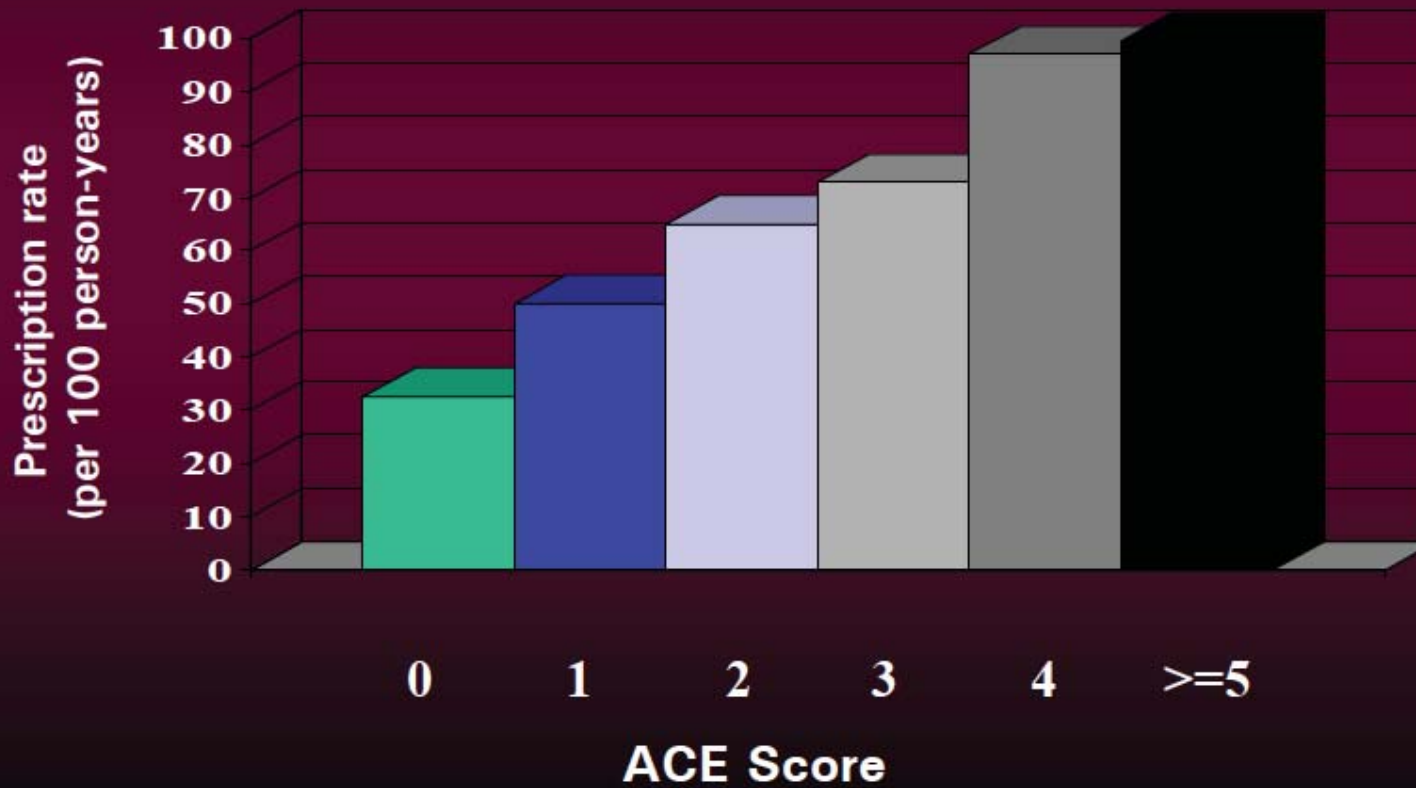


## The ACE Score and a Lifetime History of Depression

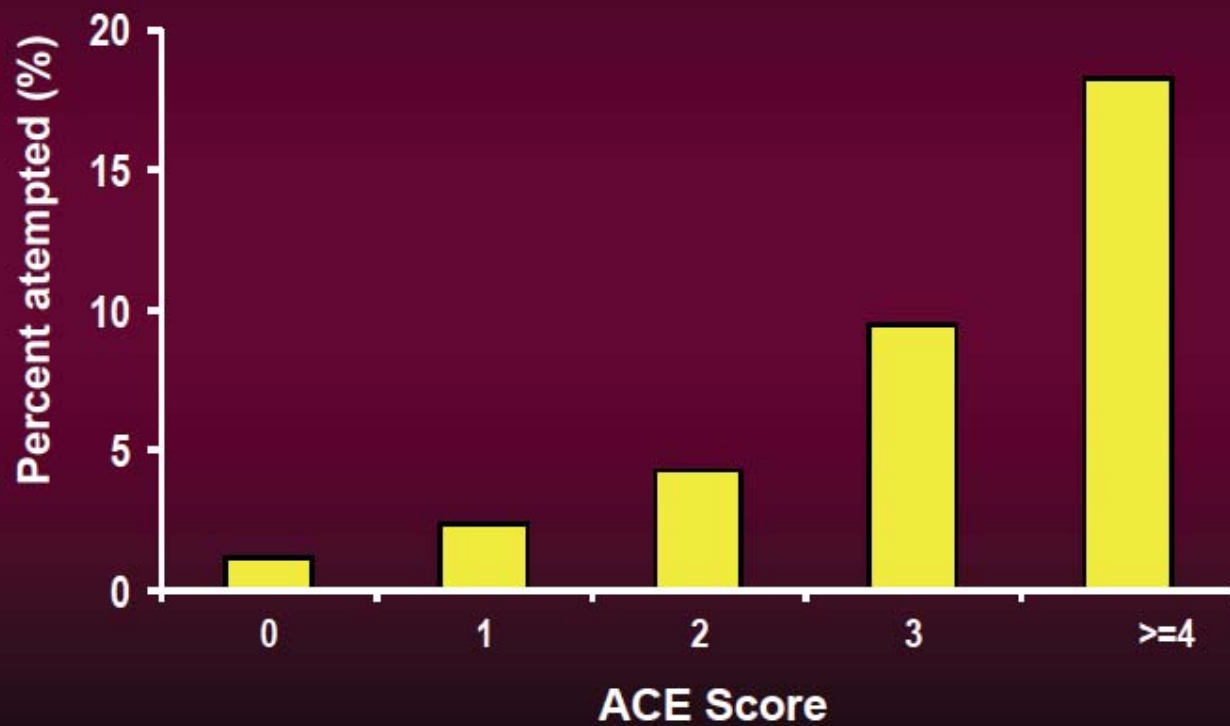




## ACE Score and Rates of Antidepressant Prescriptions



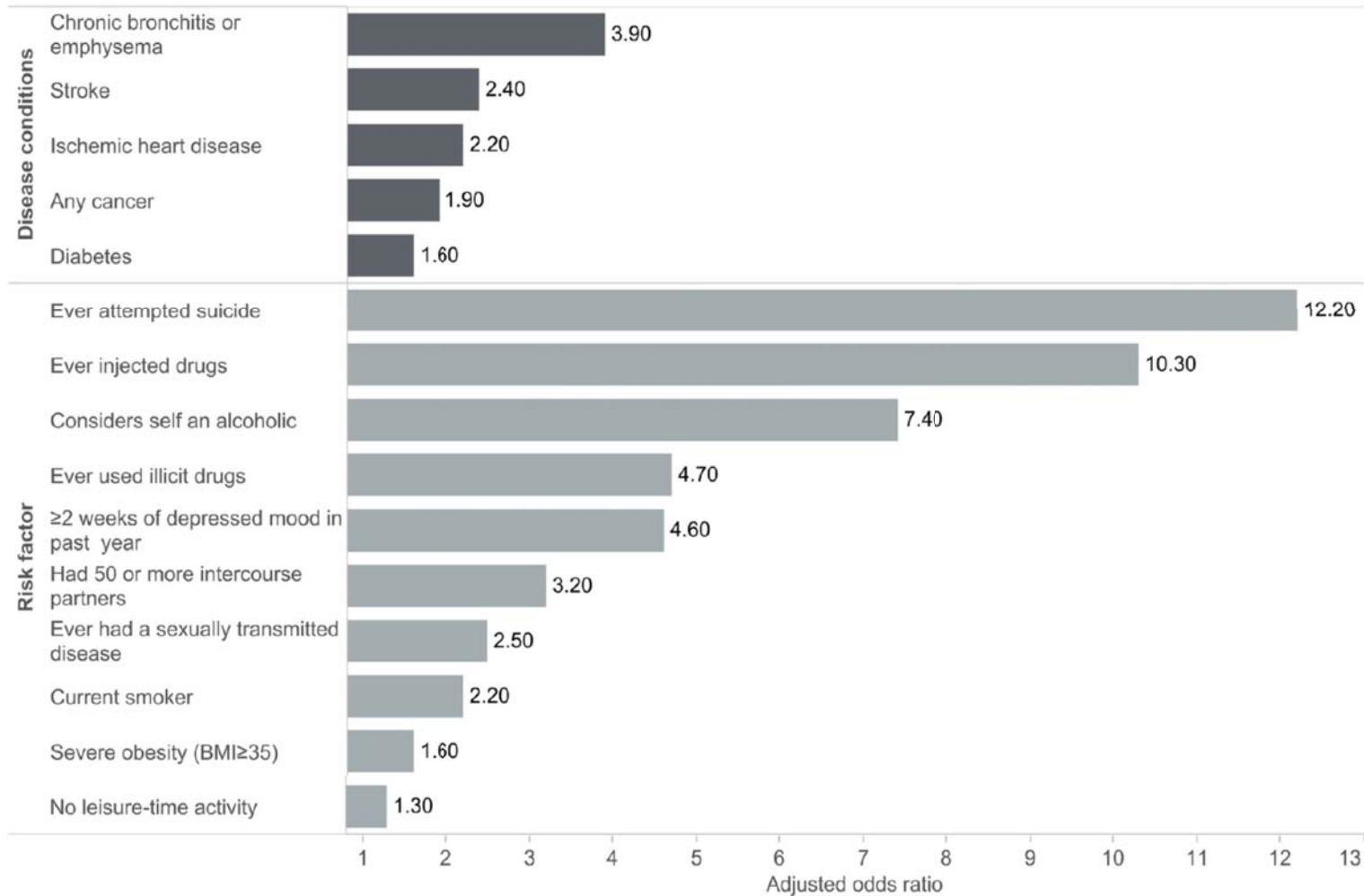
## The ACE Score and the Prevalence of Attempted