The Life-Course Effects of Childhood Adversity
Toxic Stress, Resilience, and the Case for Trauma-Informed Care

Stan Sonu, MD MPH
Assistant Professor
Division of General Internal Medicine and Geriatrics
Division of General Pediatrics & Adolescent Medicine
Associate Program Director
Emory J. Willis Hurst Internal Medicine Residency
Childhood trauma is the number one public health crisis in the United States that is hidden in plain sight.

Dr. Robert K. Ross
Pediatrician
CEO, California Endowment
OUTLINE

The Life-Course Effects of Childhood Adversity
Toxic stress, resilience, and the case for trauma-informed care

1. The effect of toxic stress on health and development over the life-course
2. How resilience-promoting factors can mitigate the negative effects of ACEs
3. Trauma-informed care: what it means and key principles
### Adverse Childhood Experiences

**ABUSE**
- Physical abuse
- Emotional abuse
- Sexual abuse

**NEGLECT**
- Physical neglect
- Emotional neglect

**HOUSEHOLD STRESS**
- Mental illness
- Substance abuse
- Domestic violence
- Incarceration
- Parental separation / Divorce

---

**Phase I data published in 1998**
- >17,000 adults total (phases I and II combined)
- Relatively affluent participant group
- >60% had ≥1 ACE
- 12.5% had ≥4 ACEs
- Link btn cumulative ACEs and health outcomes

---

**More ACEs**

**Increased Risk of:**
- Health risk behaviors
- Mental health problems
- Chronic disease
- School problems
- Unmet social needs
### ACE-Associated Health Conditions: Adults

<table>
<thead>
<tr>
<th>Symptom or Health Condition</th>
<th>Odds Ratio (excluding outliers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease* (e.g., MI, ischemic heart disease)</td>
<td>3.1</td>
</tr>
<tr>
<td>Suicide attempt*</td>
<td>≥ 1 ACE: 1.4</td>
</tr>
<tr>
<td>Strain*</td>
<td>3.0</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease (asthma, bronchitis)*</td>
<td>3.1</td>
</tr>
<tr>
<td>Anemia*</td>
<td>2.2</td>
</tr>
<tr>
<td>Diabetes*</td>
<td>1.4</td>
</tr>
<tr>
<td>Obesity*</td>
<td>2.1</td>
</tr>
<tr>
<td>Incontinence or incontinence of bowel*</td>
<td>2.4</td>
</tr>
<tr>
<td>Cancers, any†</td>
<td>2.3</td>
</tr>
<tr>
<td>Alcohol misuse† (self-reported)</td>
<td>3 ACEs, HR: 1.5</td>
</tr>
<tr>
<td>Memory impairment† (all causes, including dementia)</td>
<td>4.9</td>
</tr>
<tr>
<td>Kidney disease†</td>
<td>1.7</td>
</tr>
<tr>
<td>Headaches†</td>
<td>≤ 5 ACEs: 2.1</td>
</tr>
<tr>
<td>Chronic pain, any† (using天真 (you can’t)</td>
<td></td>
</tr>
<tr>
<td>Chronic back pain† (using天真 (you can’t)</td>
<td>1.3</td>
</tr>
<tr>
<td>Fibromyalgia†</td>
<td>1.9</td>
</tr>
<tr>
<td>Unexplained somatic symptoms, including somatic pain, headache‡,§,‖</td>
<td>2.0 – 2.7</td>
</tr>
<tr>
<td>Skilled labor‡</td>
<td>1.6 – 2.9</td>
</tr>
<tr>
<td>Physical disability requiring assistive equipment †</td>
<td>1.8</td>
</tr>
<tr>
<td>Depression†</td>
<td>4.7</td>
</tr>
<tr>
<td>Suicide attempt†</td>
<td>3.7</td>
</tr>
<tr>
<td>Suicidal ideation‡</td>
<td>18.5</td>
</tr>
<tr>
<td>Sleep disturbance‡</td>
<td>1.6</td>
</tr>
<tr>
<td>Anxiety‡</td>
<td>2.7</td>
</tr>
<tr>
<td>Pain and anxiety‡</td>
<td>2.7</td>
</tr>
<tr>
<td>Post-traumatic stress disorder‡</td>
<td>4.3</td>
</tr>
<tr>
<td>Enuresis encopresis‡</td>
<td>5.2</td>
</tr>
<tr>
<td>Incontinence†, sensorimotor incontinence, or incontinence of bowel †</td>
<td>5.2</td>
</tr>
<tr>
<td>Alcohol use †</td>
<td>6.9</td>
</tr>
<tr>
<td>Alcohol or substance use †</td>
<td>6.1</td>
</tr>
<tr>
<td>Cannabis use †</td>
<td>11.0</td>
</tr>
<tr>
<td>Tics and hyperactivity †</td>
<td>4.2</td>
</tr>
<tr>
<td>Sexually transmitted infections, lifetime †</td>
<td>1.9</td>
</tr>
<tr>
<td>Violent victimization † (intimate-partner violence, sexual assault)</td>
<td>7.5</td>
</tr>
<tr>
<td>Violent perpetration †</td>
<td>6.1</td>
</tr>
</tbody>
</table>

