PRISMA HEALTH®

62nd Annual Greenville Postgraduate Seminar

Spotlight: Primary Care

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Thinking Developmentally: Nurturing wellness in childhood to promote lifelong health

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Disclosures

- No conflicts of interest to disclose

Questions

- Does what happens in early childhood affect health in adulthood? T/F
- Are adult-onset diseases “determined” by issues in childhood? T/F
- What’s more important for health of our citizens and our society – SSRIs or SSNRs?

Objectives

1. Understand how “thinking developmentally” is critical for health intervention, maintenance and prevention
2. Integrate the ecobiodevelopmental model for childhood development
3. Understand the importance of safe, stable nurturing relationships (SSNRs) and how to identify, encourage and nurture them
4. Understand intra-office and extra-office approaches to TD
5. Review the multi-generational approach to intervention
6. Understand the distinction between adult-onset and adult-manifest

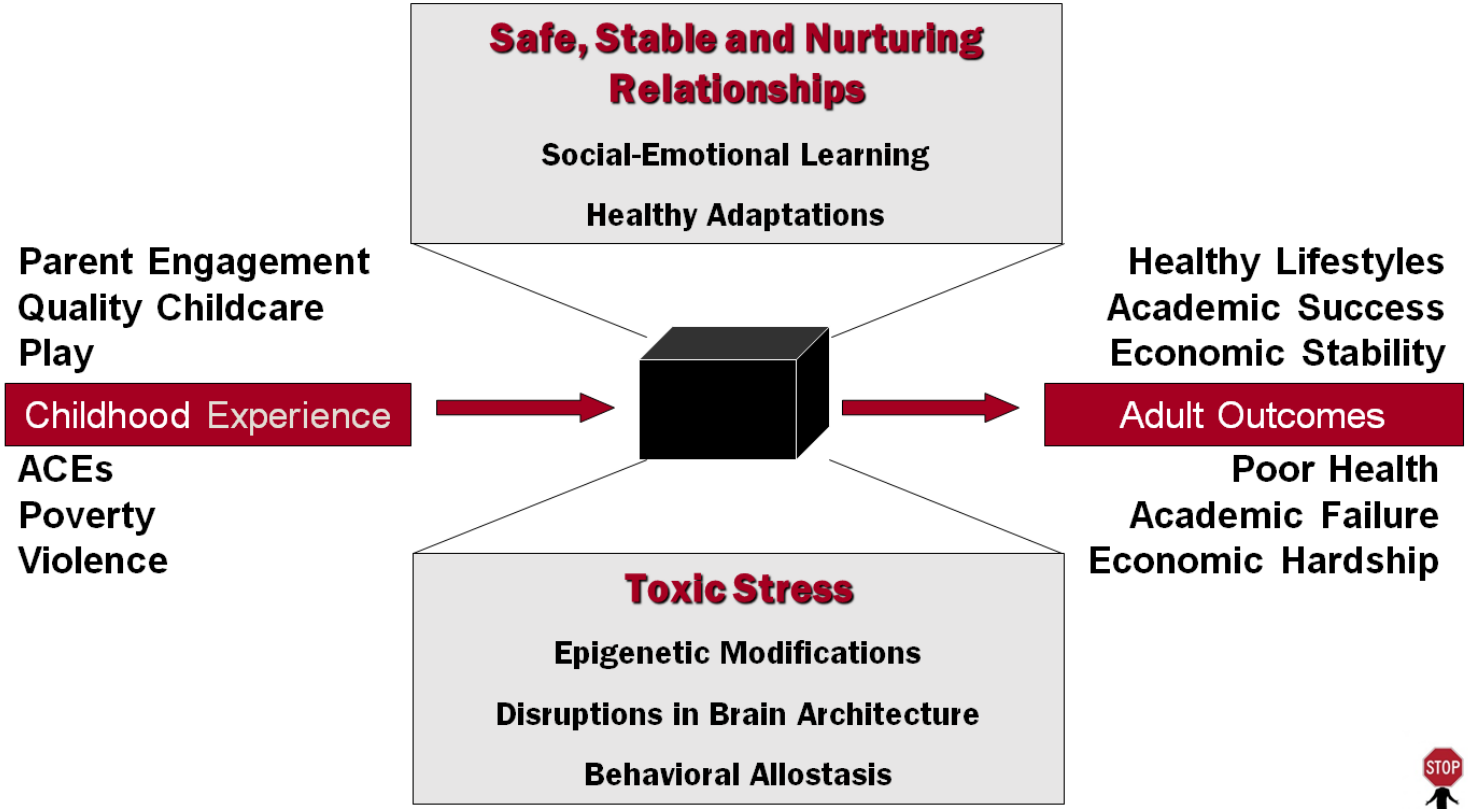
Acknowledgment

- Thanks to Dr. Andy Garner – Clinical Professor of Pediatrics, Case Western Reserve University, Cleveland OH

Critical Concept

Life-Course Science tell us that…
Experiences in childhood
(both ***affiliative*** and ***adverse***)
are **strongly** associated
with **behaviors, health** and
economic productivity …

… DECADES LATER!

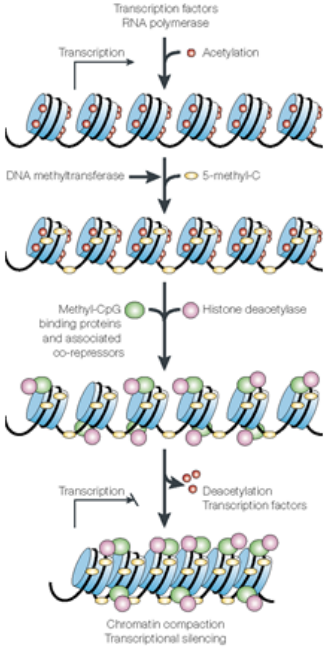

Safe, Stable and Nurturing Relationships
Social-Emotional Learning
Healthy Adaptations
Parent Engagement
Quality Childcare
Play
Childhood Experience
ACEs
Poverty
Violence
Healthy Lifestyles
Academic Success
Economic Stability