Suicide

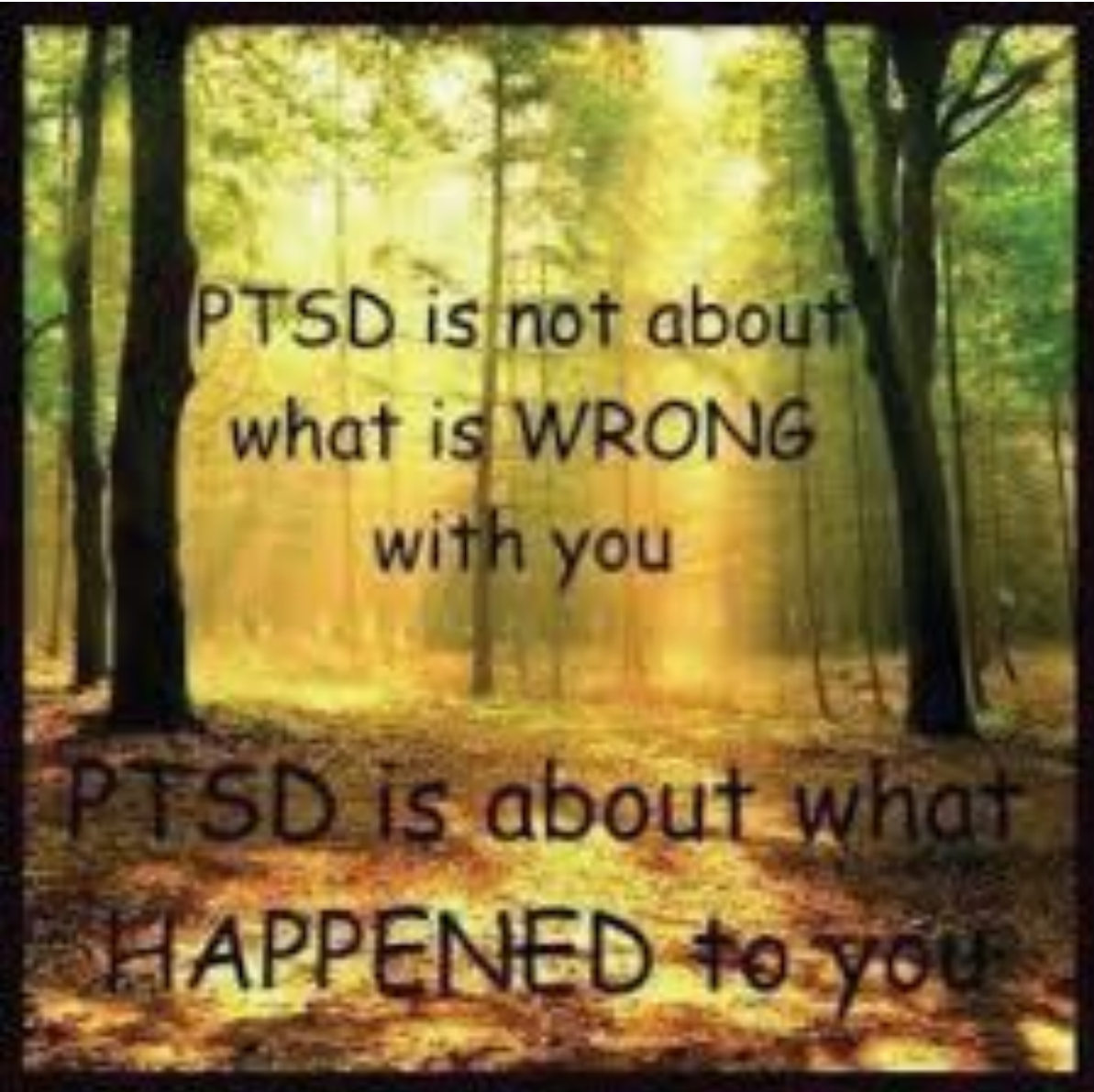


## A PERSON WITH 4 OR MORE ACES IS:

- 5.13 times as likely to suffer from depression
- 2.42 times as likely to have chronic obstructive pulmonary disease (COPD)
- 2.93 times as likely to smoke
- 3.23 times as likely to binge drink