### ACE-Associated Health Conditions: Pediatrics

<table>
<thead>
<tr>
<th>Symptom or Health Condition</th>
<th>Odds Ratio (excluding outliers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma*</td>
<td>1.7 – 3.6</td>
</tr>
<tr>
<td>Allergies*</td>
<td>2.5</td>
</tr>
<tr>
<td>Dermatitis and eczema*</td>
<td>2.0</td>
</tr>
<tr>
<td>Unintended pregnancy †</td>
<td>2.2</td>
</tr>
<tr>
<td>Increased incidence of chronic disease, impaired management*</td>
<td>3</td>
</tr>
<tr>
<td>Any unexplained somatic symptoms † (e.g., nausea/vomiting, diziness, constipation, headaches)</td>
<td>3</td>
</tr>
<tr>
<td>Headaches †</td>
<td>9.3</td>
</tr>
<tr>
<td>Enuresis encopresis †</td>
<td>–</td>
</tr>
<tr>
<td>Overweight and obesity †</td>
<td>2.0</td>
</tr>
<tr>
<td>Failure to thrive; poor growth; psychosocial disinhibition †,‡,§</td>
<td>2.8</td>
</tr>
<tr>
<td>Increased infections † (viral, URI, UTIs, and pneumonia, AOM, URI, conjunctivitis, intestinal)</td>
<td>2.8 – 4.4</td>
</tr>
<tr>
<td>Injection site reactions †,≤ 14 years</td>
<td>2.3</td>
</tr>
<tr>
<td>Sleep disturbance †,≤ 14 years</td>
<td>3.6 – 5.3</td>
</tr>
<tr>
<td>Developmental delay †</td>
<td>3.9</td>
</tr>
<tr>
<td>Learning and behavior problems †</td>
<td>32.6</td>
</tr>
<tr>
<td>Repeating a grade †</td>
<td>2.8</td>
</tr>
<tr>
<td>Not completing homework †</td>
<td>4.0</td>
</tr>
<tr>
<td>High school absenteeism †</td>
<td>4.1</td>
</tr>
<tr>
<td>Graduating from high school †</td>
<td>0.4</td>
</tr>
<tr>
<td>Aggression, physical fighting †</td>
<td>For each additional ACE 1.9</td>
</tr>
<tr>
<td>Depression‡</td>
<td>3.9</td>
</tr>
<tr>
<td>ADHD‡</td>
<td>5.0</td>
</tr>
<tr>
<td>Any of: ADHD, depression, anxiety, conduct behavior disorder †</td>
<td>3.5</td>
</tr>
<tr>
<td>Suicidal ideation †</td>
<td>1.9</td>
</tr>
<tr>
<td>Suicide attempts †</td>
<td>For each additional ACE 1.9 – 2.1</td>
</tr>
<tr>
<td>Self-harm †</td>
<td>1.8</td>
</tr>
<tr>
<td>First use of alcohol at ≤ 14 years †</td>
<td>6.2</td>
</tr>
<tr>
<td>First use of illicit drugs at ≤ 14 years †</td>
<td>9.1</td>
</tr>
<tr>
<td>Early sexual debut † (≤ 15-17 yrs)</td>
<td>3.7</td>
</tr>
<tr>
<td>Teenage pregnancy †</td>
<td>4.2</td>
</tr>
</tbody>
</table>

* Odds ratio compares outcomes in individuals with ≥ 4 ACEs to those with 0 ACEs, except where specified.
† Odds ratio compares outcomes in individuals with ≥ 4 ACEs to those with 1–3 ACEs, except where specified.
‡ Odds ratio compares outcomes in individuals with ≥ 4 ACEs to those with 0–3 ACEs, except where specified.
INTERGENERATIONAL TRAUMA

The cumulative emotional and psychological wounding transmitted from one generation to the next in the absence of direct exposure

Hesse and Main (2000)
MECHANISM OF INTERGENERATIONAL TRAUMA

How it happens

ACEs

Poor access to care

Adverse childhood experiences

Mental health problems

Substance use disorders

Insecure/Disorganized attachment

Increased vulnerability to psychiatric/behavioral problems

Epigenetics

Increased vulnerability to physical health problems

Toxic stress

Learned behaviors

Increased vulnerability to maladaptive coping, addiction

Poverty

Poor sense of self; Social/Relational challenges

HOW IS THIS HAPPENING?

