“Teen Brain Is My Name & Risk Is My Game”

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Presenter: Karen Williams
Youth Development Consultant
williamsgroup@cableone.net
903-814-1171

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

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

Our Brain

When we are born, we start out with about
100 billion nerve cells
— called neurons —
in our brain...
..and trillions in the rest of our body.

Networks of neurons do EVERYTHING...
Humans learn & develop by:

- Exploration
- Observation
- Patterns
- Guided Experience

Anything that is modeled

“is automatically stored...”

Automatic Way “in”:

Mirror Neurons

“Observer Neurons”

If it is repeated consistently

a pattern is likely to form.

At birth, only 25% of a child’s NEURAL NETWORKS ARE pre-programmed, pre-networked, pre-developed.

What can newborns do? (Only the 25% that is pre-wired/networked at birth.)

Everything they cannot do (75%) has to be BUILT/developed!
It takes at least 25 years to build/develop a **BASIC BRAIN**.

**DNA & Experience Partner in the Building**

**DNA = Nature:**
- Architect (Plan) and Contractor (Schedule)

**Materials:**
- Nerve Cells (Neurons)

**Builders = Nurture**
- Parents, Teachers, et al.

**DNA Hard-Wires AUTOMATICS:**
- Temperament = Sensitivity to Distressful Experiences
- Fight, Flight, Freeze Reactions
- Then turns-on/off sections of neurons on a schedule

**POSITIVE stimulation & CALMING interactions BUILD!**

A lack of Positive Stimulation places learning/development ON HOLD, i.e., there is DEVELOPMENT DISRUPTION.

At birth, our brain has 100 billion Neurons. Only 25% are "pre-wired". 75% are "waiting" for EXPERIENCE.

**NURTURING MEANS**

**OUR BASIC NEEDS MUST BE MET:**
- All of These Make Us CALM & Stimulate Our REWARD CENTER!
- Competence
- Contribution
- Self-Worth
- Trust
- Consistency
- Choice
- Safety
- Physical

**William's Hierarchy of Needs. CDC, 2015.**

**Maslow's Hierarchy of Needs**

**How did we know?**

**We assessed his/her BEHAVIOR.**

**But...that’s not all...**

**Temperament...**

**OUR AUTOMATIC SENSITIVITY TO DISTRESS....**

**Our temperament, which is pre-wired by DNA, is obvious at birth...**
Adolescent Development

Adolescents are:

- Brilliant & Bored!
- Brainless & Bewildered!
- Stressed-Out & at MASSIVE RISK!

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...

Multiply by 10....

Adolescence = massive changes to the BRAIN and reproductive system.

Puberty = changes in the reproductive system (including changes in appearance and functioning of the body).

Puberty is one part of Adolescence....

Adolescence = Ages 10 to 20

IT IS DIFFERENT FROM Puberty.

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 ...

We have added new stressors & taken away many supports.

It takes a MINIMUM of 25 years to build a BASIC BRAIN.

The adolescent brain is about HALFWAY there... when the thinking part “starts over”!

Pre-Frontal Cortex (PFC): Rational Thought Executive Functions & Self-Regulation

TWO MAJOR STAGES of DEVELOPMENT

As Toddlerhood begins, DNA switches “on” neurons in the PFC...

As Adolescence begins DNA begins a massive PFC pruning (removal) - PLUS opening of new PFC neural territory.

At the height of pruning, teens have less thinking capacity than a six year old!

COMPARISON OF THE 14 YEAR OLD PFC WITH THE 6 YEAR OLD PFC.
MUST BUILD NEW EXECUTIVE FUNCTIONS:

- Self-Directed Attention/Focus/ & Concentration
- Learning from Experience & Applying to Different Situations
- Behavioral Cause and Effect
- Forethought
- Abstract Reasoning
- Planning
- Behavioral Inhibition
- Risk Management
- Behavioral Cause and Effect
- Stress Management
- Negotiation/Compromise
- Sensitivity to Penalties & Consequences

Massive Pruning of Childhood Neurons: THEY CANNOT...

