Self-Regulation, Mindfulness, and the Brain: Empowering Individuals with Autism and Communication Disorders

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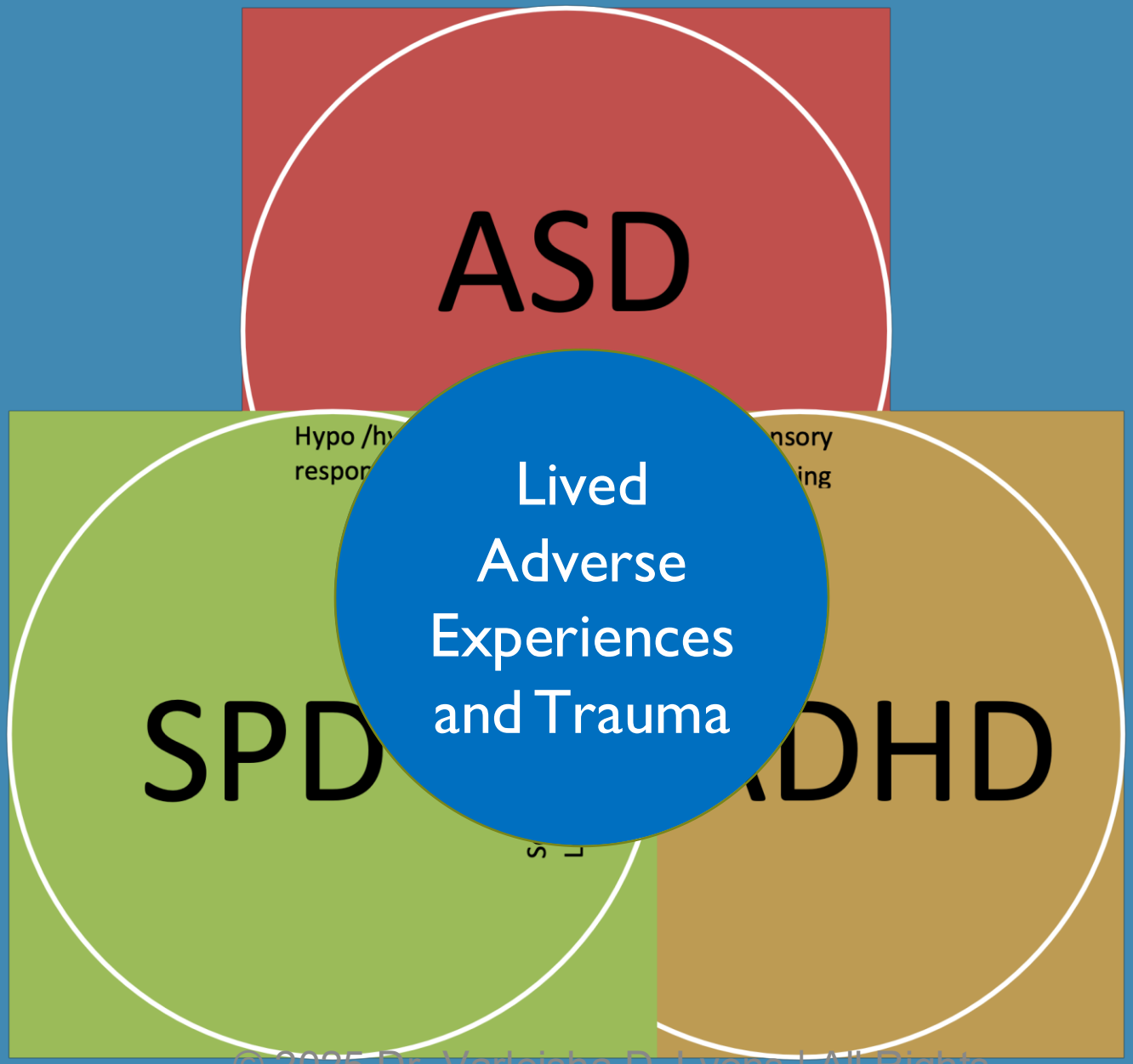
Varleisha D. Lyons PhD, OTR/Li s employed by the American occupational therapy association (AOTA). This work is independent of her role and not affiliated with AOTA, Inc.

Objectives

1. Gain knowledge relating to the neuroscience behind self-regulation and sensory processing
2. Summarize characteristics of sensory processing disorder, ADHD and autism and how the neurological overlap
3. Understanding the neurological components related to diagnosis and treatment.
4. Review primitive reflexes and the connection to function
5. Understand the cause and effect of intervention techniques as they relate to neurological components
6. Describe the evidence behind current intervention techniques
7. Identify appropriate strategies that work for treating children with ASD, SPD and ADHD
8. Introduce the Self-Regulation and Mindfulness program
9. Explore the implementation of the ACTION from Trauma program

Diagnoses and the DSM-V

- ADHD
- ASD
- Trauma
- Sensory Processing Disorder



A Few Definitions...

- Our Sense...How many and what are they?
- Self-Regulation...How do you define?
- Behavior…What is it?

What is Interoception?

	Description
Interoception	• **Detection of respiration, hunger, heart rate, digestive elimination through nerve endings**
Interoceptive Defensiveness	• **Sensation is irritating and distracting** • **Pounding heart rate may be painful or elicit fear** • **Intense hunger pain leading to over eating** • **Painful bowel and bladder sensation resulting in frequent use or avoidance of the bathroom** • **Sensations last longer than in other individuals**
Interoceptive Under-responsiveness	• **Lack of response to sensation resulting in not responding, or prolonged lag time, in response to sensations** • **Lack of hunger or thirst** • **Difficulty with potty training**
Interoceptive Seeking	• **Seeking of a pounding heart rate, and fast respiration, hence movement** • **Frequent large and deep breaths** • **Lack of desire to eat or drink due to desire the hunger/ thirst sensation** • **Withholding of bowels and urination**
Interoceptive Discrimination Disorder	• **Challenging in determining what the body needs** • **Only slight desire to use restroom even when urgent**

