

## The Progressive Nature of Adverse Childhood Experiences: **Building Self-Healing Communities**

Robert Anda, MD, MS

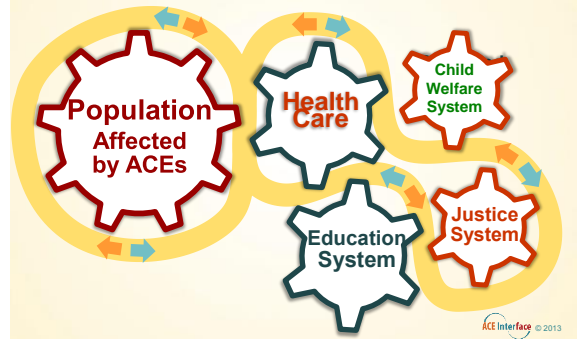
Accelerating Innovation Symposium

October 6, 2014



[www.ACEInterface.com](http://www.ACEInterface.com)

## Building Self-Healing Communities



## The Biology of Adversity



### NEAR Science

Neuroscience

Epigenetics

Adverse Childhood Experiences

Resilience

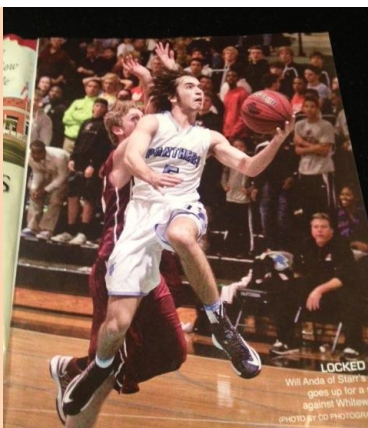


### Adolescent Brain Development A Time of Risk and Opportunity

-Gray matter forms the thin outer layer of the cerebral cortex

-The volume of gray matter may be greatest during early adolescence

Source: National Institutes of Mental Health  
The Teen Brain: Still Under Construction



**Adolescent Brain Development  
A Time of Risk and Opportunity**

The parts of the brain responsible for more “top down” control such as impulse control and planning ahead—the hallmarks of adult behavior—are among the last to mature

Source: National Institutes of Mental Health  
The Teen Brain: Still Under Construction

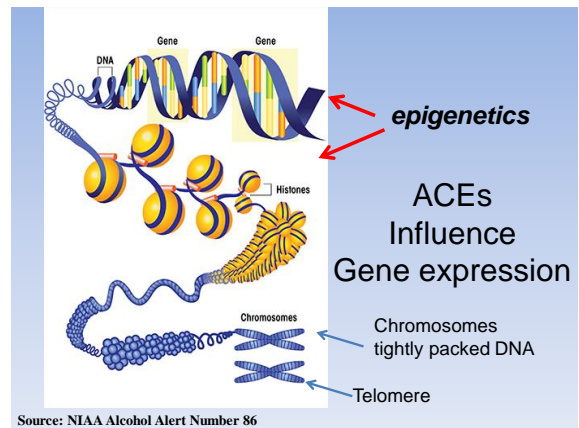
**Telomeres**

- Like the ends of shoelaces, telomeres prevent DNA from fraying
- Telomere length determines whether a cell can be reproduced-
- Emerging research suggests a link between short telomeres and certain diseases, including diabetes and dementia.

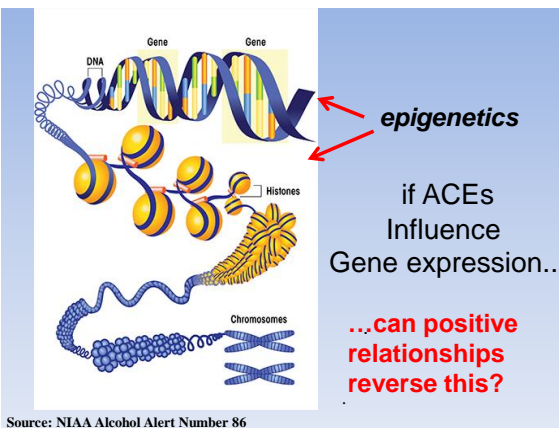


Parkeeta/Photo Researchers Inc.

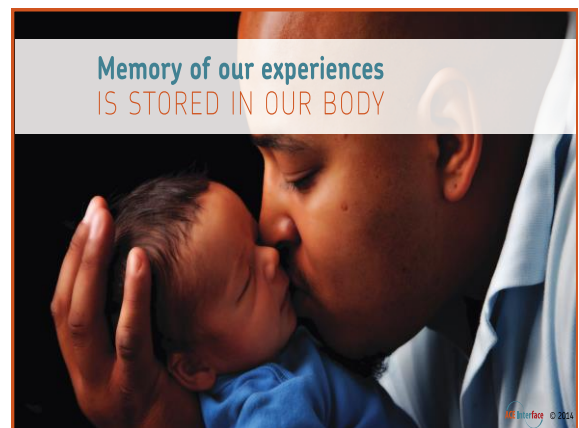
# What is epigenetics?

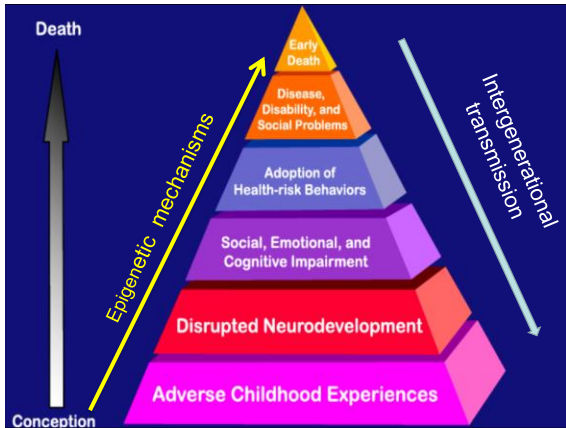


Source: NIAA Alcohol Alert Number 86



Source: NIAA Alcohol Alert Number 86





**The Adverse Childhood Experiences (ACE) Study**

Examines the health and social effects of ACEs throughout the lifespan among 17,421 members of the Kaiser Health Plan in San Diego County

*A Primary Care Setting...  
Educated...  
Middle Class...  
Predominantly White...*

**ACEs 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 Rarely Occur in Isolation...**

*They come in groups.*

ACE Interface © 2013

ACEs tend to come in groups...

