Adverse Childhood Experiences:
What do we know and what can be done about it?

Anne Menahemy, MD

- I suggest that [the role of medicine] should be interpreted as follows: To assist us to come safely into the world and comfortably out of it, and during life to protect the well and care for the sick and disabled.
- Thomas McKeown *The Role of Medicine: Dream, Mirage or Nemesis*

How childhood trauma affects health across a lifetime
Nadine Burke Harris

Adverse childhood experiences (ACE) study

- Epidemiological study: n=17,000 primary care patients (predominantly white and middle class); collaboration between Dr. V. Felitti at KP San Diego and Dr. R. Anda at CDC
- Data collected through patient completion of questionnaires at medical office visits and subsequent ACE questionnaires mailed to their homes.
- All reporting of Adverse Childhood Experiences by retrospective report; health outcomes also self reported.

ACE Questionnaire

Below is a list of some Adverse Childhood Experiences (ACEs). Check the Yes or No box next to each question.

Prior to your 18th birthday:	
Did a parent or adult in your home ever swear at you, insult you, or put you down?	☐Yes ☐No
Not including spanking, did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?	☐Yes ☐No
Did you experience sexual abuse by an adult or person at least 5 years older?	☐Yes ☐No
Did you lose a parent through divorce, abandonment, death or other reason?	☐Yes ☐No
Did your parents or adults in your home ever hit, punch or beat each other up?	☐Yes ☐No
Did you live with anyone who was a problem drinker, alcoholic or who used street drugs?	☐Yes ☐No
Did you have someone in your household who was depressed, mentally ill or attempt suicide?	☐Yes ☐No
Did you have a member of your household who went to prison?	☐Yes ☐No
Did you feel that no one in your family loved you or thought you were special?	☐Yes ☐No
Did you feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect or take care of you?	☐Yes ☐No

Your ACEs score is the total *Yes* responses _____

Prevalence by ACE category

ACE Category	Women	Men	Total
	Percent (N = 9,367)	Percent (N = 7,970)	Percent (N = 17,337)
ABUSE			
Emotional Abuse	13.1%	7.6%	**10.6%**
Physical Abuse	27%	29.9%	**28.3%**
Sexual Abuse	24.7%	16%	**20.7%**
HOUSEHOLD CHALLENGES			
Mother Treated Violently	13.7%	11.5%	**12.7%**
Household Substance Abuse	29.5%	23.8%	**26.9%**
Household Mental Illness	23.3%	14.8%	**19.4%**
Parental Separation or Divorce	24.5%	21.8%	**23.3%**
Incarcerated Household Member	5.2%	4.1%	**4.7%**
NEGLECT			
Emotional Neglect[3]	16.7%	12.4%	**14.8%**
Physical Neglect[3]	9.2%	10.7%	**9.9%**