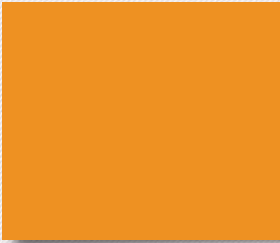
# HEALTH OUTCOMES – ACE STUDY



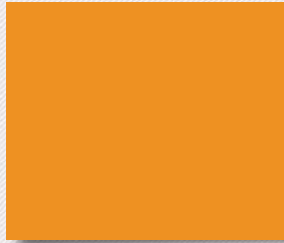


PTSD is not about  
what is **WRONG**  
with you

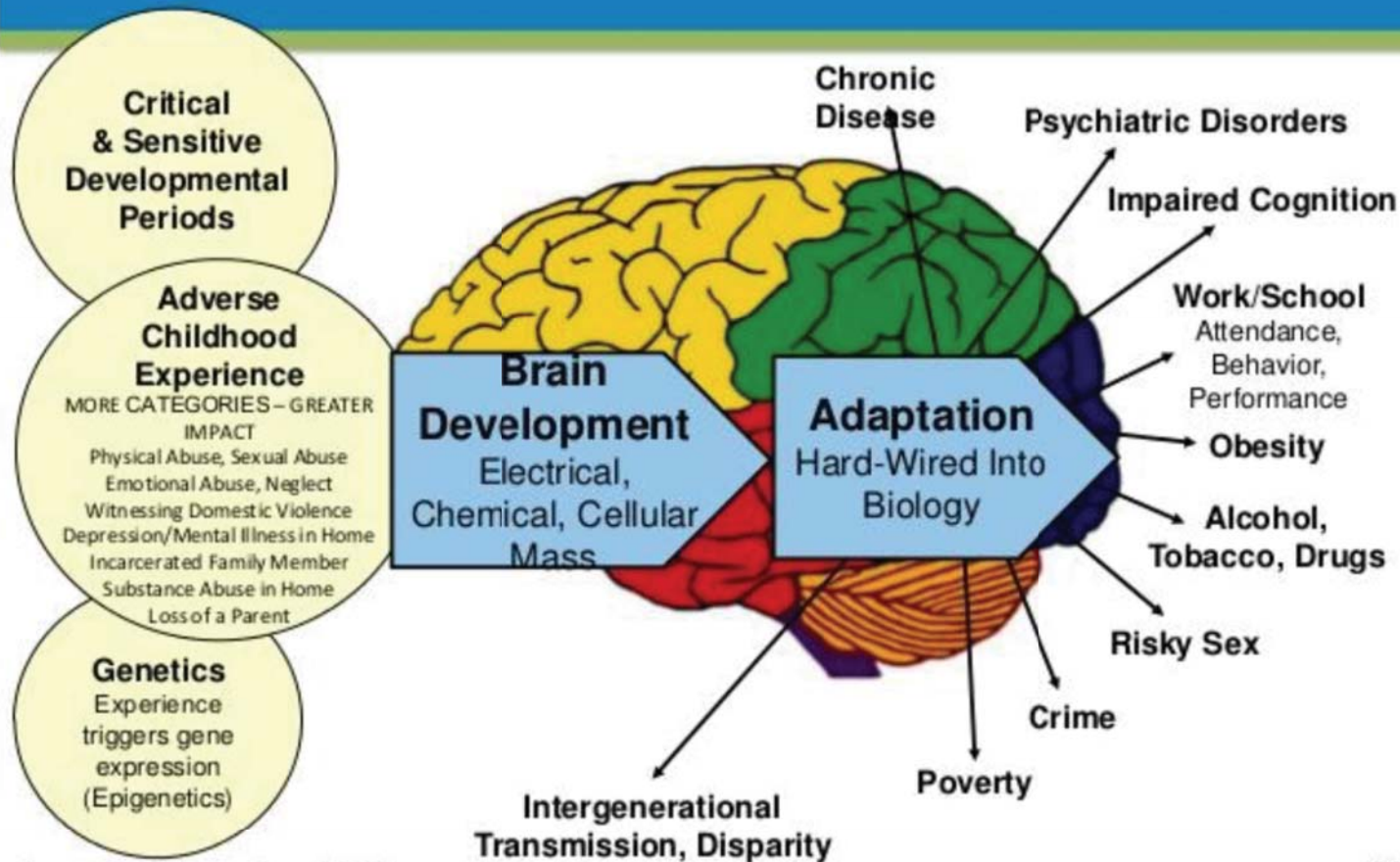
PTSD is about what  
**HAPPENED** to you



Changing the fundamental question  
from **“What’s wrong with you?”**  
to **“What happened to you?”**



# Lifespan Impacts of ACEs



Source: Family Policy Council, 2012

# How the ACES Work

## Adverse Childhood Experiences

- Abuse and Neglect (e.g., psychological, physical, sexual)
- Household Dysfunction (e.g., domestic violence, substance abuse, mental illness)



## Impact on Child Development

- Neurobiologic Effects (e.g., brain abnormalities, stress hormone dysregulation)
- Psychosocial Effects (e.g., poor attachment, poor socialization, poor self-efficacy)
- Health Risk Behaviors (e.g., smoking, obesity, substance abuse, promiscuity)



## Long-Term Consequences

### Disease and Disability

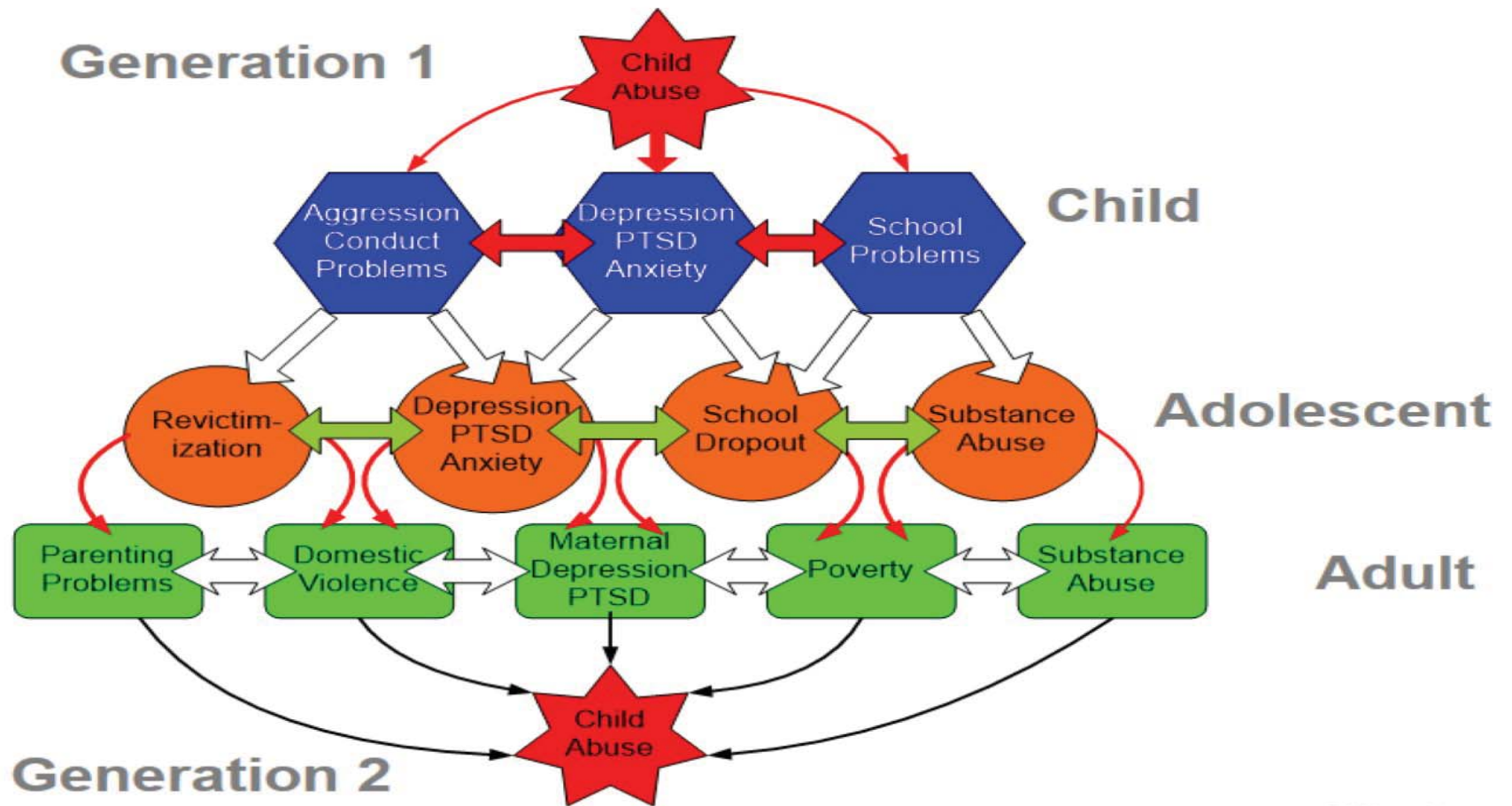
- Major Depression, Suicide, PTSD
- Drug and Alcohol Abuse
- Heart Disease
- Cancer
- Chronic Lung Disease
- Sexually Transmitted Diseases
- Intergenerational transmission of abuse

### Social Problems

- Homelessness
- Prostitution
- Criminal Behavior
- Unemployment
- Parenting problems
- High utilization of health and social services
- Shortened Lifespan

