Alaska’s Infrastructure: Improving the Health of Families with Young Children
Impact of Neglect

3 Year Old Children

Normal

Extreme Neglect

Bruce Perry, MD
Role of Experience

• The human brain has the ability to be shaped by experience

• Experience, in turn, leads to neural changes in the brain
  • birth: 50 trillion synapses
  • 1 year: 1,000 trillion
  • 20 years: 500 trillion

• The remolded brain facilitates the learning of new experiences
Synaptic Growth and Pruning

• Synaptic pruning occurs in areas that are infrequently used—results in decreased number of synapses between neurons
  • Maximum number of synapses occurs before age 3-4 y/o

• Allows for improved functionality and efficiency of synaptic transmission in the brain

• Plasticity essentially reaches adult levels by age 10 y/o
Brain Development as a Measure of Synapse Formation

HUMAN BRAIN DEVELOPMENT IS GREATEST AT VERY YOUNG AGES

Synapse Formation and Retraction

- Sensory Pathways (Vision, Hearing)
- Language
- Higher Cognitive Function

-8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 1 5 10 15 19

Conception Birth One-year old Age in months Age in years

SOURCE: C. A. Nelson in From Neurons to Neighborhoods, 2000
Persistent Stress Changes Brain Architecture

Normal

Typical neuron—many connections

Toxic stress

Damaged neuron—fewer connections

Prefrontal Cortex and Hippocampus

Sources: Radley et al. (2004) Bock et al. (2005)
Physiologic Response to Stress in Kids

• Stress without the buffering response of a strong adult relationship causes prolonged, brain-controlled secretion of stress hormones
  • Cortisol, norepinephrine, epinephrine, etc.

• Stress responses are beneficial in the short term with adult support, but can be damaging to health if they occur over long periods of time
  • Constant wear and tear
  • Potentially permanent changes in gene regulation
Brain process under typical conditions

Observe → Input → Interpret → Process → Evaluate Options → Plan → Act

Joshua Arvidson, 2011
Alarm system
“Express Route”

Observe → Interpret

DANGER

React (Flight - Flight - Freeze)

Evaluate Options

Plan

Act

Joshua Arvidson, 2011
With repeated stress, the Alarm System “Express Route” becomes the main road.
But These Effects Can Be Reversed

- Prevention programs that result in improve family function and better parenting skills result in:
  - Reversal of epigenetic changes in young children
    - Reverses the brain changes seen in adulthood
  - Improved health outcomes
  - Decreased mental health issues
  - Decreased costs
A Common Language to Explain Development

10 adverse childhood experiences surveyed:

1. Physical abuse
2. Sexual abuse
3. Emotional abuse
4. Emotional neglect
5. Physical neglect
6. Witness domestic violence
7. Mental illness in home
8. Family member incarcerated
9. Alcohol/drug problems
10. Parental separation or divorce
ACEs: Prevalence data

- Prevalence of ACEs in study group:
  - Sexual abuse = 21%
  - Domestic violence in childhood home = 13%
  - Substance abuse in home = 28%
  - Parental separation or divorce = 24%
  - Physical abuse = 28%
  - Emotional neglect = 15%
  - Emotional abuse = 11%
  - Physical neglect = 10%
  - Mental illness in home = 20%
  - Criminal household member = 5%

Health Measures Now Linked to Adverse Childhood Experiences Score

- Stepwise increased risk for:
  - Heart disease
  - Asthma
  - Diabetes
  - Cancer
  - COPD
  - Skeletal fractures
  - Sexually transmitted diseases
  - Liver disease
  - Autoimmune disorders
  - Osteoarthritis
  - Smoking
  - Alcohol abuse
  - Over eating and obesity
  - Illicit drug use
  - Promiscuity
  - IV drug use
  - Clinical depression

- And
  - Autobiographical memory disturbance
  - Poor anger control
  - Relationship problems
  - Employment problems
  - Early age at first intercourse
  - Teen pregnancy
  - Unintended pregnancy
  - Teen paternity
  - Fetal death
  - Suicide
  - Domestic violence
  - Anxiety disorders
  - Hallucinations
  - Sleep disturbances
  - Chronic pain
  - Headaches
  - Early death
Prevalence of Specific ACEs Experienced by AN People Compared with Non-AN

Source: 2013 Alaska BRFSS
Alaska ACEs in Children

- Alaska Children and Youth ACEs in the General Population
Alaska ACEs in Children

- Alaskan Children and Youth ACEs for those who Experienced Low Income
Alaska ACES in Children

• Alaskan Children and Youth ACEs for those who Witness Domestic Violence
Intimate Partner Violence and Child Maltreatment

• 8.4% of Alaska moms report some form of intimate partner violence during the 12 months prior to or during pregnancy
  • >60% of children born to these moms experienced a report to OCS
• And.....intimate partner violence was present in 19.6% of children who had an OCS report
Age When US Kids Accumulate Half of Their Lifetime ACEs
Early Childhood and OCS Referrals

• Annually
  • 10% of children less than 7 y/o are reported to OCS

That’s about 8000 kids!