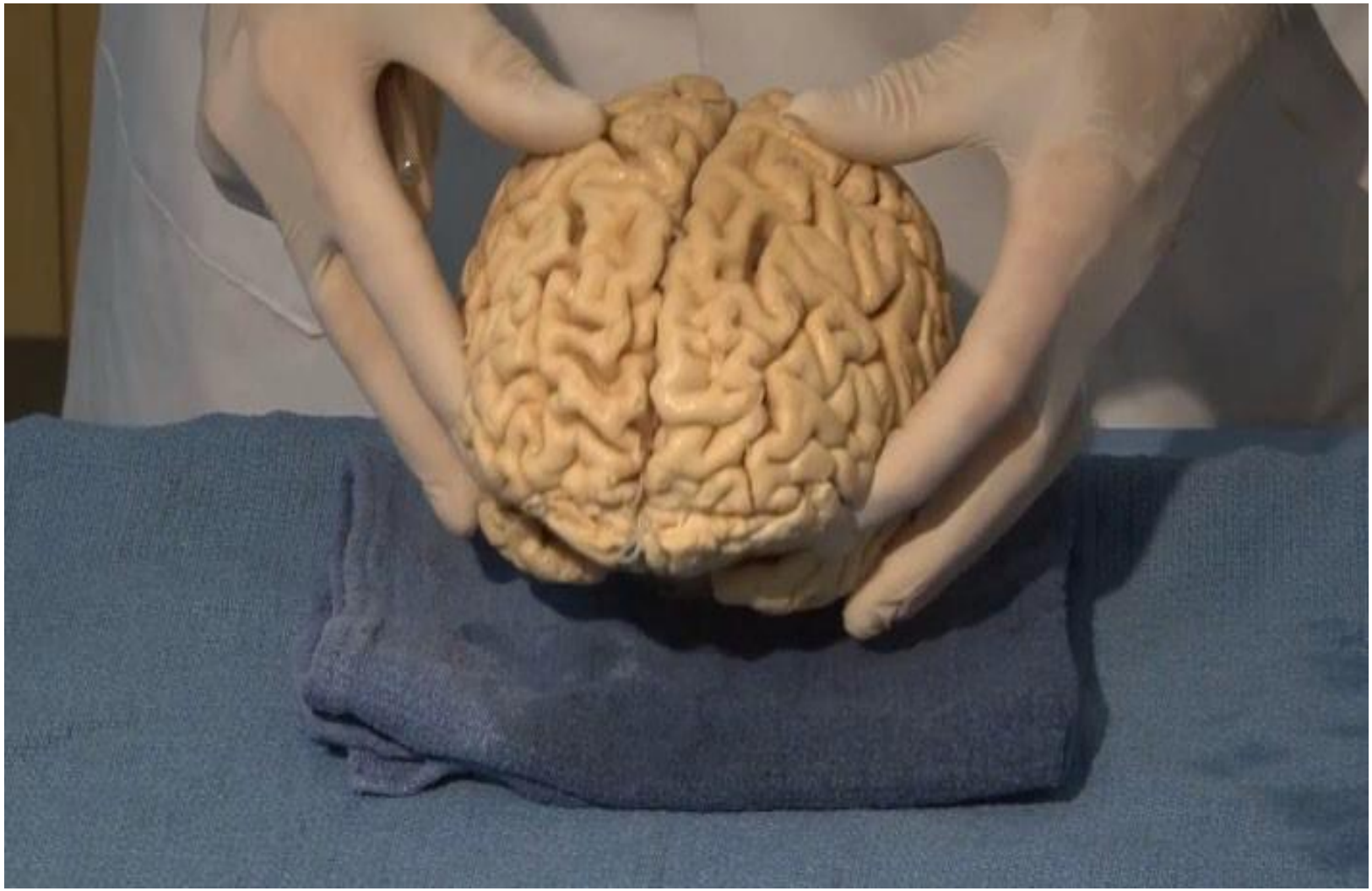
http://spdlife.org

Reciprocal Regulation

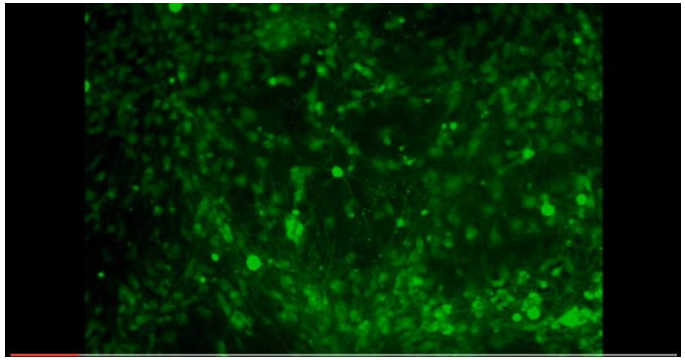
Four Principles

- Multisensory Integration
- Emotional Regulation
- Executive Functioning and Mindfulness
- Mindfulness and Compassion

