

DOMESTIC VIOLENCE FOR THE CHILD ABUSE PEDIATRICIAN

...or how toxic stress affects the developing brain

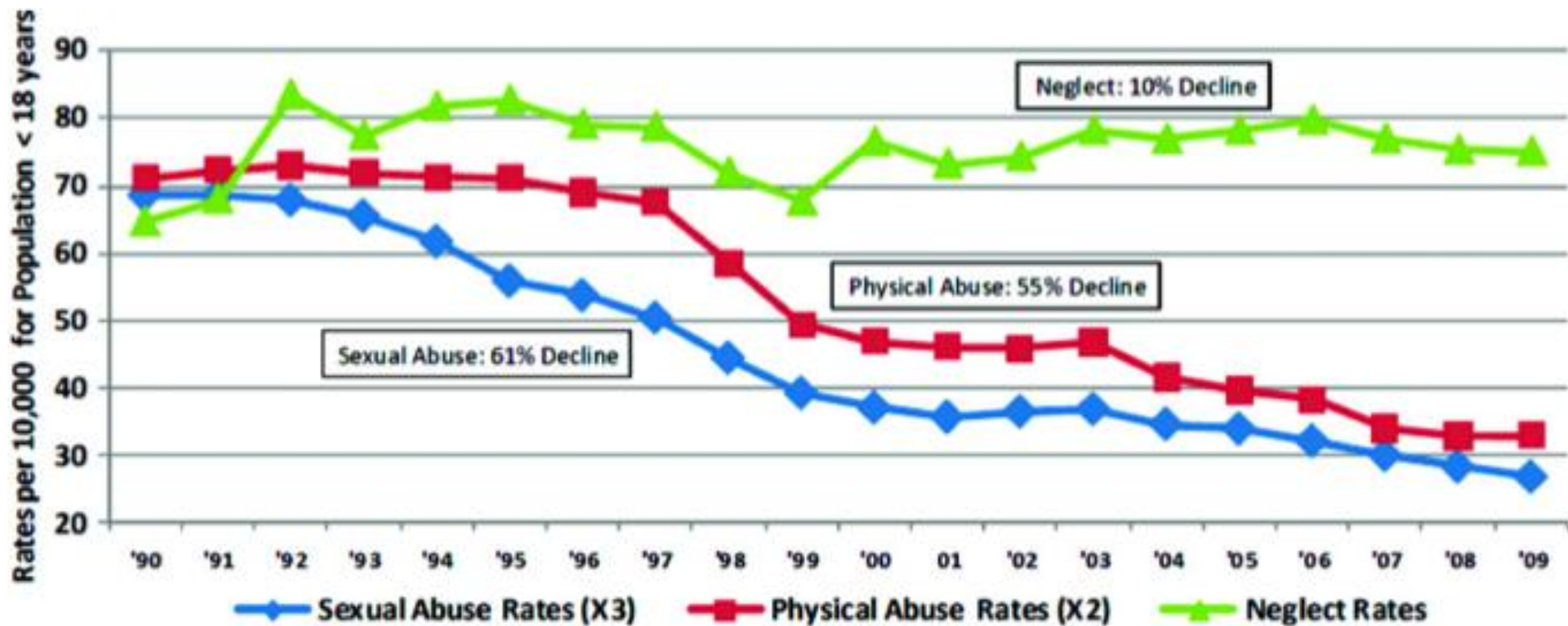
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Commentary

Child Abuse Pediatrics: New Specialty, Renewed Mission

Angelo P. Giardino, MD, PhD, MPH^{a,b}, Nancy Hanson, BA^c,
Karen Seaver Hill, BS^c, John M. Leventhal, MD^d



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TABLE 1

National Incidence of Harm Standard Maltreatment in the Fourth National Incidence Study of Child Abuse and Neglect (2005–2006) and Comparison With the Third (1993) and Second (1986) National Incidence Study of Child Abuse and Neglect Harm Standard Estimates

Harm Standard Maltreatment Category	Comparison With Earlier Studies					
	NIS-2 Estimates 1986		NIS-3 Estimates 1993		NIS-4 Estimates 2005–2006	
	Total No. of Children	Rate per 1000 Children	Total No. of Children	Rate per 1000 Children	Total No. of Children	Rate per 1000 Children
All child maltreatment	931 000	14.8 ^a	1 553 800	23.1 ^b	1 256 600	17.1
Child Abuse	507 700	8.1 ^a	743 200	11.1 ^c	553 300	7.5
Physical Abuse	269 700	4.3 ^a	381 700	5.7 ^b	323 000	4.4
Sexual Abuse	119 200	1.9 ^a	217 700	3.2 ^c	135 300	1.8
Child Neglect	474 800	7.5 ^b	879 000	13.1 ^a	771 700	10.5

Goals

- Outline the prevalence of child witnesses to IPV
- Describe the potential health consequences of living in a violent home
- Discuss the neurobiology of toxic stress
- Using an ecobiodevelopmental framework, discuss an approach to identification of child witnesses to IPV
- Discuss intervention and evaluation needed for children exposed to IPV

Prevalence

...or how big is the problem?



Prevalence

- Living in a violent home = witnessing violence
- Witnessing does not need to mean direct observation
- Battered women indicate children aware
- Police data – 85% witness the assault



Prevalence Child Abuse

- 3.3 million allegations involving 6 million children
- 62% reached the report stage, requiring an investigation or alternative response
- 772,000 of the investigations reaching the report state determined there was abuse or neglect
- Perpetrators:
 - 80.1% parents
 - 6.5% other relatives
 - 10.1% unrelated caregivers
 - Women 56.2%
 - 75.2% were younger than 40 years of age

