The Why of Adverse Childhood Experiences (ACEs) Study:

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Workshop Content Sources Include:
- National Institutes of Health (NIH)
- National Center of Biotechnical Information (NCBI) – Brain Scans
- National Research Council (NRC)
- Centers for Disease Control & Prevention (CDC) – ACE Study
- Health & Human Services – Children’s Bureau – Child Welfare
- Substance Abuse & Mental Health Services Administration
- National Center for Child Traumatic Stress (NCCTS)
- Harvard’s Center on the Developing Child (HCDC)
- Daniel Seigel, The Developing Mind
- M. Gershon, The Second Brain
- Rob Knight, Follow Your Gut

Science’s Bottom Line:
Youth CANNOT Behave, Remember, Think, Learn or Develop until they can feel CALM.

And...
NEVER . . . in the history of calming down has anyone ever calmed down by being told to calm down.


We need the HABITS to RESET – to get CALM.

To be able to reset is to be resilient.

Adversity is NOT having your needs met.

The definition of being "traumatized" is being overwhelmed.

Distress is the OPPOSITE of Calm.

Resiliency is the Ability to Adapt - To Self-Regulate - Getting Back to CALM... even when our needs are unmet.
Think of children as Firefighters, living in homes & neighborhoods that are ON FIRE...

They need habits, i.e., skills that are learned reflexes...to handle the distress – so they can think & remember...

They need at least one person they can count on to unconditionally care for them, and to be available to ask for help...at any time... & one place that meets some of their basic needs.

Three Levels of Distress Responses:

Positive Response
Brief increases in DISTRESS hormones, heart rate, etc. e.g., while learning a new skill with adequate support.

Tolerable
Serious increases in DISTRESS hormones, heart rate, etc. buffered by hope, stress-management skills/habits, protective relationships, and support.

TOXIC
Serious increases in distress hormones in the ABSENCE of relief, and WITHOUT hope, stress-management skills, protective relationships, & support.

PREVENTION:
We cannot always avoid or prevent negative/harmful situations/experiences...
...but we can provide PROTECTION that MITIGATES the risks and reduces the negative/harmful effects and impacts.

PROTECTIVE FACTORS

The Study of Childhood Adversity, Distress & Trauma
The Center for Disease Control & Prevention (CDC)

Adverse Childhood Experiences (ACE) Study

The ACE Story

https://acestoohigh.com/2016/04/05/five-minute-video-primer-about-adverse-childhood-experiences-study/
The “Adversities” measured:

There were 10 types of childhood trauma measured in the ACE Study.

Five were related to other family members:
1. a parent who is a substance abuser (alcohol and other drugs)
2. a mother who’s a victim of domestic violence,
3. a family member in jail (includes all of the justice system)
4. a family member diagnosed with a mental illness, and
5. the disappearance of a parent through divorce, death or abandonment (voluntary or non-voluntary). Now includes deportation and multiple military deployments.

Five were personal: 1) physical abuse, 2) verbal abuse, 3) sexual abuse, 4) physical neglect, and 5) emotional neglect.

How it was conducted:

The 17,000 middle & upper middle class, all races & ethnicities, highly successful, fully insured participants received a comprehensive medical screening to identify physical health risks...

...plus a 200-item questionnaire about health history, life style, etc.

...with 10 questions about adversity during childhood.

To find your “ACE Score” – You answered 10 questions:

Simple “yes” “no” answers.
Add the “yes” answers = personal ACE score.

FOR EXAMPLE:
a person who had been physically abused (1),
with an alcoholic parent (1),
and a mother who was beaten up (1)
had an ACE score of 3.

Major Findings:

• Childhood abuse, neglect, and exposure to other traumatic stressors were common – even in a well-educated, well employed, population of patients enrolled in one of the Nation’s leading HMOs.

• Almost two-thirds of participants reported at least one ACE; more than 20% reported three or more ACEs, and 10% reported 5 or more ACEs. They occurred in clusters.

• Matching the ACE scores to the medical screenings, the Study found that as the ACE score increased, so did the risk for numerous health and social problems throughout the lifespan.
The ACE Study has guided the questions that Neuroscience has asked for the last 2 decades:

- **How is this possible?**
- **How do we prevent it?**
- **When & how do we intervene & treat it?**

When the ACE Study was first published in 1998, there were major gaps in the science to explain the "why & how" of the Study's findings.

Then, science filled one gap with research that explained **HOW UNMITIGATED DISTRESS interrupts neuro-development.**

### Adverse Childhood Experiences (ACE) Study

**Probability of Outcomes**

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**ACES Are Cumulative.**

Based on CDC ACE Study, 1998

**Finding #1:**

It takes a minimum of 25 years to build a BASIC brain.