Gyri Review



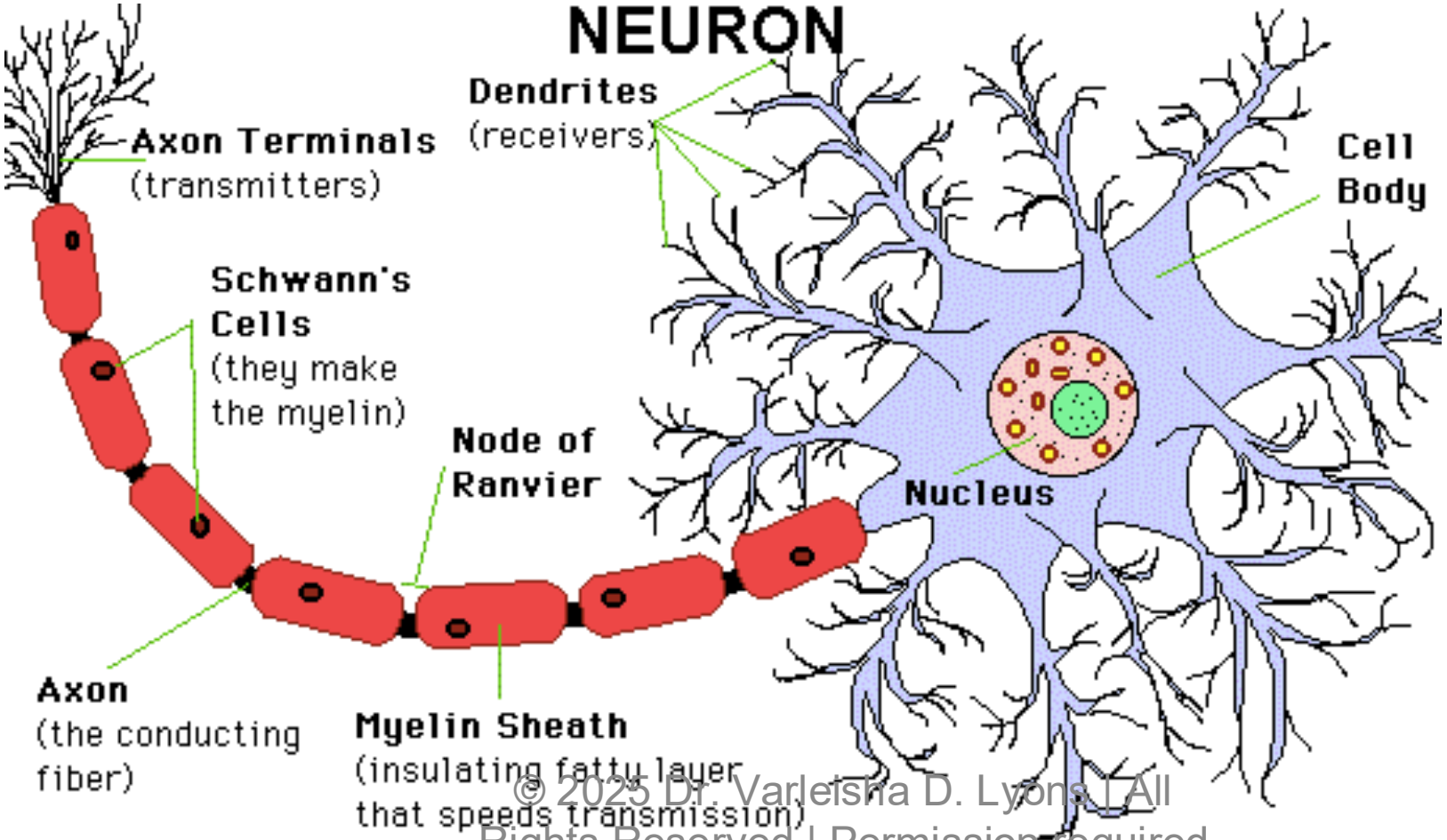
Our Connection to the World

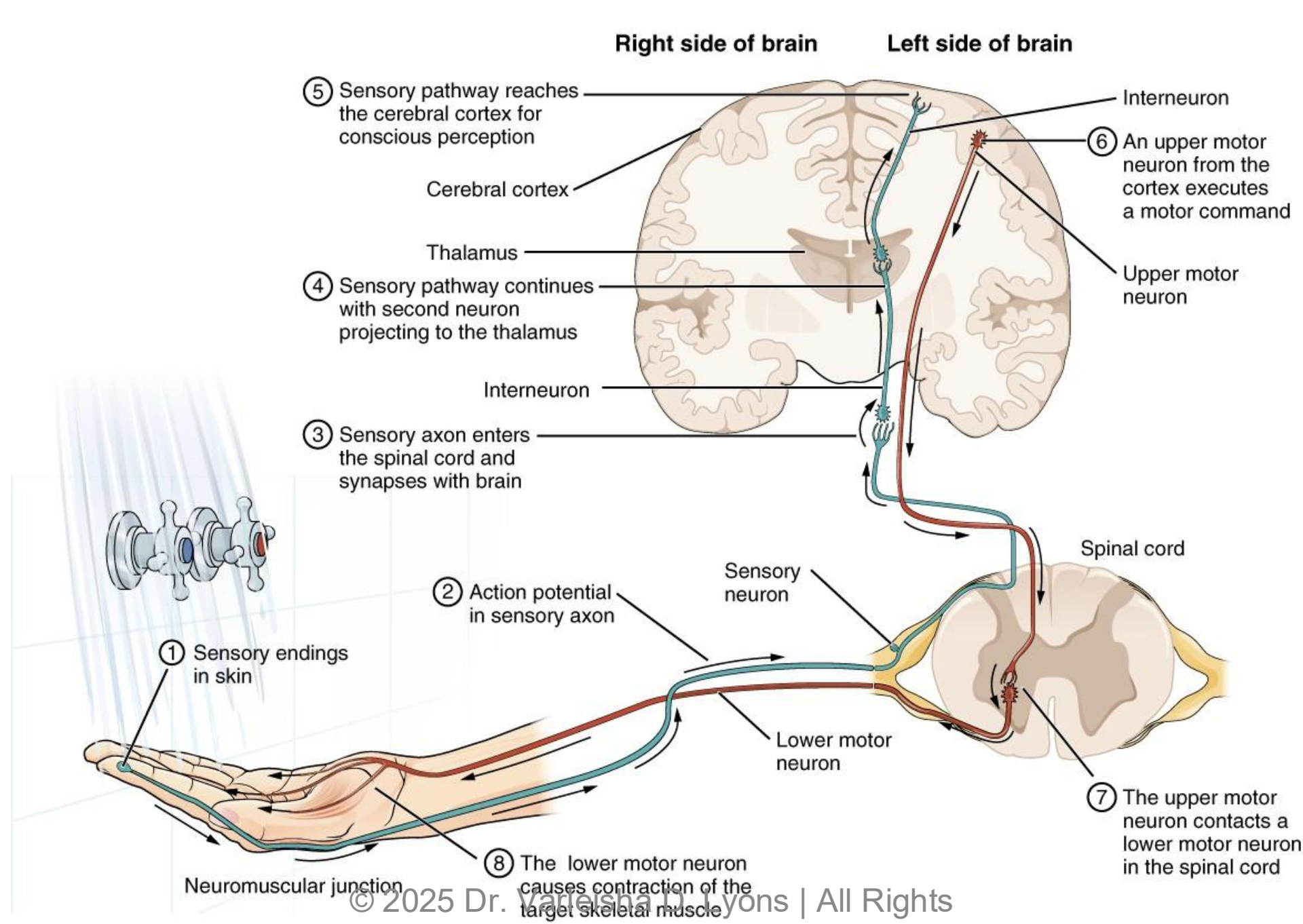


Self-Regulation

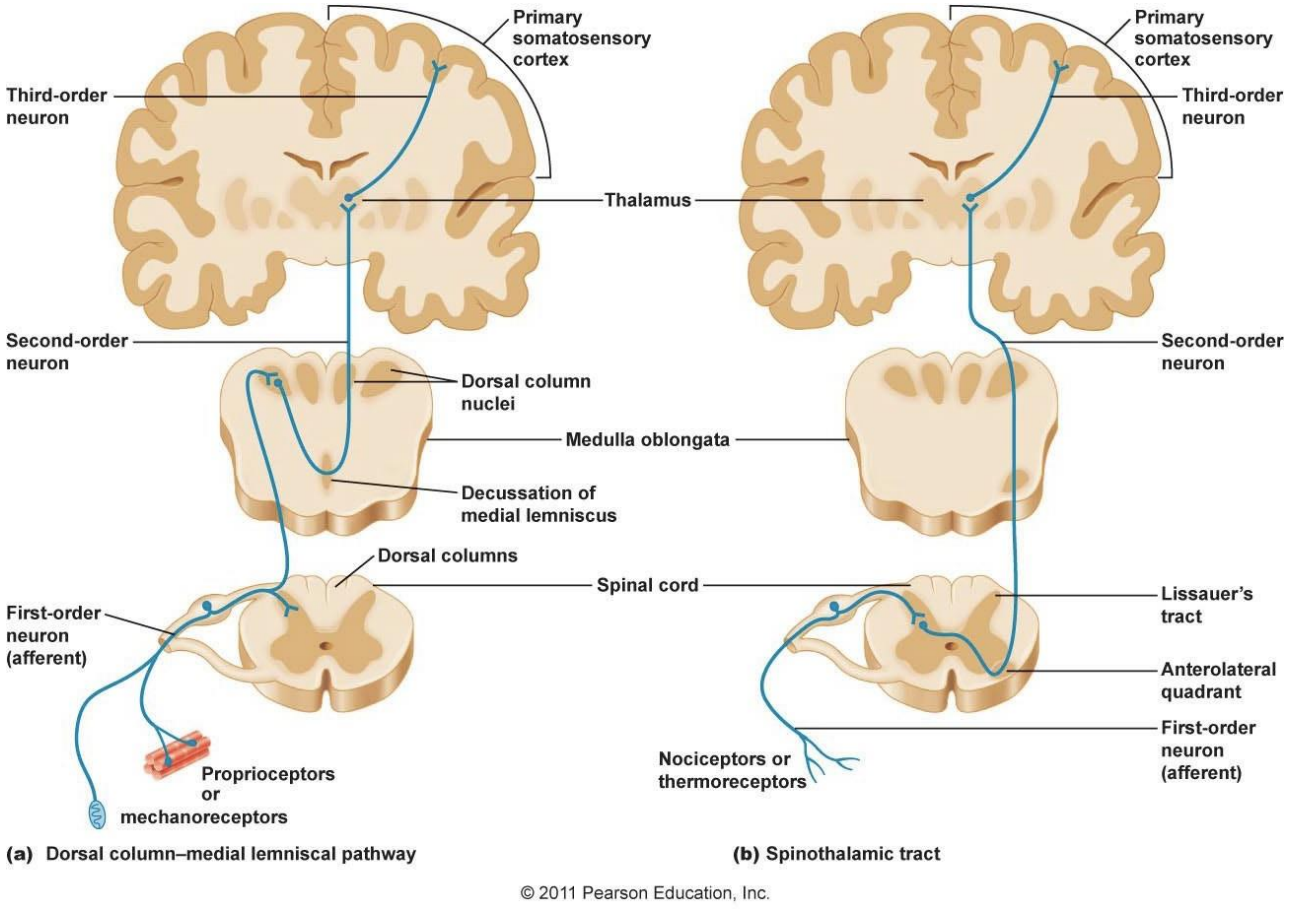
- Sensory
- Emotion
- Executive Functioning