Poor health outcomes
ACEs in Children: What's the Theme?

- Developmental delay
- Behavioral problems
- Depression
- Anxiety
- Substance use disorders
- Learning problems
- School suspensions
- School expulsions
- School attrition
- Juvenile delinquency
- Bullying
- Asthma
- Obesity
Stress
STRESS RESPONSE SYSTEM

SYMPATHETIC NERVOUS SYSTEM & HPA AXIS
↑ cortisol, epinephrine, adrenaline, cytokines

- Increased heart rate & BP
- Bronchial dilatation
- Increased muscle contraction
- Decreased urinary output
- Decreased gut motility
- Pupillary dilatation

STRESS RESPONSE SYSTEM
OUTPUTS

- FIGHT -
- FLIGHT -
STRESS RESPONSE SYSTEM
OUTPUTS

- FIGHT -

- FLIGHT -

- FREEZE -

HYPERVIGILANCE

AVOIDANCE

DISASSOCIATION
90% of a child’s brain development happens before age 5

Source: Harvard Center for the Developing Child

TYPES OF STRESS RESPONSES

POSITIVE
A normal and essential part of healthy development
EXAMPLES
- getting a vaccine
- first day of school

TOLERABLE
Response to a more severe stressor, limited in duration
EXAMPLES
- loss of a loved one
- a broken bone

TOXIC
Experiencing strong, frequent, and/or prolonged adversity
EXAMPLES
- physical or emotional abuse
- exposure to violence
KEY BRAIN REGIONS AFFECTED BY STRESS/TRAUMA

**PREFRONTAL CORTEX**
Center of executive functions; regulates thought, emotions, and actions.

**AMYGDALA**
Triggers emotional responses; detects whether a stimulus is threatening.

**HIPPOCAMPUS**
Center of short-term memory; connects emotion of fear to the context in which the threatening event occurs.
KEY BRAIN REGIONS AFFECTED BY STRESS/TRAUMA

**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.


**OUTLINE**
The Life-Course Effects of Childhood Adversity
Toxic stress, resilience, and the case for trauma-informed care

1. The effect of toxic stress on health and development over the life-course
2. How resilience-promoting factors can mitigate the negative effects of ACEs
3. Trauma-informed care: what it means and key principles
ADVERSITY IS NOT DESTINY

Resilience
The ability to adapt and succeed in the face of significant adversity
 Even in the face of adverse childhood experiences (ACEs), children can flourish in a resilient family household

**“FLOURISHING”**
- Shows interest and curiosity in learning new things (ENGAGEMENT)
- Works to finish tasks he or she starts (PERSEVERANCE)
- Stays calm and in control when faced with a challenge (SELF-REGULATION)

MUST ANSWER “DEFINITELY TRUE” TO ALL 3

**“FAMILY RESILIENCE”**
“When your family faces problems, how often do you”:
- Talk about what to do
- Work together to solve problems
- Know we have strengths to draw on
- Stay hopeful even in difficult times
- Can share ideas/talk about things that matter with your child
- Cope with the day-to-day demands of raising children

Even in the face of adverse childhood experiences (ACEs), children can **flourish** in a **resilient** family household.

"FLOURISHING"
- Shows interest and curiosity in learning new things
- Works to finish tasks he or she starts
- Stays calm and in control when faced with a challenge

**MUST ANSWER “DEFINITELY TRUE” TO ALL 3**

"FAMILY RESILIENCE"
- "When your family faces problems, how often do you”:
  - Talk about what to do
  - Work together to solve problems
  - Know we have strengths to draw on
  - Stay hopeful even in difficult times
  - Can share ideas/talk about things that matter with your child
  - Cope with the day-to-day demands of raising children

Even in the face of adverse childhood experiences (ACEs), children can **flourish** in a **resilient** family household.