	Additional ACEs (%)			
	1	2	3	4 or more
<i>If you grew up with:</i>				
<i>Household</i>				
<i>Substance Abuse</i>	81	60	41	58

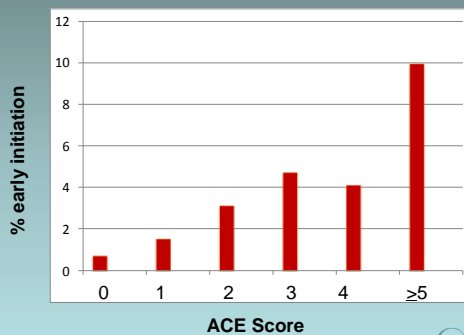
Adverse Childhood Experiences Score  
Biologic Stress "Dose"

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

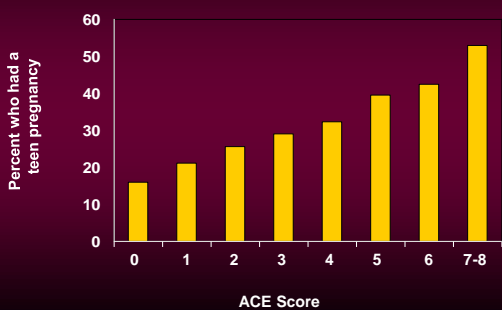
## ACEs and Adolescent Health



ACE Score and Early Initiation of Drug Use (by age 14)



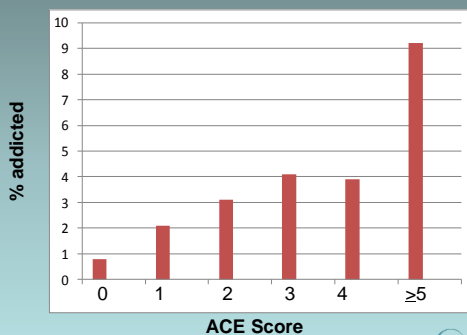
Adverse Childhood Experiences and Teen Pregnancy



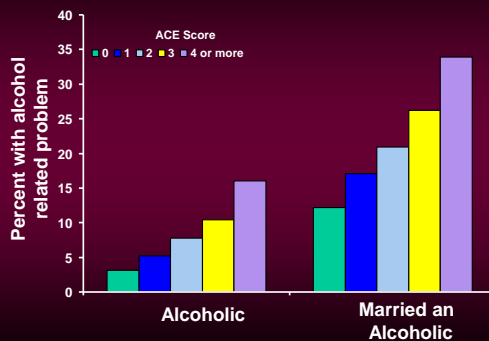
## ACEs and Addiction



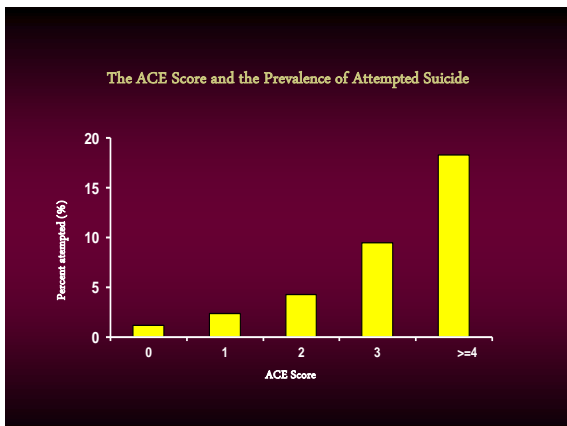
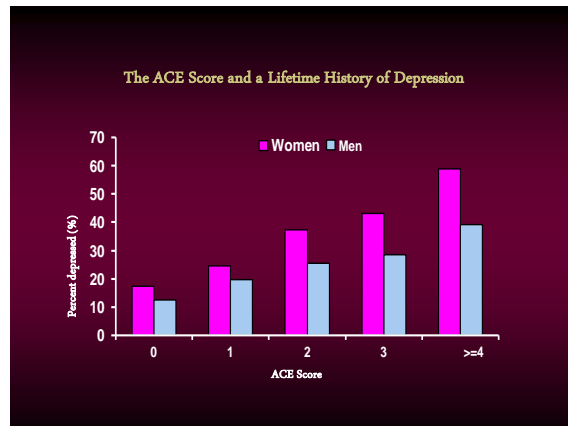
ACE Score and Ever Addicted to Drugs



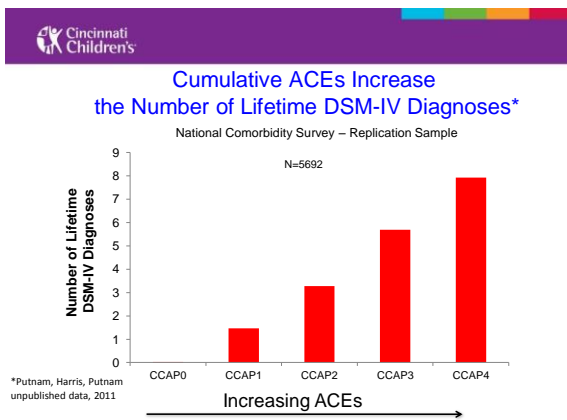
The ACE Score and Alcoholism



## A Focus on Mental Health



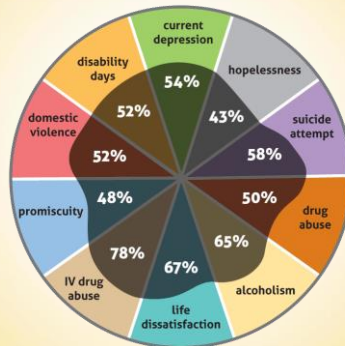
## More Adversity... More Comorbidity



## What's Predictable is Preventable



## ACEs and Population Attributable Risks



ACEs are the major preventable pathway to mental illness and substance abuse....