Adult Outcomes
Poor Health
Academic Failure
Economic Hardship
Toxic Stress
Epigenetic Modifications
Disruptions in Brain Architecture
Behavioral Allostasis
STOP

Early exposures affect—

- Brain architecture
- Brain wiring
- Gene expression (epigenetic changes)

Brain development

- Experience dependent
- Cumulative
- Integrated
- Dynamic
- Asynchronous



Turned on

Modulating factors—histone deacetylation, histone methylation, CpG methylation, RNA interference

Turned off

Source: Robertson KD, Wolffe AP: DNA methylation in health and disease. Nat Rev Genet. 2000 Oct;1(1):11-9.

Epigenetics

- Change in genes without changing the genetic code
- Now shown to be related to
  - Stress
  - Abuse
  - Nurturing
  - Maternal depression
  - Prenatal exposures
  - Nutritional changes prenatally
- Alters gene expression
- Can be passed from generation to generation

Epigenetics

Epigenetic Influences

- Epigenetic changes can occur in utero
- Changes affect postnatal development of the infant/child and occur in germ cells (sperm or ovum)
- Changes can be secondary to environmental influence and passed on to subsequent generations
- Trans-generational effects may emerge in 1-2 generations
- Monozygous twins demonstrate some divergence in methylation rates of certain genes (in about 1/3 of MZ twins)

Epigenetics: Human disease

- Early life stress (loss of parent, maltreatment, low parental care) can lead to methylation changes in glucocorticoid receptor (GR) (Tyrka et al. 2012)

- Similar findings for maternal depression in the third trimester (Oberlander et al. 2008)

Epigenetics: Human disease

- Postmortem analysis in child abuse cases show abnormal methylation and decreased GR mRNA (McGowan et al. 2019)