**MUST ANSWER “DEFINITELY TRUE” TO ALL 3**

"FAMILY RESILIENCE"
- "When your family faces problems, how often do you”:
  - Talk about what to do
  - Work together to solve problems
  - Know we have strengths to draw on
  - Stay hopeful even in difficult times
  - Can share ideas/talk about things that matter with your child
  - Cope with the day-to-day demands of raising children

Even in the face of adverse childhood experiences (ACEs), children can **flourish** in a **resilient** family household.

“**FLOURISHING**”
- Shows interest and curiosity in learning new things
- Works to finish tasks he or she starts
- Stays calm and in control when faced with a challenge

**MUST ANSWER “DEFINITELY TRUE” TO ALL 3**

“**FAMILY RESILIENCE**”
“When your family faces problems, how often do you”:
- Talk about what to do
- Work together to solve problems
- Know we have strengths to draw on
- Stay hopeful even in difficult times
- Can share ideas/talk about things that matter with your child
- Cope with the day-to-day demands of raising children

Resilience transforms potential **toxic** stress into **tolerable** stress.
“Resilience emerges not from rare or extraordinary qualities…but from the ‘everyday magic or ordinary, normative human resources in the minds, brains, and bodies of children, in their families and relationships, and in their communities.’

Ann Masten, PhD
Professor of Child Development


6-7 vs. 0-2 PCES: Adults reporting 6-7 PCEs have 72% lower odds of having depression or poor mental health compared to those reporting 0-2 PCEs.

48% v. 12.6%, OR 0.28; 95% CI 0.21-0.39. 3.8x higher rate for 0-2 vs. 6-7 PCEs.

POSITIVE CHILDHOOD EXPERIENCES:
"As a child, you..."
- felt able to talk to family about feelings
- felt your family stood by you during difficult times
- enjoyed participating in community traditions
- felt a sense of belonging in high school
- felt supported by friends
- had ≥2 non-parent adults who took genuine interest in you
- felt safe and protected by an adult in the home

6-7 vs. 0-2 PCES: Adults reporting 6-7 PCEs have 72% lower odds of having depression or poor mental health compared to those reporting 0-2 PCEs.

48% v. 12.6%; OR 0.28; 95% CI 0.21-0.39. 3.8x higher rate for 0-2 vs. 6-7 PCEs.
The Life-Course Effects of Childhood Adversity
Toxic stress, resilience, and the case for trauma-informed care

1. The effect of toxic stress on health and development over the life-course
2. How resilience-promoting factors can mitigate the negative effects of ACEs
3. Trauma-informed care: what it means and key principles

TRAUMA-INFORMED CARE
A universal precaution.
WHAT'S WRONG WITH YOU?

WHAT'S WRONG WITH YOU?

WHAT'S HAPPENED TO YOU?
THE FOUR Rs OF TRAUMA-INFORMED CARE

**REALIZE**
...and understand the widespread impact of trauma

**RECOGNIZE**
...signs and symptoms of trauma

**RESPOND**
...interpersonally and through policies, procedures, and practices

**AVOID RE-TRAUMATIZATION**
...actively, through universal and targeted actions

---

THE PAUSE

Between stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom.

Dr. Viktor E. Frankl
<table>
<thead>
<tr>
<th>SITUATION</th>
<th>REACTIVE (TYPICAL) VIEW</th>
<th>TRAUMA-INFORMED VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the setting of tapering opioids, pt angers easily</td>
<td>Pt is being manipulative, has poor insight, or cannot “control” her addiction</td>
<td>Recognize that fear often underlies anger. Prioritize building trust and collaboration.</td>
</tr>
<tr>
<td>Chronic non-adherence to medications, treatment plans, referrals</td>
<td>Doesn’t care about his body, poor literacy, poor insight, prefers alternative medicine</td>
<td>Recognize: - Influence of social determinants; - Pt may not trust the health system; - Pt may fear for safety; - Pt may be dealing with sequelae of trauma (*need problem alignment)</td>
</tr>
</tbody>
</table>

Adapted from Mary Driscoll, PhD “Veterans and Pain” webinar, VHA, 5/2018

<table>
<thead>
<tr>
<th>SITUATION</th>
<th>REACTIVE (TYPICAL) VIEW</th>
<th>TRAUMA-INFORMED VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engages in risky behavior despite knowing and having been treated for complications (e.g. STIs, alcoholic hepatitis)</td>
<td>Doesn’t care about her body</td>
<td>Recognize that behavior may represent maladaptation to past/current trauma (start with trust and problem-alignment before jumping to solution)</td>
</tr>
</tbody>
</table>

Adapted from Mary Driscoll, PhD “Veterans and Pain” webinar, VHA, 5/2018
Key Principles in Trauma-Informed Care

- Safety
- Trustworthiness & Transparency
- Peer Support
- Collaboration & Mutuality
- Empowerment Voice & Choice
- Cultural, Historical & Gender Issues

Promoting the linkage to recovery and resilience for those affected by trauma

Adapted from CDC’s “6 Guiding Principles to a Trauma-Informed Approach.”
https://www.cdc.gov/cpr/infographics/6_principles_trauma_info.htm
We are neurobiologically wired for relationships.

