The Added Risks:
The Craving for Dopamine, Anandamide & Endorphins

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The Craving for Dopamine, Anandamide & Endorphins

Our Bio-Chemistry determines everything about us.

Neuron to Neuron:
Our bio-chemicals pass messages. It’s our own B-Mail.

We have two Basic Sets of Bio-Chemicals
Those that SPEED us up...
Adrenaline & Steroids...
Released AUTOMATICALLY when our needs are NOT met.

Those that CALM us down...
The “Fabulous 5”...
Released when our needs are met, i.e., when our REWARD SYSTEM is working.

Survival/Speed Bio-chemicals = Epinephrine, Adrenaline & Steroids
Just enough gives you energy & can save your life; too much can put you OUT OF CONTROL!

Epinephrine = ATTENTION, FOCUS & EXCITEMENT
ADRENALINE = Fight, Flight or Freeze Emergencies ONLY!
CORTISOL = Our Body’s STEROIDS Short-term Use ONLY!

Anytime a situation or condition causes us tension, distress, anxiety, etc. our body automatically releases a natural steroid, called...

CORTISOL

hydrocortisone.
Heightens Attention & Fear

- Increases Heart Rate
  - Rapid, Shallow Breathing or Holding Breath
- Tenses Muscles

DECREASE in our “Fabulous 5”* Calming Bio-Chemicals
- (Rest & Digest, Think Rationally, & Self-Regulation)
* Serotonin, Oxytocin, Dopamine, Anandamide & Endorphins

Slows down Digestion

https://www.youtube.com/watch?v=bchj8uF8j2h

This helps explain why distress can be so damaging to teen brains.....and why they trouble “calming down” after a distressful episode.

Dr. Russell Romeo, Rockefeller University

For adolescents under the same distress...
the dose of the Distress Hormone Cortisol is 2 to 5 times MORE than that of adults & it stays 2 to 5 times LONGER!

Serotonin is called the “Rest and Digest” chemical.
- It allows us to rest, restore, sleep.
- Operates our digestive & elimination system.
- Allows our PFC & Hippocampus to function.
- Controls behavior.
- Helps prevent anxiety and depression.

Oxytocin is the Love, Cuddle, New Mom, Trust & Attachment Hormone

- It is vital at birth for building trust & attachment.
  A lack of Oxytocin can result in an attachment disorder.
Dr. Dopa’s FIRST AID KIT:

**Endorphins = Body’s Morphine**
- **PAIN KILLER**
- **Physical & Psychological Pain**
- **“Dr. Dopa” Dopamine**
- **“Endors”**

**Anandamide = Body’s THC**
- **BLISS CHEMICAL**
- **Feelings of Calm & Wellbeing**
- **Calms Digestion/Gut & Elimination**

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Marijuana’s THC molecule mimics our natural **Anandamide**.

Anandamide produces a feeling of calm, wellbeing, and “bliss”.

We can build Anandamide by Belly Breathing, Smiling, Laughing, Music, Gratitude, Generosity, etc.

Morphine molecule mimics our body’s natural **Endorphin**.

Our endorphins are body’s pain killers.

We build endorphins when we are active and moving, exercising, laughing heartily, & deep belly breathing.

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Put them together...

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**“Epi”**
Epinephrine
Interest & Focus

**“Dr. Dopa” Dopamine**

**“Ananda” Anandamide (THC)**

**“Oxy-T” Oxytocin**

**“Endors” Endorphins (Morphine)**

**HOMEOSTASIS = Chemical Balance**
Not Depressed

Depressed

Not enough OXY-T, DOPA, ENDORA, ANDNDA & SARA results in an increased risk of depression, lack of anger control, sleep abnormalities, craving of starches and sweets, mood swings, and in the extreme, suicidal thoughts.

“Stress” is NOT bad... Stress is Stimulation. Stimulation is LIFE!

“Neurons that fire together, wire together.”

- Donald Hebb 1949


Our Automatic response to anything adverse, uncomfortable or difficult is some form of STRESS.
Harvard’s Three Levels of STRESS:

**POSITIVE**
Focused Attention or Tension with POSITIVE COPING HABITS & SUPPORT

Brief, mild increases in DISTRESS hormones, heart rate, etc. e.g., learning with POSITIVE COPING HABITS & support.

**TOLERABLE**
Frozen Adversity & Anxiety but with Positive Coping Habits & Support

Serious increases in DISTRESS hormones, heart rate, etc. buffered by hope, POSITIVE COPING HABITS, & RELIEF via protective relationships, and support.

**TOXIC**
Adversity & Trauma with No Skills or Support

Serious increases in DISTRESS hormones in the ABSENCE of hope & relief, and WITHOUT hope, or POSITIVE COPING HABITS, protective relationships, or support.