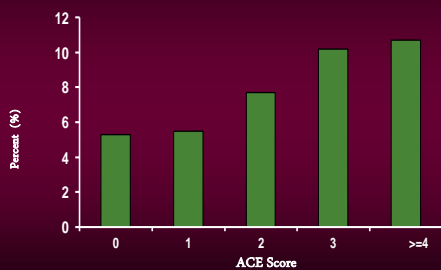
And mental illness and substance abuse lay at the "Crossroads" of public health



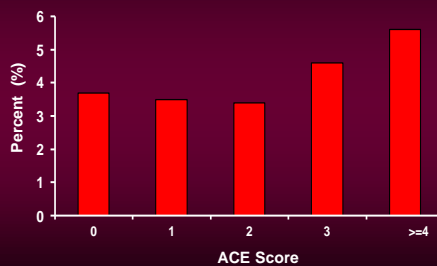
## ACEs are a Pathway to Disease



The ACE Score and Liver Disease



The ACE Score and the Prevalence of Coronary Heart Disease



## ACEs and Leading Causes of Death

ACEs increase the risk of:

- Heart disease
- Chronic lung disease
- Stroke
- Diabetes
- Cancer
- Lung cancer
- Liver disease
- Suicide
- Injuries
- HIV and STDs



## Being Trauma Informed

It's not what's WRONG with you...

It's what HAPPENED to you...

...a different narrative



## Rewriting the Narrative of Your Life

The ACE Score provides a chance  
to see the story of your life...

And to create a different path for the future...



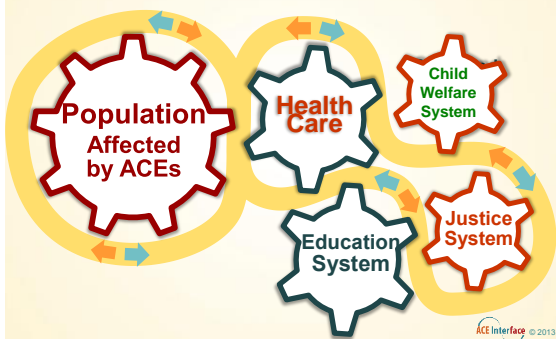
## Rewriting the Narrative of Your Life

From shame, confusion, and adaptations with a downside....

To create a different path for the future... with hope,  
meaning, and purpose



## Building Self-Healing Communities



## The Destabilizing Effects of ACES...

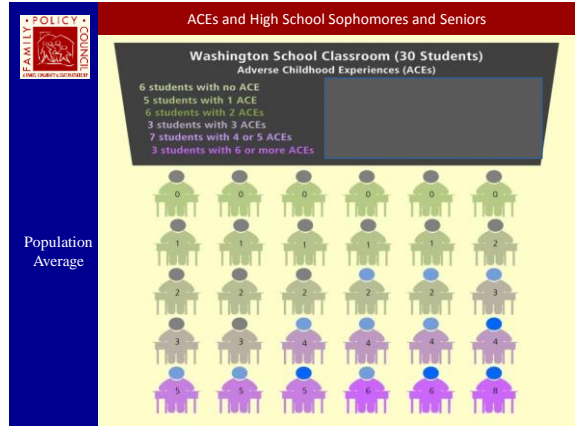
*In the Education System*



### Students with 3 or more ACEs:

- Are 2 ½ times more likely to fail a grade
- Score lower on standardized tests
  - Have language difficulties
- Are suspended or expelled more
- Are designated to special education more frequently
  - Have poorer health

Courtesy of Chris Blodgett, PhD  
Washington State University

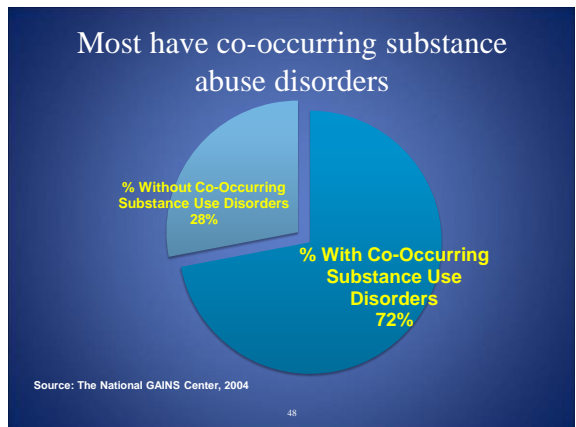
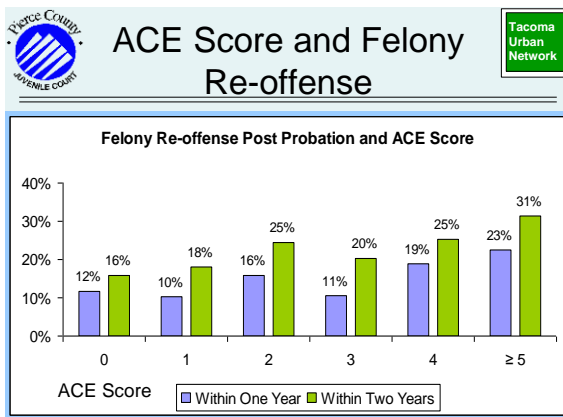
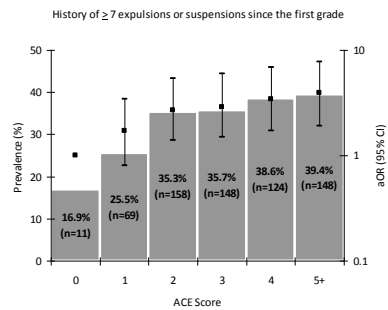