“THE HUMAN BRAIN IS NEUROBIOLOGICALLY DESIGNED FOR RELATIONSHIPS...BUT WE HAVE INVENTED CONTEXTS THAT ARE RELATIONALLY IMPOVERISHED.”

Bruce D. Perry, MD PhD
Senior Fellow, ChildTrauma Academy
Feinberg School of Medicine, Northwestern University
Listening is therapeutic.
When something becomes speakable, it becomes tolerable.


RESOURCES THAT SUPPORT HEALING FROM TRAUMA

- HEALTHY (OR RESTORED) SOCIAL CONNECTION
- MENTAL HEALTH TREATMENT (REINTEGRATION)
- SUPPORT FROM COMMUNITY (E.G. FAITH TRADITIONS)
- SOCIAL STABILITY (BASIC NEEDS ARE MET)
BEFORE OFFERING TRAUMA-INFORMED SERVICES FOR PATIENTS, INITIAL EFFORTS SHOULD FOCUS ON BECOMING TRAUMA-INFORMED INTERNALLY.

**Trauma-Informed Primary Care**

**Fostering Resilience and Recovery**

---

**GROWTH PLAN 1:**

**ROOT PRINCIPLES FOR TRAUMA-INFORMED SYSTEMS**

- **Organizational mission & goal setting:**
  - Develop a comprehensive trauma-informed mission.
- **Align organizational policies to practices:**
  - Adapt organizational policies and procedures to support trauma-informed care.
- **Build internal organizational workgroup:**
  - Engage a champions team with diverse membership.
- **Champions team with diverse membership:**
  - Build internal organizational workgroup/3 levels & multi-level engagement.
- **Use organizational tools:**
  - Implement an organizational growth plan.

**GROWTH PLAN 2:**

**EVALUATE ORGANIZATIONAL READINESS**

- **Complete readiness coaching session:**
  - Evaluate organizational engagement.
- **Informed policies and procedures:**
  - Adopt trauma-focused practices.
- **Build internal organizational workgroup:**
  - Implement an organizational growth plan.

**GROWTH PLAN 3:**

**COMPLETE READINESS COACHING SESSION**

- **Leadership commits to change model:**
  - Evaluate organizational readiness.
- **Evaluate organizational readiness:**
  - Implement a change model.
- **Organizational leadership:**
  - Engage relational leadership practices.

**GROWTH PLAN 4:**

**LEADERSHIP COMMITS TO CHANGE MODEL**

- **Complete readiness coaching session:**
  - Evaluate organizational readiness.
- **Leadership commits to change model:**
  - Develop a change model.

**GROWTH PLAN 5:**

**LEADERSHIP COMMITS TO CHANGE MODEL**

- **Organizational leadership:**
  - Engage relational leadership practices.
- **Leadership commits to change model:**
  - Develop a change model.

**GROWTH PLAN 6:**

**BUILD FOUNDATIONAL KNOWLEDGE**

- **Leadership commits to change model:**
  - Develop a change model.
- **Organizational leadership:**
  - Engage relational leadership practices.

**GROWTH PLAN 7:**

**ENGAGE DIVERSE AND MULTI-LEVEL WORKGROUPS**

- **Leadership commits to change model:**
  - Develop a change model.
- **Organizational leadership:**
  - Engage relational leadership practices.

**GROWTH PLAN 8:**

**USE ORGANIZATIONAL GROWTH CHECKLIST AS GUIDE**

- **Leadership commits to change model:**
  - Develop a change model.
- **Organizational leadership:**
  - Engage relational leadership practices.

---

**Trauma-Informed Primary Care Action Items Checklist**

**STEP 1: CREATE THE CONDITIONS FOR CHANGE**

- **Change management strategies:**
  - Establish a TIS-101.
  - Ensure continued support from leadership.
  - Implement a comprehensive training program.
  - Conduct a TIS.
  - Align organizational policies to practices.
  - Engage relational leadership practices in organizational workgroups.
  - Complete readiness coaching session.