ABUSE

Physical

Emotional

Sexual

NEGLECT

Physical

Emotional

HOUSEHOLD DYSFUNCTION

Mental Illness

Incarcerated Relative

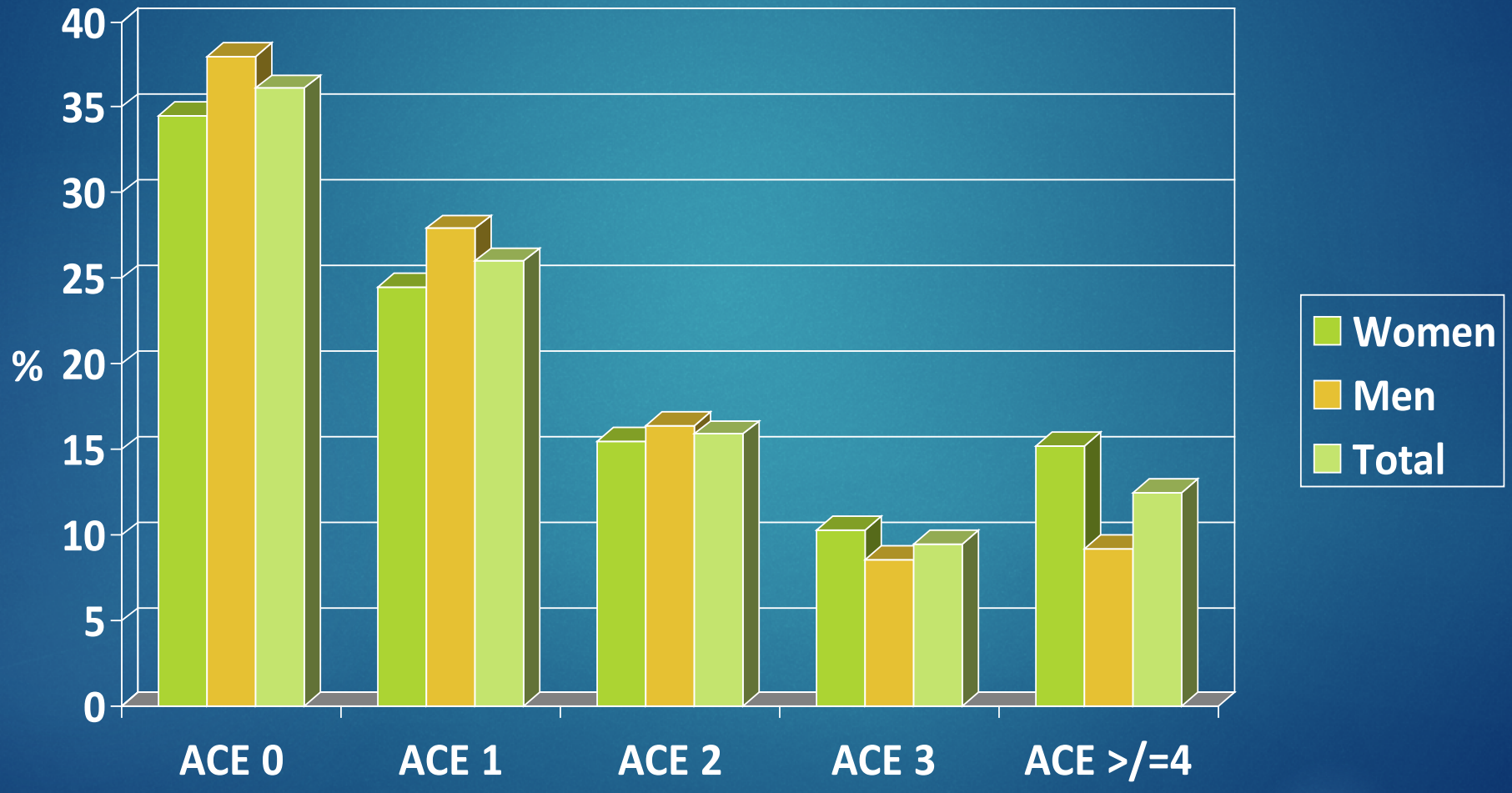
Mother treated violently

Substance Abuse

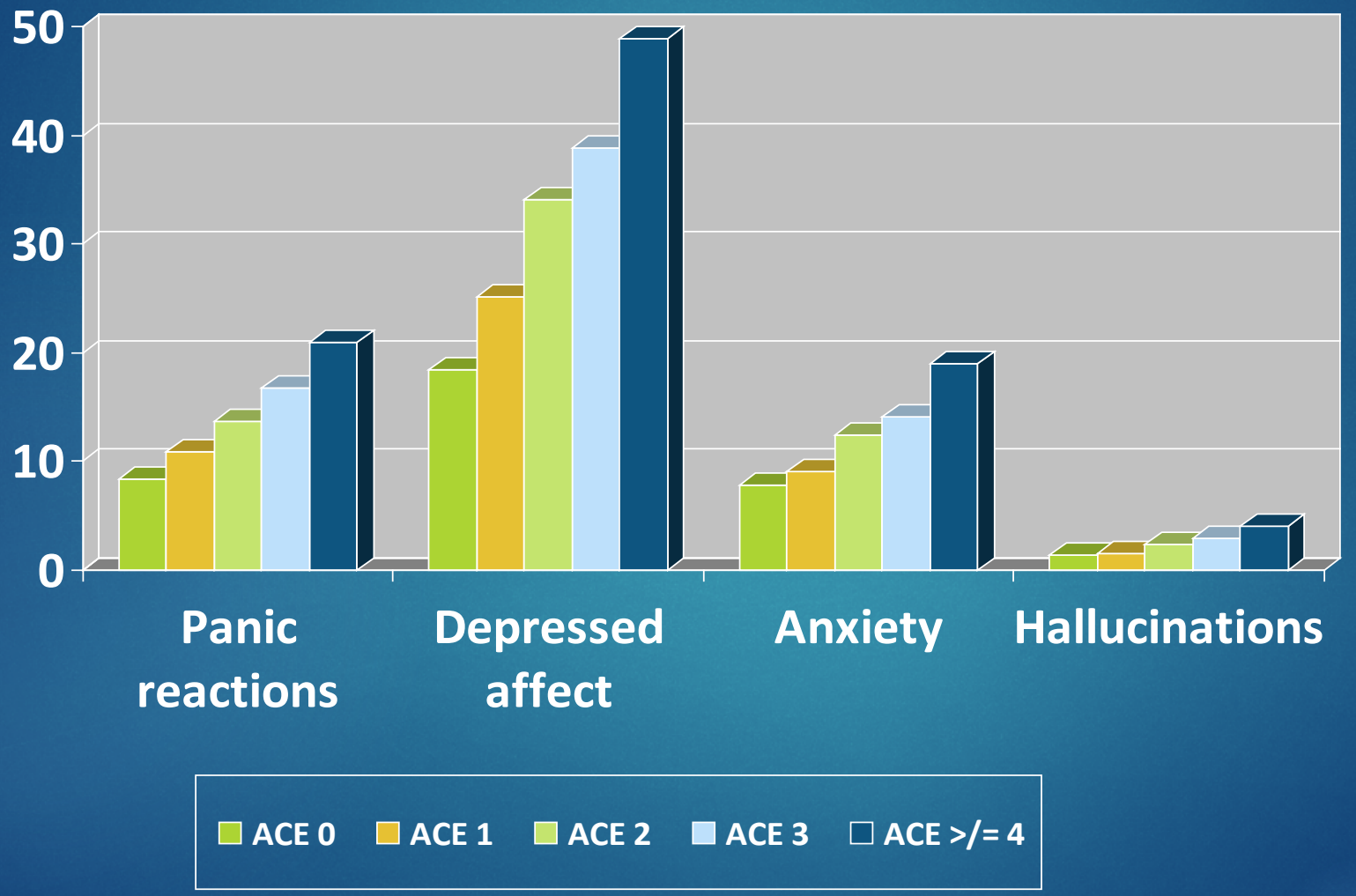
Divorce

Types of Adverse Childhood Experiences
Image courtesy of the Robert Wood Johnson Foundation