## The Destabilizing Effects of ACES...

### The Prison Pipeline

ACE Interface © 2013

### ACE Score and Repeated Suspension/Expulsion Youth on Probation, Pierce County, WA



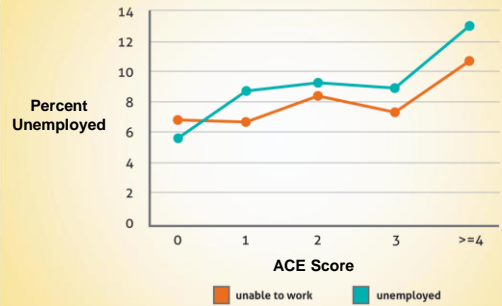


# The Destabilizing Effects of ACES...

## A Pipeline to Poverty

ACE Interface © 2013

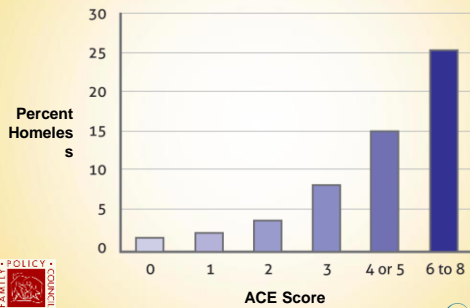
### ACES and Unemployment



Source: Soc Psychiatry & Epidemiology; Liu, et al., (2013)

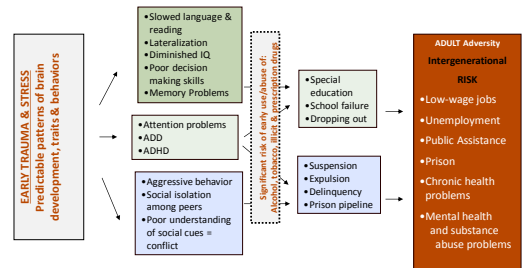
ACE Interface © 2013

### ACES and Adult History of Homelessness Washington State, BRFS



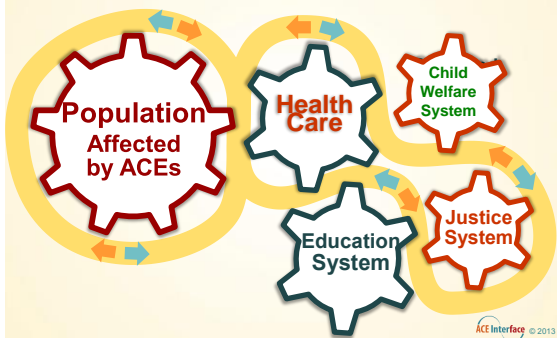
ACE Interface © 2013

### The Progressive Nature of Adversity in the Life-Course



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### Building Self-Healing Communities



ACE Interface © 2013

## The ACE Study is Shaping Public Policy...

*Emerging strategies to prevent ACEs and mitigate their effects*



### Adverse Childhood Experiences A Public Health Issue

ACEs have a strong influence on:

- adolescent health
- reproductive health
  - smoking
  - obesity
  - alcohol abuse
  - illicit drug abuse
  - sexual behavior
  - mental health
- risk of violence and revictimization
- stability of relationships
- performance in the workforce

## A National Call for Trauma-Informed Schools

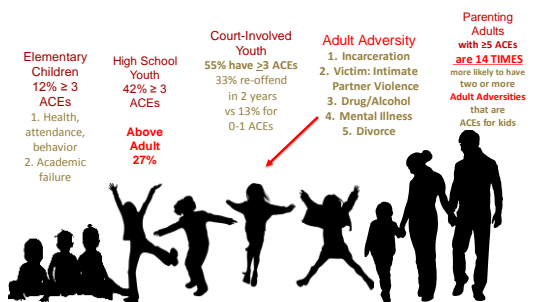
- ACEs can interfere with memory, learning & expected behavior at school (Cole et al., 2005)
- **Neighborhood violence** is associated with significant reductions in test scores (Burdick-Will et al., 2010)

as a result...

- The National Conference of State Legislatures (NCSL) has called for **nationwide trauma-informed education** (NCSL, 2014)



### The Progressive Nature of Adversity In Washington... Across the life course



## Massachusetts Funds Safe and Supportive Schools

The legislature has renewed funding for school grants that help schools integrate trauma-sensitive, anti-bullying, and mental health programs

<http://www.doe.mass.edu/grants/grants14/rfp/335.html>



## The Essence of Self-Healing Communities

*“Investing in communities is about investing in people with a stake.”*

-Rochelle Riling  
Okanagon County



**...The needs of the family affected by co-occurring disorders transcend neatly defined departments, disciplines, and organizational scopes.**

Source: AIA National Resource Center  
Research to Practice Brief. Supporting Children of Parents with Co-occurring Mental Illness and Substance Abuse



**“They demand the development of new partnerships, informal support networks, and a commitment to connecting systems that are not typically aligned.”**

Source: AIA National Resource Center  
Research to Practice Brief. Supporting Children of Parents with Co-occurring Mental Illness and Substance Abuse



The Walk to Paradise Garden  
*W. Eugene Smith*

### Vermont Seeks ACE-Informed Health Care

- [House Bill H762](#) is making its way through the legislature...
- Provisions include:
  - Voluntary use of ACE screening in health care settings
  - A position in the Department of Health to develop and implement programs at preventing and treating ACEs
  - Development of medical education related to ACEs
  - Evaluation of evidence-based interventions and tools



Beham, (Hans) Sebald (1500-1550); Hercules slaying the Hydra, 1545 from The Labours of Hercules (1542-1548).