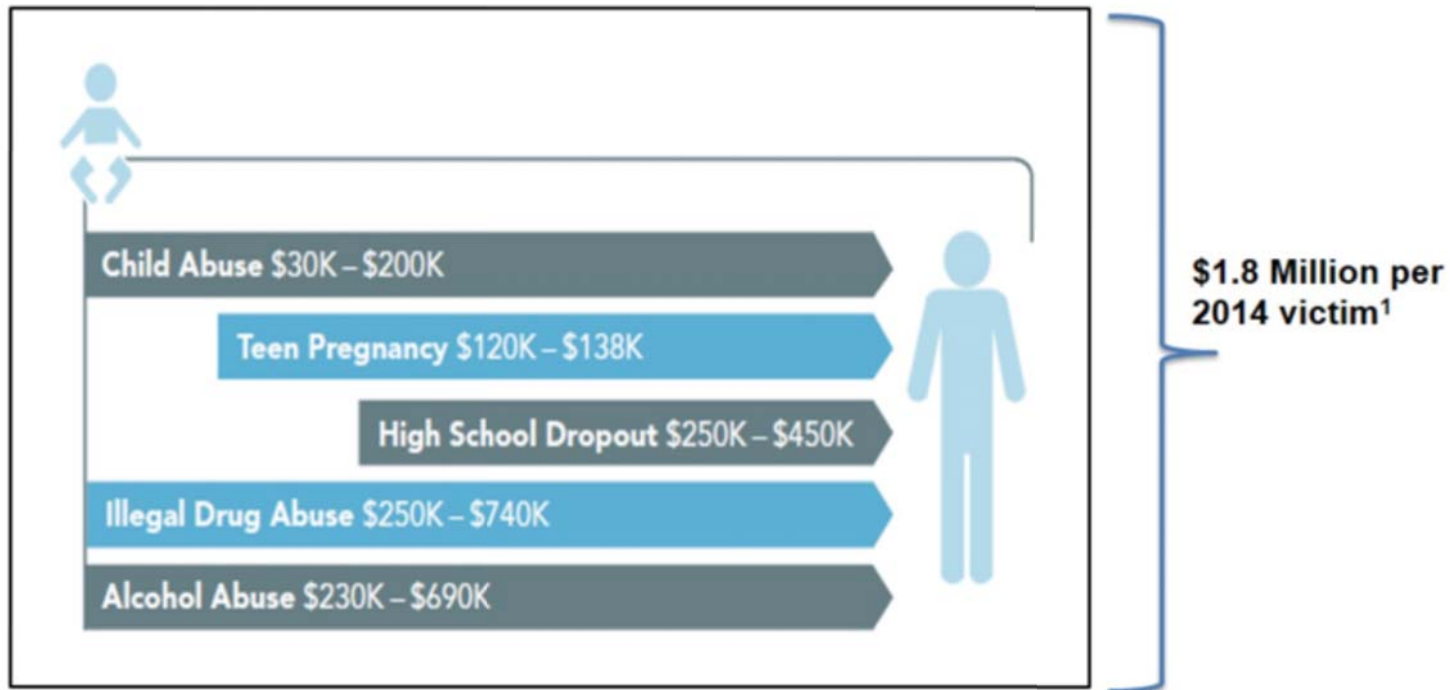


# How ACES Cross Generations



# What does it cost to do nothing?

Each 2014 First-Time Case of Child Maltreatment Costs U.S. Economy  
Approximately \$1.8 Million in Total Expenditures over their Lifetime<sup>1</sup>



Graphic from Pew Issue Brief Jan 2011: Paying Later: High Cost of failing to Invest in Young children.

<sup>1</sup>Suffer the Little Children: An Assessment of the Economic Costs of Child Maltreatment  
The Perryman Group, Nov. 2014: <http://perrymangroup.com/special-reports/child-abuse-study/>

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American Academy of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

# Adverse Childhood Experiences and the Lifelong Consequences of Trauma

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## Three Levels of Stress

### Positive

Brief increases in heart rate,  
mild elevations in stress hormone levels.

### Tolerable

Serious, temporary stress responses,  
buffered by supportive relationships.

### Toxic

Prolonged activation of stress response systems  
in the absence of protective relationships.



# STRESS RESPONSE

POSITIVE	TOLERABLE	TOXIC
Physiological response to mild or moderate stressor	Adaptive response to time-limited stressor	Maladaptive response to intense and sustained stressor
Brief activation of stress response elevates heart rate, blood pressure, and hormonal levels	Time-limited activation of stress response results in short-term systemic changes	Prolonged activation of stress response in children disrupts brain architecture and increases risk of health disorders
Homeostasis recovers quickly through body's natural coping mechanisms	Homeostasis recovers through buffering effect of caring adult or other interventions	Prolonged allostasis establishes a chronic stress response
<i>Tough test at school, playoff game</i>	<i>Immigration, natural disaster</i>	<i>Abuse, neglect, household dysfunction</i>

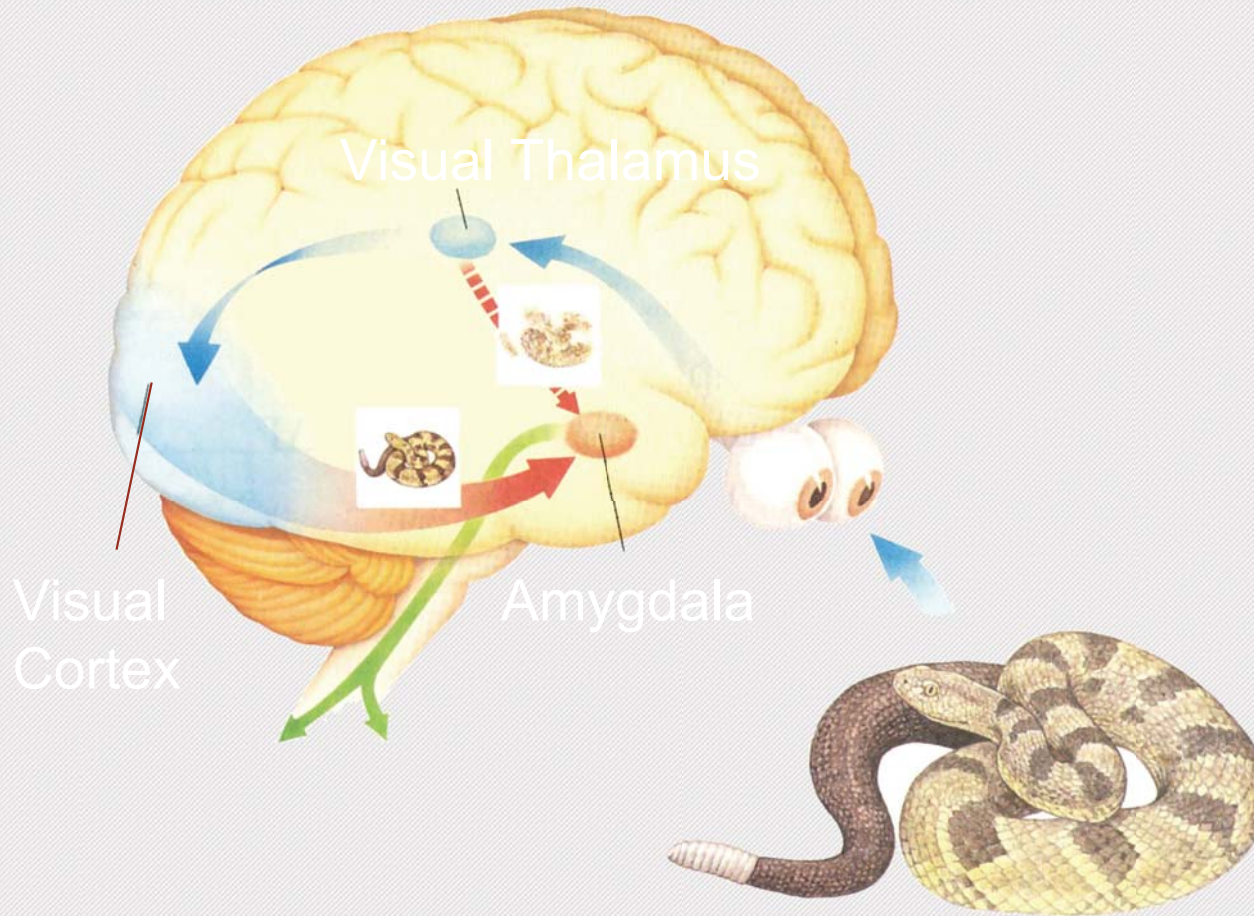
# Stress .....don't go NUTS

- Novelty,
- Unpredictability,
- Threat to the ego,
- Sense of loss of control

- Dr Sonia Lupien Centre for Studies on Human Stress



# The Fear Response: Fight or Flight and Stress



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Scientific American  
The Hidden Mind, 2002, Volume 12, Number 1

Imagine you are walking home and you see a bear...