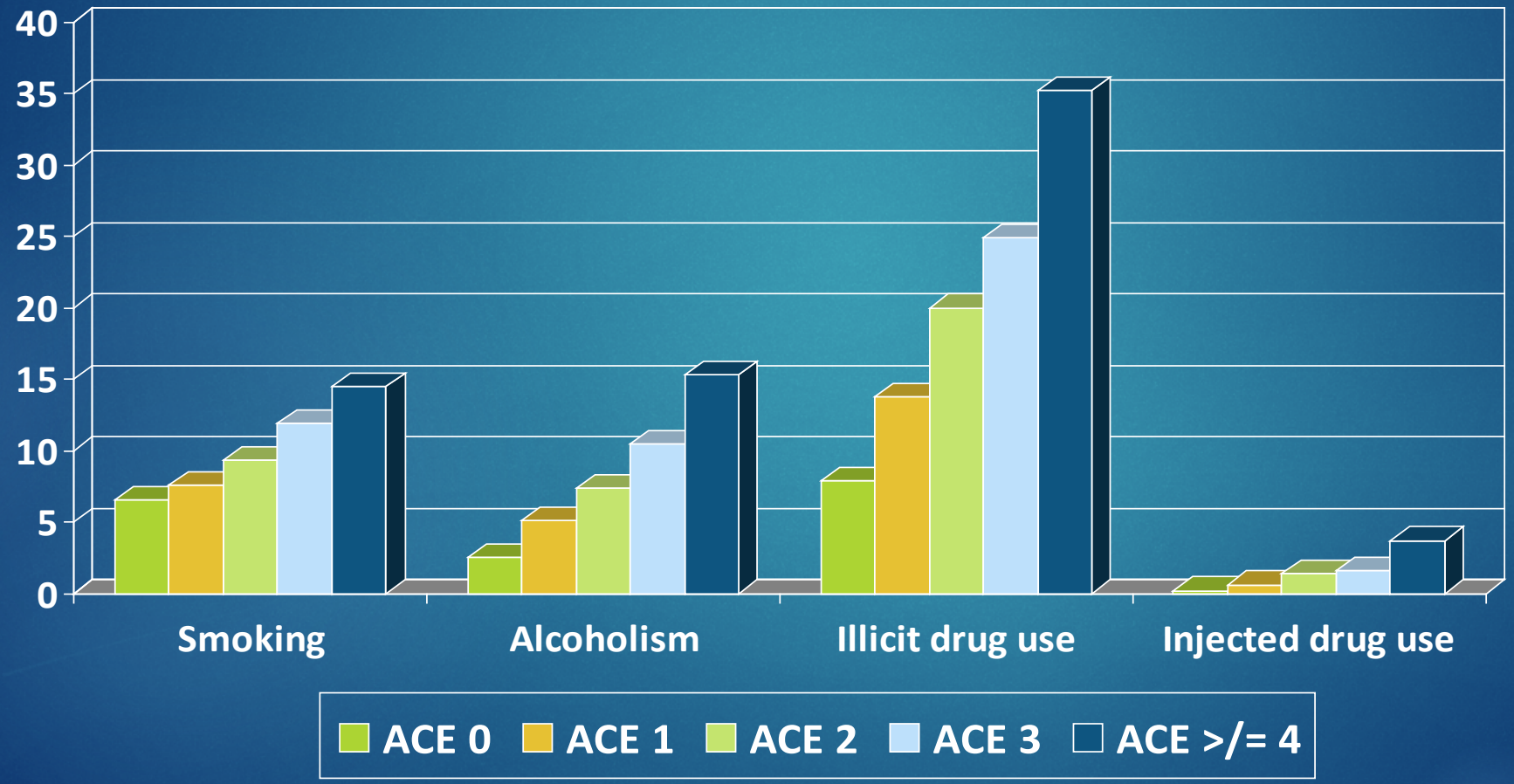
Distribution of ACE scores



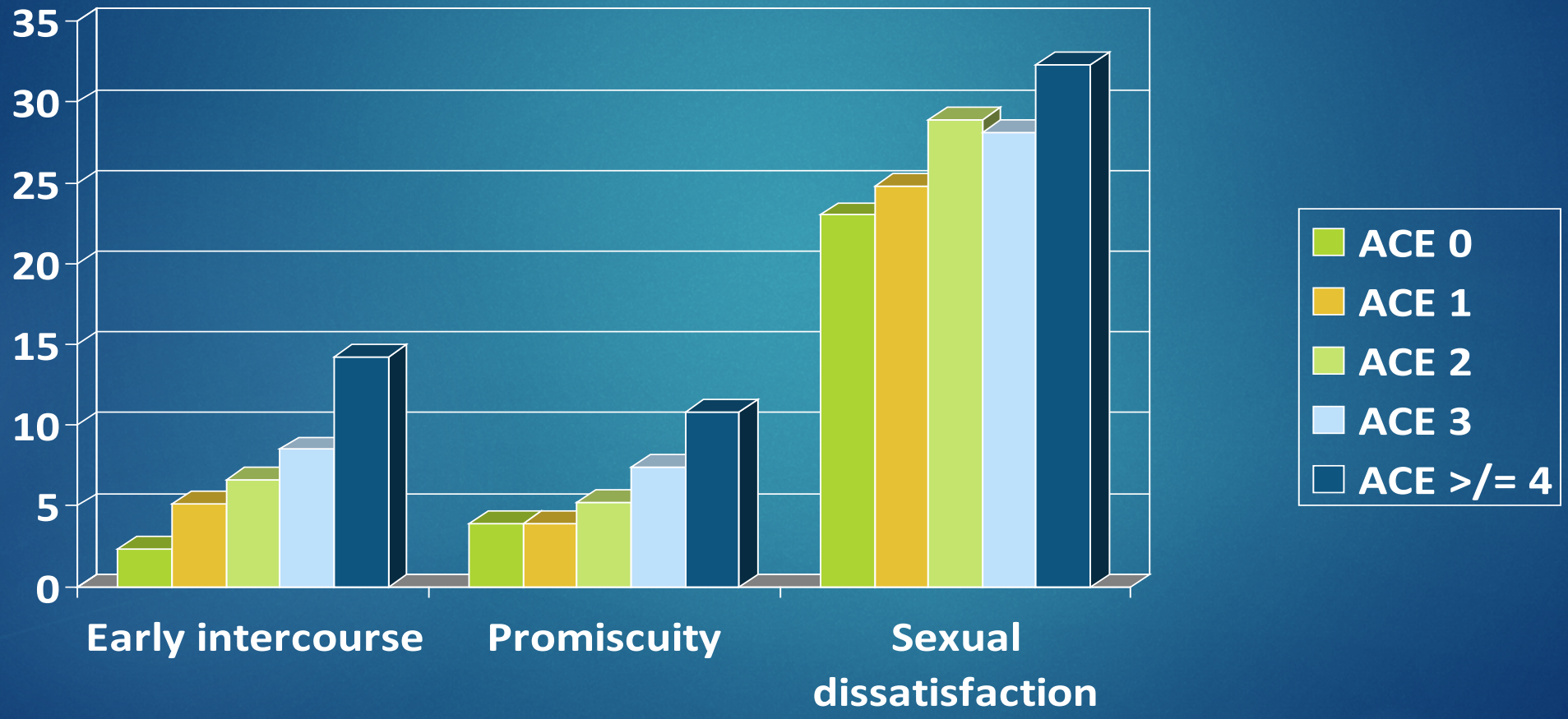
ACE scores and mental health



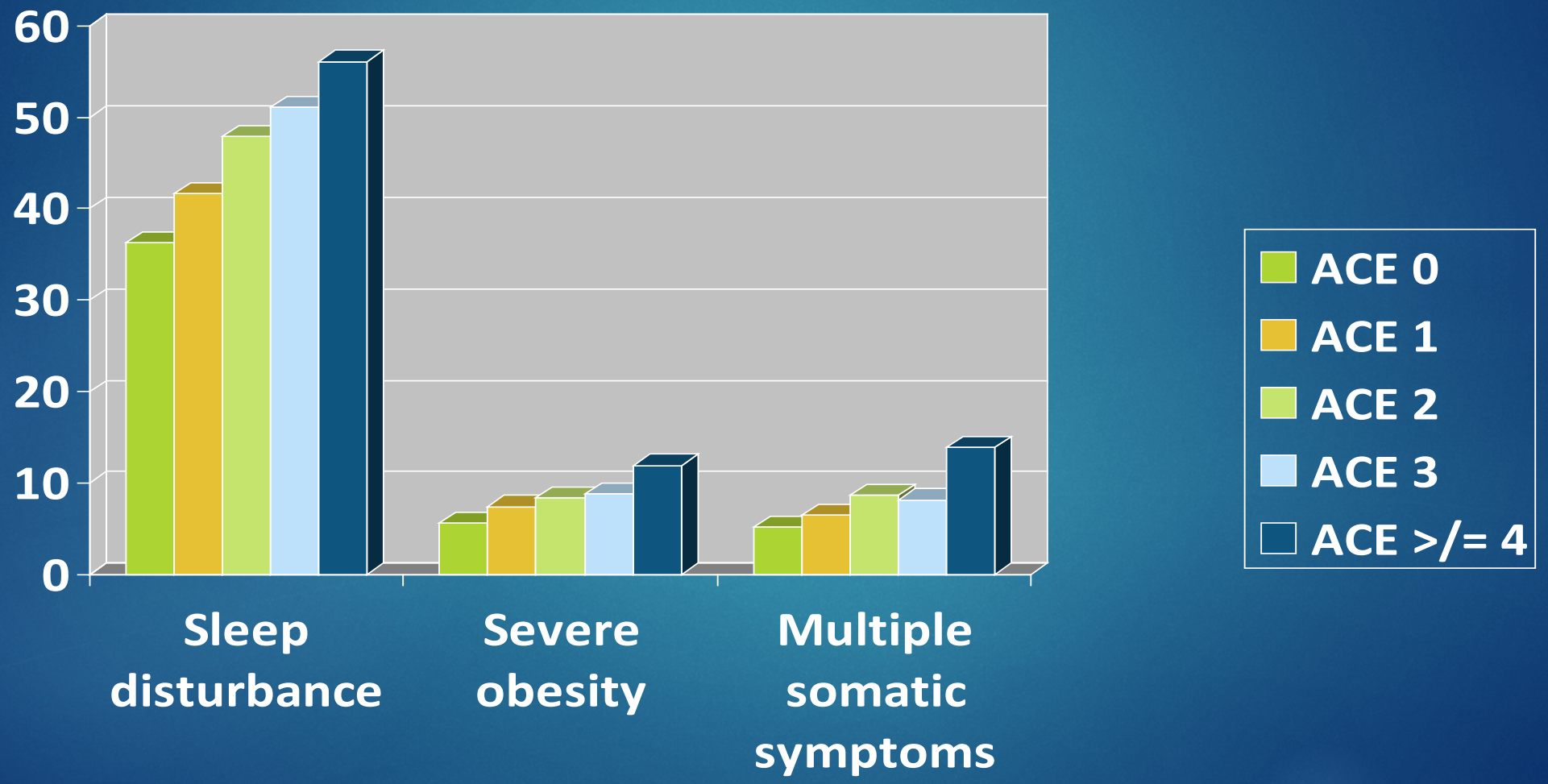
ACE scores and substance abuse



ACE scores and sexuality

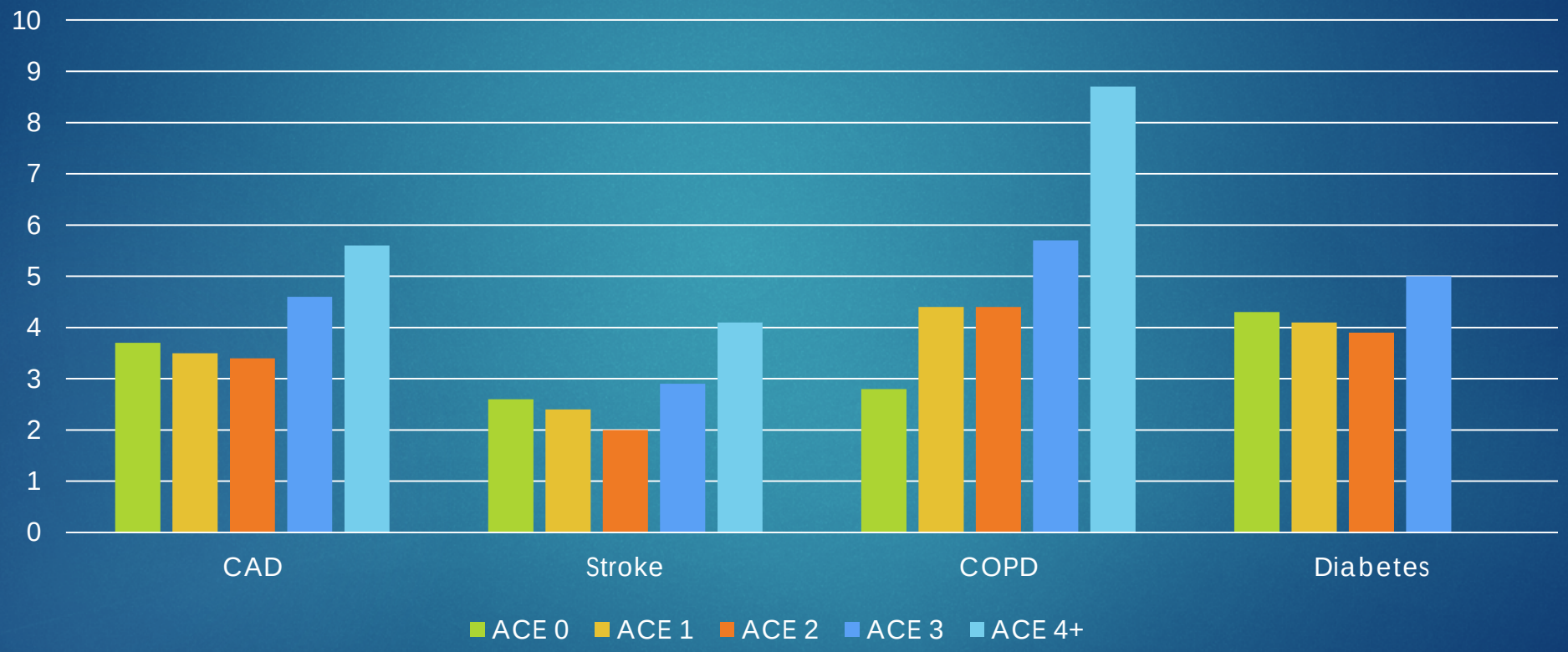


ACE scores and somatic health disturbances