We Receive Information from our surroundings Neuronal Receptors





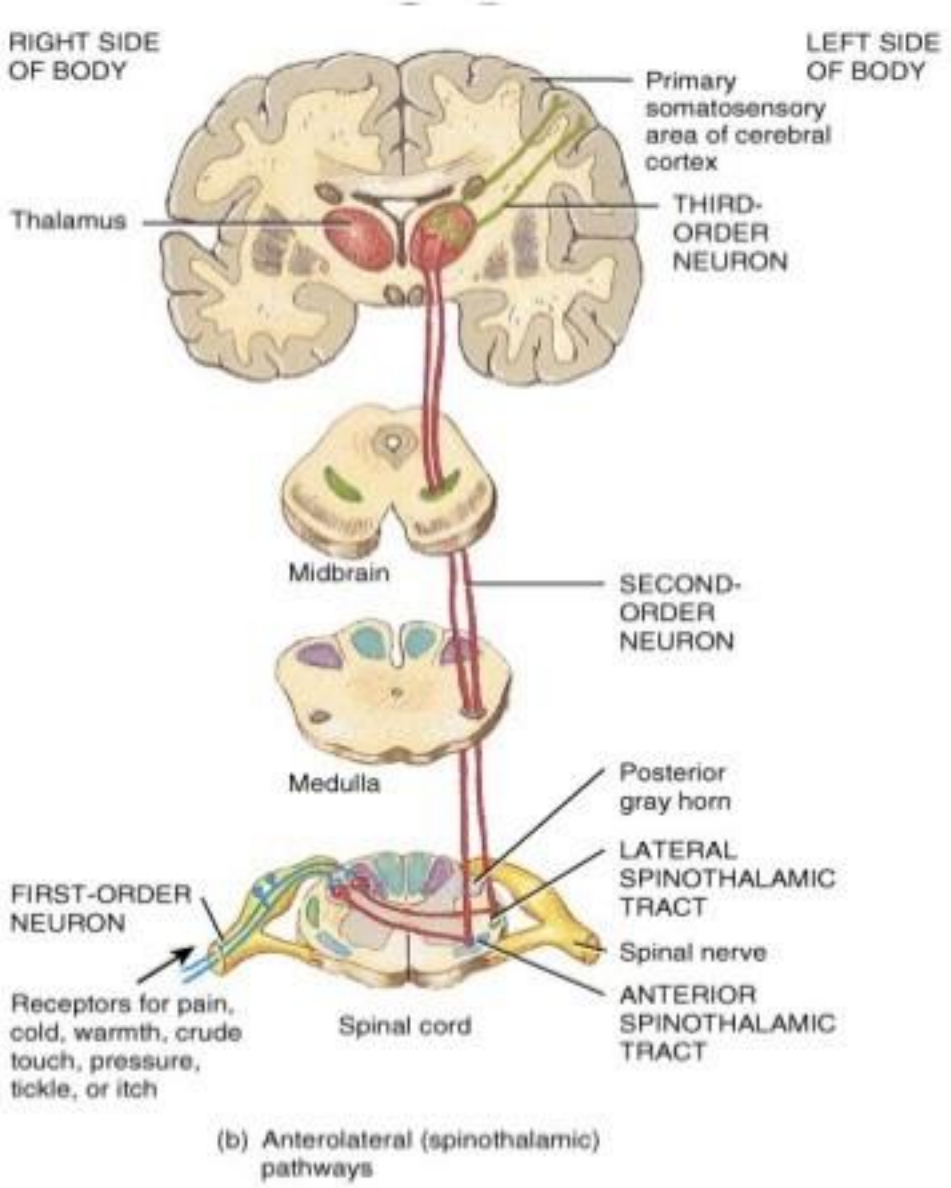
The Sensory Pathways



Spinothalamic for Pain, Temperature, and Light Touch! Signals may get crossed.

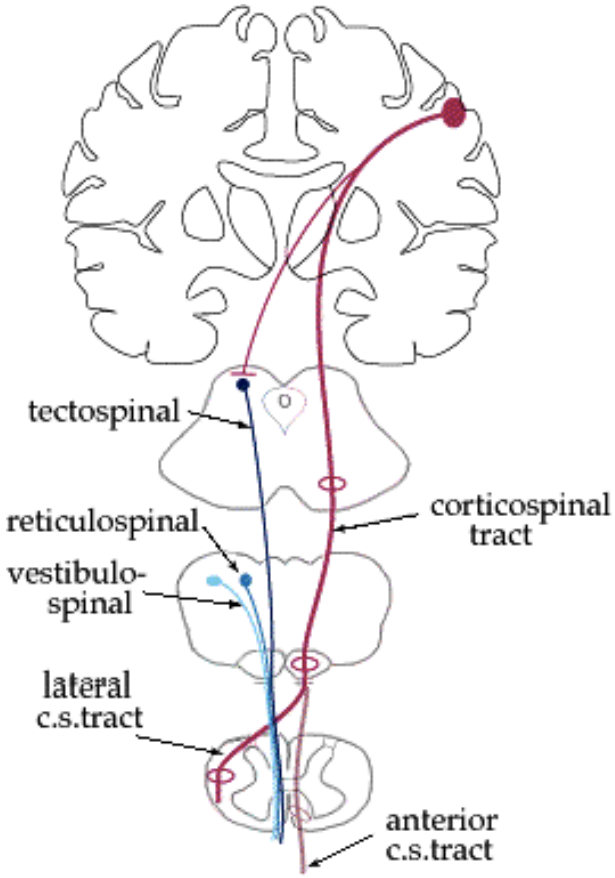
Lateral Spinothalamic Tract

- Carries pain and temperature
- Primary fibers ascend or descend 1-2 spinal cord segments before synapsing with secondary fibers.



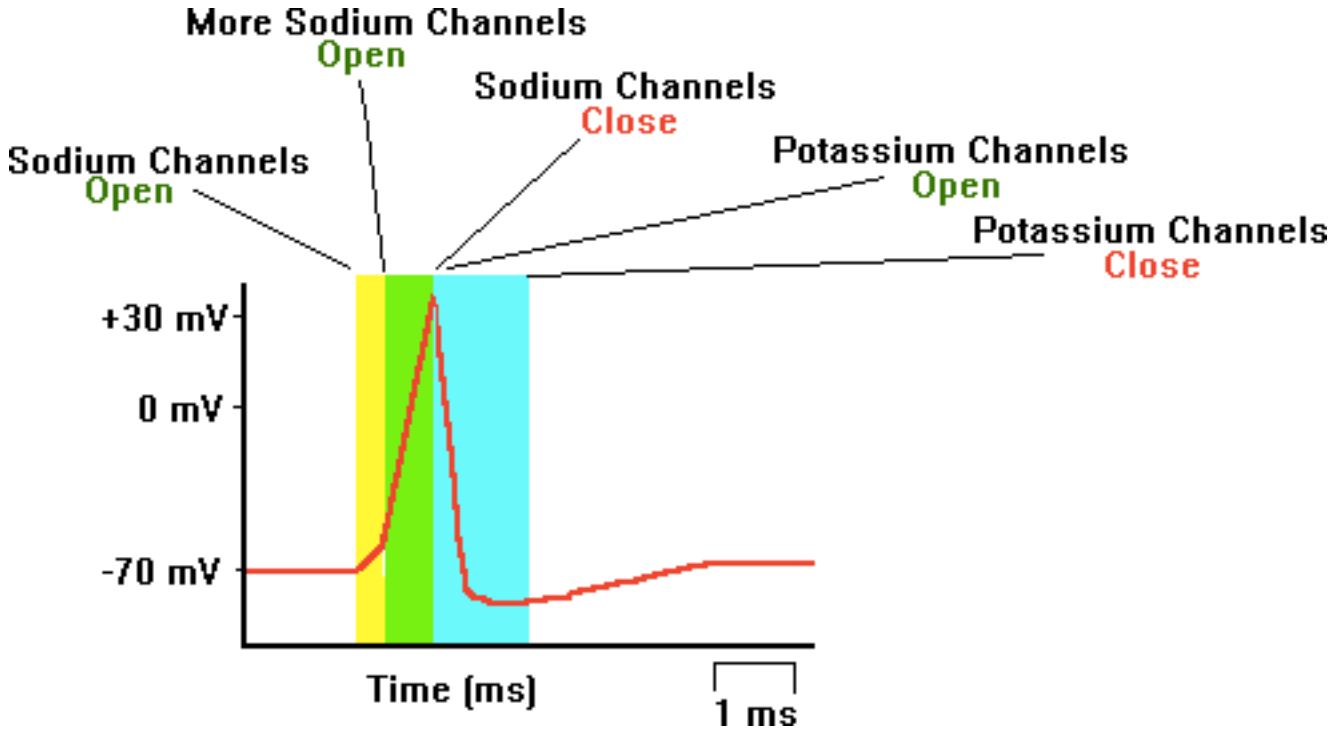
(b) Anterolateral (spinothalamic) pathways

Motor Pathways



Controlled by the pathway and communication with the Basal Ganglia and Cerebellum

Threshold!!!