- Critical Importance
  - Shows that constant stress affects CNS cortisol regulation and disrupts the ability to modulate stress reactivity

Epigenetics: Human disease

- Maternal stroking at 5 and 9 weeks after birth can reverse some negative effects (methylation) of maternal depression – direct evidence of parental nurturing and affiliative (vs. adverse) experiences (Murgatroyd et al. 2015)

- Critical Importance
  - CNS cortisol regulation can be modulated and potentially disrupt the negative effect of environmental influences

Implication and primary care applicability

- Adult-onset diseases are adult-manifest diseases from childhood exposures and events
- Through epigenetic mechanisms, early childhood ecology is biologically embedded and potentially leads to changes in the way the genetic blueprint is expressed

Implication and primary care applicability

- Dynamic changes over time—positive and negative
- Not a fixed state but not easily malleable either
- Multiple exposure points
- Potential lifetime effects
- Potential multi-generational effects
- Trauma-informed care can potentially ameliorate some effects and their transgenerational passage
- Never too late to make a difference!

Ecobiodevelopmental model

- Driven by science
  - Developmental neuroscience
  - Epigenetics
- Understanding of
  - Ecology (physical, nutritional, and psychosocial milieu)
  - Biology (genome, brain)
  - Health as a dynamic continuum between disease and wellness
  - Early experiences play a pivotal role

ACE study—Felitti et al, 1998

- Over 17,000 middle class adults
- Retrospective reporting of adverse childhood events (10 in three categories of abuse, household dysfunction, and/or neglect)
- Higher ACE score – greater frequency in adulthood of common adult- onset diseases (hypertension, obesity, cancer, heart disease), decreased school performance and increased risk taking behaviors
- Increase in the BIG 5 – smoking, obesity, promiscuity, obesity and substance abuse

Why? Behavioral allostasis

- Compensatory behavioral changes for physiologic changes—to minimize physiologic stress response [like changes that occur with fever]
- Seems self-destructive but serves to dampen internal conflict
- Internal neurophysiologic changes and epigenetic changes have affected the ability to respond in a paradoxically ineffective way (in our estimation)
- Yet not irreversible!