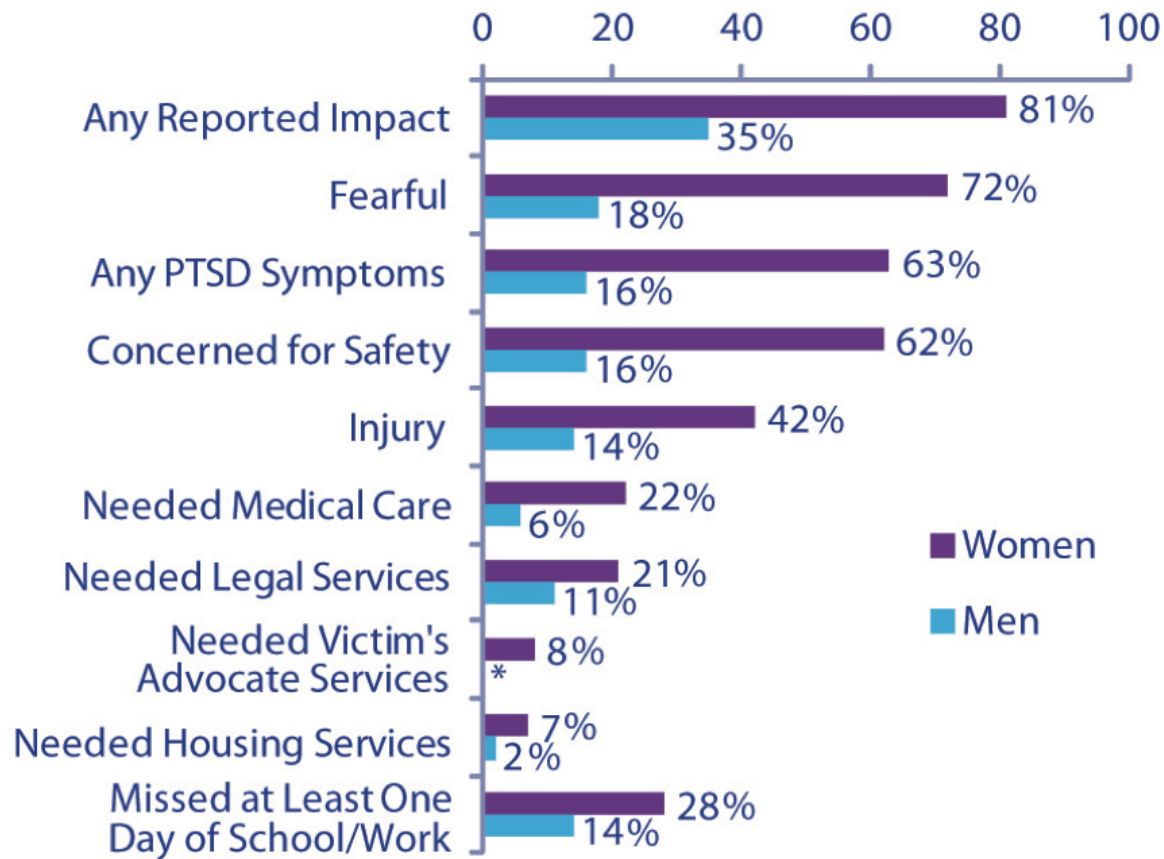
Prevalence Child Abuse

- Ages:
 - 21.7/1000 children 0-1 year
 - 54.5% < 7 years
- Type of abuse:
 - 71.1% neglect
 - 16.1% physical abuse
 - 9.1% sexual abuse
 - 7.3% emotional abuse
- Children may have suffered more than 1 form of abuse and were counted for each maltreatment type
- Fatalities:
 - 1740 children died due to abuse or neglect
 - 2.33 deaths per 100,000 children
 - 31.9% due to neglect
 - 79.7% were < 4 years

Prevalence IPV

- Telephone survey CDC
- 35.6% women and 28.5% men victims of rape, physical violence and/or stalking
- > 1 in 3 women experienced multiple forms of IPV
- 24.3% women and 13.8% men victims severe violence other than rape
- Most victims experience violence for the first time before 25 years of age

IPV-Related Impacts Among Victims of Rape, Physical Violence, and/ or Stalking by an Intimate Partner



Average annual number and percentage of households experiencing nonfatal intimate partner violence where children under age 12 resided, by gender of victims, 2001-2005

Households with intimate partner violence victims	Annual average	
	Number	Percent
All households with -	615,795	100%
Children	216,490	35.2
No children	303,615	49.3
Unknown	95,685	15.5
Female victim households with -	510,970	100%
Children	194,455	38.1
No children	235,940	46.2
Unknown	80,580	15.8
Male victim households with -	104,820	100%
Children	22,040	21.0
No children	67,680	64.6
Unknown	15,105	14.4

Child Abuse and DV

- 45-60% women whose children at risk for child abuse/neglect battered
- 32% caseloads protective service workers involve domestic violence
- 37-63% abused women have children who are abused/neglected



Prevalence witnesses to IPV

- 3.3-10 million children witness IPV each year
 - 3.3 estimate excludes divorced, separated and families with children < 3
 - 10 million based on recall data from adults
- 15.5 million children live in dual parent homes where IPV occurred in past year, 7 million IPV severe
 - Based on randomly selected heterosexual couples



Prevalence witnesses to IPV

- Academic PCP :
 - 2% current (0-18 yr), 13% past
- Private practice PCP
 - 2.5% current (0-10 yr), 15% past
- Inner city PCP
 - 3.7% mothers assaulted in past 12 months
- Suburban
 - 31% mothers screened at well visits IPV as adult, 16% in past 2 years

Effects

...or why should
you care?



Effects

- Injuries:
 - Acute
 - Chronic
- Physical health
- Mental health
- Adult health consequences



Abuse

- Caught in the crossfire
- Physical abuse
- Neglect
- Fatalities
- Sexual abuse



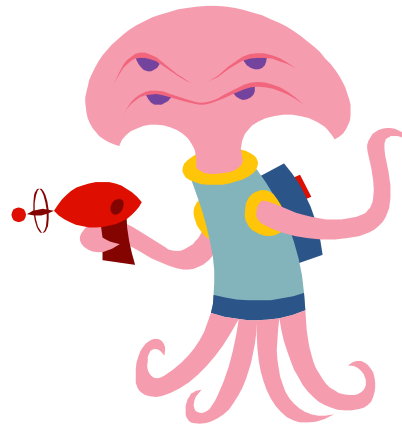
Pregnancy

- Direct trauma
 - Placental abruption – elastic uterus deforms and separates from more rigid placenta, increase in amniotic pressure shears placenta from uterus
 - Fetal injuries rare
 - Blunt trauma releases arachidonic acid
- Secondary effects through co-morbidities



Caught in the crossfire

- Most assaults not reported
- Not likely to be identified as harmed if no injury
- With minor injuries healthcare not sought
- Young children harmed when being held
- Adolescents harmed while trying to intervene



Sexual Abuse

- Shares secrecy and control dynamics of IPV
- ACE data reveal 2.3% of men and 3.9% of women were physically and sexually abused as children AND witnessed abuse of mothers
- In sexual abuse clinic:
 - IPV present in 52% homes of children (7-19 years) seen in sexual abuse evaluation clinics
 - 85% in home male perpetrators physically abused adult female partner

Neglect

- Failure to meet the basic needs of the child
- Emotional neglect may include exposure to IPV
- IPV in first 6 months of life significant predictor of abuse and neglect up to 5 years (McGuigan 2001)