ACE SCORE & CHRONIC DISEASE

Felitti et al *Am J Prev Med* 1998



ACE & ISCHEMIC HEART DISEASE

Dong et al *Circulation* 2004

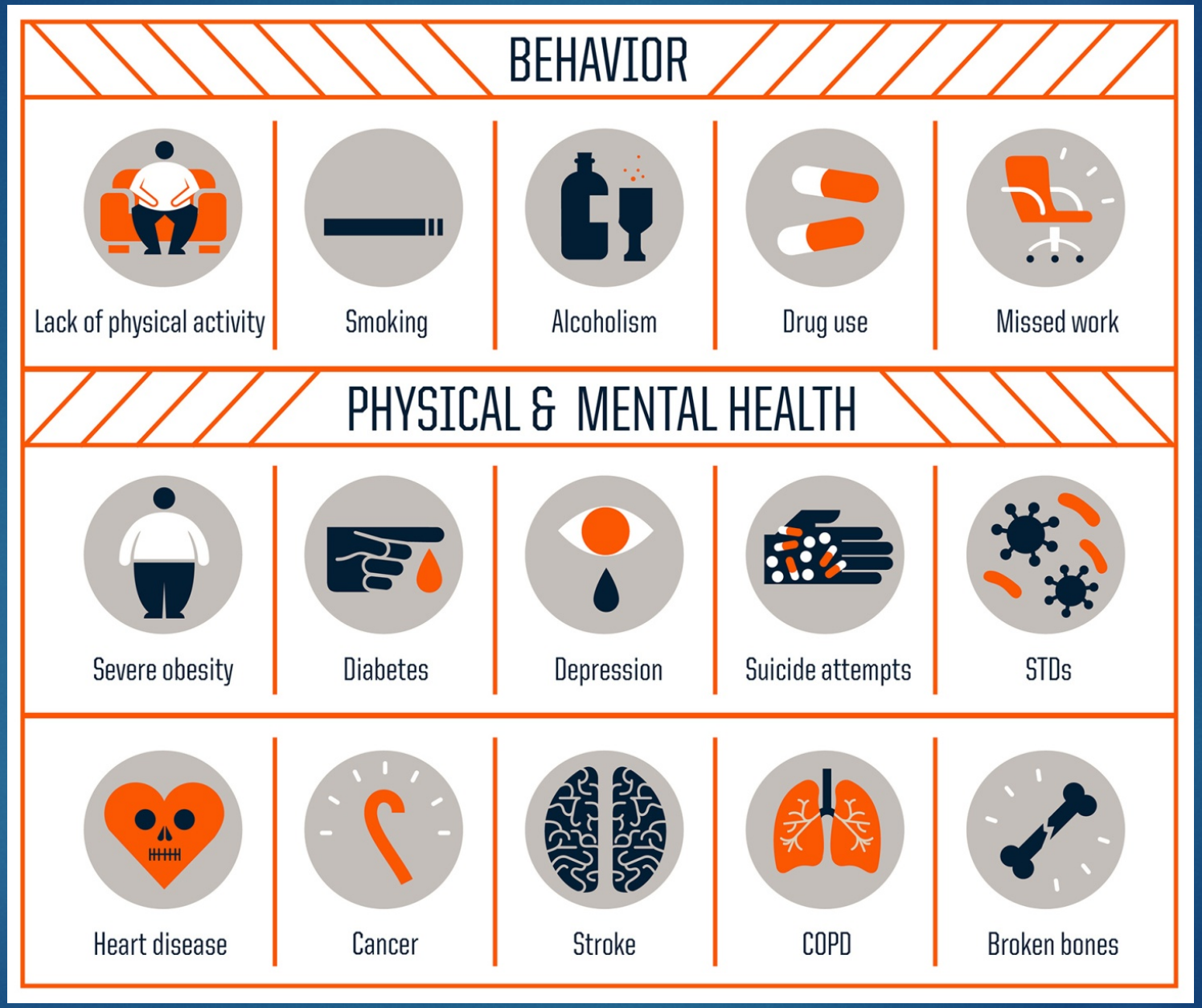
- ACE-IHD relationship mediated more strongly by depression and anger than by traditional IHD risk factors (like smoking, physical inactivity, obesity, diabetes and hypertension)