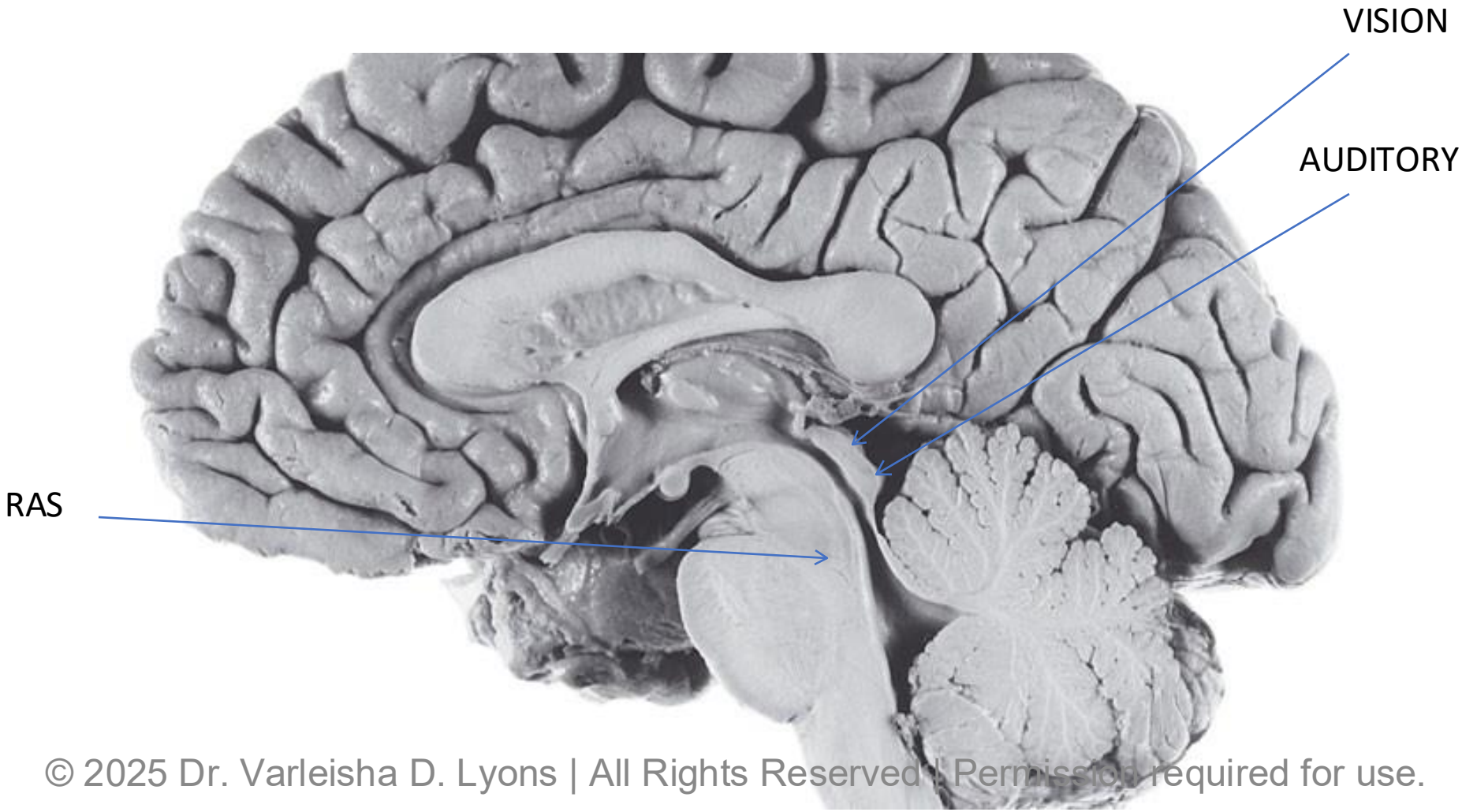


Resting Potential is at -70 mV
Neuronal firing “action potential”
only occurs when threshold is met: “Strong Enough and Long Enough”
Happens differently for all of us!

	Over Responsiveness to Sensory Input	Under Responsiveness to Sensory Input	Craving Sensory Input
Threshold	Low; Hyper vigilant	High; Inattentive	High; Hyperactivity
Arousal	High; Overreaction	Low; Lacking a response	High; Energetic
Preferences	Avoiding certain activities and preferring routine and predictable activities	Needs motivation and encouragement to attend to activities especially gross motor play	High intensity activities; Risk taking
Example Treatment Activities	Slowly introducing new activities by pairing with preferred activities in a non-threatening nature, weight bearing activities, deep breathing, yoga and exercises moving from a flexed position to extension due to connection of primitive reflexes	Contrasting activities; fast versus slow; cold versus hot; High-energy activities such as fast swinging; jumping and crashing. Strengthening activities secondary to lack of gross motor activities resulting in decreased muscle activation	Intense activities such as Ice play; stimulating multiple sensory areas; swinging and crashing while listening to music; Weight bearing activities and intense input to the muscles and joints, deep breathing, yoga and meditation

What Our Children Should Know About Their Developing Brains

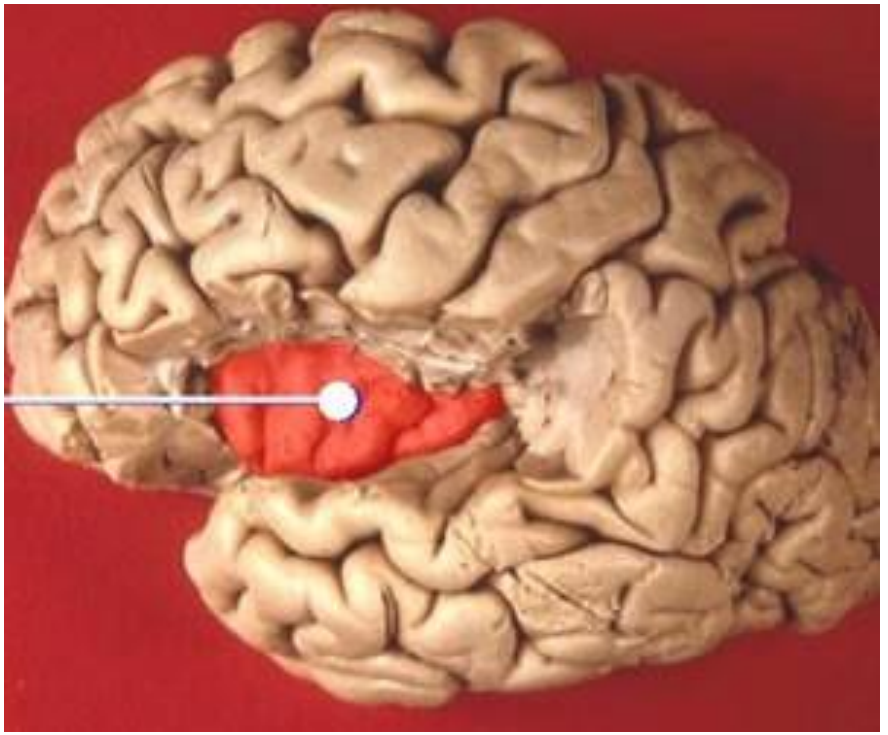
THE VISION, SOUND, AND ANS CONNECTION



The Emotional Brain

Insular Cortex

- Fifth lobe of brain; Sensory, Emotional, and Cognitive Integration “hub”
- Vagus nerve termination: Correlation to the ANS
- Research revealing dysfunction in Dxs including Anxiety disorder, addiction, Autism



Check all that apply as reported or observed.