Healthcare Utilization

- Healthcare utilization higher if history of childhood abuse for use of mental health, outpatient, ED, primary care, specialty and pharmacy services
- If history of both SA and PA, 36% higher adjusted costs



Healthcare Utilization

- Healthcare utilization and costs higher for children of mothers with history IPV
- Significantly higher costs for mental health services, primary care visits/costs, lab costs
- If IPV ended prior to birth had greater use mental health, primary care, specialty care, pharmacy compared with no history IPV
- If IPV continued after birth, greater use ED, primary care, 3 times more likely to use mental health services after IPV ended

Abuse and inflammation

- Maternal care influences development of stress response
 - Abused have decreased ability of gluco-corticoid signaling to control the HPA axis
- Adults abused as children have increased inflammatory markers:
 - New Zealand cohort 1000 men and women followed since birth in 1972
 - Abused more likely to have increased hsCRP levels
 - Estimated 11% of increased hsCRP due to abuse
 - Linked child abuse to biomarkers of inflammation in adults

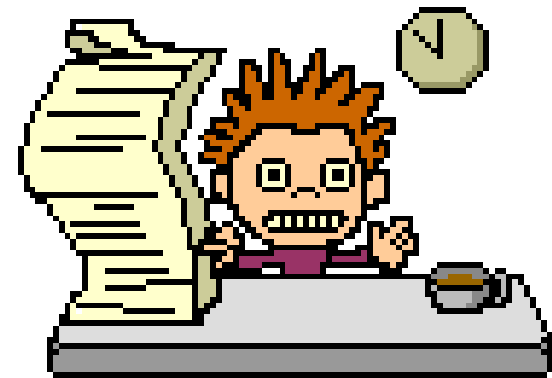
Neurobiology of Stress

...or what is wrong
with this kid?



Stress

- Protective and damaging
- Adaptive:
 - Respond to challenges/events by releasing chemical mediators
 - Allostasis refers to process by which respond to daily events/maintain homeostasis
 - Achieving stability through change
- Maladaptive:
 - Too much
 - Prolonged
 - Inefficient management
 - Doesn't turn on/off appropriately



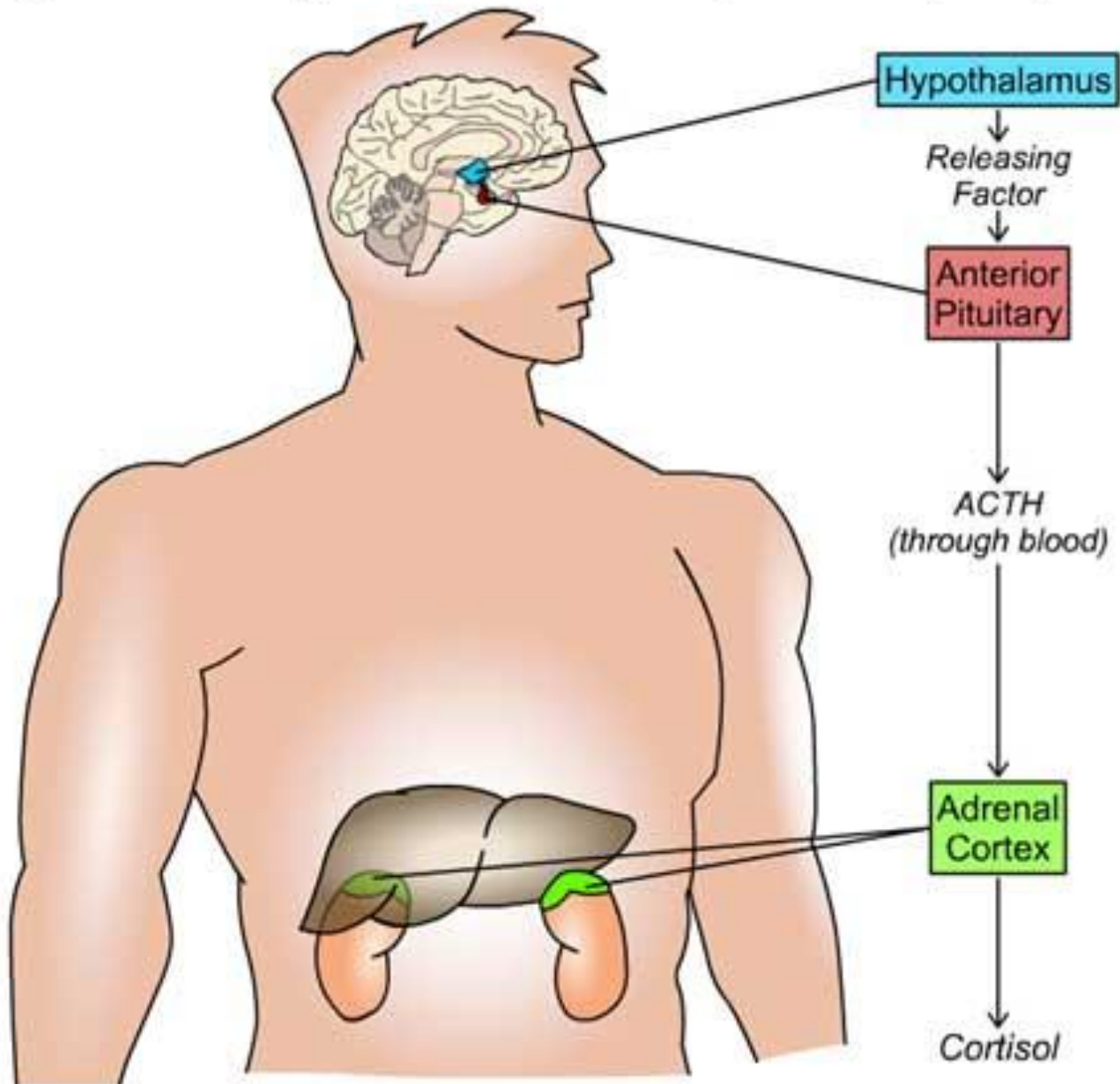
Stress

- Positive
 - Physiologic state that is brief and mild to moderate
 - Caring responsive adult who helps the child cope
 - Facilitates return of stress response system to baseline
- Tolerable
 - Non-normative experiences which present adversity or threats
 - Need buffering by supportive adults to be tolerable
- Toxic
 - Strong, frequent, prolonged activation stress response system
 - No protective adult
 - May lead to permanent brain changes
 - Supportive adults mediate effects
 - Appropriate support/intervention help return stress response system to baseline