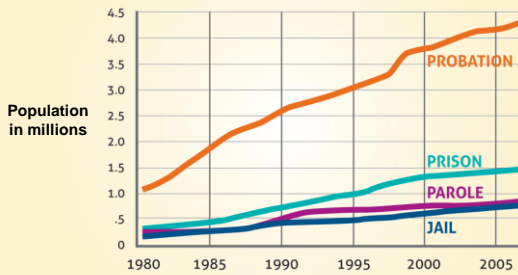
### Rewriting the Narrative of Your Life

From shame, confusion, and adaptations with a downside....

To create a different path for the future... with hope,  
meaning, and purpose



## Burgeoning Criminal Justice Populations



Sources: Bureau of Justice Statistics (2007); Skeem, Emke-Francis, et al. (2006) ACE Interface © 2013

## Adolescent Brain Development A Time of Risk and Opportunity

-Gray matter forms the thin outer layer of the cerebral cortex

-The volume of gray matter may be greatest during early adolescence

Source: National Institutes of Mental Health  
The Teen Brain: Still Under Construction

## Comparative ACEs among Women

Female juvenile offenders in Florida, women in 5 California prisons & Kaiser Permanente members

# of ACEs	Female Juveniles	Women in Prison	Women in ACE Study
0	1.9%	15.7%	34.5%
1	7.8%	M.T. 16.7%	24.5%
2	11.8%	21.8%	15.5%
3	16.7%	14.0%	10.3%
4+	61.8%	31.8%	15.2%

Bakula, M.T. et al. (2014). The prevalence of adverse childhood experiences in the lives of juvenile offenders. *CLJEP: Journal of Juvenile Justice*, 3(2).  
Cohen, P. & Caspi, A. (2003). Childhood adversities and mental health outcomes in California prison population. *Am J Public Health*, 96:1843-1846.  
Masten, A.S. & Cicchetti, D. (2005). Childhood trauma and women's health outcomes in California prison population. *Am J Public Health*, 96:1843-1846.

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## Massachusetts Funds Safe and Supportive Schools

### Funding supports:

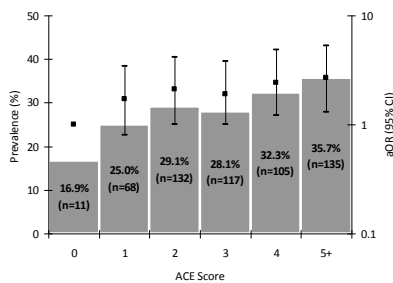
- Leadership and professional development
- Access to services, such as mental health
- Development of academic and non-academic supports that enable all children, including those with behavioral difficulties to learn at school
- Collaboration with families

<http://www.doe.mass.edu/grants/grants14/rfp/335.html>

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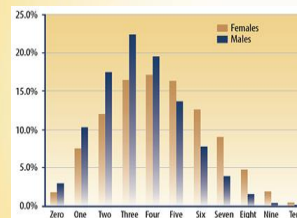
## ACE Score and Poor Academic Performance Youth on Probation, Pierce County, WA

Poor academic performance during most recent school term



## Prevalence of ACEs by Gender

$N_{total} = 64,329$  |  $N_{female} = 13,359$  |  $N_{male} = 50,970$



# of ACEs	% Female	% Male
Ave Score	4.29	3.48
0	1.9%	3.1%
1	7.8%	10.7%
2	11.8%	17.5%
3	16.7%	22.3%
4	16.7%	19.4%
5+	45.1%	27.4%

M.T. Bakula et al. (2014). The prevalence of adverse childhood experiences in the lives of juvenile offenders. *CLJEP: Journal of Juvenile Justice*, 3(2).

ACE Interface © 2013

## Prevalence of ACEs among Juvenile Offenders

% of each ACE among those reporting adverse childhood experiences, by gender

ACE	% Female	% Male
Witness DV	84%	81%
Separation/Divorce	84%	78%
Family Member Incarceration	68%	65%
Physical Abuse	41%	26%
Emotional Abuse	39%	31%
Emotional Neglect	39%	31%
Sexual Abuse	31%	7%
Household Substance Abuse	30%	24%
Physical Neglect	18%	12%
Household Mental Illness	12%	8%

M.T. Bates et al. (2016). The prevalence of adverse childhood experiences in the lives of juvenile offenders. *CLJDP: Journal of Juvenile Justice*, 3(2).



## Comparative Prevalence of ACEs

% of each ACE among incarcerated women in California and members of Kaiser Permanente

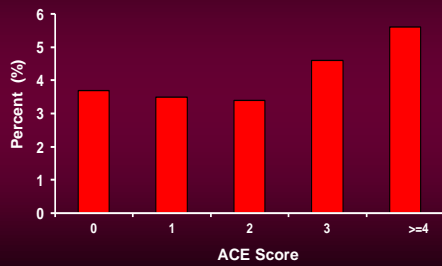
ACE	Women in Prison	HMO Members
Witness DV	47.6%	12.7%
Sexual Abuse	45.1%	20.7%
Separation/Divorce	43.7%	23.3%
Emotional Abuse & Neglect	34.2%	25.4%
Family Member Incarceration	33.8%	4.7%
Physical Abuse	30.6%	28.6%
Household Substance Abuse	Not reported	26.9%
Household Mental Illness	Not reported	19.4%