Experiences

- Affiliative – positive, buffered
- Adverse – negative, unbuffered

A Spectrum of Adversity

Discrete, Threatening Events

On-going, Chronic Conditions

Abuse Bullying Spanking Homeless Parental SA Parental MI Racism Poverty Neglect

Individuals with the **Highest Risk** for a Toxic Stress Response

Physiologic Stress Response

Largest Number of Individuals at Risk for a Toxic Stress Response

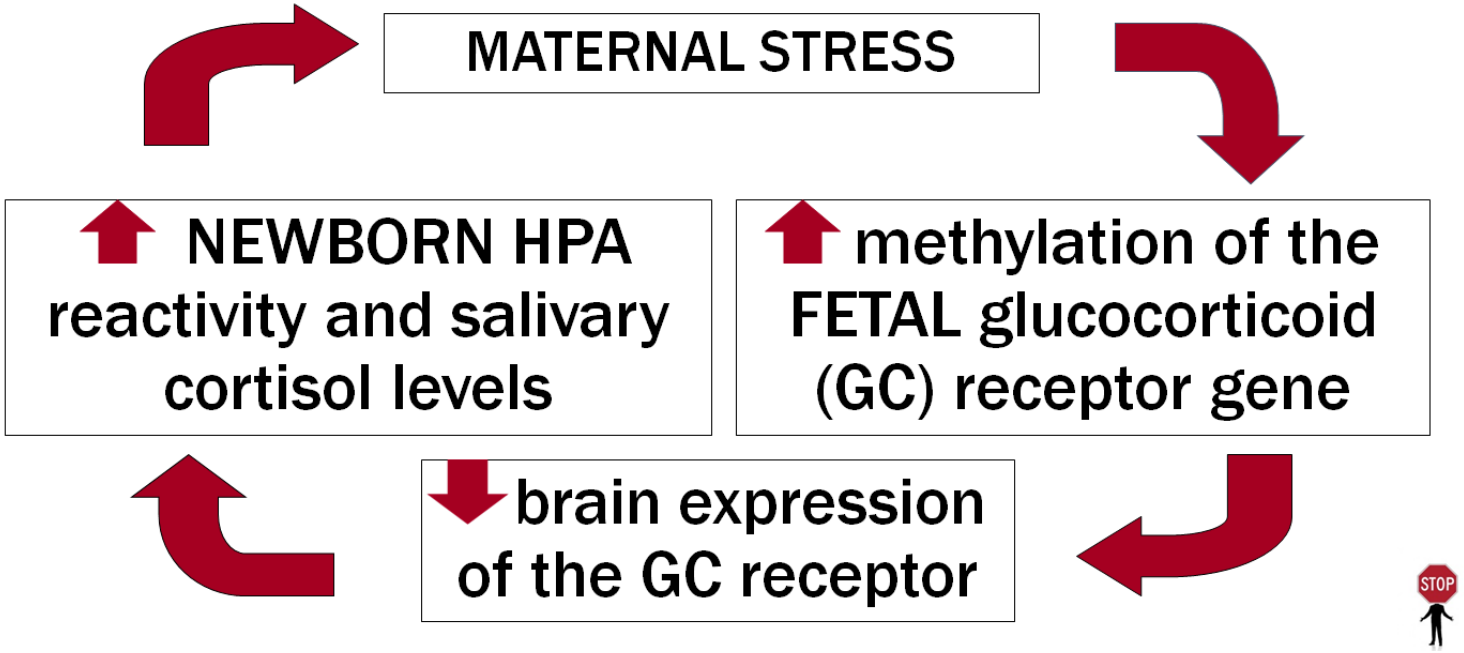
They all make it more difficult to form **SAFE, STABLE** and **NURTURING RELATIONSHIPS**

SOCIAL ISOLATION IS BAD FOR THE HUMAN CONDITION

Stress

- Positive – brief, mild, infrequent and BUFFERED
  - Shots, falls
- Tolerable – sustained, moderate/severe and BUFFERED
  - Divorce, death
- Toxic – sustained, severe and UNBUFFERED
- BUFFER—SAFE, STABLE NURTURING RELATIONSHIPS (SSNRs)