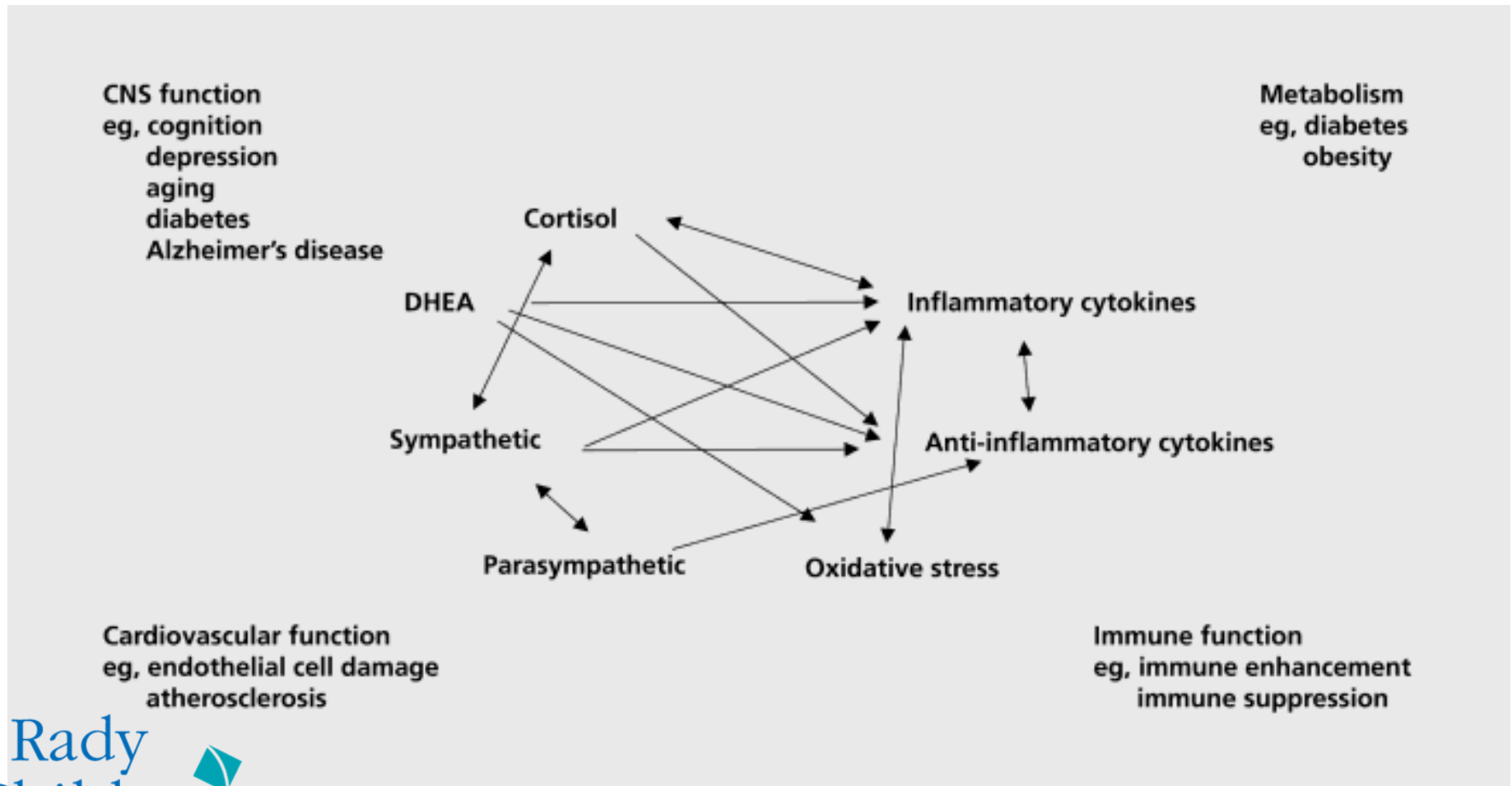
Toxic stress

- Excessive or prolonged activation of the physiologic stress response systems in the absence of the buffering protection afforded by stable, responsive relationships
- Leads to disruptions in brain circuitry and other systems during sensitive developmental periods
- Disruption may cause anatomic changes and/or physiologic dysregulation which are precursors to later learning/behavior problems
- Root of chronic stress related physical and mental illness

Figure AN-1: Hypothalamic-Pituitary-Adrenal (HPA) Axis



Stress response network



Stress Response System

- Neural circuits malleable or plastic in fetus and early childhood
- Need well functioning stress response systems to survive
- Frequent or sustained activation of stress response systems creates problems
- Adrenaline production occurs in response to acute stress
 - Mobilizes energy
 - Alters blood flow
- Cortisol produced in response to stress
 - Mobilizes energy
 - Suppresses immune responses
 - Long term regulates gene expression in neural circuits that modulate stress response, emotion and memory

Brain Development

- Prenatal brain has 2-3 times number adult neurons
- Maximum numbers neurons at birth
- New neuron formation ends at birth with few exceptions
- Brain growth over first years of life due to myelination and synaptic connections
- Growth dependent on stimulation
- Few synapses at birth
- New synapses form in response to stimulation
- Neural pathways allow for skill acquisition and memory formation:
 - Motor
 - Cognitive
 - Emotional

