Neurobiology of Kindness
Maggie Bennington-Davis, MD
We serve people exposed to trauma, violence, and overwhelming chronic stress, particularly as children, affecting neural development.

These experiences call forth a range of responses, including the easy triggering of fight/flight/freeze, intense feelings of fear, loss of trust in others, chronic hypervigilance, a decreased sense of personal safety, feelings of guilt and shame, and difficulty engaging in traditionally administered healthcare services.
Those we seek to serve

More than ¾ of Medicaid recipients have had experiences of trauma and violence during their childhoods.
Traumatization occurs when both internal and external resources are inadequate to cope with external threat.

Van der Kolk, 1989
Impact depends on:

- Single vs. repeated trauma
- Age when trauma occurs
- Agent – natural vs. human
- Nature of the trauma – accidental vs. purposeful
- Environmental/social supports
- Political/economic context
- Philosophical/religious/spiritual context
- The other things going on – “reserve”
- Innate resilience
Trauma-informed services take into account an understanding of trauma in all aspects of service delivery and place priority on the individual’s safety, choice, and control. Such services create a treatment culture of nonviolence, learning, and collaboration.

Utilizing a trauma-informed approach does not require disclosure of trauma. Rather, services are provided in ways that recognize the need for physical and emotional safety, as well as choice and control in decisions affecting one’s treatment. TIP is more about the overall essence of the approach, or way of being in the relationship, than a specific treatment strategy or method.
Brains are built from the bottom up

700 new neural connections/second

Brain development most rapid in early months; continues through age 22

Sandra Bloom, MD
Here’s how patterns develop

The brain needs safe experiences to live.

- Birth: 50 trillion
- Age 6: 1000 trillion
- Age 14-60: 500 trillion

It grows, is “pruned”, and learns.
It forms connectomes.
Most neural network development occurs after birth

Childhood environment determines basic brain architecture

 ATTACHMENT DETERMINES COMPLEX FUNCTION AND INTERACTION WITH THE WORLD

Sandra Bloom, MD
Disruptions in which an attachment figure is perceived as unavailable as the result of a substantial, repetitive or unplanned separation

- Child maltreatment
- Illness, injury
- Divorce
- Military service
- Imprisonment
- Mental illness
- Substance abuse
- Family violence
- Community violence
STRESS CONTINUUM

- Allostatic Load
- Traumatic
- Toxic
- Tolerable
- Positive

Sandra Bloom, MD
WHAT ARE WE UP AGAINST?
OUR OWN BIOLOGY: HUMAN STRESS RESPONSE:

State of high alert
Action, not thought
Inability to think clearly
Extreme thoughts
Attention to threat
Intense and prolonged anxiety
Drive to take action

A DISASTER WHEN THIS BECOMES CHRONIC

Sandra Bloom, MD
Between Stimulus and Response

Sensory Thalamus → Cortex

Cortex → Hippocampus

Hippocampus → Amygdala

Amygdala → Response

Very Fast: Sensory Thalamus to Amygdala

Slower: Cortex to Hippocampus

(LeDoux, 1996)
Between Stimulus and Response

Stimulus

Sensory Thalamus

Cortex

Hippocampus

Very Fast

Amygdala

Response

(LeDoux, 1996)
Between Stimulus and Response

Sensory Thalamus → Very Fast → Hippocampus → Slower → Amygdala → Very Fast → Cortex

Stimulus → Sensory Thalamus

Cortex → Response

(LeDoux, 1996)
Between Stimulus and Response

Stimulus

Sensory Thalamus → Cortex

Hippocampus → Cortex

Cortex → Amygdala

Amygdala → Response

Very Fast

Slower

(LeDoux, 1996)
Play

Physiologic changes during F/F/F/F...

- Increased heart rate
- Increased BP
- Increased respiration

Do you run because you are afraid or are you afraid because you run... (Kohut)
Stress Research from Jerusalem

- Ariah Shalev at Hadassah Medical School
  - Survivors of suicide bombers
- Following ER treatment
  - Those that do not develop stress symptoms are able to decrease heart rate, calm, quiet their bodies
  - Those that do develop stress symptoms still have hyperarousal, high heart rates, high blood pressure
- Regulated states appear to be correlated with decreased likelihood to develop stress syndromes
ADAPTIVE COPING

Community

Friends, teachers, other adults

Family

Self
MALADAPTIVE COPING

- Substance use: Addiction
- Avoidance of triggers: Anxiety, phobias, agoraphobia
- Pain as a distraction: Self-harming
- Avoidance of grief: Depression, suicidality
- Risky behavior: Addiction to trauma
- Controlling behavior: Alienation from others
- Dissociation: Reenactment, revictimization
- Empowerment through violence: Criminal, antisocial behavior
People we serve

May have tremendous exposure to events (trauma) especially as children that causes a wash of threat detection all the time

Those of us who serve them

- Have created ways of thinking about and perceiving the people we serve and their behaviors and our environments
- These patterns of thinking sometimes get in our way
- We must begin with ourselves!
What we see

Disengagement

Aggression and loss of impulse control in the face of novel situations

Immediate deterioration into power and control struggles

Aggression and fear in the context of rule enforcement

“Minor” events precipitating catastrophic reactions
Personality disorder
Depression
Generalized anxiety disorder
Panic disorder
Conduct disorder
Oppositional disorder
ADHD
ETC
ETC
ETC
Sandra Bloom, MD
It’s not “What’s wrong with you?”

It’s “What happened to you?”