• For kids born during the years 2009-2011
  • 9% were reported to OCS before age 1 y/o
  • 18% were reported to OCS before age 3 y/o
  • 25% were reported to OCS before age 5 y/o
  • 31% were reported to OCS before age 7 y/o

That’s a total of 10,000 kids!!!

Jared Parish—State of Alaska
SLEEP-RELATED INFANT MORTALITY IN ALASKA

2012-2014

11/21/14
Jared Parrish, Margaret Young, Abigail Newby-Kew
Section of Women’s Children’s and Family Health
MCH-Epidemiology Unit
SLEEP-RELATED INFANT MORTALITY
ALASKA, 1992-2014

*This review describes the 53 sleep-related deaths that occurred between 1/1/2012 and 9/30/2014

N = 53
### DEMOGRAPHIC CHARACTERISTICS

#### Sleep Related Deaths, 2012 - 2014

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>%</th>
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<tbody>
<tr>
<td>Sex (53)</td>
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<tr>
<td>Female</td>
<td>22</td>
<td>41.4</td>
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<tr>
<td>Male</td>
<td>31</td>
<td>58.5</td>
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<tr>
<td>Maternal Race (53)</td>
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<tr>
<td>Alaska Native</td>
<td>32</td>
<td>60.4</td>
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<tr>
<td>White</td>
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<td>13.2</td>
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<tr>
<td>Marital Status (51)</td>
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<tr>
<td>Married</td>
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<td>27.5</td>
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<tr>
<td>Unmarried</td>
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<td>72.6</td>
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<tr>
<td>Children Living (50)</td>
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<tr>
<td>0</td>
<td>19</td>
<td>38.0</td>
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<tr>
<td>1</td>
<td>11</td>
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<td>20</td>
<td>40.0</td>
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<tr>
<td>Gestation (51)</td>
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<tr>
<td>Preterm</td>
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<tr>
<td>Early/Full Term</td>
<td>43</td>
<td>84.3</td>
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<tr>
<td>Infant Age (53)</td>
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<tr>
<td>0-3 Months</td>
<td>31</td>
<td>69.8</td>
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<tr>
<td>4-9 Months</td>
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<td>30.2</td>
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#### Maternal Education (32) 2013 and 2014 Births

<table>
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<tr>
<th>Category</th>
<th>N</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>12th Grade or Less; No Diploma</td>
<td>7</td>
<td>21.9</td>
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<tr>
<td>High School Graduate or GED</td>
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<td>37.5</td>
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<td>College, But No Degree or Associates Degree</td>
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<tr>
<td>Bachelors Degree</td>
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<td>0</td>
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<tr>
<td>Doctorate Degree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Demographic distributions of sleep-related mortality are in general similar to all cause infant mortality*
SUBSTANCE USE, VIOLENCE, & SES

Family History

- Prenatal Alcohol or Narcotic Use: 15%
- Family History of Dysfunction: 26%
- Caregiver or Family Contact with OCS Pre-Death: 30%
- Prenatal Tobacco Use: 33%
- Medicaid and/or WIC: 49%

Family History of Dysfunction

- Percent of Sleep Related Deaths (n=53): 20.8% for Arrests, 26.4% for Domestic Violence, and 41.5% for Substance Abuse.
Maternal Stress and OCS Referrals

• Before 7 y/o, half of all children born to moms with 4 or more stressors are reported for child maltreatment

Stressors:
1. Being homeless
2. Husband/partner went to jail
3. Bing in a fight
4. Loss of job even though wanted to keep working
5. Husband/partner lost job
6. Argued with husband/partner more than usual
7. Close family member very sick or hospitalized
8. Separated/divorced
9. Moved to a new address
10. Husband/partner said they didn’t want pregnancy
11. Has a lot of bills couldn’t pay
12. Someone close had problem with drinking/drugs
13. Someone close died

Jared Parish—State of Alaska
Public Investment in Children by Age
Public Investment in Children by Brain Growth
Disparities in Vocabulary Development

Economics of Early Intervention and Prevention

• Funding early interventions provides the largest possible return on investment

How Do We Identify These Kids?
This means we ask the question, “What’s happened to you in the past?” rather than “What’s wrong with you?”

- This fundamentally changes the way we interact with people
- Changes a interaction with a family from “I must fix you” to “I must listen to you”
Behaviors Associated with Early Childhood Trauma

• Ages: 0-2
  • Dysregulated eating, sleeping patterns
  • Developmental regression
  • Irritability, sadness, anger
  • Poor appetite, low weight gain
  • Increased separation anxiety, clingingness

• NCTSN.org/earlychildhoodtrauma

• Ages 3-6
  • Increased aggression
  • Somatic symptoms
  • Sleep difficulties/nightmares
  • Increased separation anxiety
  • New fears
  • Increased distractibility/high activity level
  • Increased withdrawal/apathy
  • Developmental regression
  • Repetitive talk/play about the event
  • Intrusive thoughts, memories
  • Absenteeism
When Is the Best Time to Screen Families?
Parent Screening Questionnaire

• One-page questionnaire, completed by the parent
• Targets risk factors that jeopardize children’s health, development and safety
• Administered at selected well-child visits
• Free, available in 4 languages

http://theinstitute.umaryland.edu/seek/
Survey of Well-Being of Young Children

• Comprehensive screening instrument for children under 5. Forms available for each recommended well-child visit recommended by the AAP.