**Unmitigated distress & trauma** interrupt the development process.

We used to think that “development” just happened...

We used to think development was “automatic”. **NOT TRUE!**
Unmitigated Distress not only slows down Memory, Learning & Development...
...it can even harm & shrink our brains!

How Chronic Distress Affects the Adult Brain

https://www.youtube.com/watch?v=bcbj8uf8j2k

Multiply by 10....

Because youth are all about building their brains, you can multiply what you know about how stress affects the adult brain by ten-fold when you think about a 10-20 year old's brain...

Dr. Robert Sapolsky, Stanford University

Now research shows that...

both chronic stress & frequent periods of normal to moderate stress appear to be particularly damaging to YOUNG BRAINS...

National Science Foundation, 2010.

The Science: Our Chemistry
**Calming Bio-Chemicals**

- **Oxytocin** = Safety, Trust, Relationships, Bonds
- **Dopamine** = Relief, Reward, Pleasure, Motivation
- **Endorphins** = Pain Relief & Euphoria – Body’s Morphine
- **Anandamide** = “Bliss” & Wellbeing – Body’s THC
- **Serotonin** = Rest, Digest, Calm Alertness, Learn, Develop

**Protective & Survival Bio-Chemicals**

- **Norepinephrine** = Focus/Attention/Excitement
- **Noradrenaline** = Alarm – Tension - Anxiety
- **Adrenaline** = ACTION! (Fight/Flight/Freeze)
- **CORTISOL** = A-C-T-I-O-N

Homeostasis = All in Balance


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**Behavior is Determined By:**

- **“Sara” Serotonin (Bliss, High)**
- **Dr. Dopamine** (Comfort, Control, & Connectedness)
- **Cortisol** (Alerted & Armed Against Threats) = Automatic Fight, Flight, & Freeze

**First Aid Kit:**
- Endorphins
- Anandamide

Seeking Balance = “Homeostasis” = Calm


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**Experience Chemical Automatic Response**

- Sara Cortisol Distress
- Sara Cortisol Anxiety
- Sara Cortisol TOXIC Stress!

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**To ask for help, we need Oxy-T.**

Oxytocin produces trust, which keeps Cortisol in check.

The more Cortisol; the less Sara!

Can’t think. Can’t remember.
Can’t learn. Can’t develop.

...we crave Dopa to restore comfort and balance. Chemical balance restores a sense of CONTROL.
**Behavior...**

**Which of these infants is CALM?**

**How did we know?**

**We assessed his/her BEHAVIOR.**

**We have AUTOMATIC PRIMITIVE BEHAVIORS that let us know we feel threatened...**

- Bullying/Controlling
- Verbal
- Physical
- Flight
- Freezing
- Appease

**FEAR – Discomfort – Distress – Anxiety – Trauma (Frustration, Anger, Helplessness, Hopelessness....)**

**Unmitigated distress, anxiety and trauma can create future behavioral health disorders.**

National Research Council and the Institute of Medicine.

NRC & SAMHSA, CDC, 2009

4/13/2018
• Childhood & adolescent STRESS is linked to clusters of preventable EMOTIONAL and BEHAVIORAL health problems.

• Most mental, emotional and behavioral health disorders have their roots in CHILDHOOD & ADOLESCENCE – when the brain is still building/developing.

75% of MEB disorders in US begin prior to age 24.
➢ 50% begin PRIOR TO AGE 14!

Symptoms show up 2-4 (up to 7) years before reaching criteria for a disorder!

MAJOR FINDINGS:

Children of Substance Abusers are Most At Risk for the Following Emotional and Behavioral Health Disorders

Youth are FAR MORE at RISK for:

- Anxiety Disorders
- Depression/Mood Disorders
- PTSD/Child Traumatic Stress
- Conduct Disorder
- Oppositional Defiant Disorder
- Obsessive/Compulsive Disorder
- Eating Disorders
- Substance Use Disorders
- Self-Harm Disorders

Half of behavioral health problems begin before age 14...

One Quarter between the ages of 14 and 24.

3/4 of all behavioral health problems in the U.S. begins before age 25... when the brain is still developing...

Prevalence of Mental Health Disorders Among Youth

According to a 2010 report:

49.5% of U.S. adolescents met criteria for mental health disorders.

42% of all affected youth also met criteria for a second disorder.

PREVALENCE OF SEVERE IMPAIRMENT:

22.2% of adolescents with mental health disorders were classified as exhibiting severe impairment and/or distress. Of the 22.2%:

- 11.2% met criteria for MOOD DISORDERS
- 8.3% met criteria for ANXIETY DISORDERS
- 9.6% met criteria for BEHAVIOR DISORDERS
More than 40% of youth ages 13-17 have experienced a behavioral health problem by the time they reach 7th grade.