Relative risk for individuals with 4 or more ACEs Brown *AmJPrevMed* 2009

Condition	*Increased Risk*
Diabetes	1.6
Cancer	1.9
Ischemic Heart Disease	2.2
Stroke	2.4
Alcoholism	7.4
Attempted Suicide	12.2

ACE scores & mortality

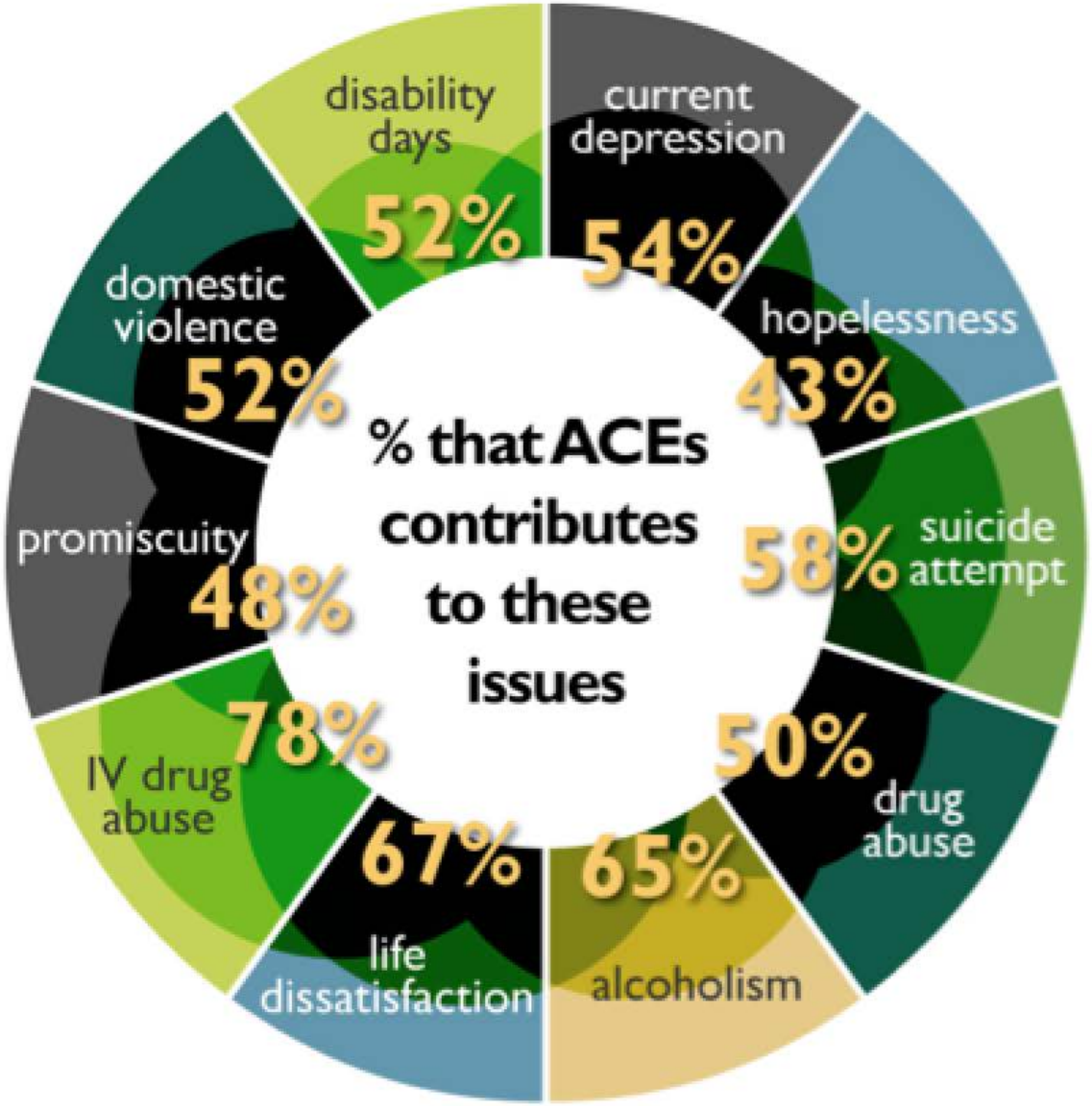
- *Premature death* (people with 6 or more ACE died nearly 20 years earlier than those with no ACEs—effect only partially explained by documented ACE related health and social problems)


BEHAVIOR
Lack of physical activity
Smoking
Alcoholism
Drug use
Missed work
PHYSICAL & MENTAL HEALTH
Severe obesity
Diabetes
Depression
Suicide attempts
STDs
Heart disease
Cancer
Stroke
COPD
Broken bones

Higher ACEs scores also predict:

- More doctor visits with unexplained physical symptoms
- 6x increased risk of Chronic Fatigue Syndrome
- Higher rates of autoimmune disease (for every additional ACE 20% increased risk of hospitalization for autoimmune disease) Dube, et al 2009
- 10x increased risk of learning and behavioral problems, including ADHD

ACEs and Population Attributable Risks



How to make sense of this?

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

The ACEs are attachment disruptors

- Betrayal
- Boundary violation
- Emotional wounding
- Humiliation
- Fear
- Neglect
- Separation
- Violence
- Emotional deprivation
- Abandonment
- Exploitation
- Narcissistic injury

Yet secure attachment is essential for neural development...

- If caregivers are depressed, stressed, high, inconsistent, or absent, ***crucial neural networks develop abnormally***.

- Child becomes ***more vulnerable*** to future stressors ***and less resilient***; also less capable of benefiting from subsequent opportunities for connection.

ACEs create the conditions for toxic stress

National Scientific Council on the Developing Child, Shonkoff et al *JAMA* 2009

- *Positive stress*: moderate, short-lived and essential to healthy development
- *Tolerable stress*: disruptive but buffered by supportive relationships that facilitate adaptive coping
- ***Toxic stress***: strong, frequent or prolonged activation of stress response *in the absence of buffering protection of adult support*

Toxic stress = psychological trauma

"Traumatic reactions occur when action is of no avail. When neither resistance nor escape is possible, the human system of self-defense becomes overwhelmed and disorganized."

