



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

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

Adverse Childhood Experiences Are Common

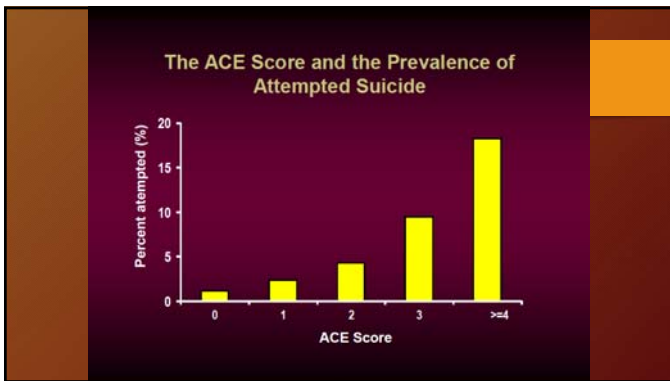
<u>Household dysfunction:</u>	
Substance abuse	27%
Parental sep/divorce	23%
Mental illness	17%
Battered mother	13%
Criminal behavior	6%
<u>Abuse:</u>	
Psychological	11%
Physical	28%
Sexual	21%
<u>Neglect:</u>	
Emotional	15%
Physical	10%

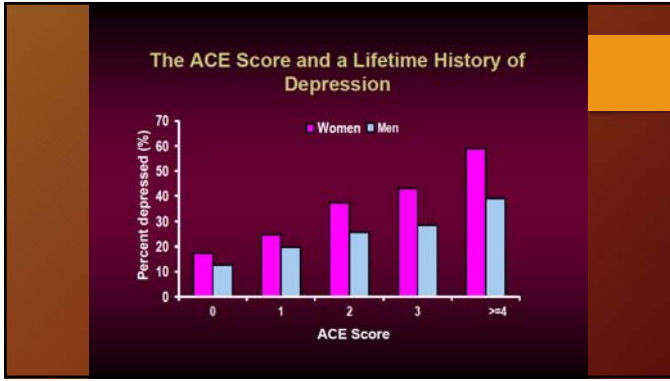


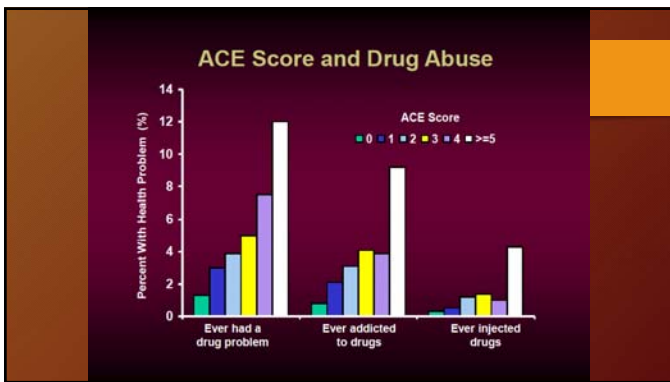
Adverse Childhood Experiences Score Complex Trauma--Trauma "Dose"

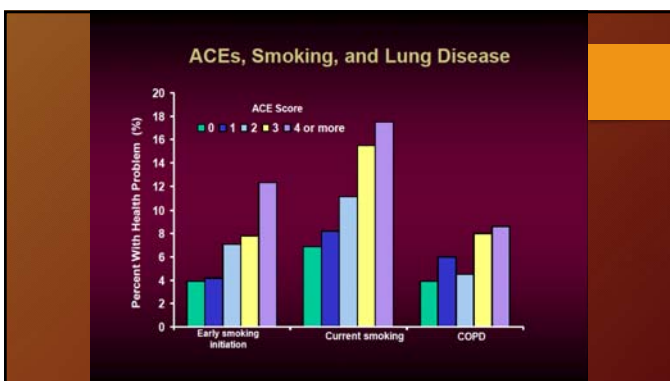
Number of individual types of adverse childhood experiences were summed...