Suicide is the third leading cause of death among youth ages 15-24... after accidents and homicide.

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They are trying to let us know that what we are doing is NOT working for them...

Viva our Vagus Nerves!

Our Nervous System Has 2 Major Divisions.

One we hear a lot about and one we don’t!

We have 2 “Two-Way Communication Pathways”

1. Amy G. & NORA CORTISOL work with the SPINAL NERVES

2. PFC & HIPPO work with the VAGUS NERVES

Our Spinal Nerves are in charge of MOVEMENT & RESPONSE to THREATS.

The Vagus Nerves (left/right):

- Cranial Nerve X (No. 10)
- Para-sympathetic System
- Exits the Brain Stem & “wanders” throughout the thorax and abdomen
- Called the “compassion” nerves

Karen Williams,
WilliamsGroup, 2015

Karen Williams,
williams@group.cableone.net
Constricts pupil

Sympathetic – Handles "Threats"

Movement, Tension, Discomfort, Distress, Anxiety, Trauma

Para-sympathetic – Handles "Pacetime"

Comfort & Sense of Control = Calm Allows Learning & Development

Our Gut is our Second Brain!

Our Vagus Nerves Run Our "Second Brain"

The digestive system

Our gut "composts", i.e., breaks down our food into bacteria, which produces the bio-chemicals we need NOT just for life, energy & survival, but also for our feelings & thoughts.

Our Digestive system uses the food we give it to make the chemicals we need to function, even the brain chemicals we use to think and learn, and the chemicals that protect us from disorders and diseases.

Our Gut is Our "SECOND BRAIN"

Has 500 Million Neurons that are in constant contact with the neurons in our "First/Big Brain".

Job: To produce hundreds of chemicals our brain and the rest of our body use to function.

Produces:

- 85-95% of Serotonin
- 40-50% of Dopamine
- 40-50% of Oxytocin
- Houses and programs 60% of our Immune System, that protects us from illness & disease.

The two brains “chat” all the time.

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Why does it matter that our “2nd Brain is off the job"?
When distress SLOWS/DISRUPTS our gut, it leads to:

- Digestive & Elimination Problems - Acid Reflux, Indigestion, IBS, Constipation, Collitis, Crohn’s
- Metabolism Problems, Gall Bladder, etc.
- Weight Gain, Obesity
- Diabetes (Type 2)
- High Cholesterol, Blood Pressure
- Heart Disease
- Slower Healing
- Inflammations and Allergies
- Infections
- Anxiety & Depression

**OUR GUT’S JOBS:**
- Digestion, Elimination
- Metabolism
- Immune System, Mfg. of Sara, Dopa, & Oxy-T

*Karen Williams, WilliamsGroup, 2015*

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**“PEACETIME” – REWARD, HIPPO & PFC**
- Oxytocin = Trust
- Dopamine = Comfort/Control
- Anandamide = Wellbeing/Bliss
- Endorphin = Pain Mgt./Euphoria
- Serotonin = Rest, Digest, Learn

**“WARTIME” – AMY G. & NORA CORTISOL**
- Norepinephrine = Alarm
- Noradrenaline = Armed
- Adrenaline = Action
- Cortisol = A-C-T-I-O-N

*Findings from the ACE Study Center for Disease Control and Prevention (CDC)*

The “Second Brain” and Vagus Nerve research have filled “the last gaps”.

The shift is intended to be TEMPORARY & SHORT-TERM for EMERGENCIES ONLY!

**How do we Trigger, Control & GROW Our Vagus Nerves?**

- TENSE Muscles
- RAPID Heartbeat
- RAISED BP
- SLOW/DISRUPTED GUT; Digestive & Elimination Problems

The TRIGGER:
- OPEN Esophagus = “Whew” - Blowing Out & Deep, Regular, Diaphragmatic Breathing

RESULTS/GAINS:
- Calm Alertness & Resilience

**Blood and energy are shifted away from thinking, learning, developing, healing and digesting to tensing the muscles and preparing for fight or flight.**

Implies a sense of threat.

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**Deep, regular BELLY Breathing Restores Homeostasis...**

This Gif image is available on Google Images.

“Gif” means that it is animated in PowerPoint Slide Show mode.

Immediately increases Dopamine, Oxytocin, Endorphins, Anandamide & Serotonin.
We are filled with a flood of calming, healing, bio-chemicals. Immediately produces a flood of Dopamine, Oxytocin, Endorphins, Anandamide & Serotonin.

Laugh

Give or Receive Compassion

Our Vagus Nerves are called our COMPASSION NERVES...

MOVE!

We are ALL 1st Responders!

Tell Someone!