The brain under stress: structural remodeling

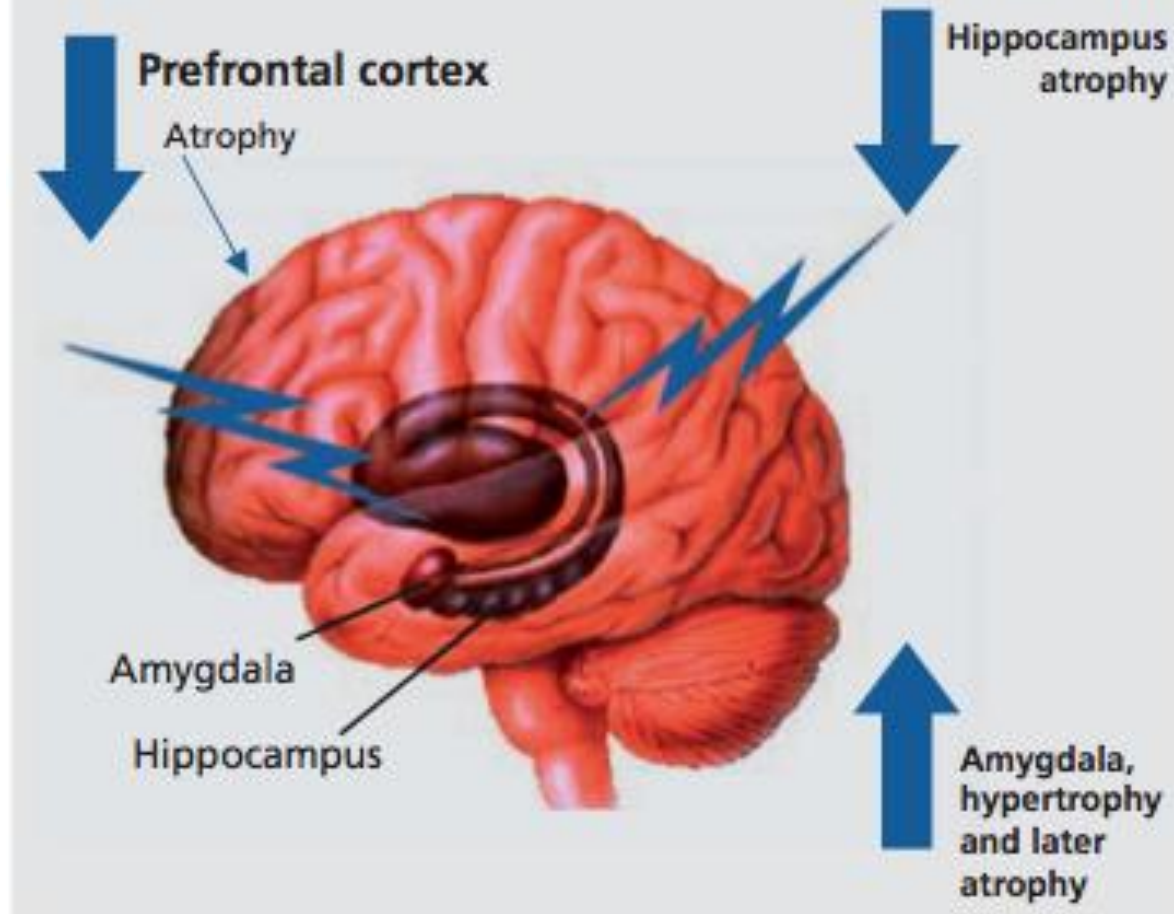
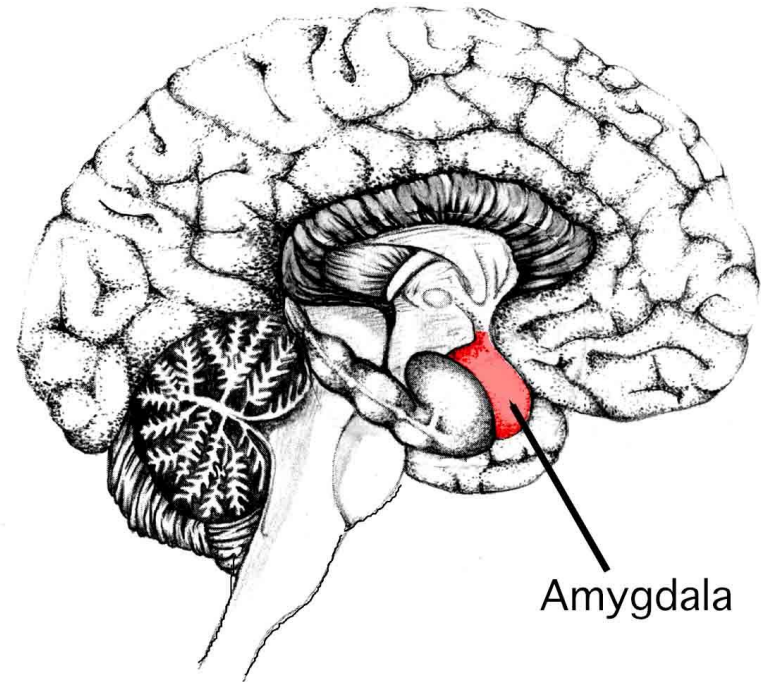


Figure 4. Brain regions that are involved in perception and response to stress, and which show structural remodeling as a result of stress.

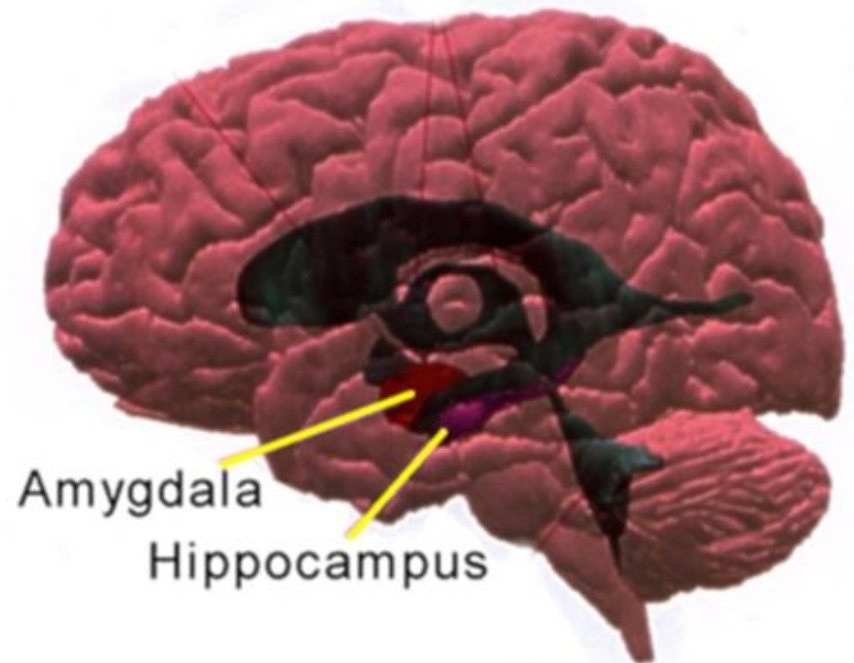
Stress and Developing Brain

- Amygdala:
 - Process, interprets, integrates emotions
 - Weighs value of sensory input
 - Sensitive to kindling
 - ***Role in fear, anxiety, aggression***
 - Stress decreases the density of GABA (inhibitory) receptors