### Trauma

*Trauma* happens when the **demands** of an unmitigated **adverse** situation, condition, environment, relationship or event exceed one’s ability to cope in a personally & socially healthy way.

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**To Mitigate**

alleviate, reduce, diminish, lessen, weaken, lighten, attenuate, take the edge off, allay, ease, assuage, palliate, relieve, tone down. **Make less severe, serious, painful or harmful.**

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**Most Importantly**

One who mitigates does **NOT ADD** to the tension, distress, anxiety, panic or trauma already present in clients’ situations, conditions, relationships, and environments.
Our first understanding of the impact of unmitigated Distress, Anxiety & Trauma came from the Center for Disease Control & Prevention (CDC)’s ACE Study

The ACE Study showed the ADULT outcomes of UNMITIGATED DISTRESS, ANXIETY, & TRAUMA in childhood.

The ACE Study looked at different types of Adversity such as neglect, abuse, and other hallmarks of a rough childhood and found that...

The Adverse Childhood Experiences (ACE) Study

IF NOTHING IS DONE to MITIGATE the DISTRESS, ANXIETY & TRAUMA that results from such Adversity, there are HIGHER RISKS for LATER HEALTH PROBLEMS – psychological, behavioral and physical.

CDC RECOMMENDS:
Using the ACE Study as the basis of our national strategy to prevent major diseases and disorders.

Wales has adopted the combination of ACES, Resilience, and Trauma-Informed Care as it’s public health approach.

Ireland, Scotland and New Zealand are pursuing the same path...
It all began in 1985, when Dr. Vincent Felitti, who had just founded the Department of Preventive Medicine at Kaiser Permanent Insurance, was conducting a weight loss program to prevent obesity and its many risks.

The program was going well, when Felitti was stunned to find that 55% of the 1,500 patients enrolled in his weight-loss clinic had dropped out BEFORE completing, and the more successful they were the more likely they were to drop out.

Follow-up interviews uncovered that at least half of the cohort dropping out reported childhood sexual abuse that they not previously revealed — and further reported having unexplained panic attacks when they begin losing and receiving compliments on their weight loss.

They were literally hiding behind their weight for protection. When their shield was threatened, they felt vulnerable. They could not even drive by, or think about the weight loss clinic, without feeling a sense of panic.

Dr. Felitti published his findings, which were read by Dr. Robert Anda at CDC.

Dr. Anda wondered if other forms of childhood adversity could also lead to health risks in adulthood, and proposed the Adverse Childhood Experiences (ACE) Study to find out.

The “Adversities” measured:

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

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

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.

The Adverse Childhood Experiences (ACE) Study

- Public/Private Partnership – KP* and CDC**
- Largest Study of Its Kind
- 17,000+ Middle, upper-middle class, college-educated San Diegans - with good jobs and Kaiser Permanent Insurance

Note: Was the impetus for “Child Traumatic Stress” Field

Co-Principal Investigators:

Vincent J. Felitti, MD
Internist
Kaiser Permanente*
Founded the Dept. of Preventive Medicine for Kaiser Permanente

Dr. Robert F. Anda MD
Internist and Epidemiologist
Centers for Disease Control (CDC) & Prevention**
How it was conducted:

The 17,000+ participants received a comprehensive medical screening to identify physical health risks...

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

...with 10 questions about adversity during childhood.

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.

Unmitigated ACES can have a lasting effect on...

Psychological Health: anxiety, depression, post-traumatic stress disorder, suicide attempts

Behavioral Health: acting out, smoking, alcoholism, drug use

Life Potential: graduation rates, academic achievement, lost time from work

Physical Health: obesity, diabetes, heart disease, cancer, stroke, COPD, STDs, etc.

ACEs have been found to have a graded dose-response relationship with 40+ negative outcomes.

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.

Childhood Trauma = 3X more likely to develop ANXIETY

2X more likely to develop DEPRESSION

Long-Term Impacts:

Affects ones perception of reality...

Affects sense of safety, wires brain to expect danger, increases stress hormones flowing through the body, triggers Fight, Flight or Freeze behaviors - which can be lead to serious behavior problems, & can create a sense of helplessness & hopelessness

As the number of Adversities/ACEs increases, so do the risks for the following:

Myocardial infarction

Asthma

Mental distress

Depression

Smoking

COPD Disability

Reported income

Unemployment

Lowered educational attainment

Coronary heart disease

Stroke

Diabetes
The higher the ACE Score, the higher the risks for emotional, social, and behavioral problems and disorders.

If you smoke to calm down, you might be more likely to have pulmonary problems.