Impact of Early Stress



Impact of Early Stress

CHILDHOOD STRESS

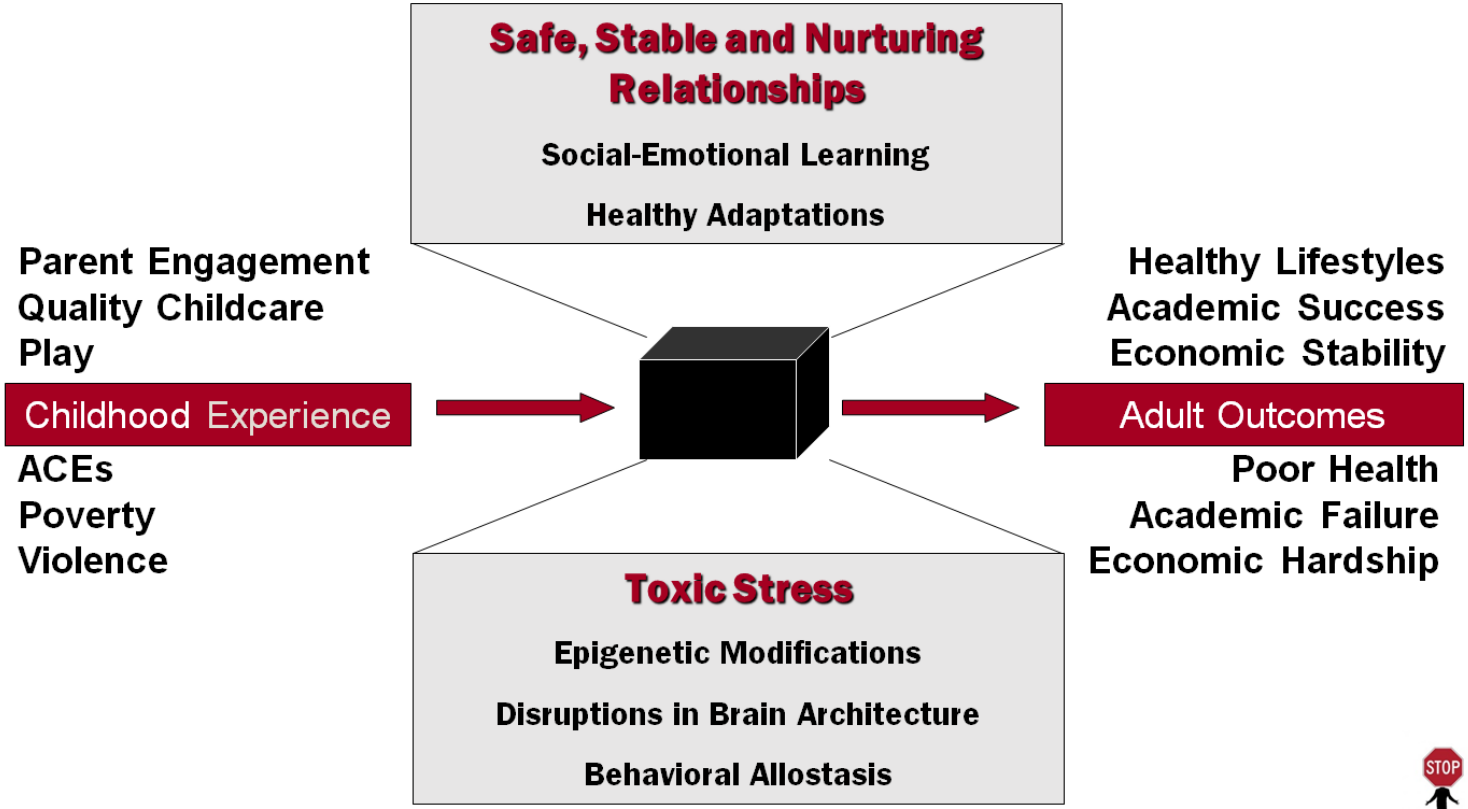
Chronic "fight or flight;" ↑ cortisol / norepinephrine