- Connect past experience with present action
- Focus on multiple streams of information at the same time, learn to use complex working memory
- Filter distractions, self-prioritize actions
- Delay gratification - PATIENCE
- Over-ride emotions & desires
- Remember details
- Manage time and space
- Switch gears as needed
- Plan and organize
- Strategize rationally

They have trouble with CAUSE & EFFECT...

- Does not build without guided experience, coaching & support.

The underside of the cortex at Ages 5 and 20.

- Red = Least Developed
- Yellow & Green = Early development
- Dark Blue = Half-way
- Bright Lavender = Full developed

New Territories Open for ABSTRACTS:

- Self-Awareness
- Empathy
- Fairness
- Internal LOC
- Patience
- Optimism
- Will-Power
- Engagement
- Respect
- Gratitude
- Generosity
- Judgement

How many teen crashes are due to poor decision based on a lack judgment?
When this pruning and opening of new neural territory begins, teens become *tall toddlers*!

This phase can last from 6 months to two years...

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Adolescence = Double Whammy!

“Massive Brain Changes”

The parts of the brain in charge of listening, thinking, making decisions, empathy, patience, etc. are removed... so new experiences can wire the brain for adulthood. This creates enormous distress.

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Outside of disease and injury, these two major developmental events, PUBERTY, are the most distressful that an individual will ever encounter in his/her life.

Brain Pruning and Reorganization PLUS Puberty.

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Teens wake up one day and the adults in their lives are either frustrated, impatient, or angry with them - - or - - all three- - all of the time!

Teens have no idea their behavior has changed.

Among the first things that adolescents lose in the massive brain pruning process are self-awareness & judgment!

...and they think adults have lost their minds!
This helps explain why distress can be so damaging to teen brains… and why they trouble “calming down” after a distressful episode.

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!

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

Poverty
Hunger/Food Insecurity
Homelessness
Foster Care
Blended Families
Bullying
Child Neglect/Abuse
Substance Abusing Parent/Sibling
Parent w/Life-threatening Illness
Parent/Sibling in Prison/Jail
Military Deployments
Deportations

Teens can be overwhelmed by “Family Adversity”.

• They are super-sensitive to OTHERS’ Body Language
• They see a “concerned face” as an angry face.
• They are super-sensitive to OTHERS’ voice intonations.

Juggling is a way of life.

Adolescents are expected to do well in everything.

Exhaustion reigns...

Adolescents are expected just “get over it” and “get on with it!”
And...
lack of sleep just adds to the
Stress...

The evening Melatonin release in adolescents is behind adults.
Sleep onset often triggers the
starvation response in the body.
Sleep is needed for
regulating and storing
long-term memories.
Lack of sleep lowers the
brain’s capacity to learn
new things.

Teaching adolescents how
to fall asleep at night is vital!

But...starting in childhood is best!

Adolescents are also
“WIRED”
so they can complete all
this new development on
schedule.

Teens have “Cat-Like”
Physical Reflexes...

They count waaaay too
much on these to save them.
It's the only thing that can go as fast as teens' brains & one of the few things they get to control.

Teens' brains are PRE-WIRED for Technology. They can use new technology IMMEDIATELY.... while we are still reading the Instructions!

It's an OPPORTUNITY!

Why are teens so much more at risk for drug use?

Teens have 3 NEW drives....

Power! If we don’t meet their need for these drives, Gangs and Terrorists will.... Partnerships!
Adolescents are under significant stress just being teenagers!

- Always seeking to meet IMMEDIATE NEEDS
- Now!
- Make it go away!
- Make it stop!
- Anything that works!
- Don’t Care About Tomorrow
- YOLO!
- Fatalistic!
- Exhausted
- No “real jollies” – fakes are available
- No stress management/coping skills!

There are more receptors in children’s and adolescents’ brains than in adults’ brains, increasing the exposure of their brains to all psychoactive substances.

They are 5 times more at risk for addiction than adults. Medications affect them differently.