J. Herman 1992

Biphasic trauma response

adapted from van der Kolk, 1987

	+	-
Arousal	Hyperarousal	Hypoarousal
Affect	Flooding	Numbing
Memory	Flashbacks	Amnesia
Behavior	Reenactment	Avoidance

Pathways of response to stress may become “hard wired” Perry, 1998

Hyperarousal response

- Fight or flight
- Increased sympathetic arousal (increased heart rate, blood pressure, respirations, increased muscle tone)
- Hypervigilance
- Over time: hyperactivity, anxiety, behavioral impulsivity, sleep problems

Dissociative response

- Freeze and surrender
- Circulating stress hormones, but with increased parasympathetic response (decreased heart rate and blood pressure) and endogenous opioids
- Numbing, compliance, avoidance and restricted affect
- Over time: dissociative and mood disorders

Biology of children exposed to maltreatment

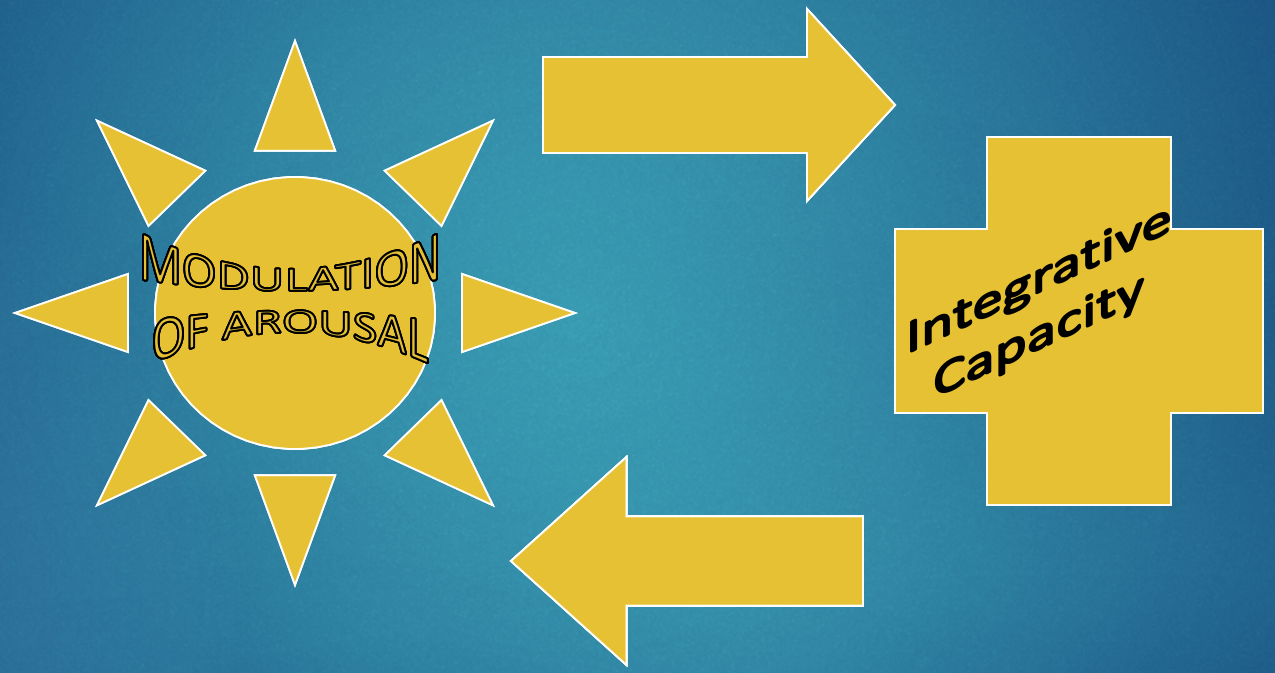
Danese, McEwen *Physiology & Behavior* 2011

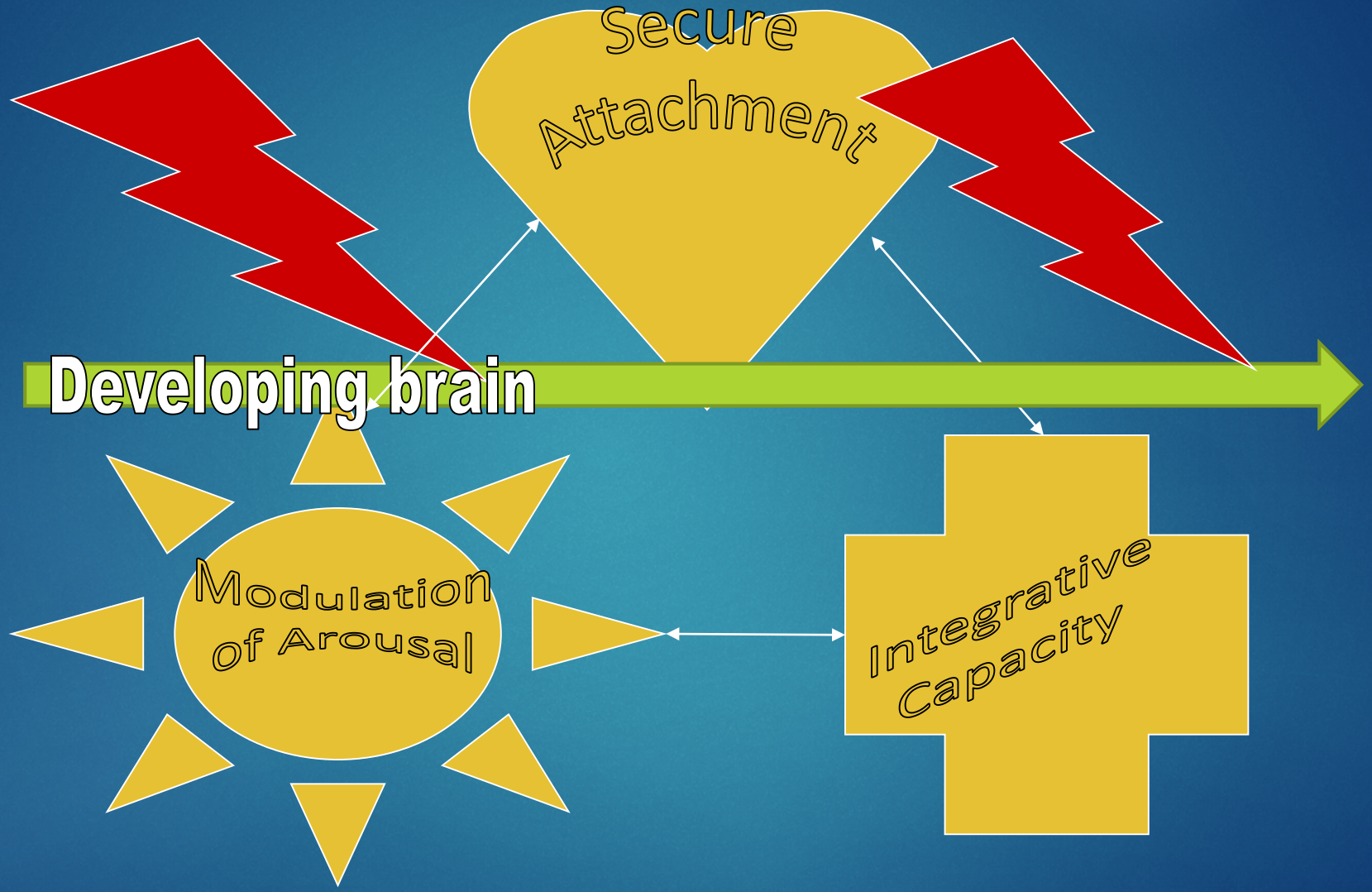
- Smaller volume of prefrontal cortex
- Greater (baseline) activation of HPA axis
- Elevation in inflammation levels
- Deficits in executive functioning, sustained attention and impulse control.
- Increased motor activity
- Blunted cortisol response to acute stress
- Greater vulnerability to obesity
- Impaired response to chronic infections (HPV)
  Khanna 2004, Shirtcliff, 2009