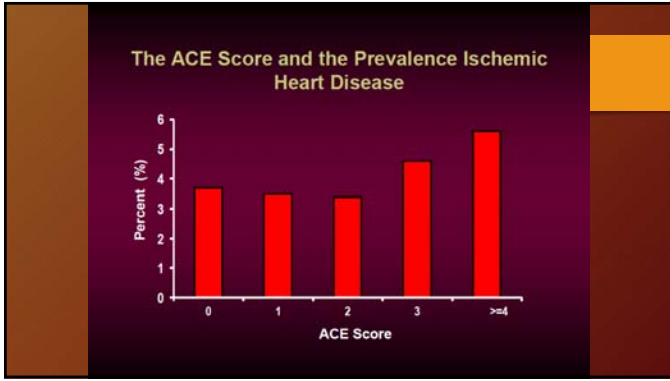
ACE score	Prevalence
0	33%
1	26%
2	16%
3	10%
4 or more	16%

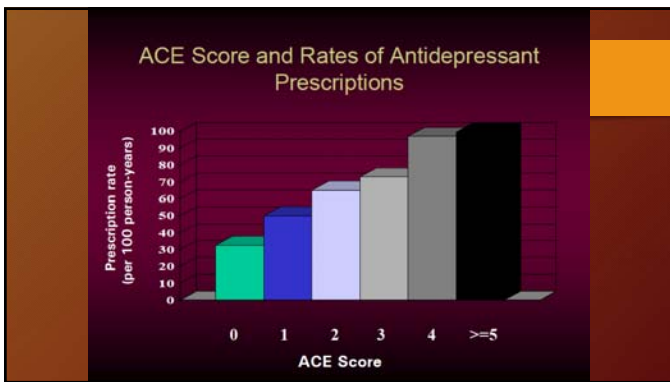


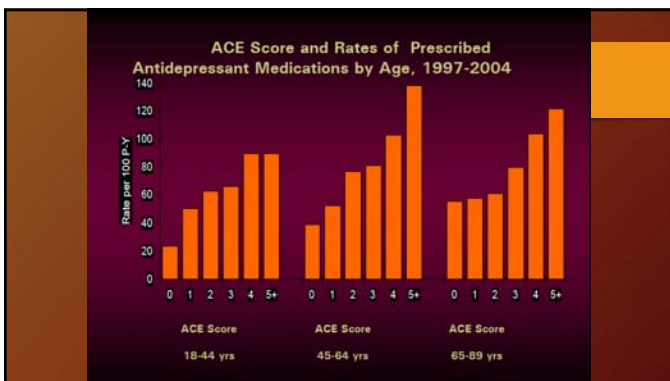












Relative Risk of disease for ACEs ≥ 4

- Hepatitis 240%
- STD 250%
- COPD 260%
- Depression 460%
- Suicidality 1,220%

Stress Response

- Activation of the HPA Axis - release of ACTH, adrenaline and cortisol
- Increase in centrally controlled peripheral sympathetic nervous system activity
- Activation of nor-adrenaline throughout the midbrain and forebrain including the cortex

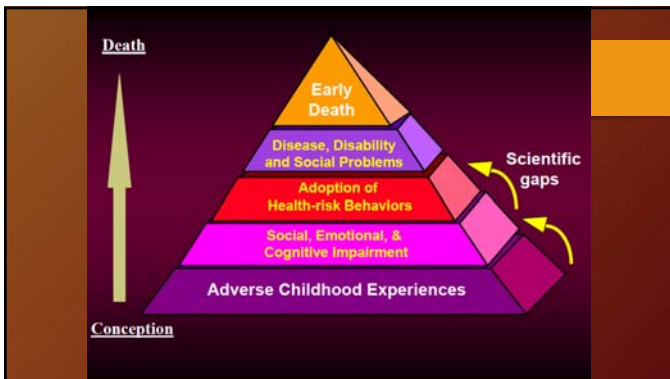


Multi-systemic Impacts

- Neurologic:
 - HPA Axis Dysregulation
 - Reward center dysregulation
 - Hippocampal neurotoxicity
 - Neurotransmitter and receptor dysregulation
- Immunologic
 - Increased inflammatory mediators and markers of inflammation such as interleukins, TNF alpha, IFN- γ

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.