If you use sex to deal with stress...

If you use unprotected sex to deal with stress...

ACE Exposure Associated with Academic Problems

ACE Score and Indicators of Impaired Worker Performance

Adverse Childhood Experiences vs. Adult Alcoholism
ACE Score vs. Intravenous Drug Use
ACE Score vs. COPD
ACE Score and the Risk of Physical/Affective Violence
ACE Score vs. Smoking as an Adult

Graded Relationship Between ACE Score and Cardiovascular Disease

Based on CDC ACE Study, 1998

Adverse Childhood Experiences (ACE) Study
Probability of Outcomes

<table>
<thead>
<tr>
<th>33%</th>
<th>51%</th>
<th>16%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No ACEs</td>
<td>1-3 ACEs</td>
<td>4-8 ACEs</td>
</tr>
</tbody>
</table>

ACES Are Cumulative.

Based on CDC ACE Study, 1998

ADVERSE CHILDHOOD EXPERIENCES
looking at how ACEs affect our lives & society

LIFE EXPECTANCY
People with 6 or more unmitigated ACEs die nearly

0 ACEs: 80 YEARS
6+ ACEs: 60 YEARS

20 years earlier on average than those without ACEs.

How It Works...

TOXIC BIO-CHEMISTRY INTERRUPTS DEVELOPMENT
Domestic Violence Creates Distress, Anxiety & Trauma

CRY for HELP!

SELF-FIX

Addiction & Heart Disease

The ACE Primer Video

https://vimeo.com/139998006
What is predictable is PREVENTABLE.

Work productivity would INCREASE by 61%
Life dissatisfaction and suicide would DECREASE 67%
Anxiety could be REDUCED by 56%

www.aceinterface.com

Dr. Robert Anda, CDC

When the DISTRESS, ANXIETY & TRAUMA, that results from childhood adversity, goes UNMITIGATED...

...a TOXIC BIO-CHEMICAL STATE is produced that interrupts the neural networking in the parts of the brain in charge of calm behavior, focus, concentration, memory, learning & development...

...& disrupts the bio-functioning of belly breathing, rest, sleep, digestion & the immune systems, so that illness, disorders, diseases and social problems are set in motion.

The ACE Study has guided the questions that Neuroscience has asked for the last 2 decades:

- What is the neuroscience that supports these findings, i.e., how is this possible?
- How do we mitigate the impacts?
- When & how do we intervene?

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.

From 5 Rungs...

Then, science filled one gap with research that explained how unmitigated distress interrupts neuro-development.
Each Rung Is an Opportunity...
to USE the latest science...
to proactively protect, prevent, intervene to reduce the adult risks and impacts of childhood adversity.

Science shows we repeat what we don’t repair...

Our Goal:
MITIGATING
Reducing IMPACT

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

Science’s Bottom Line:
Humans CANNOT Behave, Listen, Focus, Concentrate, Remember, Learn, Develop, Think Rationally, Self-Regulate, Become Resilient, Be Patient, Be Courteous, Recover from Trauma or other Behavioral Health Problems, or Stay Psychologically or Physically Healthy until they can FIRST feel CALM.

And...we know that...
Teaching people what not to do DOES NOT teach them what to do.
“NOT never equals WHAT.”

The Power of CALM...

And... NEVER . . . in the history of calming down has anyone ever calmed down by being told to calm down.
The Science:
It’s not what happens to us that causes us problems, it is how we respond.

Nature pre-wires our automatic fight, flight & freeze responses.

How can we tell when we are CALM?
- Regular Heartbeat
- Sense of Stillness, Quiet, Restful Alertness, Contentment, Satisfaction, Ease, At Peace
- Trust/Confidence
- Open Esophagus & Deep Regular Breathing
- Relaxed Muscles
- Relaxed Digestion & Elimination

Dr. Lauri Nummenmaa, Finland’s Aalto University’s School of Science

How can we tell when we are Agitated?
- Rapid Heartbeat
- Sense of Distress, Tension, Anxiety, Nervous, Hungry, Sleepy, Tired, Exhausted & Dis-ease
- Digestive & Elimination Upsets
- Muscles Tense
- Short, Rapid, Labored Breathing, Or Holding Breath

The HABIT of CALMING DOWN Is SELF-REGULATION.

When behavior is out of control:
1. Regulate
   Teach CALM...
2. Relationship
   Bonds
   Trust
3. Reason
   Build
   Think

Self-Regulation
When we are **UPSET**

We stop being **ALL-SET**.
We have trouble listening, focusing, learning, remembering, recalling, & developing.

That is when we need to **RESET**:

The more we practice our **RESET HABITS**, the more balanced we become.