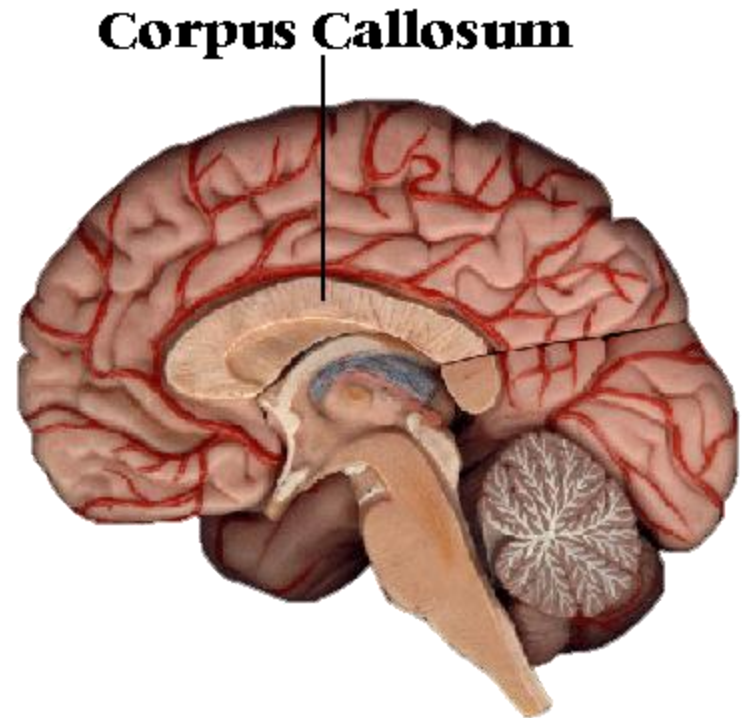
Stress and Developing Brain

- Hippocampus:
 - Memory storage/retrieval
 - Learning
 - Links with RAS
 - **Central role in fear response**
 - Grows slowly
 - Continues to form new neurons after birth
 - High density cortisol receptors
 - Sensitive to stress



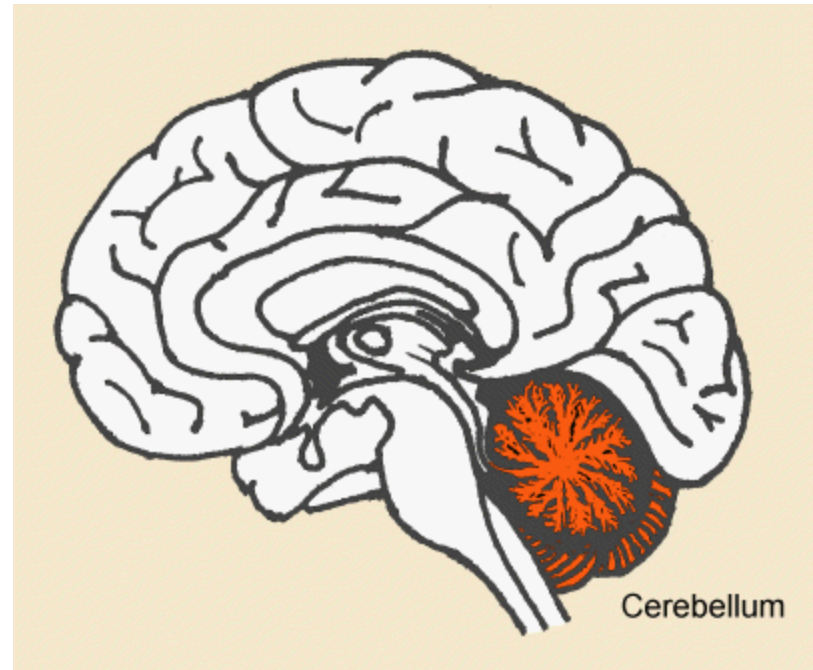
Stress and Developing Brain

- Cerebral cortex/corpus callosum:
 - Stress affects myelin formation
 - Corpus myelinated
 - May affect hemispheric integration of memory
 - Prefrontal cortex rich in glucocorticoid receptors – sensitive to stress
 - Also plays inhibitory role thru neg feedback in HPA



Stress and Developing Brain

- Cerebellum:
 - Mental health maintenance
 - Grows slowly after birth
 - Continues neurogenesis
 - High density glucocorticoid receptors
 - Stress can blunt activity in the vermis
 - Moderates limbic irritability
 - ***Involved in attention, language, affect, thinking***



Fear and Anxiety Affect the Brain Architecture of Learning and Memory

PREFRONTAL CORTEX

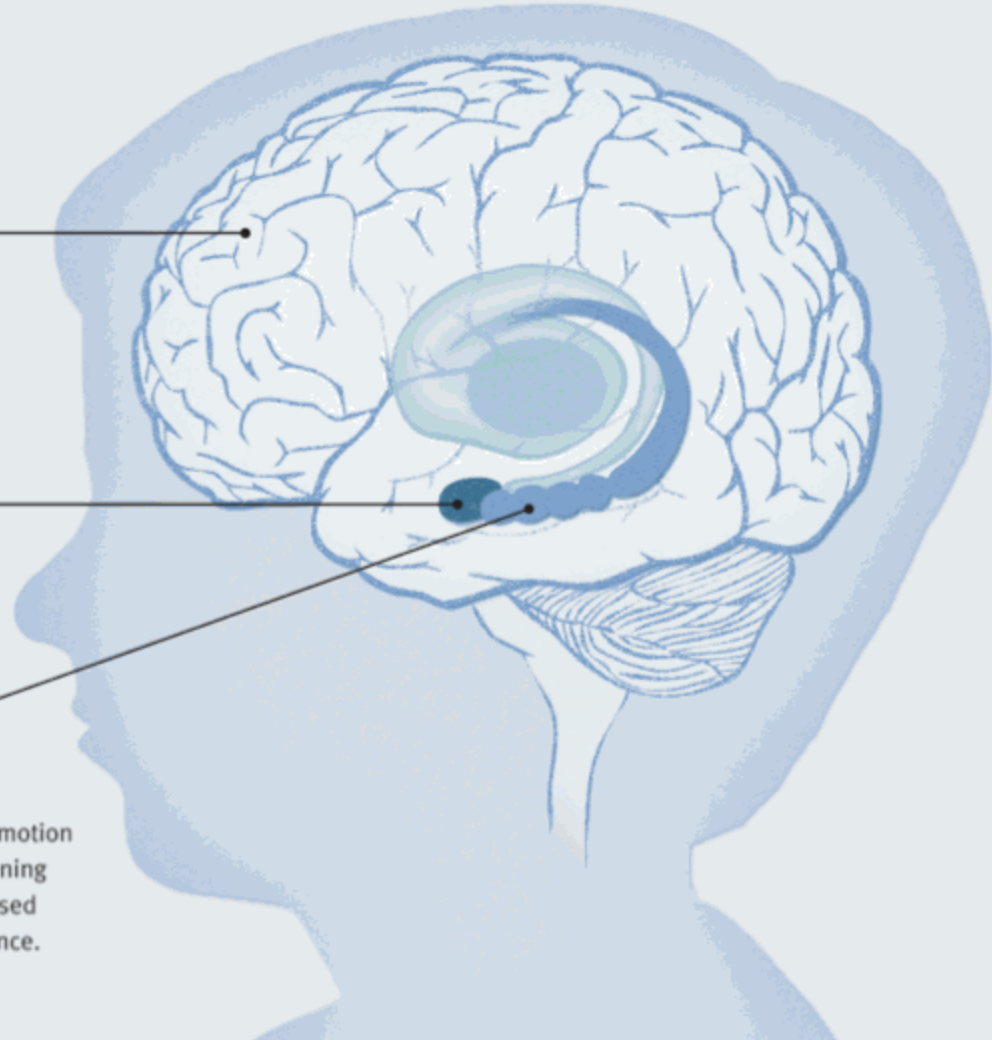
Center of executive functions; regulates thought, emotions, and actions. Especially vulnerable to elevation of brain chemicals caused by stress. Matures later in childhood.