Sandra Bloom, MD
Mechanisms by which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

Adverse Childhood Experiences

Disrupted Neurodevelopment

Social, Emotional and Cognitive Impairment

Adoption of Health-risk Behaviors

Disease, Disability, and Social Problems

Early Death

Deaths

Intergenerational Transmission

Epigenetic Mechanisms

Conception

Slide Courtesy of Rob Anda, MD, MS
The ACE Questionnaire

**ABUSE**
- Physical
- Emotional
- Sexual

**NEGLECT**
- Physical
- Emotional

**HOUSEHOLD DYSFUNCTION**
- Mental Illness
- Mother treated violently
- Substance Abuse
- Incarcerated Relative
- Divorce
Results

- 2/3 had experienced one or more types of adverse childhood experiences
- Of those, 87% had experienced two or more
- Direct link between childhood trauma and risk of adult onset of chronic disease, mental illness, doing time in prison, and work issues
- Linear relationship with medical, mental, and social problems
Top Ten...

- Heart disease
- Cancer
- Chronic respiratory disease
- Stroke
- Unintentional injuries

- Alzheimer’s disease
- Diabetes
- Nephritis
- Influenza and pneumonia
- Suicide
The wear-and-tear on the body and brain resulting from chronic over-activity or inactivity of physiological systems that are normally involved in adaptation to environmental challenge.

Extreme poverty, repeated abuse or neglect,

Growing up in families facing economic hardship can produce elevated cortisol levels that may stay elevated even after conditions have improved.

Even infants and young children are affected by significant stresses that negatively affect their family and caregiving environments.
What “High Needs / High Cost” Members Have Taught Us

Moving from “What’s wrong with you”… to “What has happened to you”

Formal qualitative study of “Adverse Life Events”

- Health Resilience participant “open ended” interviews
- Survey now being sent to 9000 Health Share members
  - Can we identify common pathways to “high utilization?”
The Prevalence of Adverse Life Experiences

**0-6 yo**
- 30% Suffered repeated physical, sexual or emotional abuse in early childhood
- 47% Neglect
- 17% Had unmet basic needs (food, clothing)
- 13% Lived with an adult with a substance use issue
- 17% Were separated from parents

**What the Numbers Tell Us**

**Before Age 19:**
- 63% experienced some form of abuse;
- 52% experienced extended maltreatment

**7-19 yo**
- 54% struggled in school
- 50% dropped out of school
- 28% Ran away or left home early
- 30% Became teen parents
- 15% Became homeless at some point
- 46% Were substance users

**19-30 yo**
- 30% Were arrested or incarcerated at some point
- 52% Were substance users
- 26% Were homeless
- 74% Report job insecurity or become unable to work at all

**30+ yo**
- 40% Struggle with mental health
- 70% Describe struggling to get needed healthcare
- 30% Struggle to manage their medication
- NONE able to work
- 30% Describe being socially isolated

Lauren Broffman, Center for Outcomes Research and Education (CORE)
What We Are Most Trying to Prevent:

- Future generations of “high utilizers”
- Cascading adverse life events that derail a healthy life

Parents not able / ready to “parent”

Pregnancy

Birth

3 yo

5 yo

6-12 yo

12-21 yo

21 yo +

Unintended pregnancy

Chronic illness, Substance use, Mental illness, Criminality, Isolation, Disability

Job Insecurity

Social Deprivation

Risk Behaviors

Kindergarten School Failure

Poor Attachment

Abuse Neglect

Behavioral Problems Skill Deficits

Substance Use Unhealthy Relationships

Housing Insecurity

Unintended pregnancy

Adult violence, SUD

Together we are health share
Goal:
A healthy, productive next generation of Oregonians

Birth

Pregnancy

Wanted Pregnancy

Healthy, productive adult

Healthy Lifestyle

Positive Relationships

Academic Success

Ready for kindergarten

6-12 yo

5 yo

12-21 yo

21 yo +

Healthy Mom / Child

Strong Attachments

Happy, healthy adult

Goal: A healthy, productive next generation of Oregonians
What Does This Mean For Providers?

Somehow we must engage people into services, relationships with providers, and their own health
Takes into account the impact of toxic stress on

- how people perceive the world (and you),
- how they interpret cues (and you), and
- what they feel they need to do in order to keep themselves and their families safe (including from you)
A Note on Welcoming

First impressions: biology!

Remember the hypervigilance phenomenon

Not triggering someone in the first place is the best scenario

Create a relationship

Offer something
Physical Environments

Impact on attitude, mood, heart rate, and behavior

Strong link between physiologic state, emotional state, and the physical environment

ACES have less impact if person is in natural environment

Pay attention to your environment, and how it may be affecting you and others!
Between Stimulus and Response

S | Sensory Thalamus

Amygdala

Very Fast

Response

Cortext

Neuroregulatory Intervention

Psychopharmacology

Social Environmental Intervention

Hippocampus

Cognitive engagement

Stimulus

(LeDoux, 1996)
Secure, reasonably healthy adults,
With good emotional management skills,
With intellectual and emotional intelligence,
Able to actively teach and be a role model,
Are consistently empathetic and patient,
Able to endure intense emotional labor,
Are self-disciplined, self-controlled, and
Never abuse power
Healthy Staff

Reinterpret difficult behavior through the lens of trauma exposure
Listen (really listen)
Avoid over-reacting
Avoid power struggles
Lean into service
Find the distress
Open up communication
Healthy Teams

Treat each other with kindness, interest, patience, and respect

Have sophisticated conflict resolution skills and practices

Know their voices are heard and respected in their organizations

Are emotionally intelligent

Have team rituals and practices to relieve stress and deal with grief
Often have our own stuff
May perceive behaviors as threat or provocation as personal attacks
Are potentially vulnerable to triggers for our own anger, fear, rejection, challenge of authority

Sandra Bloom
A responsive environment will

Facilitate physiologic calm
Avoid triggering the fight/flight/freeze response
Encourage thinking, problem-solving, decision-making, collaboration
“I've learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.”

Maya Angelou