The Brain and Stress!

Reduce Stress, Increase Availability to Learn!

IECC
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Outcomes

1. Participants will identify what prevents learning from happening from the brain’s perspective.

2. Participants will identify strategies that successfully facilitate availability for learning by students with multiple disabilities, including deaf-blindness.

1. Participants will consider how the biobehavioral states impact availability of learning.
“Despite a century of sustained research, brain scientists remain ignorant of the workings of the three-pound organ that is the seat of all conscious human activity.”

A few facts:

2.08% of special education students (3 - 21 years old) have multiple disabilities (2013)

This is consistent with statistics from federal government

http://www.k12.wa.us/SpecialEd/Data/Childcount/Placement.aspx
Multiple Disabilities definition

Federal and State

- Multiple Disabilities means concomitant [simultaneous] impairments (such as mental retardation-blindness, mental retardation-orthopedic impairment, etc.) the combination of which causes such severe educational needs that they cannot be accommodated in a special education program solely for one of the impairments.

- The term does not include deaf-blindness.
(b) **Deaf-blindness** means concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational needs that they cannot be accommodated in special education programs solely for students with deafness or students with blindness and adversely affect a student's educational performance.
What supplies the brain with information?

- The 7 senses... yes 7
- Cranial nerves
- Peripheral nerves
Vision
Hearing
Smelling
Tasting
touching
 proprioception

 Vestibular
<table>
<thead>
<tr>
<th>Cranial Nerves</th>
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<tbody>
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<td>I Olfactory</td>
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<td>III Oculomotor</td>
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<td>IV Trochlear</td>
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<td>V Trigeminal</td>
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<td>VI Abducens</td>
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<td>VII Facial</td>
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<td>VIII Vestibulocochlear (auditory)</td>
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<td>IX Glossopharyngeal</td>
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<td>X Vagus</td>
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<td>XI Spinal Accessory</td>
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<td>XII Hypoglossal</td>
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**The Cranial Nerves**

- Olfactory Nerve
- Optic Nerve
- Oculomotor Nerve
- Trochlear Nerve
- Abducent Nerve
- Trigeminal Nerve
- Facial Nerve
- Auditory Nerve
- Glossopharyngeal Nerve
- Vagus Nerve
- Hypoglossal Nerve
- Accessory Nerve
Peripheral Nerves
What can prevent learning from happening?

• Just a short quiz about the brain
  (so we are all on the same page)

1. The part of the brain that provides for thinking, planning, judgment, reasoning, decision making, is the

  1. Limbic system
  2. Sensory system
  3. Cortex
  4. All of the above
What can prevent learning from happening?

2. The non-verbal part of the Brain that is concerned with memory and emotion is the
   A. Limbic system
   B. Sensory system
   C. Digestive system
   D. All of the above
What can prevent learning from happening?

3. One thing that prevents availability for learning is:
   A. Cognitive level
   B. Being non verbal
   C. Stress
   D. All of the above
What is stress?

Stress occurs when an individual perceives challenges as overwhelming when compared to resources and coping abilities.

www.youtube.com/watch?v=n9m1DshQPcc
What Sapolsky said:

Good Stress must be

- The right kind
- Moderately challenging
- Not go on too long

Exercise
Meditation
Hobby
Reflection
Social outlet
If structured on regular basis
Something that feels good to you
Stress and how it impacts our students

Stress is often easy to see in our students.

However, the cause is not...
What if they can’t talk, or can’t see or can’t hear....
Stress and how it impacts our students

Below is a great short video about the need to train the adults and develop their skills to reduce the child’s stress and the family’s:

- poverty,
- violence,
- abuse,
- neglect,
- drug abuse,
- mental illness

What is **toxic or chronic** stress?
Strong, frequent or prolonged activation of the body’s stress response and it is provoked by stressful events that are chronic, uncontrollable and/or experienced without the person having access to support from caring persons.

- Perceived lack of control
- Experience of negative emotions
- Resources are judged to be not effective or not available
- Absence of support relationships

National Scientific Council on the Developing Child, 2009
If our students could tell us...

No, No, don’t wheel me near Sarah! She screams. I get scared!

Does this student watch Sarah more closely, does his breathing increase rapidly, does he vocalize when he is closer to Sarah, what other things does he do, to tell us something is wrong.
Healthy development can be derailed by excessive or prolonged activation of stress response systems in the body especially the brain, with damaging effects on learning, behavior, and health across the lifespan.
“Early in Development, toxic stress can impair emotional well-being, exploration and curiosity, school achievement and other qualities”

Consider each of the things mentioned above
What does that mean for all your teaching?

Nelson, Greenfield, Hyte, Shaffer & Paul (2011)
What can prevent learning from happening?

4. One hormone that is released when **stress** is present is:
   A. Estrogen
   B. Cortisol
   C. Testosterone
   D. All of the above
Some of what happens when toxically stressed

1. Stress hormones divert glucose from the brain to muscles
2. Compromises ability to form new memories
3. Frequent sustained stress hard-wires maladaptive responses
4. Limbic brain receives permanent insult from cortisol

Some of what happens when toxically stressed

5. Toxic stress can impair: emotional well being, early learning, exploration and curiosity and school readiness and school achievement

6. Excessive cortisol affects long-term memory

7. ½ of cases of depression caused by some type of hyper cortisol production

8. Increased risk of heart disease, diabetes, hypertension, drug abuse, alcoholism, depression, anxiety disorders

Among the most relevant findings in research is that development of healthy brain architecture relies on **responsive relationships** with adult caregivers, and such relationships help children to learn how to handle stressful experiences.