Biology of children exposed to maltreatment

Danese, McEwen *Physiology & Behavior* 2011

- Smaller volume of prefrontal cortex
- Greater (baseline) activation of HPA axis
- Elevation in inflammation levels
- Deficits in executive functioning, sustained attention and impulse control.
- Increased motor activity
- Blunted cortisol response to acute stress
- Greater vulnerability to obesity
- Impaired response to chronic infections (HPV)
  Khanna 2004, Shirtcliff, 2009


Modulation of arousal
Integrative Capacity


Secure Attachment
Developing brain
Modulation of Arousal
Integrative Capacity

Biology of adults exposed to maltreatment in childhood Danese, McEwen

Physiology & Behavior 2011

- Smaller volume of pre-frontal cortex and hippocampus
- Chronic activation of HPA axis; high CRH levels in CSF
- Elevation of inflammation levels (CRP, fibrinogen, WBC, IL-6)
- Reduced telomere length
- Deficits in declarative memory
  Bremner, 2004
- Heightened or blunted ACTH and cortisol response to stress
- Increased risk for cardiovascular disease, diabetes, asthma, and chronic lung disease
- Accelerated aging

Biology of adults exposed to maltreatment in childhood Danese, McEwen

Physiology & Behavior 2011

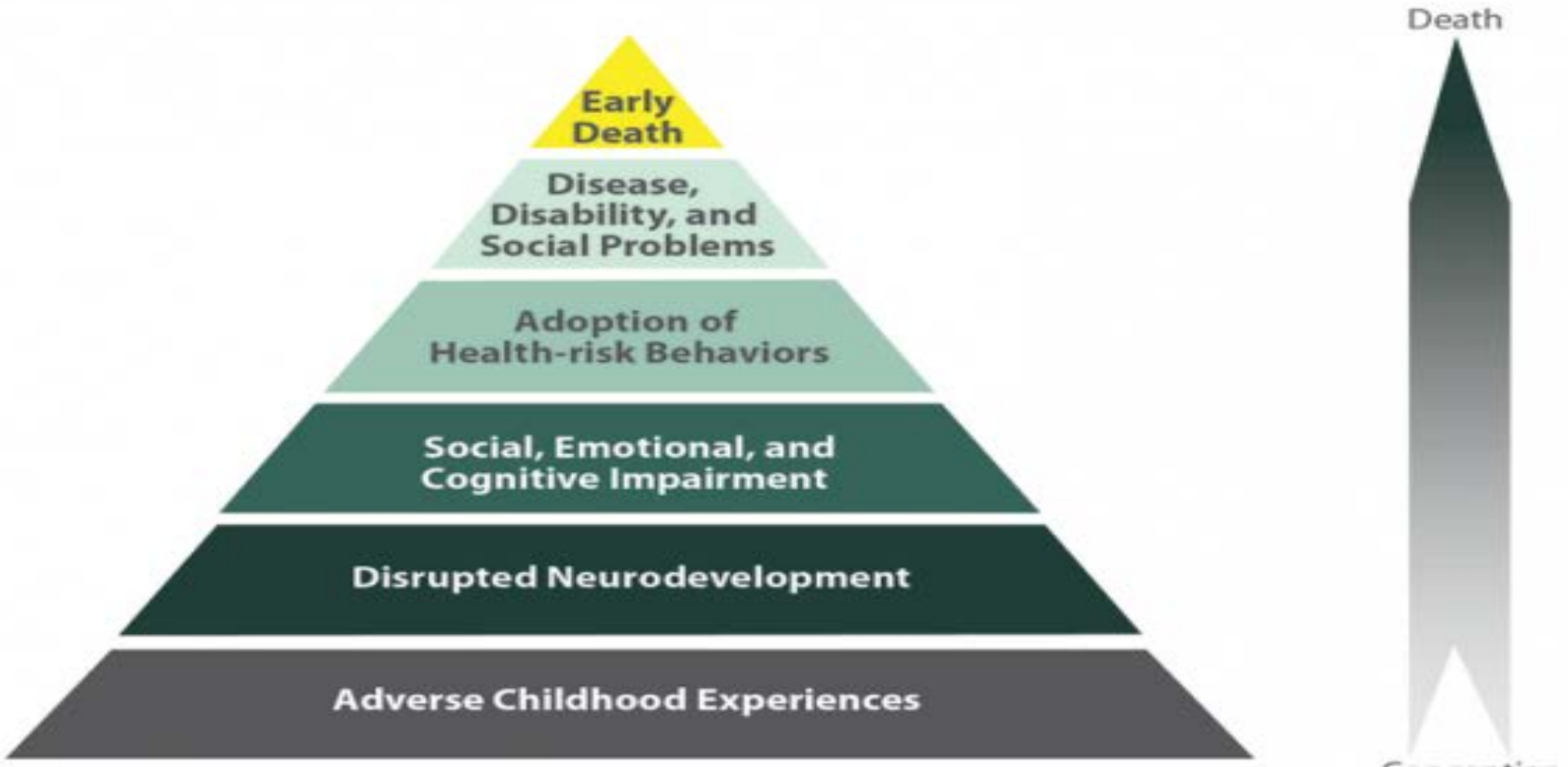
- Smaller volume of pre-frontal cortex and hippocampus
- Chronic activation of HPA axis; high CRH levels in CSF
- Elevation of inflammation levels (CRP, fibrinogen, WBC, IL-6)
- Reduced telomere length

- Deficits in declarative memory Bremner, 2004
- Heightened or blunted ACTH and cortisol response to stress
- Increased risk for cardiovascular disease, diabetes, asthma, and chronic lung disease
- Accelerated aging

A vicious cycle of biological and psychological effects of childhood adversity and toxic stress

- Chronic unpredictable stress
- Epigenetic silencing of genes that regulate stress response
- Increased exposure to inflammatory chemicals
- Increased pruning by microglia
- Loss of synaptic connections
- Loss of integration between areas of the brain involved in decision making, self regulation, attention, emotional regulation
- Greater vulnerability to toxic stress
- Further increase in neuro-inflammation