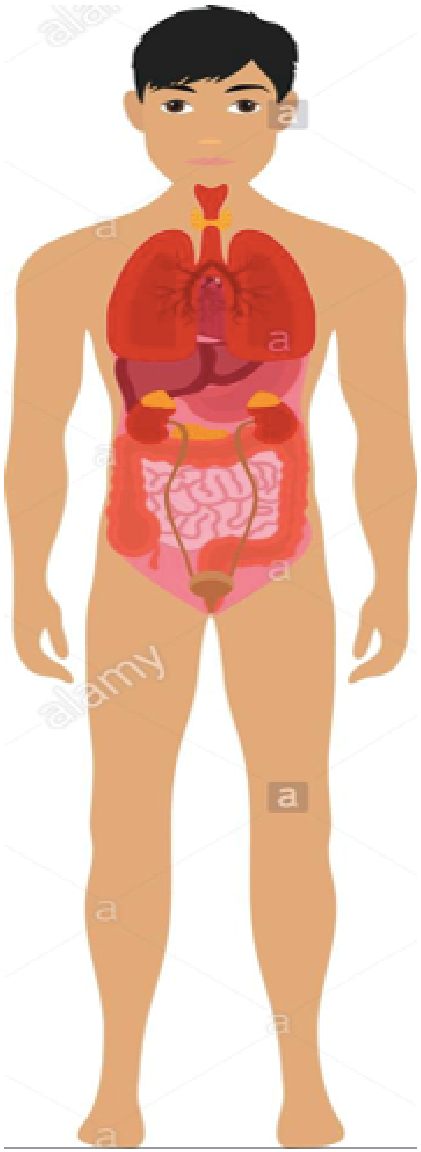
- ○ Atypical auditory Processing
- ○ Auditory distortions
- ○ Sensitivity to sound

- ○ Atypical visual processing
- ○ Dry Eye Syndrome
- ○ Sensitivity to Light

- ○ Atypical vestibular processing
- ○ Sensitivity to movement
- ○ Seeking of gross motor activity

- ○ Gustatory sensitivity to certain food textures
- ○ Dry Mouth

- ○ Olfactory sensitivity to unpleasant odors



- ○ Increased nociception (pain) /Pruritus (itch) sensitivity
- ○ Hypersensitivity to pain
- ○ Nociceptive reflexes (eye blink, flexion, flexor withdraw)

- ○ Atypical tactile processing
- ○ Tactile sensitivity
- ○ Seeking of tactile input
- ○ Frequent perspiration
- ○ Skin picking disorders

- ○ Atypical thermoreception
- ○ Seeking of cold temperatures

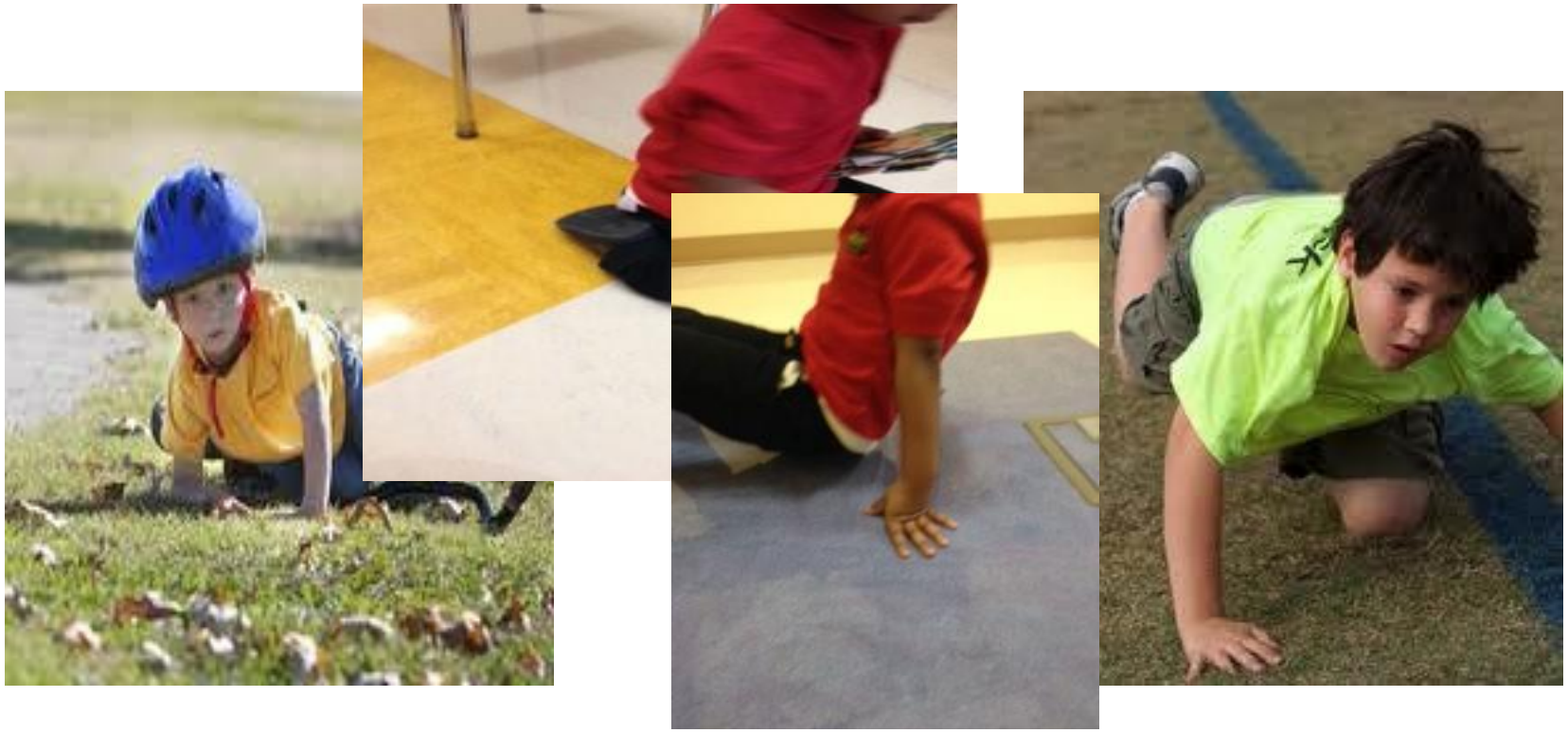
- ○ Atypical interoception processing
- ○ Seeking or Avoiding (urination, bowel movements, gross motor movement, eating, drinking)
- ○ Frequent yawning
- ○ Poor discrimination between bodily functions (i.e. Late detection of the need to go use the bathroom)

- ○ Atypical proprioceptive processing
- ○ Seeking of proprioceptive input
- ○ Clumsiness

Modulation and Vestibular

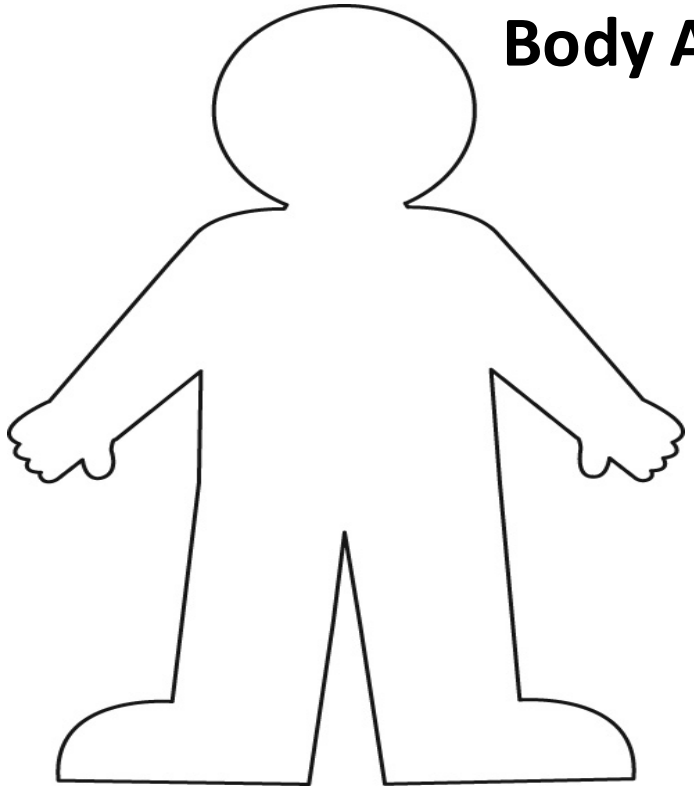
Sensory Based Motor Disorders:

Postural challenge Information Organized Incorrectly=> Disorganized output



(Miller, Anzalone, Lane, Cermak, & Osten, 2007)

Body Awareness



Think about a client. Where would they color?

What's your theory?

Reflexes to Assess and What to Look for

- Moro reflex
- Tonic Labyrinthine reflex
- Palmar reflex
- Asymmetrical tonic neck reflex
- Symmetrical tonic neck reflex
- Spinal Galant Reflex
- Landau Reflex

Brainstem/ RAS Connection!!!