Centers for Disease Control (2014). Prevalence of individual adverse childhood experiences. Retrieved from <http://www.cdc.gov/nchs/data/brb/ace/prevalence.html>

Heenan, N., & Carlin, C. (2008). Childhood trauma and women's health outcomes in California prison population. *Ain - J Public Health*, 98, 1842-1848



## The ACE Score and the Prevalence of Coronary Heart Disease



## Massachusetts Funds Safe and Supportive Schools

### Funding supports:

- Leadership and professional development
- Access to services, such as mental health
- Development of academic and non-academic supports *that enable all children, including those with behavioral difficulties to learn at school*
- Collaboration with families

<http://www.doe.mass.edu/grants/grant14/rfp335.html>

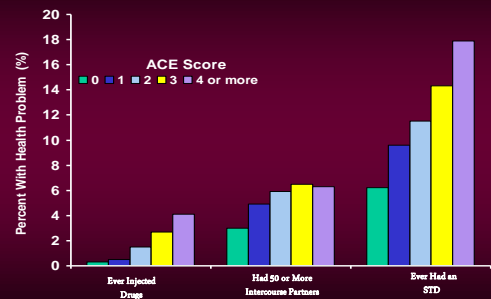


## A National Call for Trauma-Informed Schools

- ACEs can interfere with memory, learning & expected behavior at school (Cole et al., 2005)
- **Neighborhood violence** is associated with significant reductions in test scores (Burdick-Will et al., 2010)  
**as a result...**
- The National Conference of State Legislatures (NCSL) has called for **nationwide trauma-informed education** (NCSL, 2014)



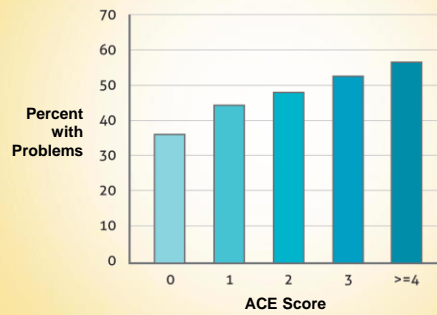
## ACE Score and HIV Risks



# The Destabilizing Effects of ACES on Relationships, Family, Households and Community

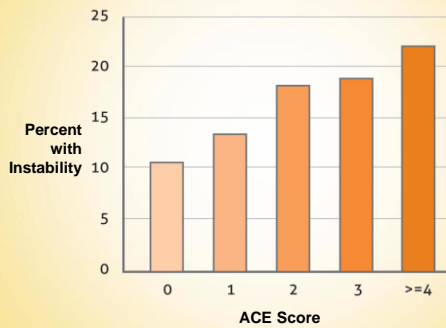
ACE Interface © 2013

## ACES and Relationship Problems (Divorce, Family Problems, Sexual Dissatisfaction)



ACE Interface © 2013

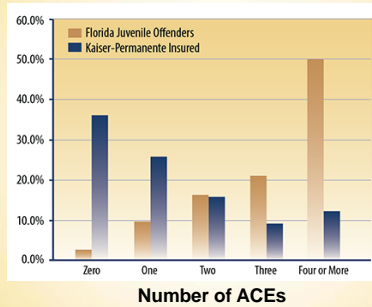
## ACES and Financial Instability



ACE Interface © 2013

## Incarcerated Youth Have Very High ACEs

As measured by Florida's risk assessment tool vs. Kaiser Permanente ACE study



M.T. Bates et al. (2014). The prevalence of adverse childhood experiences in the lives of juvenile offenders. *CLEOP Journal of Juvenile Justice* 3(2).

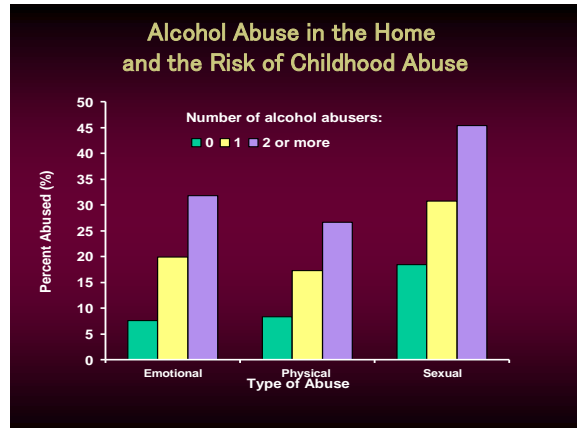
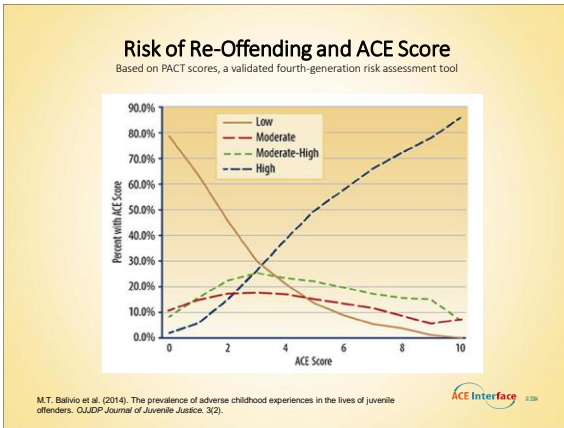
ACE Interface © 2013