**STEP 2: AREAS OF ACTION**

- **Change Concept 1: Help All Individuals Feel Safety, Security, and Trust**
  - Create a culture of safety, security, and trust.
  - Establish trauma-informed rooming policies.

- **Change Concept 4: Identify and Respond to Trauma Among Patients**
  - Respond to past trauma.
  - Conduct inquiry for past trauma.
  - Identify patients’ resilient factors.
  - Develop and tailor advocacy messaging for identified stakeholders.

- **Change Concept 5: Finance and Sustain Trauma-Informed Approaches in Primary Care**
  - Finance trauma-informed approaches.
  - Identify all planned, new, and existing activities and procedures resulting from implementation.
  - Identify nonfinancial resources for sustainability.

- **Change Concept 6: Educate and Train Staff on Symptoms of Common Workforce Concerns**
  - Educate and train staff on symptoms of common workforce concerns.
  - Provide universal education materials.
  - Ensure staff safety.
  - Develop and implement workforce policies that support trauma-informed approaches.

- **Change Concept 7: Create a Culture of Compassion and Resilience**
  - Create a culture of compassion and resilience.
  - Establish trauma-informed rooming policies.
  - Assess patient safety.

---

**Step 1**: Attend a trauma informed systems (TIS-101)

**Step 2**: Identify and respond to trauma among patients

**Step 3**: Develop and tailor advocacy messaging for identified stakeholders

**Step 4**: Finance trauma-informed approaches

**Step 5**: Identify all planned, new, and existing activities and procedures resulting from implementation

**Step 6**: Identify nonfinancial resources for sustainability

**Step 7**: Educate and train staff on symptoms of common workforce concerns

**Step 8**: Create a culture of compassion and resilience

**Step 9**: Establish trauma-informed rooming policies

**Step 10**: Assess patient safety

---

**A Change Package for Advancing Trauma-Informed Primary Care**
# Case Studies of Positive ROI After TIC Transformation

**Kaiser (CA)**
- Improved utilization practices
  - ED visits down 11%, readmissions down 3%

**Saint A’s (Wellpoint)**
- Improvement in permanent placements of clients (59% vs 30% (control))
- Growth in net worth from $12 million to $36 million

**Bluecross / Blueshield Tennessee**
- ~$2 million saved annually across all locations

**St. Mary-Corwin Medical Center (Colorado)**
- ED visits down 29%; decrease in no-shows; increased patient satisfaction

**Delnor Community Hospital (Chicagoland)**
- Reduction in employee turnover: 28% -> 21% over two years (~$800,000 savings)

---

## Case Studies of Positive ROI After TIC Transformation

**Stroul et al (2015)**
- Children’s hospital inpatient costs decreased
  - ~$122,000 (51% savings) in 1 year

**Calhoun et al (2016)**
- ~$225,000 per year increased productivity

**Amaro et al (2007)**
- Substance use treatment attrition down 31% after 4 months
Lincoln High School
Walla Walla, Washington

- Alternative school
- Avg ACE score = 4.5
- 25% homeless
- 80% serious depression
- 65% with family member incarcerated
- Implemented trauma-informed practices in 2011

**Number of school discipline actions before and after TIC implementation**
Lincoln High School, Walla Walla, WA

<table>
<thead>
<tr>
<th></th>
<th>BEFORE (2009-2010)</th>
<th>AFTER (2011-2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspensions</td>
<td>798</td>
<td>600</td>
</tr>
<tr>
<td>Expulsions</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Written Referrals</td>
<td>135</td>
<td>135</td>
</tr>
</tbody>
</table>

Lincoln High School in Walla Walla, WA, tries new approach to school discipline – suspensions drop 85%. Retrieved from acestoohigh.com, 04.2019
A VISION FOR HEALTHCARE IN THE 21ST CENTURY:

Trauma-informed & relationship centered

EMPATHY

The willingness (or ability) to understand the experience or perspective of another
SYSTEMIC EMPATHY
Empathy as a guiding norm

OUTLINE
The Life-Course Effects of Childhood Adversity
Toxic stress, resilience, and the case for trauma-informed care

1. The effect of toxic stress on health and development over the life-course
2. How resilience-promoting factors can mitigate the negative effects of ACEs
3. Trauma-informed care: what it means and key principles
History, despite its wrenching pain, cannot be unlived, but if faced with courage, need not be lived again.


Thank you!
stan.sonu@emory.edu