ACE impact throughout the lifespan



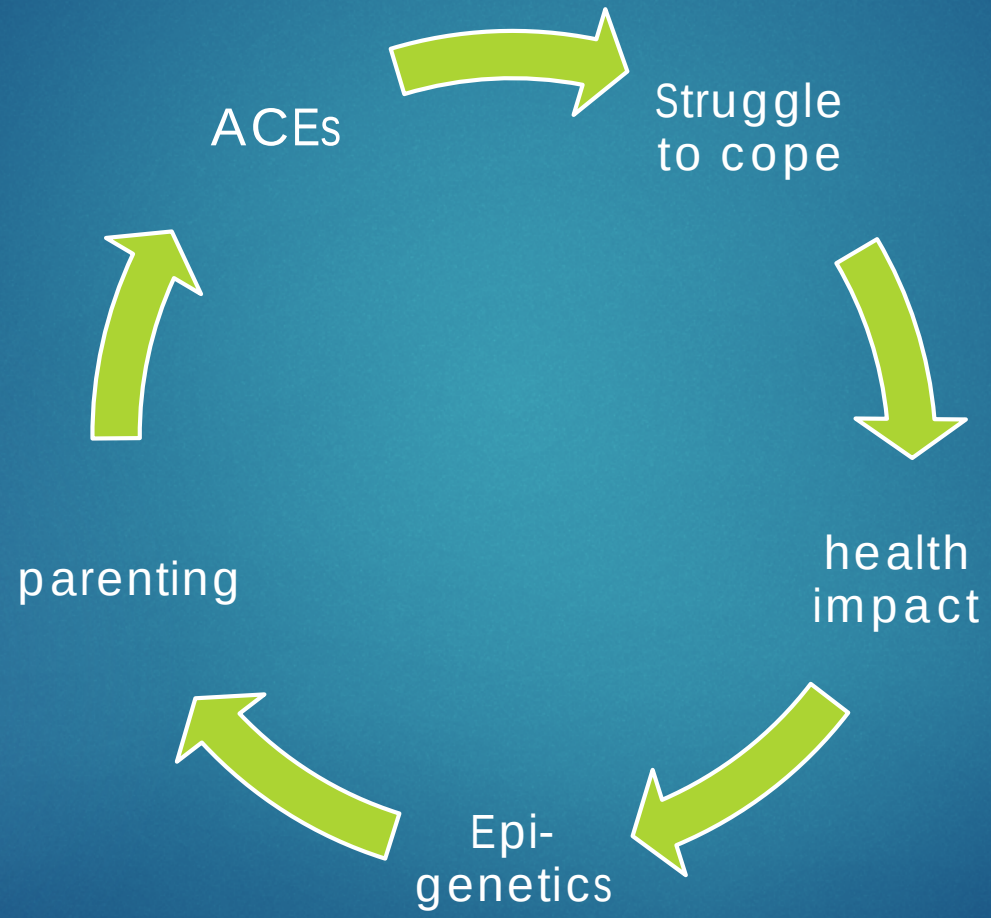
Mechanism by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

ACE transmission across generations

- Epigenetics
- Parenting challenges
- Disrupted extended families
- Economic impact of chronic illness
- At risk communities

What to do?

Where do we begin?



Advocate for social policies that support families National Scientific Council on the Developing Child

- Flexible family leave
- Affordable and high quality day care
- Reduce job turnover in day care (to facilitate long term relationships)
- Expert help for parents when children are struggling
- Broaden the mandate of child welfare services

Evidence based interventions for children & families CANarratives

- High quality home visitation programs resulted in mean 40% reduction in child abuse incidents (CDC meta-analysis)
- Triple P (Promoting Positive Parenting): in clinical trial reduced substantiated cases (of abuse), out of home placements, and maltreatment injuries; effect size: d=0.51

Intervene in childhood

www.developingchild.harvard.edu

- Strengthen supports and *services for struggling parents*
- Increase access to *high quality child care and education* for at risk children in order to **provide stable, supportive relationships with caring adults**
- *Expert assistance* for parents, caregivers and providers
- Increase access to *quality mental health services* for young children
- *Developmental assessment* of children suspected to be victims of abuse or neglect

In the pediatrician's office

Center for Youth Wellness website

- Screen for ACEs (screening instrument available on Center for Youth Wellness website)
- Educate parents and teens about relationship between ACEs and lifelong health
- Provide integrated multidisciplinary care for high ACE families
  - Parent support
  - Resources for children and teens
  - Mindfulness education

Psychological treatment for children Ghosh Ippen C

Child Abuse & Neglect 2011; CANarrative

- Trauma Focused Cognitive Behavioral Therapy (TFCBT)
- Child Parent Psychotherapy (CPP)
- Parent Child Interaction Therapy (PCIT)

- Treatment **improves** both children and parents' **mental health** outcomes.

- Treatment seems to **restore normal biology of stress response** in some instances.

In adult primary care

- Screen for ACEs and for PTSD
- Educate about link between psychological trauma and physical and mental health
- Support and empower patients to learn skills to maximize resilience

Nurturing resilience in adults

- Facilitate nurturing relationships & communities
- Teach skills for self-regulation: mindfulness, exercise
- Provide trauma specific psychological treatment
- Teach parenting skills

Build resilience in individuals and communities

SAMHSA's Center for the Application of Prevention Technologies

- ***Capability/Self regulation***: activating social engagement in conjunction with calming physical tension in the body helps to improve self regulation
- ***Attachment and Belonging***: Positive relationships with competent and nurturing adults increase resilience
- ***Community, Culture, and Spirituality***: Co-creating art, movement, rhythm, and music and developing ceremonies or rituals promote a sense of belonging with social and cultural environment

Asking, listening and accepting are a powerful form of DOING that provides great relief to patients.

Vincent Felitti

“asking, listening and accepting”

- **Educating** about the impact of ACEs
- **Acknowledging** challenges as well as strengths
- Building self awareness and self regulation skills through **mindfulness** practices
- Building **connection** through therapeutic relationships and community
- Supporting **self care** through relaxation, sleep, movement and diet

To interrupt the ACE cascade, we have to create the conditions for *safe and nurturing relationships* across the lifespan.

Trauma informed care aims to create the conditions for safe and nurturing relationships.

The 4 R's of trauma informed care

SAMHSA's Center for the Application of Prevention Technologies

Realizes the widespread impact of trauma and understands potential paths for recovery

Recognizes signs and symptoms of trauma in clients, families, staff and other involved with the system

Responds by fully integrating knowledge about trauma in to policies, procedures, and practices; and

Seeks to actively **resist** re-traumatization

How childhood trauma affects health across a lifetime
Nadine Burke Harris

Thanks to….

- Mason Turner, MD
  Director of Outpatient Mental Health and Addiction Medicine
- Brigid McCaw, MD, MS, MPH, FACP
  Medical Director
  KPNC Family Violence Prevention Program
- Catherine A Gutfreund, MD
  Family Violence Prevention Champion Kaiser Permanente

Resources

- Center for Disease Control (CDC) http://www.cdc.gov/ace/findings.htm
- SAMSHA (Substance Abuse and Mental Health Services Administration) Center for the Application of Prevention Technologies
- National Scientific Council on the Developing Child at Harvard University
- CANarrative: Frank Putnam, MD, UNC at Chapel Hill, NC
  William Harris, PhD, Children's Research and Education Institute, NY
  Alicia Lieberman, PhD, UCSF, San Francisco, CA
  Karen Putnam, PhD, UNC at Chapel Hill, NC
  Lisa Amaya-Jackson, MD, Duke University, Durham, NCs
- Neurosequential Model of Therapeutics, Child Trauma Academy, Bruce Perry
  http://childtrauma.org/nmt-model/
- Harris, Nadine Burke. *The Deepest Well: healing the long term effects of childhood adversity. 2018*
- Nakazawa, Donna Jackson. *Childhood Disrupted: How your biography becomes your biology and how you can heal.* 2015