## ACES AMONG INCARCERATED YOUTH IN FLORIDA

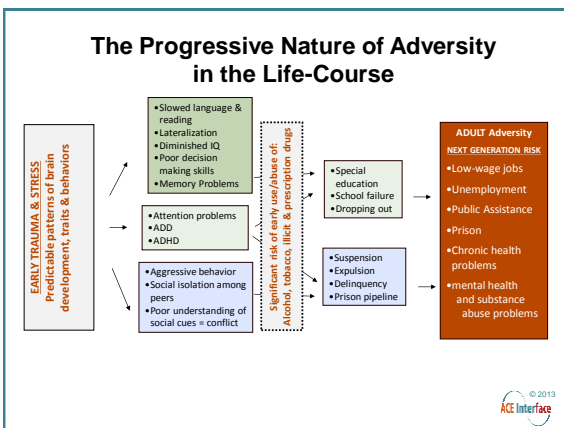
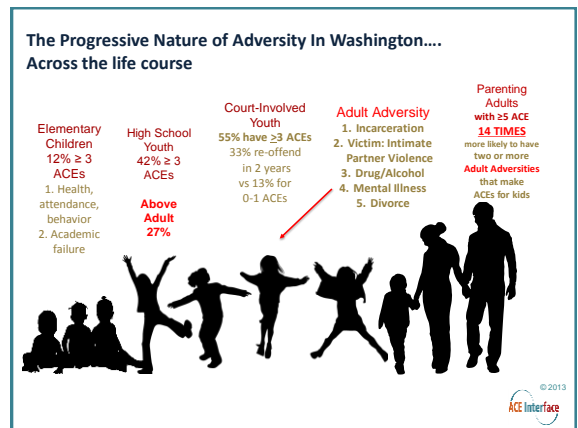
Findings from 64,329 Juvenile Offenders

ACE Interface © 2013

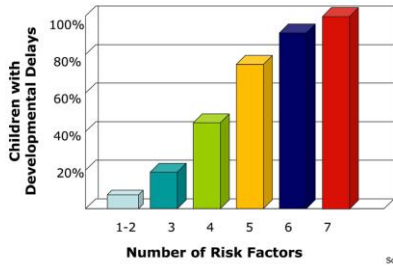


### Large numbers of youth in the juvenile justice system are experiencing mental health disorders

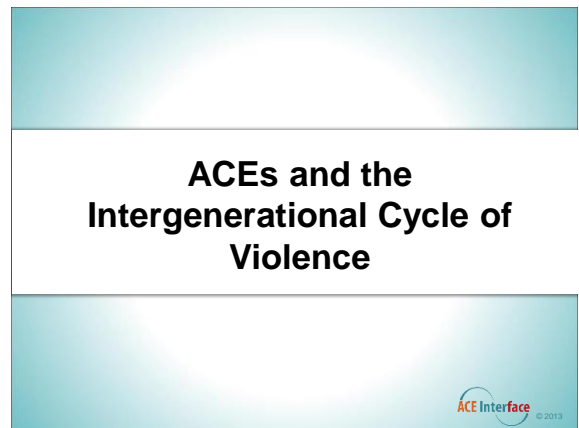
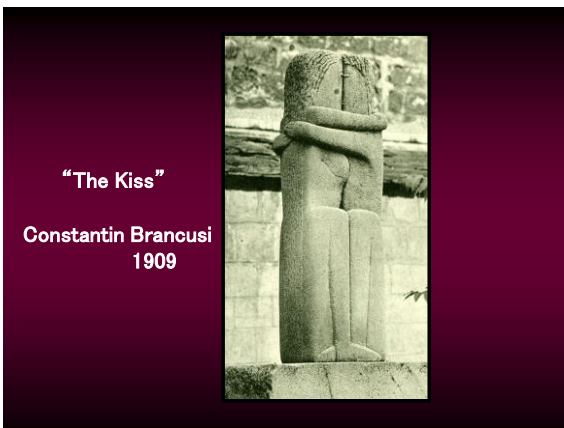
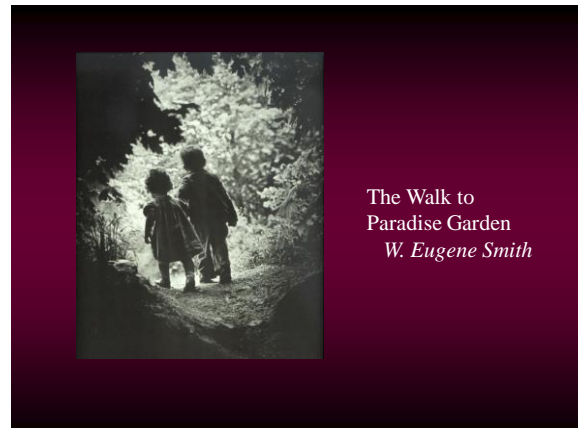
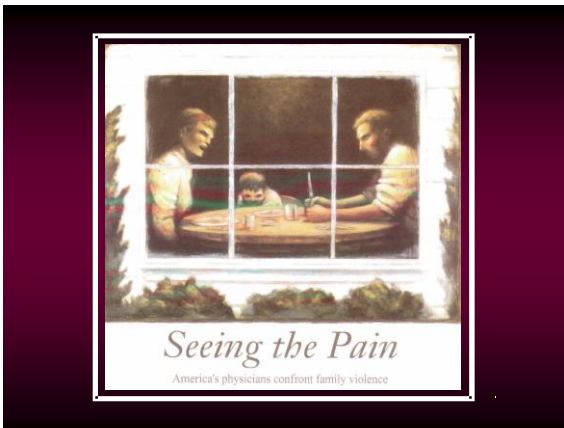
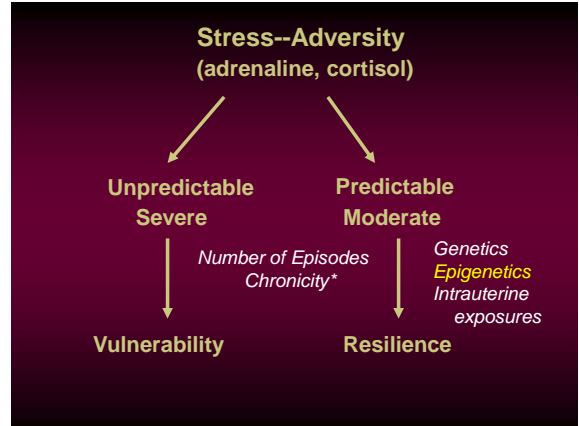
Prevalence of Mental Disorders- Findings From Recent Studies	Positive Diagnosis
NCMHJJ (2006)	<b>70.4%</b>
Teplin et al. (2002)	<b>69.0%</b>
Wasserman et al. (2002)	<b>68.5%</b>
Wasserman, Ko, McReynolds (2004)	<b>67.2%</b>