AMYGDALA

Triggers emotional responses; detects whether a stimulus is threatening. Elevated cortisol levels caused by stress can affect activity. Matures in early years of life.

HIPPOCAMPUS

Center of short-term memory; connects emotion of fear to the context in which the threatening event occurs. Elevated cortisol levels caused by stress can affect growth and performance. Matures in early years of life.



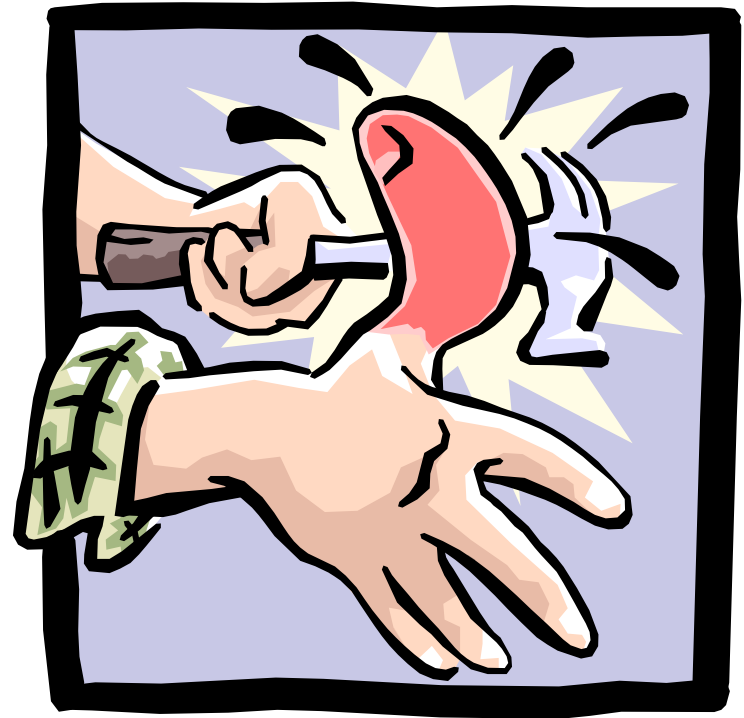
Stress

- Hyperarousal
- Dissociation
- Attachment problems
- Lack of empathy - antisocial
- Aggression
- Impulsive behaviors
- Emotional, not cognitive response to problems



Remember...

- All these processes are affected by genetics AND environment



Identification

...or how do I know
my patient has
been affected?



Ask!

- Injuries
- Medical problems
- Behavioral problems
- Mental health problems
- Substance abuse
- Medical complaints without an organic basis
- High utilization healthcare



JCAHO

- Applies to licensed healthcare facilities
- Recognizes that abuse victims may present anywhere in a healthcare organization
- Standards that address:
 - Identification
 - Assessment
 - Referrals
 - Education of staff

Screening

- Potential for:
 - Opportunity for prevention
 - Early identification victims
 - Letting patients know that abuse is an important health problem
 - Diminishing isolation of victim
- Insufficient evidence for or against screening by USPSTF or Canadian Task Force on Preventive Healthcare
- “intervening on behalf of battered women is an active form of child abuse prevention” AAP Policy Statement
- Use CPT code 99420 when assessing child’s risk
- Maternal depression screening

Anticipatory Guidance

- Geared towards prevention/early detection
- Pediatricians form longitudinal relationships
- Regularly scheduled visits at frequent intervals
- Pediatricians are viewed as non-threatening
- Battered women unlikely to seek medical care for injuries but do bring children to pediatrician

Child Abuse Pediatrics

- Prevalence of domestic violence high in abuse and neglected children
- Exposure to IPV is a form of child abuse
- Health consequences and risks significant
- Identifying IPV exposure early form of child abuse prevention
- No diagnostic “test” for IPV exposure
- Develop standardized practices
- Data – policy, education, treatment, advocacy

Intervention and evaluation

...or now what do I
do?

“It is easier to build strong children than to repair broken men” Frederick Douglass (1817-1895)

“I would unite with anybody to do right
and with nobody to do wrong”

From the American Academy of Pediatrics



Policy Statement

**Early Childhood Adversity, Toxic Stress,
and the Role of the Pediatrician:
Translating Developmental Science Into
Lifelong Health**

**Committee on Psychosocial Aspects of Child and Family Health,
Committee on Early Childhood, Adoption, and Dependent Care, and
Section on Developmental and Behavioral Pediatrics**

Of a good beginning cometh a good end.
John Heywood, Proverbs (1546)