Primitive Reflexes

Primitive Reflex *Brainstem Level	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Asymmetrical Tonic Neck (ATNR) Appears 18 weeks in utero, disappears around 6 months	Extension of one side of the body and flexion of the other to assist in the birthing process and later with reaching, eye-hand coordination, airway passage clearance · Have the child get on all fours · Gently turn their head or have them turn it to the side and hold for 5 seconds Look to see if they can maintain the position or if they fall to the side opposite of the head being turned	Poor balance; difficulty with coordinated eye movements needed for reading and writing; challenges in crossing midline of the body and separating the upper body and lower body movements

Primitive Reflex *Brainstem Level	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Symmetrical Tonic Neck (STNR) Appears 4–6 months, disappears around 8–12 months	Assists in preparation for crawling; when the child is on hands and knees, a flexed head results in legs extending; when the head is extended, the opposite occurs, with arms extending and legs flexing · Have the child get on all fours · Gently move or have the child move their head up and down and hold for 5 seconds in each position Look to see if they can maintain the position, if they have excessive movement in their trunk, or if they are sitting back on their legs	Difficulty crawling on all fours; poor balance; clumsiness; difficulty with midline activities; poor sitting position—"W" sitting

Primitive Reflex	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Moro **Appears in utero, disappears around 6 months**	**Occurs during the first breath of life; continues as a startle reflex in response to an unexpected stimulus or threat; the involuntary response is protective, as the infant is unable to distinguish threats; extension of the body (fall reaction), followed by full flexion (protective position), occurs spontaneously. Can be triggered by any sensory stimuli!** **· Have the child stand with both feet on the ground and tilt their head back to look at the ceiling** **· You can also ask the child stand on one foot with their arms out to the side** **Look for loss of balance and excessive movement**	**Hypervigilant; overactive fight-or-flight reactions; sensitivity to light, sound, touch; poor emotional regulation; hyperactivity; poor attention to task; frequent illness due to a stressed immune system; fatigue**

Primitive Reflex	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Spinal Galant **Appears 20 weeks in utero, disappears around 9 months**	**Activates when either side of the spine of an infant is stroked; neck extension, hip rotation, and body flexion occur; assists with hip movement and rotation, specifically in utero and during the birthing process, as well as in the development of crawling.** **· Have the child get on all fours** **· Gently stroke the left and right sides of their spine** **Look to see if they can maintain the position, if they have excessive movement in their trunk, or sitting back on their legs**	**Difficulty maintaining a seated position; constant fidgeting; bed-wetting and bladder accidents; sensitivity to touch and certain textures (clothing); challenges in following directions and with short-term memory**

Primitive Reflex	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Palmar **Appears 18 weeks in utero, disappears around 6 months**	**Assists in sucking, as the hands contract as the baby sucks; stimulation of the palms results in flexion or a grasp reflex; activation also leads to the mouth opening and jaw movement** **· Have the child stand with straight arms and ask them to wiggle their fingers** **· You can also have the child face their palms toward the ceiling; stroke the hand from the thumb toward the palm** **Look for excessive wrist movement and movement in the mouth and/or tongue**	**Mouth movement as the child performs cutting, writing, or coloring activities; chewing on objects such as pencils; biting people; difficulty with grasp and speech due to tension in hands and mouth**

Primitive Reflex	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Rooting **Appears at birth, disappears around 4–6 months**	**Assists with feeding; baby will respond to stimulation of the check by turning toward the stroked side and opening mouth** **· Gently stroke the cheeks and the above the upper lip of the child approximately 3-5 times.** **Look for head movement towards the direction of the stroke and mouth opening and movement.**	**Sensitivity in the mouth; challenges with food textures; messy eating; poor speech articulation**

Primitive Reflex	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Tonic Labyrinthine Appears in utero, disappears around 4–6 months *Backward may extend into 3 years of age	Assists baby through the birthing canal; Forward: As head is flexed, the arms and legs curl Backward: As the the head is extended, the arms and legs extend · Ask the child to get into the above position—on their belly extending their neck, lifting chest slightly off the floor, with arms extended behind and legs straighten and elevated Look to see if the feet turn upward with flexed knees	Difficulty coordinating body movement and eye movement; motion sickness; poor balance and posture; poor timing and sequencing (dyspraxia)

Primitive Reflex	Pattern of Movement and How it is Elicited (Parts retrieve from Gibbs, 2017)	Interference
Landau Appears 3 months, disappears around 12 months	Head, legs, and spine extend when baby is held in the air horizontally; assists with muscle tone · Ask the child to get on their belly, extending their neck, lifting chest slightly off the floor, with arms extended toward the front of the body and legs straighten and maintained on the floor · Remind the child to lift their chest but keep their feet on the floor Look to see if they are able to lift legs from the floor or remain grounded	Challenges with motor activities; high muscle tone (hypertonia) and difficulty learning; toe walking and lack of coordination; possible difficulty sitting against chair back; absence of the reflex during infant years indicates hypotonia and possible intellectual disability

Breaking Up Patterns with Functional Movement...

For Now Let's Do the XYZ!

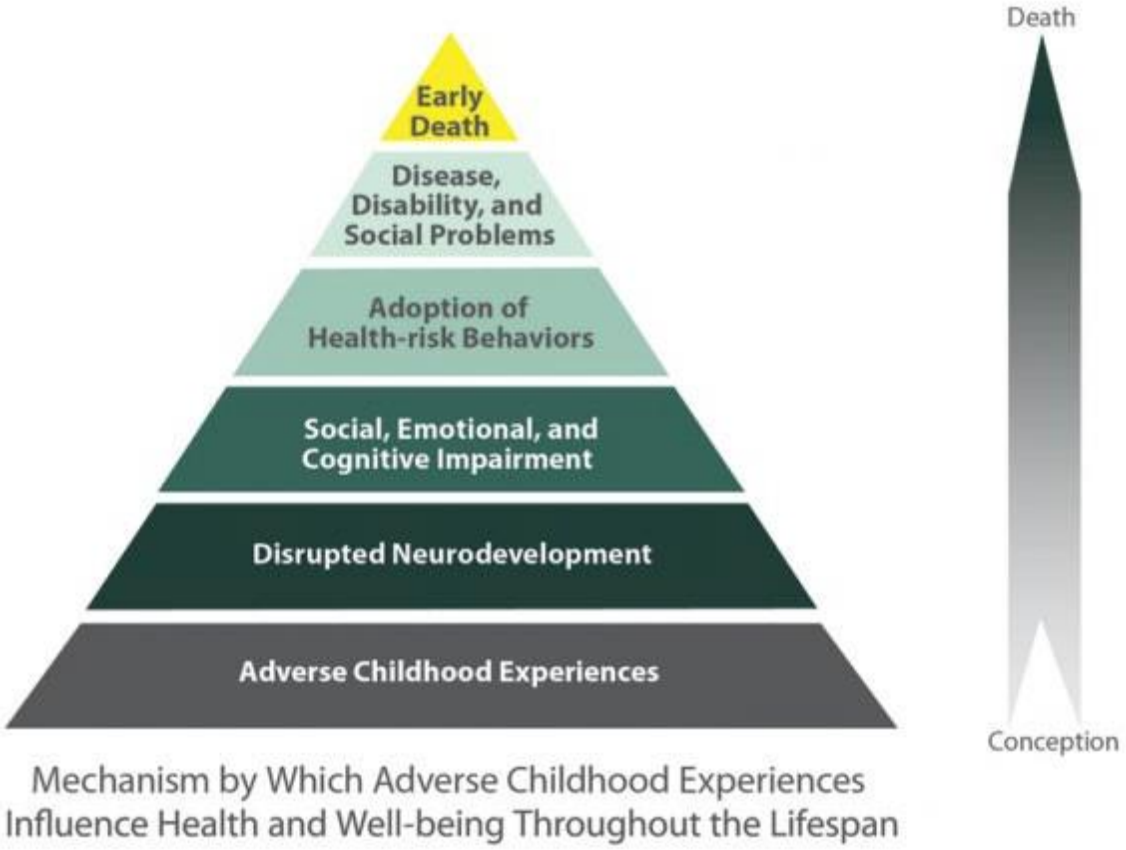
History of "Trauma"

- Centers for Disease Control and Prevention (CDC)–Kaiser Permanente Adverse Childhood Experiences (ACEs) Study
- 1995 and 1997
- N= 17,000

- Results:
  - Childhood trauma is common
  - Two thirds of adults reported experiencing least one ACE, and 1 in 5 reported three or more (Pardee et al., 2017).