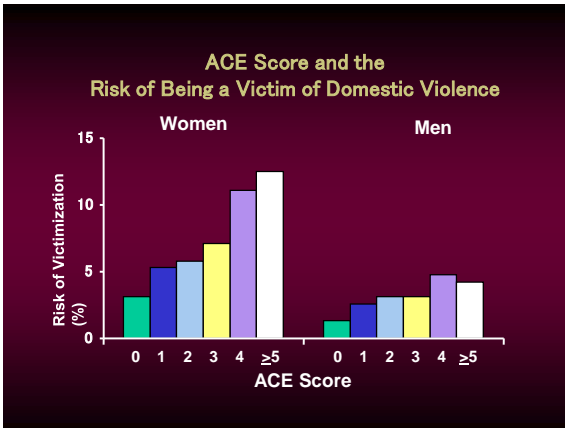
**Significant Adversity Impairs Development in the First Three Years**



Source: Barth et al. (2008)







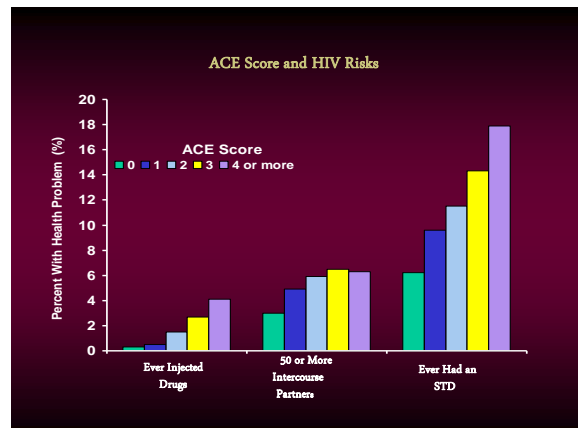
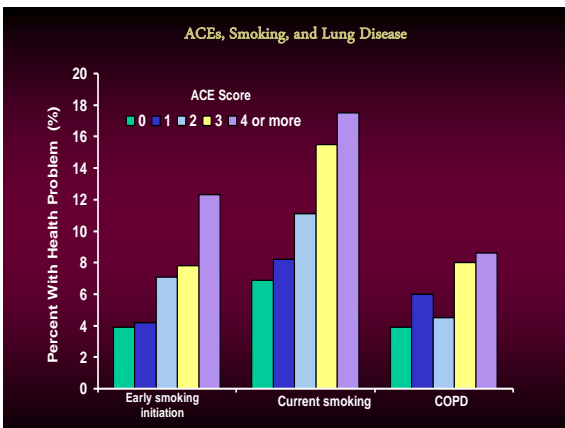
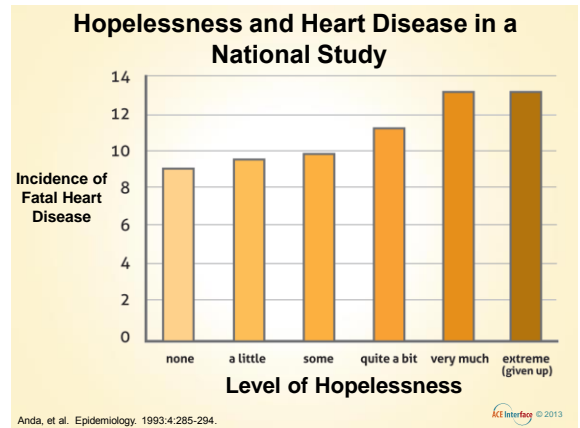
### Telomeres & ACEs

- Telomeres appear to be impacted by exposure to violence
- In a longitudinal study of twins, researchers found the twin exposed to violence had shorter telomeres than the twin who was not.
- Telomeres in individuals removed from a violent environment by age 5 showed improvement by age 10.



Photo/Photo Researchers Inc.

# The Biology of Hope





# ACEs Lead to *Adaptations With a Downside*

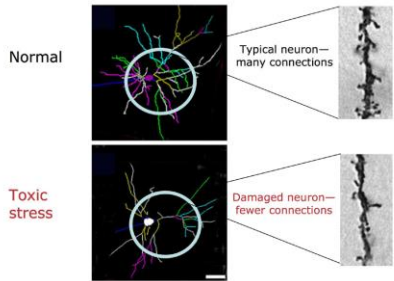


Anxiety  
Depression  
Difficulty Concentrating  
**SMOKING**



Center on the Developing Child  
HARVARD UNIVERSITY

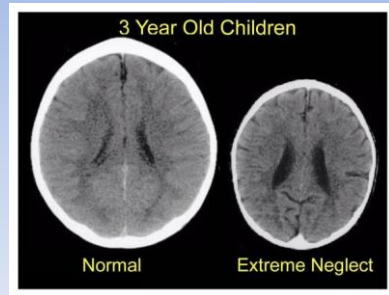
## Persistent Stress Changes Brain Architecture



Prefrontal Cortex and Hippocampus

Sources: Radley et al. (2004)  
Bock et al. (2005)

## Impact of Neglect



Bruce Perry, MD

ACEs Among Youth on Probation in Pierce County, Washington