From the American Academy of Pediatrics



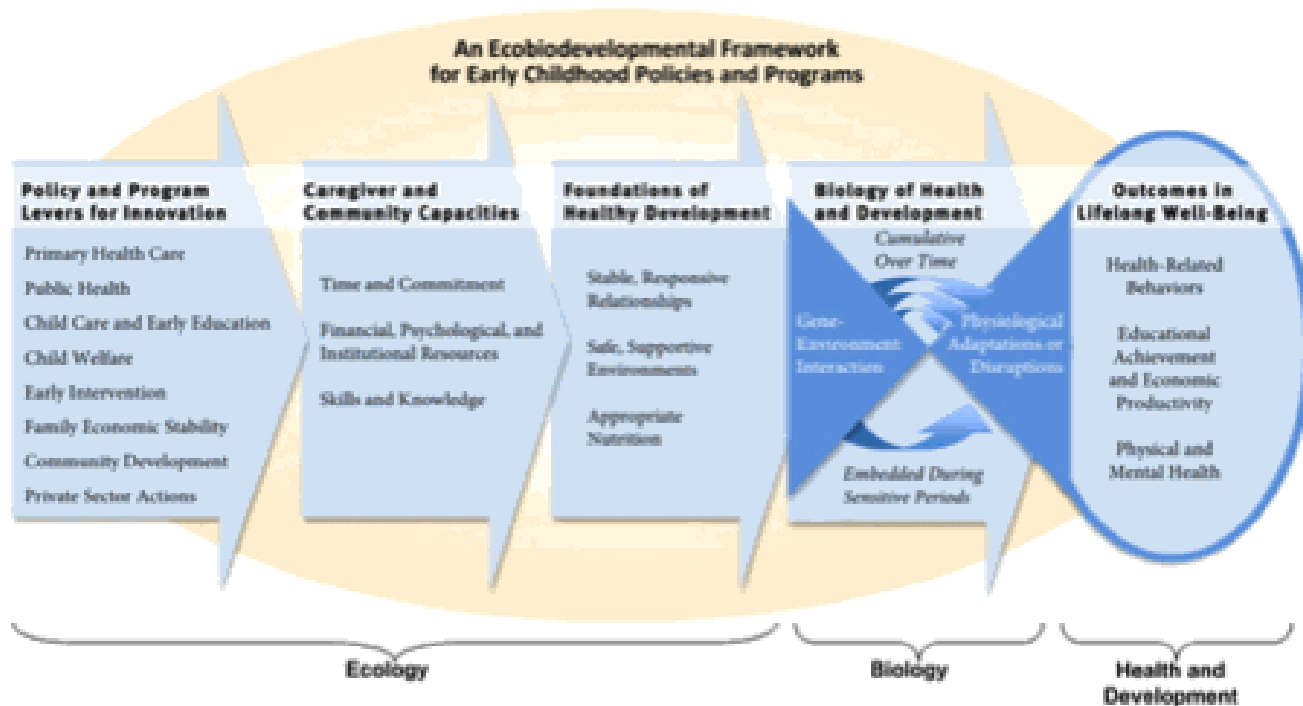
Technical Report

The Lifelong Effects of Early Childhood Adversity and Toxic Stress

Jack P. Shonkoff, MD, Andrew S. Garner, MD, PhD, and THE COMMITTEE ON PSYCHOSOCIAL ASPECTS OF CHILD AND FAMILY HEALTH, COMMITTEE ON EARLY CHILDHOOD, ADOPTION, AND DEPENDENT CARE, AND SECTION ON DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS

Benjamin S. Siegel, MD, Mary I. Dobbins, MD, Marian F. Earls, MD, Andrew S. Garner, MD, PhD, Laura McGuinn, MD, John Pascoe, MD, MPH, and David L. Wood, MD

An ecobiodevelopmental framework for early childhood policies and programs.

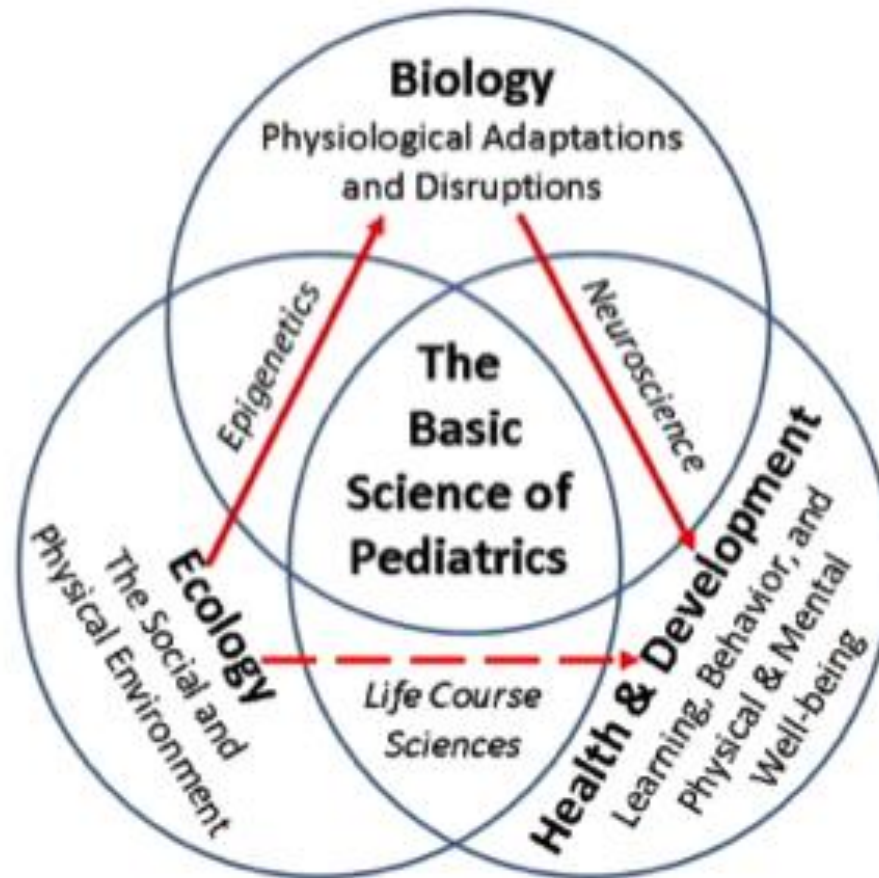


Shonkoff J P et al. *Pediatrics* 2012;129:e232-e246

PEDIATRICS

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The basic science of pediatrics.



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Intervention and evaluation

- Injury evaluation
- Child abuse reporting
- DV reporting
- Safety assessment
- Mental health treatment
- Battered women's services
- Advocacy



Intervention

- Role of child welfare has focused on physical safety, reduction repeated injury, child custody
- Role of pediatrician has been on identification of suspected abuse and documentation and treatment of physical injuries
- Using model and understanding of toxic stress mandates need for broader approach to abused children
- Beyond scope of most primary care but not child abuse clinic

Summary

- Intimate partner violence is prevalent
- Abused and neglected children are at high risk of living in a home where IPV is present
- Living in a violent home = witnessing violence
- Witnessing violence is stressful
- Chronic or high impact stress without the mediation of a caring adult can have lifelong consequences for children
- In order to identify these children early routine inquiry is key

Role of the Child Abuse Pediatrician

- Educate multidisciplinary partners on health and developmental consequences of violence exposure
- Evaluate children identified as living in violent homes for other forms of abuse
- Facilitate connection to mental health treatment
- Research on prevalence
- Connect with genetics, behavioral/developmental, mental health colleagues