Changes in Brain Architecture

Hyper-responsive stress response; ↓ calm/coping

Critical Concept

SSNRs are the antidote for toxic stress responses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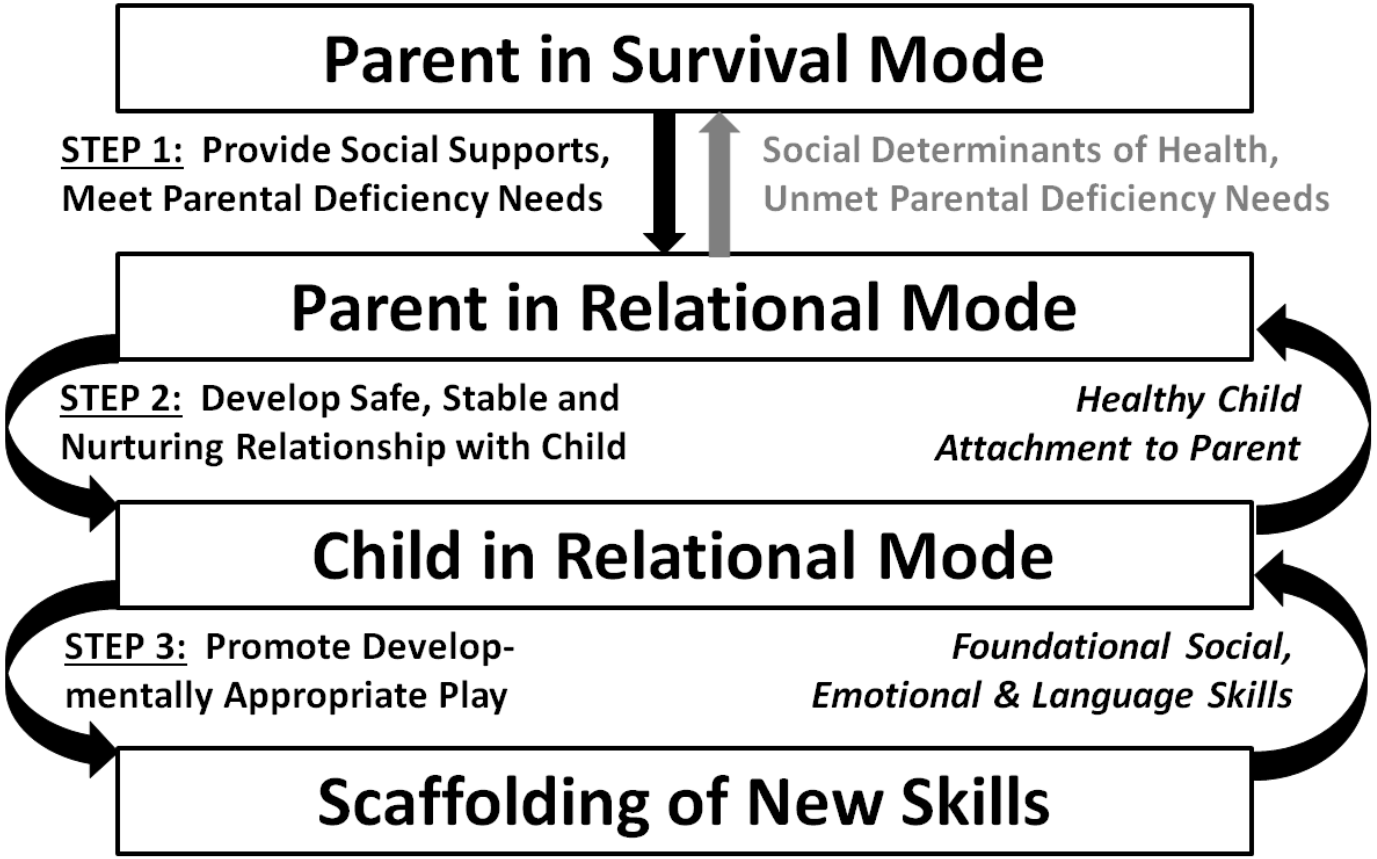
Critical Concept

Promoting SSNRs will require a 2-GEN APPROACH from providers


Parent in Survival Mode
STEP 1: Provide Social Supports, Meet Parental Deficiency Needs
Social Determinants of Health, Unmet Parental Deficiency Needs
Parent in Relational Mode
STEP 2: Develop Safe, Stable and Nurturing Relationship with Child
Healthy Child Attachment to Parent
Child in Relational Mode
STEP 3: Promote Developmentally Appropriate Play
Foundational Social, Emotional & Language Skills
Scaffolding of New Skills

