Biomedical Impacts of Childhood Poverty
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Disclosures
Elizabeth Hanson, M.D., M.A. has no relationships with commercial companies to disclose.

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Learning Objectives
At the end of this presentation the participant will be able to:
• Recognize the impacts of childhood poverty on lifelong health outcomes
• Discuss the mediators of these impacts incorporating the concepts of epigenetics and toxic stress
• Examine opportunities to mediate these impacts in our patients and communities

Roadmap
• Outcomes
  — Poverty and Health
• Mediators
  — How poverty “gets under the skin”
• Resilience
  — Tipping the Scales

http://www.childrensdefense.org/
Nearly Half of US Children Live in Low Income Families

Health Impacts of Poverty

- Neonatal: prematurity, low birth weight, increased infant mortality
- Developmental: Language, Brain development
- Chronic illnesses: Asthma
- Self-regulation and Executive Function
- Teen pregnancy
- Educational difficulties and school failures
- Mental health and substance abuse disorders


Income and Health

Figure from Robert Wood Johnson Foundation report on the 2003 National Survey of Children's Health

Income and Health

not just unhealthy behaviors...

Figure from Robert Wood Johnson Foundation report on the 2003 National Survey of Children's Health

“The Early Catastrophe”

“Meaningful Differences in the Everyday Experiences of Young American Children.” University of Kansas.

Income and the Brain

Cortical Surface Area

http://www.earlyedgecalifornia.org/our-issues/infants‐‐‐toddlers/

Adverse Childhood Experiences (ACE) Study

- Type 2 Diabetes
- Ischemic Heart Disease
- Stroke
- Cancer
- Metabolic Syndrome
- Autoimmune Disease
- Peptic ulcer Disease
- Irritable Bowel Syndrome
- Chronic Pain Disorders
- Mental Health Disorders
- Substance Abuse Disorders

Biology: Toxic 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.

http://developingchild.harvard.edu/science/key-concepts/toxic-stress/

Ecology: Social Environment

- The number of words addressed to children differs across income groups.

Hart and Risley, 1995

http://thirtymillionwords.org/

How Poverty “gets under the skin”

- Biology: Physiological Adaptations and Disturbances
- The Basic Science of Pediatrics

Stress Physiology

Ecology: Physical Environment

FLINT WATER PLANT

http://developingchild.harvard.edu/science/key-concepts/toxic-stress/


Hart and Risley, 1995

http://thirtymillionwords.org/
Environmental Disparities

Figure 2. Estimated lifetime cancer risks from ambient air toxics exposures by race, ethnicity and income (South Coast Air Basin).

Epigenetics

Experiences leave a chemical “signature” on genes that determines whether and how genes are expressed.

- Maternal obesity
- Gestational DM
- Fetal alcohol exposure
- Nutrition/Malnutrition
- Smoke Exposure
- Toxic Stress
- Environmental Toxins

Brain Architecture

Timing is everything

Resilience

http://developingchild.harvard.edu/resources/inbrief-the-science-of-resilience/
Interventions

Advocate

Medical Home

On the Horizon

“SBIRT” Model

Summary

- Clinic practices/policies sensitive to the needs of children and families in living in poverty
- Offer integrated care services to support the whole family
- Integrated medical home programs
  - Healthy Steps
  - Reach Out and Read
  - Health Leads
  - Medical Legal Partnerships

- Child Poverty has demonstrated negative impacts on health that persist into adulthood
- Exposure to toxic stress is one important mediator of these impacts
- Pediatricians and other child health providers have an important role in mediating these impacts and promoting resilience