# SYMPATHO-ADRENOMEDULLARY AXIS ACTIVATION

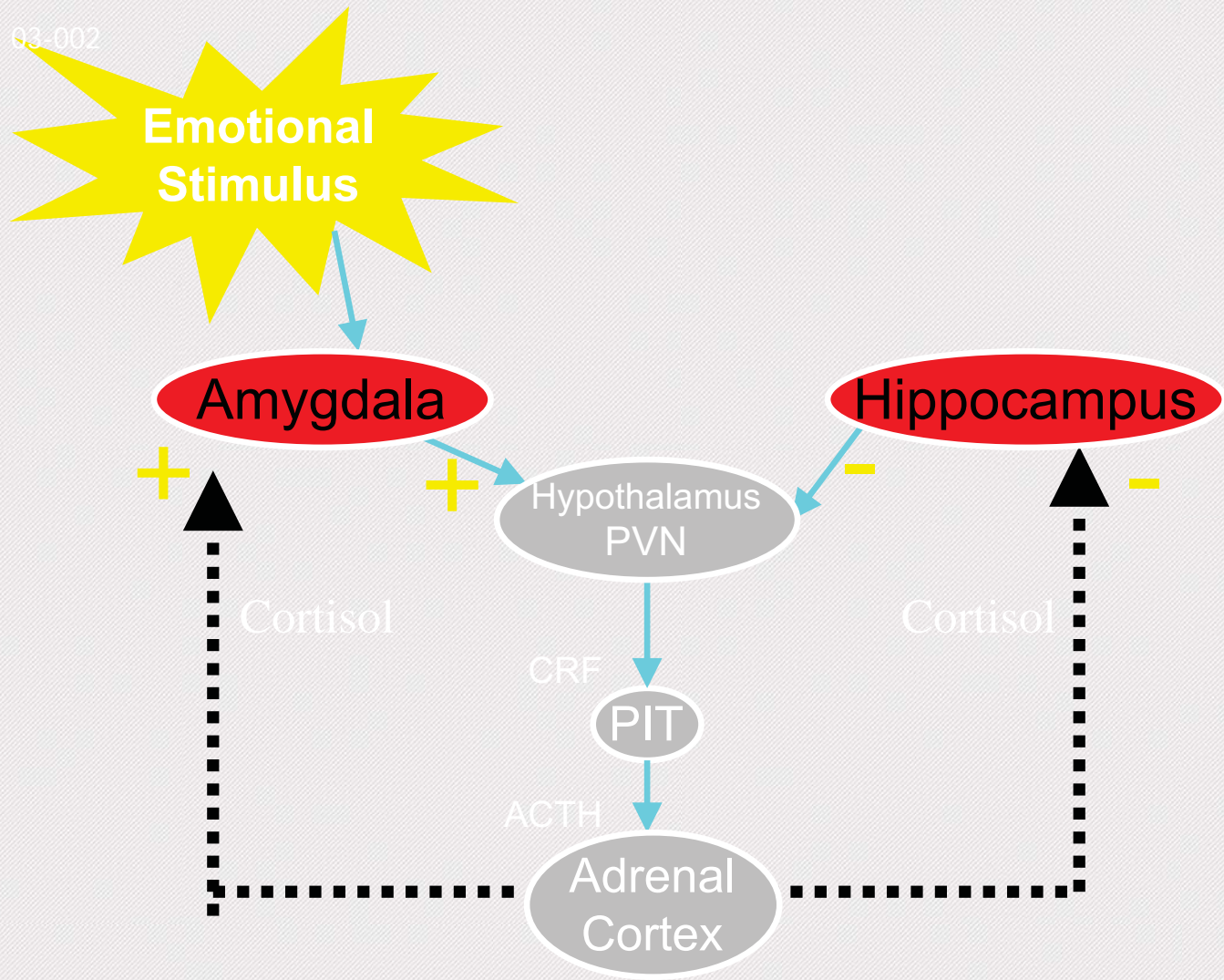
**FIGHT**

**FREEZE**

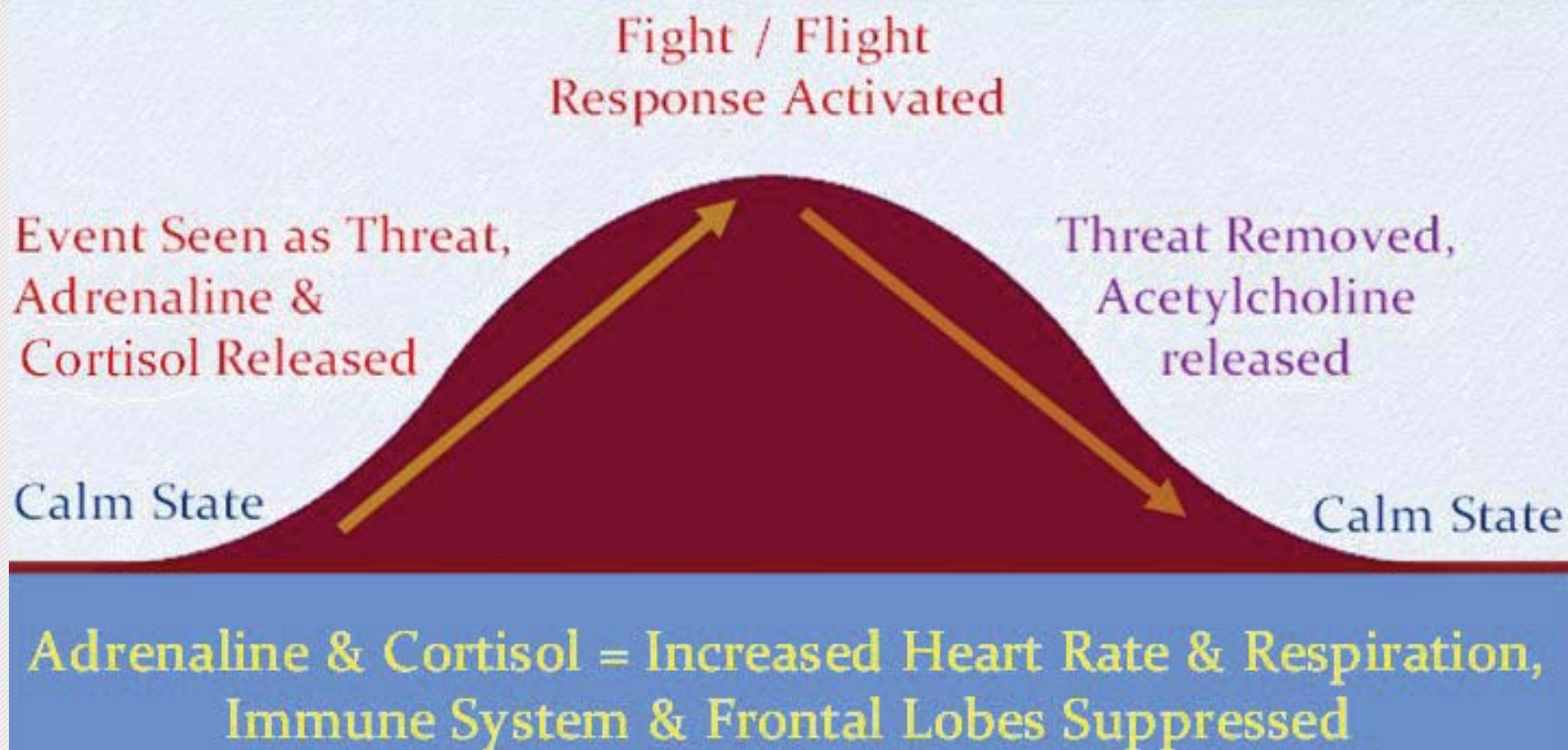
**FLIGHT**



03-002



# The Stress Response Cycle



## What happens when the bear is always there...

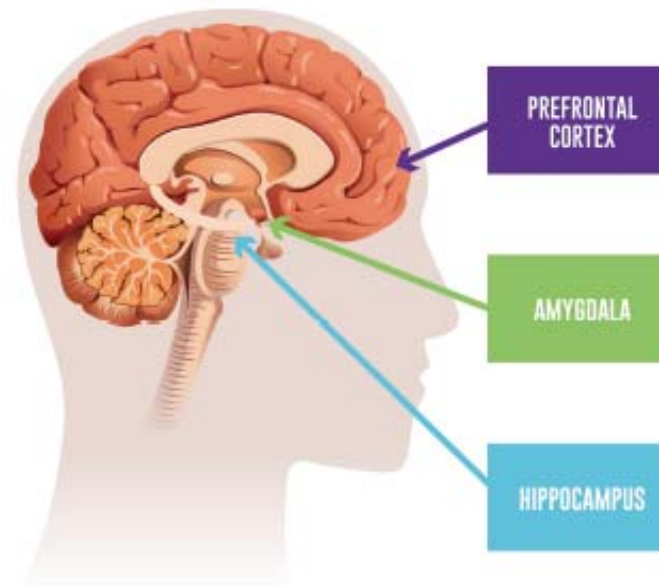
Irritability

Poor memory

Difficulty focusing

Critical thinking difficulty

Increased anxiety and fear



# Amygdala and Hippocampus

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# Cortisol can be bad for the brain