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.

Center on the Developing Child
HARVARD UNIVERSITY

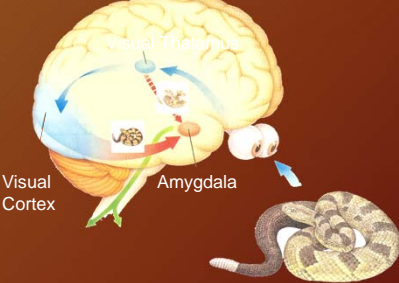
Stressdon' t go NUTS

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



• Dr Sonia Lupien Centre for Studies on Human Stress

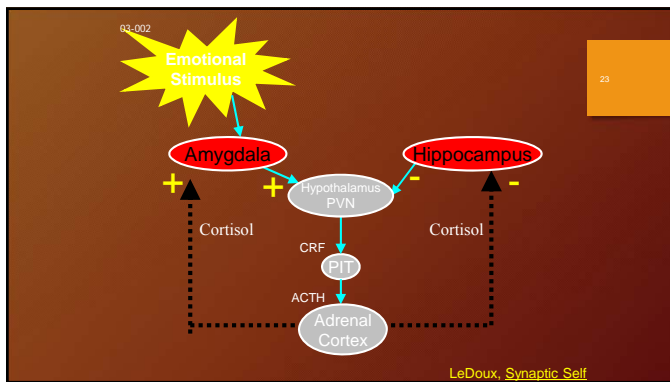
The Fear Response: Fight or Flight and Stress



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

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



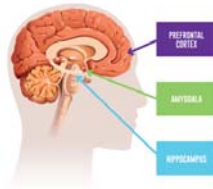


The Stress Response Cycle

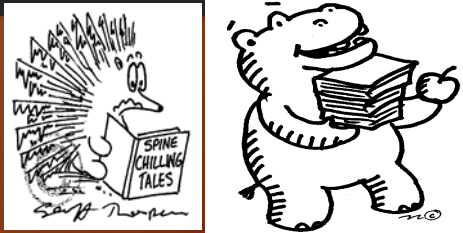


What happens when the bear is always there...

- Irritability
- Poor memory
- Difficulty focusing
- Critical thinking difficulty
- Increased anxiety and fear



Amygdala and Hippocampus



Cortisol can be bad for the brain

Hippocampus

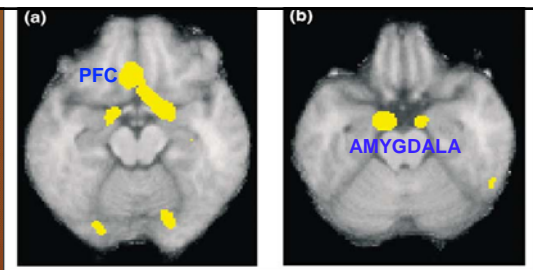
- ➔ high sterol levels cause loss of dendrites and cell death

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

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Chapter 1



Chapter 2



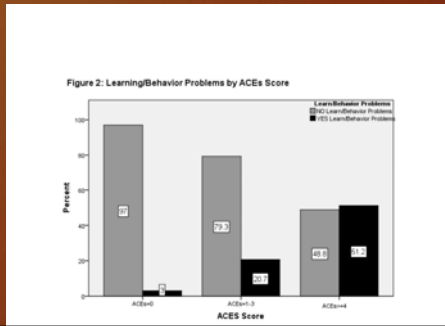
Chapter 3



Chapter 4: Still Face Experiment

Main Menu
Chapters 5 - 10

Effect of ACEs on Educational Outcomes



SCOPE OF THE CHALLENGE

- Impacts are pervasive and long-lasting
 - Development
 - Physical and Mental Health
 - Social and Educational impacts
 - Economic impacts
- Prevalence is high
- Strong evidence relating the risk
- Early intervention improves outcomes

PUBLIC HEALTH APPROACH IS NECESSARY

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/>

References

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