Adolescents’ neurons react more strongly to psychoactive chemicals than adults.

- If it feels good...
- if it relieves pain...
- if it comforts me...
- it owns me!

The adolescent brain craves comfort & control. If they don’t have the skills to trigger their own, they will use fakes -- no matter the risks or consequences.

Adolescent Substance Abuse: America’s #1 Public Health Problem

The Earlier Teens Use Any Substance, the Greater the Risk of Addiction

<table>
<thead>
<tr>
<th>Age of Alcohol Use</th>
<th>% Develop.</th>
<th>FH (%)</th>
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<tbody>
<tr>
<td>≤ 13</td>
<td>26%</td>
<td>57%</td>
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<tr>
<td>14-15</td>
<td>32%</td>
<td>48%</td>
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<tr>
<td>16-17</td>
<td>21%</td>
<td>35%</td>
</tr>
<tr>
<td>18-19</td>
<td>13%</td>
<td>22%</td>
</tr>
<tr>
<td>≥ 21</td>
<td>9%</td>
<td>16%</td>
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Alcohol, Development & Addiction

The risk for developing alcoholism increases the younger a person starts using.

Coincides with the peak of pruning in the adolescent brain.
At no time in life is the drive tooting for Dopamine, Anandamide, and Endorphins, Bio-chemicals that STRESSED TEENS CRAVE...Ages 10-20

Dr. Dopa’s FIRST AID KIT:
Endorphins = Body’s Morphine
- PAIN KILLER
- Physical & Psychological Pain “Endora”

“Dr. Dopa” Dopamine
Anandamide = Body’s THC
- BLISS CHEMICAL
- Feelings of Calm & Wellbeing
- Calms Digestion/Gut & Elimination

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.

Addictive drugs “hijack” the Dopamine/Reward Circuit

All drugs of abuse target the Reward/Pleasure Center, i.e., they hi-jack the DOPAMINE system.

They all “fake” Comfort & Control.
The sending neuron “sucks up” the unused dopamine and stores it for later use, thereby ensuring an adequate supply is always on hand. Fake chemicals (drugs, meds) block the uptake of the extra dopamine. At some point the supply runs low, making the craving worse and dependence greater.

Chemical fakes disrupt the natural dopamine processes.

All drugs of abuse cause a Dopamine “Rush of Relief” -- like hearty laughter does. They all use the Reward/Pleasure Circuit, i.e. they hijack the Dopamine pathway.

Drugs of Abuse Such as Heroin Target the Brain’s Pleasure Center

The “rush” of stress and physical and psychological pain relief are so intense that if a person does not have ways of achieving stress and pain relief on his/her own, the risk for abuse and addiction is high.

Effects of Drugs on Dopamine Release

Adderall & Ritalin = Amphetamines

Trigger and Piggyback on the Dopamine Pathway which triggers an increase in focused attention, concentration, short-term and working memory...

But, as the Dopamine supplies are “tapped out”, it takes more Adderall/Ritalin to trigger/trick the Reward Circuit, and dependence begins.
Unlike other drugs of abuse, alcohol is also a food ("empty calories"). It is metabolized & affects the digestive system.

Recovery = Dopamine Returns...
It takes time for the bio-chemical system to heal.
It is so difficult to recover when the craving never stops.

One can get older WITHOUT MATURING...
Adult Adolescents
It takes at least 25 years to build a basic brain...

Adolescence is about building maturity and preparing for the "launch into adulthood".

It's our job to anticipate & remove the brick walls...
“Teens & Compassion” are seldom in the same sentence!

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)
- Daniel Siegel: The Developing Mind & Brain Storm
- Tim Hollister: Not So Fast
- Jenson & Nutt: The Teenage Brain

Karen Williams
Youth Development Consultant & Trainer
In Private Practice

Cell: 903-814-1171
3621 Pottsboro Road, #250
Denison, Texas 75020
williamsgroup@cableone.net

Guidance

Direction

Trust

Tell Someone!

Karen Williams
Youth Development Consultant & Trainer
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williamsgroup@cableone.net