## Hippocampus

- high steroid levels cause loss of dendrites and cell death

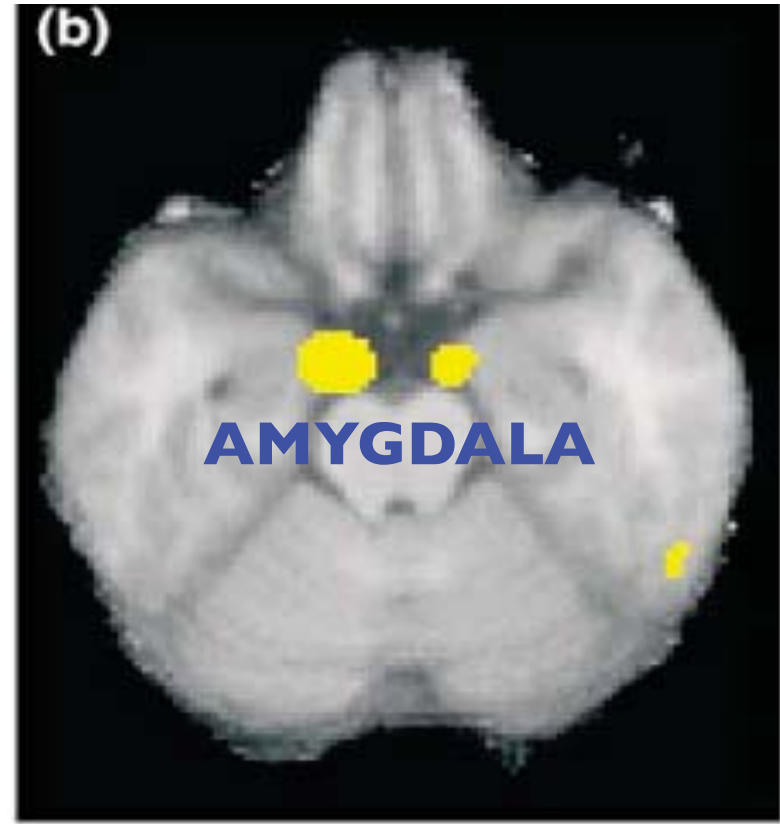
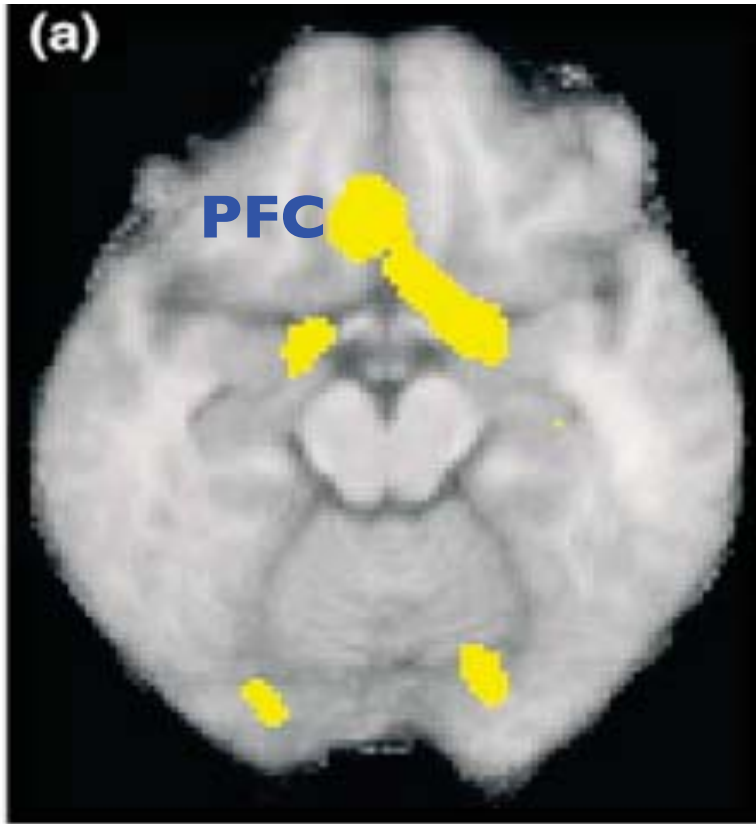
## Frontal brain

- attention deficits

# Cortisol & Brain Development

Cortisol affects the parts of the brain that

- regulate stress
- store memory
- Are involved in planning and executing complex functions
- Are involved in language



**A: Positive emotional state, flow through amygdala to PFC and better memory test results.**

**B: Stressed state: No passage of information to PFC & lower memory testing short and long-term. (Hamman, et al. Cognitive Neuroscience.)**



# Still Face Experiment –Dr Ed Tronick

## Chapter Index



**Chapter 1**



**Chapter 2**



**Chapter 3**



**Chapter 4: Still Face Experiment**

**Main Menu**

**Chapters 5 - 10**

# MULTISYSTEMIC ALTERATIONS



## NEUROLOGIC

- Prefrontal cortex: reduced synaptic plasticity in children and selective cortex atrophy in adults → executive functions
- Amygdala: increased amygdala volume in children and atrophy in adults → hypervigilance, unlearned fear and fear conditioning
- Hippocampus: reduced hippocampal volume in adults → attention, memory and learning

## PSYCHIATRIC

- VTA dopaminergic system → dysphoria and aggression
- Anorexia nervosa, obsessive-compulsive disorder, panic anxiety, excessive exercise, chronic active alcoholism, post-traumatic stress disorder, chronic anxiety, melancholic depression

## BEHAVIORAL

- Suicide, eating disorders, substance and alcohol abuse, aggressive and impulsive behaviors

# MULTISYSTEMIC ALTERATIONS



## ENDOCRINE

- Chronic activation of the glucocorticoid receptors

## METABOLIC

- Thyroid function inhibited
- Obesity/dyslipidemia
- Insulin resistance/glucose intolerance
- Hypertension

## REPRODUCTIVE

- Suppression of reproductive function
- Irregularities of the menstrual cycle

# MULTISYSTEMIC ALTERATIONS



## IMMUNE

- Deficiency of the humoral and cellular immune responses

## INFLAMMATORY

- Allergies and atopic diseases
- Asthma
- Early atherogenesis and vascular remodeling

## CARDIOVASCULAR

- Increased plasma endothelin 1, total peripheral resistance, DBP and pulse wave velocity

# Multi-systemic Impacts

## Epigenetic

- Changes in the way DNA is read and expressed

- Changes in the way the brain responds to stress

## Endocrine

- Long-term changes in ACTH, cortisol and adrenaline levels.