Critical Concept

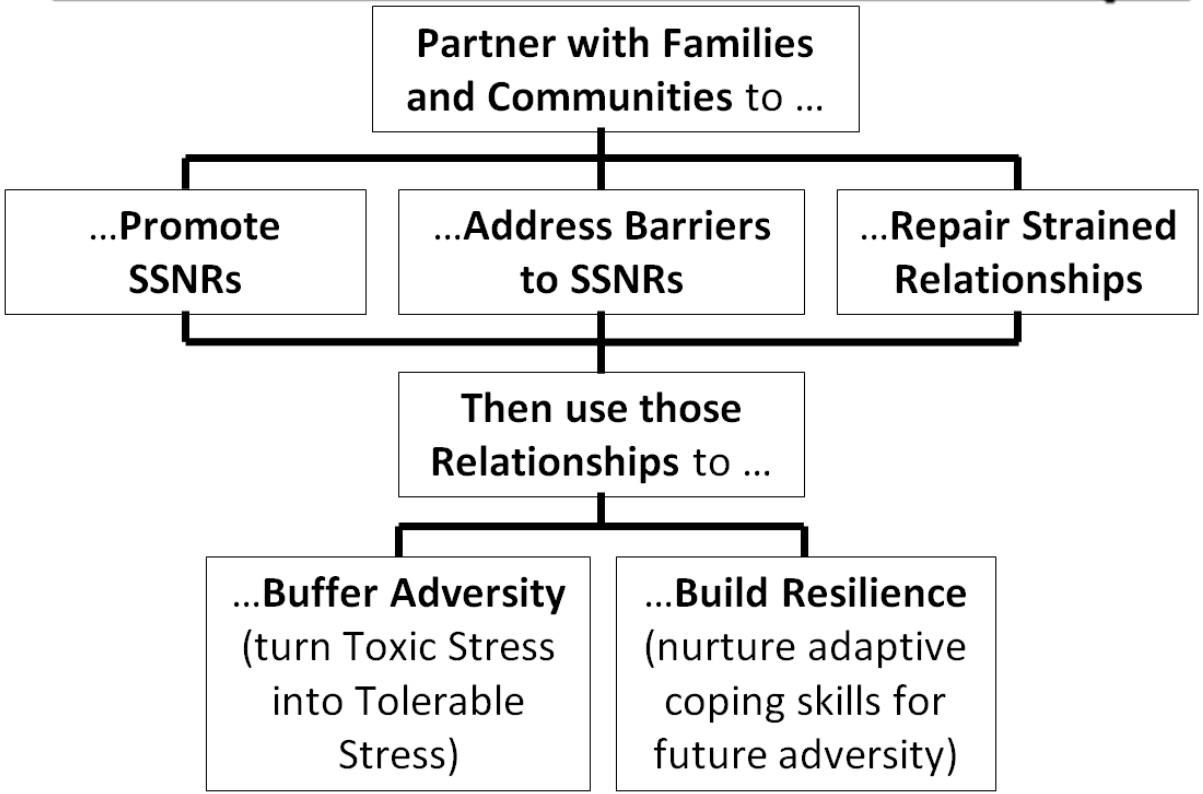
Promoting SSNRs

will require

POLICY CHANGES

that reflect cultural / societal shifts

SUMMARY: It's all about Relationships!



Racism—AAP Policy Statement July 2019

- “A system of structuring opportunity and assigning value based on the social interpretation of how one looks that unfairly disadvantages some individuals and communities, and saps the strength of the whole society through the waste of resources”
- A social determinant of health
- Affects children, adolescents, adults and their families
- No biologic basis for race

Racism—AAP Policy Statement July 2019

- To be addressed through
  - Implicit bias
  - Explicit bias
  - Institutional structures
  - Interpersonal relationships

Racism—AAP Policy Statement July 2019

- How can physicians address and ameliorate the effects?
  - Optimize clinical practice
    - Culturally safe medical home
    - Assess for signs of stress
    - Cultural diversity
  - Optimize workforce development and professional education
  - Optimize systems through community engagement, advocacy, and public policy
  - Optimize research

Vignette

- 18 month old with fever and diagnosis of otitis media

Vignette

- 2 yr old female for well child visit
  - Identify strengths
  - Areas of improvement
  - Establish trust
    - Tough in the EHR era
    - Tough in the “box-checking” era

Vignette

- Advocacy—Have to advocate!
  - Clinic
  - Institution (not adequate investment in these issues)
  - Community
  - Professional association

Take home messages

- Adult-onset diseases are adult-manifest from childhood experiences

Take home messages

- When assessing, do not ask “what is wrong with you” but rather “what happened to you”

Take home messages

- Nurturing children and families
  - Through health care
  - Through policies
  - Through education
  - By community involvement

Take home messages

- SSNRs are crucial
  - Assess for
  - Encourage
  - Establish trust
  - Nurture them
  - Monitor for
  - Always dynamic and evolving

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