• Targets developmental milestones, social-emotional development, and family risk factors.

• Free; available in 3 languages—theswyc.org
• Not a validated screening tool (they’re working on it), but available for young kids and teens
Four Questions—Gets Almost Everything

• Has anything really stressful happened to your child since the last time I saw you?

• How has that affected your child’s behavior?
  • Corollary question: How has this event and any changes in your child’s behavior affected you?

• What have you done that’s really fun with your child since the last time I saw you?

• Give me three words that describe your child to you
Ok....so screening is positive...
Just Screening is Pretty Effective

• Studies suggest that screening alone for ACEs can improve health and reduce both ER (11%) and sick office visits (31%)
  • Just talking about past experiences with a respected provider relieves stress and improves physical and mental health
  • Suggests that screening should start immediately, but......providers are nervous
If a Traumatic Stressor Is Identified:

• Assess for child and family safety
• Provide education/guidance about behavior management, routines and daily living activities to promote recovery and sense of safety
• Refer to social work, child protection, domestic violence team or for mental health intervention, if needed
• Alaska Child Trauma Center
• Help Me Grow
Help Me Grow—Alaska

• Connects at-risk children with the services they need
  • Training for primary care offices to provide effective developmental screening to facilitate early detection
  • Builds collaboration across sectors to improve access
  • Identifies gaps and barriers to access systems
• Four Core Components
  • Child health care provider outreach to support screening
  • Community outreach to identify resources
  • Centralized telephone access point
  • Collection of data, including service gap analysis
• https://www.a2p2.org/help-me-grow-alaska
Washington State Institute for Public Policy—WSIPP

• Most early childhood interventions have a benefit to cost ratio of great than $1.00
  • Evidence based interventions
  • Can be applied locally or statewide
  • Much more effective than intervening in later years, when the issues are much more ingrained
Resilience to ACEs

• The most important protective resource to enable a child to cope with exposure to violence is a strong relationship with a competent, caring, positive adult, most often a parent—but doesn’t have to be!
• With the support of good parenting by either a parent or other significant adult, a child’s cognitive and social development can proceed positively even with adversity.
So...Where Is the Best Place to Focus Society Efforts to Improve Family Health

- Data from the National Survey on Children’s Health (2011-12) combining ACEs data with chronic child health outcomes, and overlaying environmental changes to see if there is an effect
Effect of Neighborhood Amenities on Child Health

1. Sidewalks
2. Parks
3. Recreational Center
4. Library
Effect of Neighborhood Amenities on Child Health
Effect of Neighborhood Detracting Elements on Child Health

1. Litter or garbage about
2. Dilapidated housing
3. Broken windows or graffiti
Effect of Neighborhood Detracting Elements on Child Health

Average Number of CSHCN Screener Conditions by ACE Score and Number of Detracting Neighborhood Conditions

- 3 detracting elements
- 2 detracting elements
- 1 detracting element
- No detracting elements
Effect of Neighborhood Cohesion on Child Health

1. People help each other out
2. People watch each others children
3. People to count on
4. Adults I can trust
Effect of Neighborhood Cohesion on Child Health

Average Number of CSHCN Screener Conditions by ACE Score and Neighborhood Cohesion
Effect of Self-Regulation Skills on Child Health

1. Finishes tasks and follows through on commitments
2. Stays calm and in-control when facing a challenge
3. Shows interest and curiosity in learning new things
Effect of Self-Regulation Skills on Child Health

![Average Number of CSHCN Conditions by ACE Score and Number of Self-Regulation Skills](chart.png)
Self-Regulation: ARC Framework

- **Attachment**
  - Caregiver affect management
  - Attunement
  - Consistent response
- **Regulation**
  - Identification
  - Modulation
  - Expression
- **Competency**
  - Executive function
  - Self development
- **Alaska Child Trauma Center**—training available for organizations to implement ARC
Building an Agenda for Families

• Support programs that train caregivers and parents to care for their children
  • Strengthening Families and Parenting Programs

• Support affordable, high-quality childcare for all families so that parents may work without compromising their child’s development
  • Thread

• Support a living wage and ongoing training for teachers, Head Start workers, and childcare workers
Building an Agenda for Families

• Support improved mental health services for families in all areas of Alaska
• Support safe housing for families

• In general.....
  • Targeted support for families with low education and income levels
  • Intensive intervention for families at high risk of experiencing toxic stress
  • Help Me Grow
Basically....

Families with young children are the infrastructure of Alaska, and there’s nothing more important to Alaska’s successful future

- Maximizing the potential of children is much easier (and cheaper) if we start them out right
Thank you!!!