# All Roads Lead to Resilience



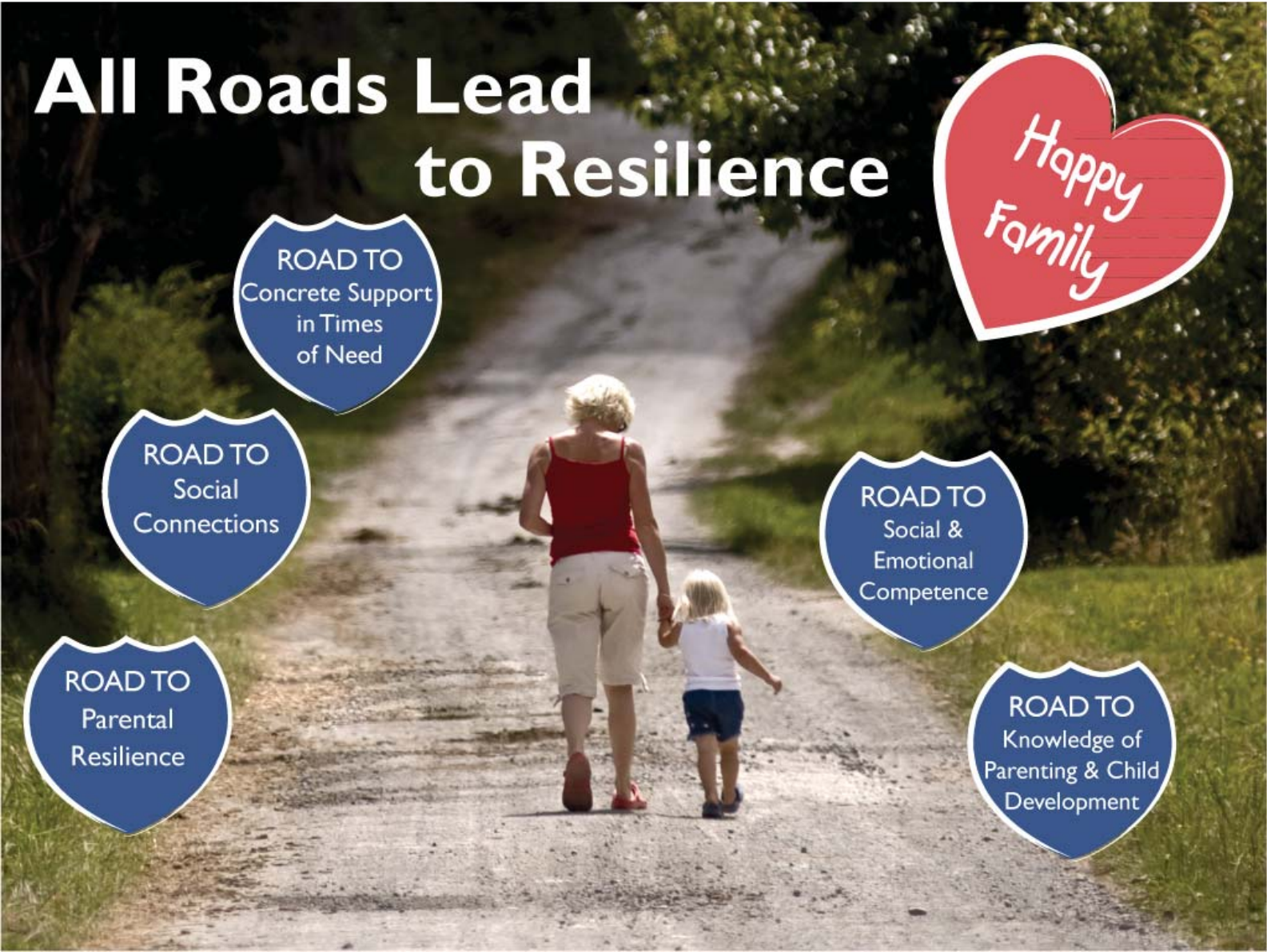
ROAD TO  
Concrete Support  
in Times  
of Need

ROAD TO  
Social  
Connections

ROAD TO  
Parental  
Resilience

ROAD TO  
Social &  
Emotional  
Competence

ROAD TO  
Knowledge of  
Parenting & Child  
Development





# ACES Too High!

## NEWS

ACES = Adverse Childhood Experiences



[HOME](#) [ABOUT](#) [GOT YOUR ACE SCORE?](#) [RESOURCES](#) [RESEARCH](#) [OUR STORIES](#) [ACES CONNECTION](#)

[ACES IN ACTION](#)

### Children's Resilience Initiative in Walla Walla, WA, draws spotlight to trauma-sensitive school

October 7, 2014

By Jane Ellen Stevens

in [ACE Study](#), [Adverse childhood experiences](#), [Child trauma](#), [Community prevention programs](#), [Resilience](#), [Solutions](#), [Washington State](#)

[1 Comment Edit](#)



### The Camden story: A physician and a priest plant seeds of repair

September 30, 2014

By Anndee Hochman

in [ACE Study](#), [Adverse childhood experiences](#), [Community prevention programs](#), [Resilience](#), [Solutions](#)

[1 Comment Edit](#)



Simultaneously making changes at the organizational level and building alliances across sectors for larger system change, Father Jeff Putthoff, SJ, and Dr. Jeffrey Brenner realized they had to dig deeper — beyond symptoms to root causes — to understand the struggles they were witnessing in Camden, NJ. What they found were ACEs.

Putthoff, a Jesuit priest known locally as

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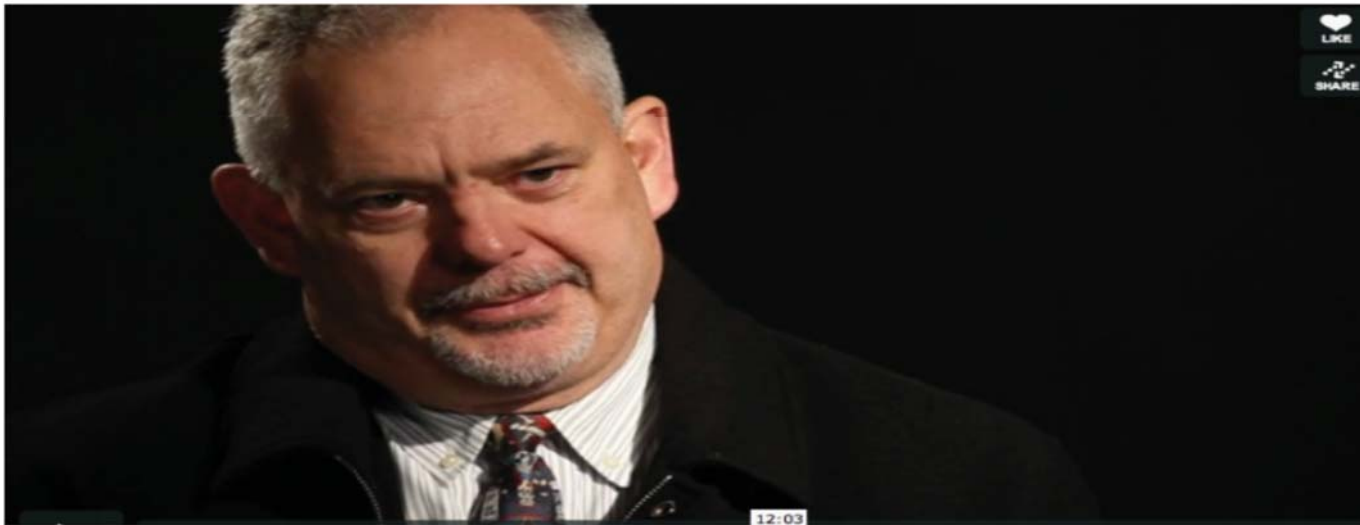
TWEETS

Four Things the NFL Can Do to Stop Abuse and Keep Players on the Field [huff.to/Ylpb3a](http://huff.to/Ylpb3a) via [@HuffPostSports](#) 1 week ago

RT [@jstevens](#): Four things the NFL can do to stop abuse AND keep its players on the field. [acestoohigh.com/2014/09/25/how...](http://acestoohigh.com/2014/09/25/how...) 1 week ago

"Homelessness? Crime? Poverty? How Tarpon Springs, FL, became a community that cares.