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**One must be BALANCED BEFORE**

One can listen, focus, concentrate, remember or think well!

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**DNA**

**Automatic Responses**

The only tool as powerful as our **AUTOMATIC BEHAVIORS**, which are set at birth by DNA.

**Experience**

**Learned Habits**

...are our **LEARNED HABITS**, taught to us by experience & practiced until we can do them **without thinking**.

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Forming a **HABIT** is the process by which a behavior, through regular, consistent repetition, becomes automatic, i.e., it is accomplished **WITHOUT THINKING**.

It’s a **S-L-O-W** process.

The average time to reach automaticity was **66 days** with a range of **18–254 days**.

Lally et al. (2010)

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**Learning a New Skill Requires:**

1. **CALM Demonstration/Modeling**
2. **CALM Explicit Instruction**
3. **CALM Coaching, PRACTICE...**
4. **CALM Positive Feedback**
5. **CALM Support, Encouragement**

Repeat....repeat....repeat....repeat.... Repeat.... Practice.... practice...practice...
**Cue**

+ Consistent, Positive Modeling & Coaching
+ Consistent Repetition
+ Consistent Reward

= Positive Behavior HABIT...

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**Find your Diaphragm:**

The diaphragm is shaped like a parachute.

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**How our diaphragm works...**

...breathing in pushes the diaphragm down.

Breathing OUT contracts the diaphragm – pushes it up.

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**To stop the flow of Cortisol:**

The emergency blow – IS OUT...SLOWLY from 7 to 11 seconds

When we blow out slowly, we STOP the release of cortisol...

We still have cortisol in our bloodstream, but we have stopped the release of more... at least for the moment.

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**CLEANSING BREATH: Reset Your Chemistry!**

<table>
<thead>
<tr>
<th>In</th>
<th>Nose breathe in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count 1 to 7</td>
<td>... pushed from outside down</td>
</tr>
<tr>
<td>Out</td>
<td>Mouth breathe out</td>
</tr>
<tr>
<td>Count 1 to 11</td>
<td>... push, counting at the same rate</td>
</tr>
</tbody>
</table>

Do once. If you have been breathing shallowly, you may feel light-headed and dizzy.

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**Use this Gif (off of Google Images) to teach the length of a calming breath.**

It's IN for 4 seconds...HOLD for 4 seconds... BLOW OUT for 8 seconds

Immediately increases Dopamine, Oxytocin, Endorphins, Anandamide & Serotonin.
Use an expanding “Hoberman Sphere” as a model for the calming 4 second breath...

Matching Techniques to Temperaments

Matching Practices to Temperaments

Matching Practices to Temperaments

Matching Practices to Temperaments

Laughter is the BEST Medicine!

When we laugh, which way does our breath go? In or out?
Immediately produces a flood of Dopamine, Oxytocin, Endorphins, Anandamide & Serotonin.

The direction of our breath when we are laughing is the secret of the healing power of laughter.

Laughter produces an immediate rush of Dopamine, Anandamide, Endorphins, Oxytocin & Serotonin!

Laughter is instant relaxation

Children are wired to laugh up to 300-400 times a day.

Adults about 40 times a day.

& it feels SOOOOO good!
We cannot always avoid or prevent the negative/harmful situations and experiences in children’s lives…but we can provide PROTECTION that MITIGATES the risks and reduces the negative/harmful effects and impacts. Think of children as FIREFIGHTERS…Equip them, Train them, Support them.

Become an “Inhaler”…

An inhaler does not cure asthma, but it mitigates the shortness of breath, and reduces the risks for added discomfort and difficulties. It reduces the distress and prevents it from getting worse.

When you give affirmations to yourself, they are positive self-talk. They train the brain to think positively, increase serotonin, and build resilience – and BUILD THE VAGUS NERVE.

Positive Self-Talk

I WILL
I CAN
I AM
I HAVE
I BELIEVE

A sense of personal power, sense of autonomy, internal locus of control, safety, self-worth, optimism, confidence, engagement and persistence, i.e., resilience.
Workshop Content Sources Include:

- National Institutes of Health (NIH)
- National Center of Biotechnical Information (NCBI) – Scans
- National Research Council (NRC)
- Centers for Disease Control & Prevention (CDC) –
- Health & Human Services – Children's Bureau
- Substance Abuse & Mental Health Services Administration
- National Center for Child Traumatic Stress (NCCTS)
- Harvard's Center on the Developing Child (HCDC)
- Drs. Daniel Siegel, Louis Cozolino, Karyn Parvis, Jay Giedd, Paul Thompson, Aaron White, Vincent Felitti, Robert Anda, Bruce Perry, Carol Dweck, Sandra Bloom, Nora Volkow, et. al.

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