Hello Neurosculptors

Preview of coming attractions!

Watch for these themes throughout the presentation
Every ‘neurological unit’ comes into the world with some **hard wiring**...

That can be changed somewhat: The brain is malleable throughout life, but there are *windows of neuro-opportunity*…

Many of those windows fall within the **MAGIC DECADE** [birth to 10 years of age]

Everyone in this room is a **NEUROSCULPTOR** of children
We need to vip vop children early!

He Says

“Education is a key component of a child’s development.

The relationships that teachers have with their students and the experiences they provide for them directly shape the neural circuitry of the next generation.

Teachers in this way can be seen as neurosculptors of our future.”

The same can be said for parents...

Daniel J. Siegal: The Fourth “R” of Education

The first five years are often called the formative years

It is where many of the ‘windows’ of sensitivity and opportunity are...

What are ‘windows’ & why are they important?
A window is a **critical, but limited** period of time when a part of the brain...

1. Is designed to be **used and developed**... letting the brain ‘know’ it is an important area

2. **Is very plastic and malleable** and when used you get more ‘bang for the buck’

3. If used ‘enough’ during this time it sets the end point higher
   AND keeps the **power** for later use THROUGHOUT LIFE.

4. **If not used enough**, the opposite happens...

---

The brain goes through waves of growth, plateaus and pruning...

**First wave of proliferation:**  3-6 months in utero

max. brain cell density

**First wave of pruning:**  7-9 months in utero

---

And then the baby enters the world with about **100 BILLION NEURONS**
These are the tasks they will eventually do…

AKA: artificial neurological tasks

BUT FIRST>>>

… in the beginning:
Those ‘given’ # of neurons are distributed differently in EVERY individual brain

IN GENERAL, OR SIMPLY PUT:
areas of the brain that have more neurons
or more myelin
or conduct better
lead to easier aptitude or talent
[NATURE]

ENTER… THE RUBBER BANDS!
What influences the distribution pattern?

the gene pool

sex

????????

other stuff

Brain Basics 101

You don’t get to choose your rubber bands…
No brain has the same size rubber bands in all sectors.
The bigger the rubber band the easier…aptitude…
When you ask a ‘neurologic unit’ to use a big rubber band, the emotional part of the brain tends to feel a positive emotion…
The obverse is true…
Rubber bands or neurons grow, with use, until you die, but earlier is better…. Plasticity.

In the first five years of life, the natural parts need to be formatted or ‘muscularized” well…
Then when several natural areas combine
Each natural Area can contribute well, Or “pull its own weight.

To do artificial neurological tasks

Before a part of a brain can expand and grow

The neurons must be ready or ROBUST

[Which is MOSTLY influenced by chronology or age]

GRADUALLY, THE AVERAGE BRAIN FORMS OVER 100 TRILLION CONNECTIONS
Neurons grow in length and diameter with age [readiness].
They sprout connections when used [use it or lose it].
Gradually many neurons combine to make neuronal networks
[e.g. sensory information slowly combines to make sense, a thought…].
These networks become more and more connected and complex
crossing the corpus callosum for complicated thinking.
Ultimately they stream to the prefrontal cortex, and are held and juggled and organized and prioritized into very high levels of judgment. You have now reached the age of 30 ish.
Neurons grow naturally with age:
They are small at birth and are growing in length and diameter

Neurons start out short, skinny and naked. Gradually, they grow in length and diameter with age [ROBUST].
The magic glial cells cover the robust neuron with myelin [READINESS].

Don’t mess with the BIG THREE during growth periods!

Or at any other time of life...
1. A good deal of natural brain growth occurs during sleep.

2. Is enhanced by nutrition.

And:

3. Water

SLEEP: growing neurons & dendrites, & making myelin

nutrition: Your fish and eat it, too

MINIMIZE CAFFEINE & SODIUM

PROTEIN
CALCIUM
FAT
OMEGA 3 FATTY ACIDS
VITAMINS/ANTIOXIDANTS

With time and the help of the big 3

Parts of the brain gradually become robust

And for the next… however long…

That part of the brain is in a window!

This is the peak time of plasticity: use it!

To make it grow in another way… learning!
Learning: growing with use, not age
now that they are robust in an area

The triumvirate brain:

What are the windows in each area?

Let’s look at the cortex first…
The first five years of life are critical for development of ALL of the SENSORIUM [input]

- Visual...
- Auditory...
- Tactile...
- Motor
- Kinesthetic...

Use of palm & wrist will lead to writing capability later

The problem: inordinate stretching of the rubber bands!

Zero to Eight Children’s Media Use in America
A Common Sense Media Research Study
FALL 2011

Among all children up to age 8, an average of one hour and 40 minutes is spent watching television or DVDs in a typical day, compared to 20 minutes reading or being read to, 20 minutes listening to music, 17 minutes using a computer, 14 minutes using a console or handheld video game player, and 5 minutes using a cell phone, video iPod, iPad, or similar device.

In a typical day, zero- to 3-year-olds spend more than twice as much time watching television and DVDs (53 minutes) as they do reading or being read to (23 minutes).

And some young children have already begun media multitasking—23 percent of 5- to 8-year-olds use more than one medium “most” or “some” of the time.

Among the survey’s key findings: 42 percent of children under 8 years old have a TV in their bedroom. Half (52 percent) of all zero- to 8-year-olds have access to a new mobile device such as a smartphone, video iPod, iPad, or tablet.

More than a third (38 percent) of children this age have used one of these devices, including 10 percent of zero- to 1-year-olds, 39 percent of 2- to 4-year-olds, and more than half (52 percent) of 5- to 8-year-olds.

In a typical day, one in 10 zero- to 8-year-olds uses a smart phone, video iPod, iPad, or similar device to play games or watch videos, or use other apps.

Those who do such activities spend an average of 43 minutes a day doing so.
The problem: inordinate stretching of the rubber bands!

Also in the cortex... The most critical language period of sensitivity:

Patricia Kuhl video
Let's look at the emotional center:

**AMYGDALA**
[Limbic system]

Sex differences: temperament is in the lower brain!

We need to 'vip vop' them early...

Periods of emotional sensitivity:
When cognitive understanding and memory are possible...
and all through life

**Crucible Events:**
- Death of a loved one + Birth of a sibling
- Divorce of parents + Family vacations
- Molestation + Early holding...

**Crucible Moments:**
+ or - An off-hand comment from a teacher
  - A roll of the eyes by the "queen bee"

Source: *Girls Will be Girls*, J. Deak
And now let’s add the PFC…

Another critical early window…

sympathy, empathy, understanding others!

All three parts of the triumvirate brain combine…

The key to teaching parenting developing a facile brain:

Using the big rubber bands for learning, passion…

Using the small rubber bands enough to insure a lifetime of facile use…

Knowing which to do when!

Strengths and shadows…
Be careful of inordinate stretching of the rubber bands in the first decade of life!

Unless you are going for Olympic gold! [or remediation or "catch up"]

The magic of the teachable moment

AKA
The Magic of DOING!

There's more to come…

Beyond the formative years

Plasticity continues:
A peek into the next window…
Second wave of proliferation:
Massive dendritic growth & thickening of gray matter

6-12 years old
Girls peak at 11 years old
Boys peak at 12.5 years old

Second wave of pruning:
From peak ages (above), gray matter thins by .7% a year until age 20ish
Concurrently, white matter is thickening: speed & efficiency

Kisspeptin is a protein that when released from the brain, triggers the cascade of biochemical changes that leads to puberty, moving children closer to adulthood… but not quite.
Four hugely important areas of neurological sensitivity

More resources available on the website:
www.DEAKgroup.com