*Lincoln High School in Walla Walla, WA,  
tries new approach to school discipline —  
suspensions drop 85%*

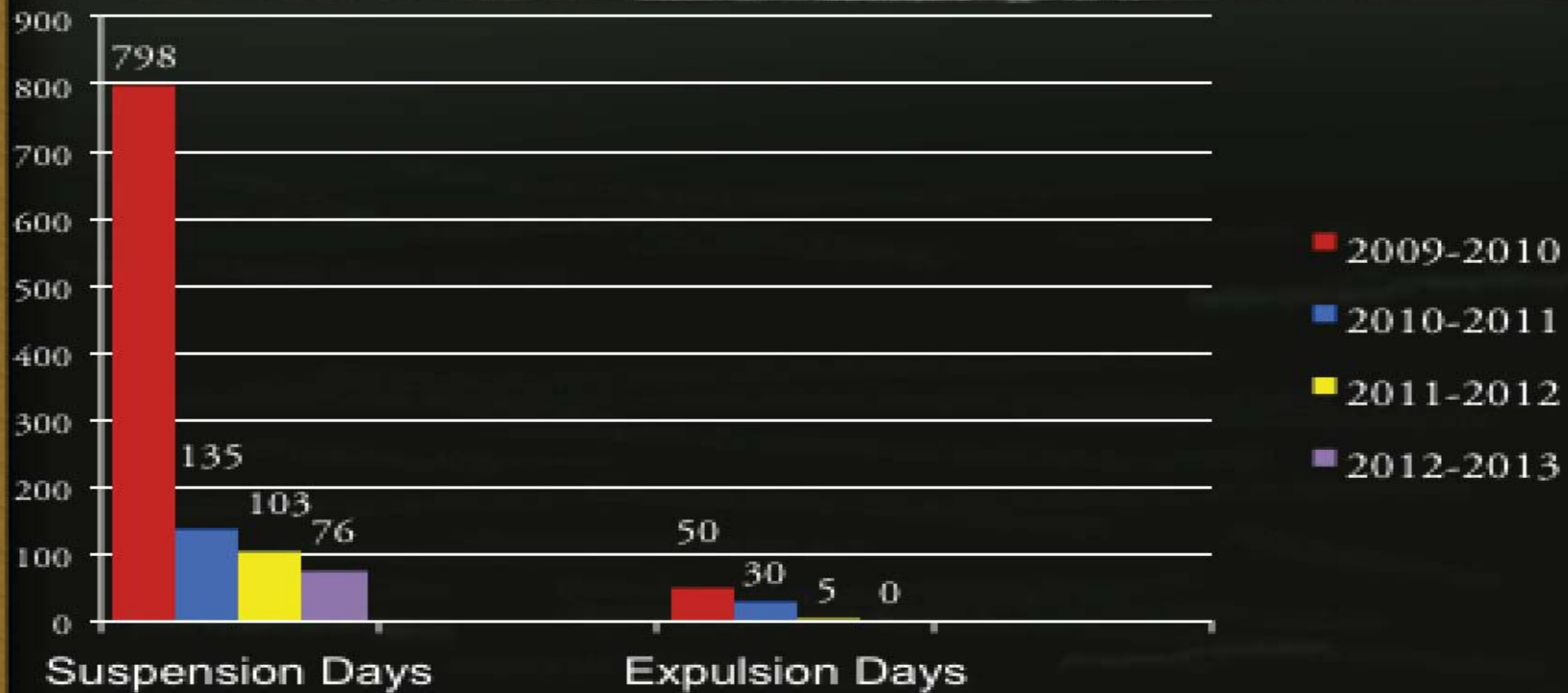


Jim Sporleder, principal of Lincoln High School

**THE FIRST TIME THAT** principal Jim Sporleder tried the New Approach to Student Discipline at Lincoln High School in Walla Walla, WA, he was blown away. Because it worked. In fact, it worked so well that he never went back to the Old Approach to



# Number of days students were out of school



# *Ex-pastor marries science, Bible studies to heal wounds of childhood trauma*



It wasn't your everyday experience, hearing Bible verses mixed with particulars from epidemiology and neurobiology in the same breath. But that's what Dave Lockridge was doing as the 20 people in his Monday night [ACE Overcomers](#) class at [Gateway Community Church](#) in Merced, CA, busily scribbled in their workbooks.

Lockridge – a grandfather, former pastor and businessman – is executive director of ACE Overcomers, an organization he created to provide programs to “overcome addiction, depression, anxiety, and anger caused by a childhood filled with abuse, neglect and household dysfunction.”

He was pastor of a small church in nearby Atwater, CA, when his wife, Susan, director of medical staff

# Knowing about ACEs changes what people believe about themselves

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- They weren't born bad.
- They weren't responsible for the things that happened to them when they were children.
- They coped appropriately, given that they were offered no other ways - it kept them alive.
- They can change.

*Trauma-informed judges take gentler approach, administer problem-solving justice to stop cycle of ACEs*



**Judge Lynn Tepper hugs Taylor, 11, at his final adoption hearing. Before finding his permanent home, he'd been returned by three**



# ACES Too High! NEWS

ACES = Adverse Childhood Experiences



HOME ACES 101 GOT YOUR ACE SCORE? ACES IN ACTION ACES CONNECTION RESEARCH RESOURCES ABOUT



## Pediatricians screen parents for ACEs to improve health of babies

AUGUST 3, 2015  
By Jane Ellen Stevens  
in ACE STUDY, ADVERSE CHILDHOOD EXPERIENCES, CHILD TRAUMA, CHRONIC DISEASE, RESILIENCE, SOLUTIONS  
8 COMMENTS



Pediatricians Teri Petterson (l) and RJ Gillespie (r)

The [Children's Clinic](#), tucked in a busy office park five miles outside downtown Portland, OR, and bustling with noisy babies, boisterous kids and energetic pediatricians, seems ordinary enough. But, for the last two years, a quiet revolution has been brewing in its exam rooms: When parents bring their four-month-old babies in for well-baby checkups, they talk about their own childhood trauma with their kid's pediatrician.

Wait. What's Mom or Dad's childhood got to do with the health of their baby? And aren't pediatricians supposed to take care of kids? Not kids' parents?

It turns out that just 14 questions about the childhood experiences of parents provide information critical to the future health of their baby, say Children's Clinic pediatricians Teri Petterson and RJ Gillespie. The answer to the questions can help determine not only

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We were sent to juvenile detention for refusing to live with our father [wpo.st/q7cWo](#) [@aces2high](#) 1 week ago

Via [@NPR](#): Are Traumatized Students Disabled? A Debate Straight Outta Compton [n.pr/1NF9Ka7](#) [@aces2high](#) 1 week ago

Kids and Trauma: Science trumps handcuffs: [acesconnection.com/blog/kids-and-...](#) [@aces2high](#) 1 week ago

Results of NE Michigan ACEs survey: [acesconnection.com/blog/ne-michig...](#) [@aces2high](#) 1 week ago

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### CATEGORIES

# What We Can Do Now!

- Start Early!
  - Identify kids exposed to ACEs through routine screenings and establish prevention programs in healthcare, schools and youth-serving organizations
- Focus on early childhood and early adolescence
  - Critical developmental stages
- Invest in programs that heal
  - Don't spend money on programs that don't support the health and development of our kids – punitive school discipline/juvenile justice

# What We Can Do Now!

- Change Public Policy
  - Support prevention and healing using policy to prioritize funding for early detection and effective intervention
- Make ACEs a public issue.
  - Educate our community about the impact and the role each of us can play.

# Resources

- ❑ Centers for Disease Control and Prevention
  - ❑ <http://www.cdc.gov/ace/index.htm>
  
- ❑ UCSF Child Trauma Research Program
  - ❑ <http://childtrauma.ucsf.edu/>
  
- ❑ Lucile Packard Early Life Stress Program
  - ❑ <http://childpsychiatry.stanford.edu/clinical/stress.html>
  
- ❑ National Child Traumatic Stress Network
  - ❑ <http://www.nctsn.org/>



# Resources

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- [ACEs 101](#) - FAQs about adverse childhood experiences research with links to reports, stories and videos.
- [Got Your ACE Score?](#) - Do your ACE score and your resilience score, and find out more about the consequences of each.
- [ACEsTooHigh.com](#) - A news site for the general public. It covers research about ACEs and how people, organizations, agencies and communities are implementing trauma-informed, resilience-building practices based on ACEs research.
- [ACEsConnection.com](#) - A social network for people who are implementing - or thinking about implementing - trauma-informed and resilience-building practices based on ACEs research.
- [The CDC-Kaiser Permanente ACE Study](#) - The official ACE Study site, provided by the CDC.
- [The Center on the Developing Child at Harvard University](#) - Here, take a deep dive into a site rich with reports, tools and videos about the neurobiology of toxic stress and resilience.
- [SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach](#) -- Introduces a concept of trauma and offers a framework for how an organization, system, or service sector can become trauma-informed. Includes a definition of trauma (the three "E's"), a definition of a trauma-informed approach (the four "R's"), 6 key principles, and 10 implementation domains.