In the **absence** of these supportive relationships as the severity or number of adverse experiences mounts, the likelihood of a child’s poor outcomes also increases, including development delays, learning disabilities and childhood behavior problems as well as diabetes, heart disease, depression, drug abuse, alcoholism and other major health problems over a lifetime.

Clancy Blair, principal investigator of an intervention for mothers in New York City says…
as much as possible early head start should be focusing on parent-child interaction because that where the rubber hits the road; that where things are going to change for kids and for caregivers as well”

What do these children seem to have in common?
Are these children available to learn?
Biobehavioral Arousal States

The Carolina Record of Individual Behavior (CRIB) describes nine levels of arousal (Simeonsson, et. al., 1988)

State 1: Deep sleep, eyes closed, regular respiration, no movement

State 2: Intermediate sleep, eyes closed, few minor facial, body and/or mouth movements, respiration is “periodic” alternating periods of shallow and deep breathing

State 3: Active sleep, eyes closed, irregular respiration, some gross motor activity (stirring, writhing, grimacing, mouthing, or other facial expression)

State 4: Drowsiness, eyes open and closed intermittently, fluttering eyelids, eyes have glassy appearance, frequent relation followed by sudden jerks
Biobehavioral Arousal States

The Carolina Record of Individual Behavior (CRIB) describes nine levels of arousal (Simeonsson, et. al., 1988)

State 5: **Quite awake**, relatively inactive, eyes open and appear bright and shiny, respiration regular

State 6: **Active awake**, eyes open, diffuse motor activity of limbs or whole body, vocalization of a content nature

State 7: **Fussy awake**, eyes open, irregular respirations, diffuse motor activity, vocalizations of fussy, cranky variety

State 8: **Mild agitation**, eyes open, diffuse motor activity, moderate crying, tears may or may not be present

State 9: **Marked uncontrollable agitation**, screaming, eyes open or closed, tears may or may not be present

Handout
Think about what you know so far about the brain, the senses, and stress.

What might be going on inside this young child?

What would be going on inside you if you looked like him emotionally?
If our students could tell us...

Mariska, my para educator is nowhere to be seen. Oh, no... Who will be there to understand me?
MNS- do you know what it means?

**Mirror Neuron System**

- First I will show you two videos and then we will discuss it.
- What to look for... do you see something you might call imitation in these videos?
This first video is of twins

www.youtube.com/watch?v=_JmA2ClUvUY
This second video is of a young child and her mother
What is so important about this?

• It is not just about mirroring **behavior**

• It is about mirroring **emotion**

• When you watch another person’s emotions, your own emotional system is triggered

• Brain studies have taught us that sensory stimuli not only carries information, which is processed in the cortical areas of the brain but is also associated with emotions
What protects the child from toxic stress?

- Presence of sensitive and responsive caregivers/service providers
- Secure attachment relationships
- High quality early care and education
- Peer acceptance
- Responsive environments
- Feeling of competence
Strategies that successfully facilitate learning

It is about anticipation and understanding:

- Connection or relationship
- Likes and Dislikes
- Following Child’s Lead
- Strongest sensory channels
- Consistent Routines
- Following calendars/schedules
- Communication-Conversation
If our students could tell us...

My schedule says it is time for gym, but we are going the wrong direction. What is happening?

Note the actions of the child when you make changes in the child’s schedule without having a way of letting him know that and giving him sufficient time to process the information.
Parents too! And what about you?

Long term stress
Same long term impact
Need our understanding, support
Help them understand behavior of their child
Help them learn positive strategies to cope
Help with ID of resources, but they are in charge

“Addressing the stressors affecting a child requires addressing the stressors on his or her family in order to ensure that the critical environment of relationships can be maximally supportive”

One strategy to use

Think carefully, what is one strategy that you want everyone in your class to follow to help make the student available to learn?

What do you need to do to make this happen?
“Learning produces physical change in the brain.” “…we talk about the brain being plastic meaning the brain changes its own wiring…like a piece of silly putty,…”

Remember that!

Zull, J.E. The Art of changing the brain, Educational Leadership Sept 2004 Volume 62 no 1 Teaching for meaning pages 68-72
Thanks to the children, families, and service providers who make sharing videos possible.

While we all know we are not perfect, it is hard to have ourselves starring in videos that may have some... “Oh rats, I wished I hadn’t done that!”
Resources


Resources


Resources


Resources


Resources


Washington Sensory Disabilities Services (WSDS)

WSDS is here to help families and service providers by supporting the developmental and learning needs of children aged birth to 21 who are:

- Deaf or hard of hearing
- Blind or visually impaired
- Deaf-blind or combined vision and hearing loss

WSDS is a state needs project funded through the Office of Superintendent of Public Instruction – Special Education Section.

www.wsdsonline.org