Retrieved 12/3/2020 from: https://www.cdc.gov/violenceprevention/acestudy/about.html

PTSD and Complex Trauma



Mechanism by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

Retrieved 12/3/2020 from:
https://www.cdc.gov/violenceprevention/acestudy/about.html

The Four R's of TIC

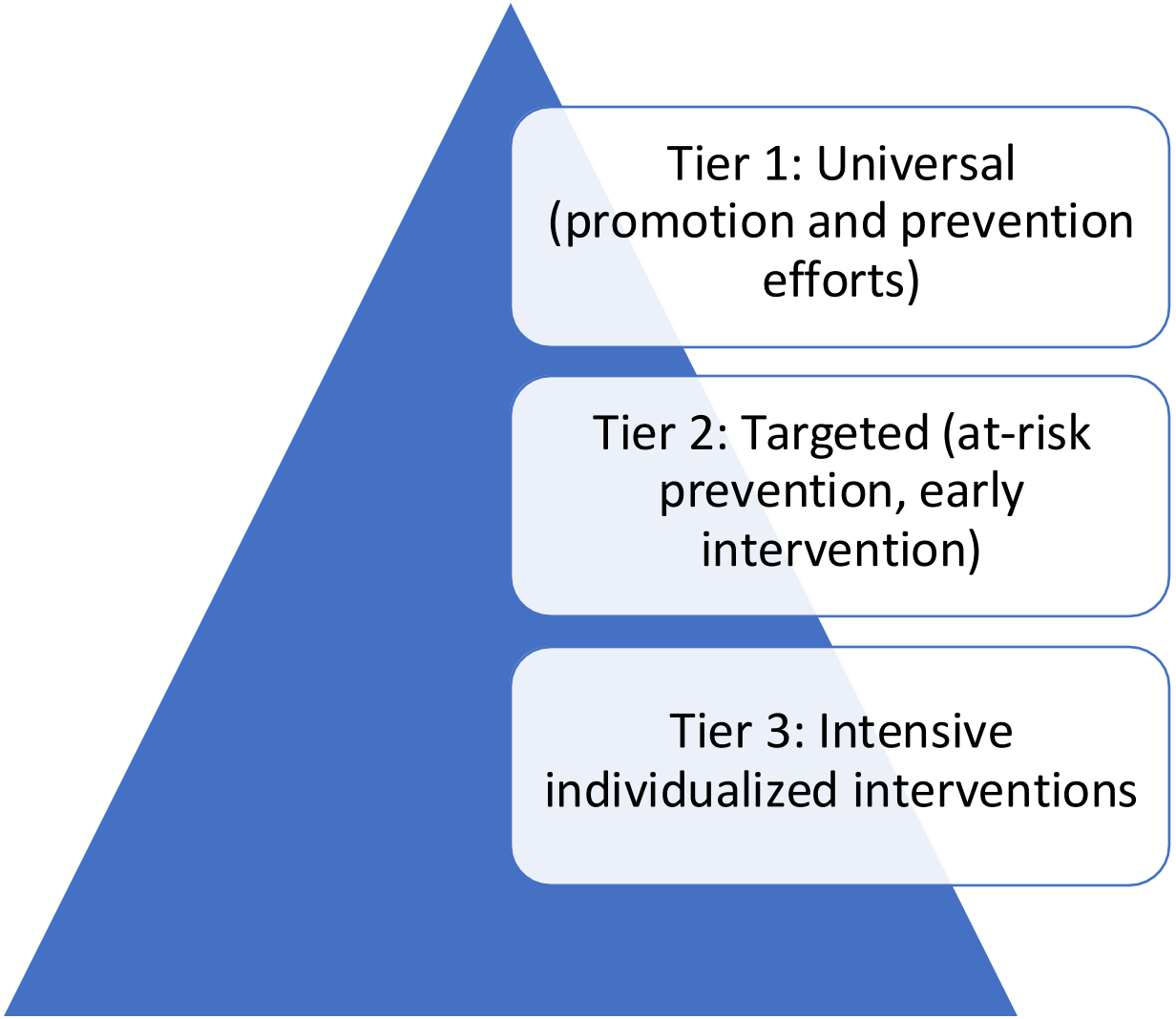
- Realizes- trauma impacts us all! But recovery is possible
- Recognize- the signs and symptoms of trauma and that traumatic events expand to families, staff, and systems not just our clients
- Respond- trauma must be addressed with a tiered approach; individuals, policies, procedures, and practices.
- Resist re-traumatization!

(SAMHSA, 2014)

SAMHSA's Six Core Trauma-Informed Principles

- Safety
- Trustworthiness and transparency
- Peer support and mutual self-help
- Collaboration and mutuality
- Empowerment, voice, and choice
- Cultural, historical, and gender issues.

Public Health Approach



(Fette, Lambdin-Pattavina, & Weaver, 2019)

Engaging Family

- Identify champions
- Adopt a vision and specific goals
- Deliberately build buy in with staff and management
- Create the family-advocate role description
- Orient staff
- Identify a staff mentor and develop their role description
- Establish compensation for family advocates

(Dayton et. al., 2016)

TIC Language

- Ask, “What happened to you?”
- Ask preferred pronouns.
- Ask permission.
- Train all providers and support staff.
- Screen for Adverse Childhood Experiences with all clients.
- Assess and follow up with trauma-related needs.
- Acknowledge what you cannot change to support well-being (e.g., unsafe neighborhood)
- Recognize trauma and the varying symptoms (i.e., flat affect, defensiveness, and aggressiveness)
- Recognize historical trauma.
- Share how and why you need to gather information (is it necessary?)
- Foster growth and positivity.

(Fette, Lambdin-Pattavina, & Weaver, 2019)

ACE Questionnaire

While you were growing up, during your first 18 years of life:

Did you live with anyone who was depressed, mentally ill, or suicidal?

_____ Yes _____ No

Did you live with anyone who was a problem drinker or alcoholic?

_____ Yes _____ No

Did you live with anyone who used illegal street drugs or who abused prescription medications?

_____ Yes _____ No

Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?

_____ Yes _____ No

Were your parents separated or divorced?

_____ Yes _____ No

Did your parents or other adults in your home often or very often slap, hit, kick, punch or beat each other up?

_____ Yes _____ No

Did a parent or other adults in your home often or very often hit, beat, kick, or physically hurt you in any way? Ever hit you so hard that you had marks or were injured? (Do not include spanking.)

_____ Yes _____ No

Did a parent or adult in your home often or very often swear at you, insult you, or put you down?

_____ Yes _____ No

Did an adult or person at least five years older than you ever touch you sexually?

_____ Yes _____ No

Did an adult or person at least five years older than you ever try to make you touch their body sexually?

_____ Yes _____ No

Did an adult or person at least five years older than you ever force you to have sex?

_____ Yes _____ No

Now add up your “yes” answers. This is your ACE score

CLIENT WORKSHEET

PEDIATRIC ADVERSE EXPERIENCES QUESTIONNAIRE

I'd like to ask you some questions about your child. Some of these questions are sensitive. You do not have to answer if you are uncomfortable. This information will assist in gaining clarity of your child's needs and can provide areas to address when we develop a treatment plan.

Has your child experienced any of the following?

1. Problems with sleep, such as difficulty falling asleep, difficulty staying asleep, restlessness, nightmares, or bedwetting?

   _____ Yes _____ No

2. Changes in behavior, such aggression, increased attachment, detachment, or increased sadness?

   _____ Yes _____ No

3. Challenges with eating, such as loss of appetite, eating quickly, overeating, or other significant changes in eating habits?

   _____ Yes _____ No

4. Verbalized feelings of hopelessness or feeling unsafe?

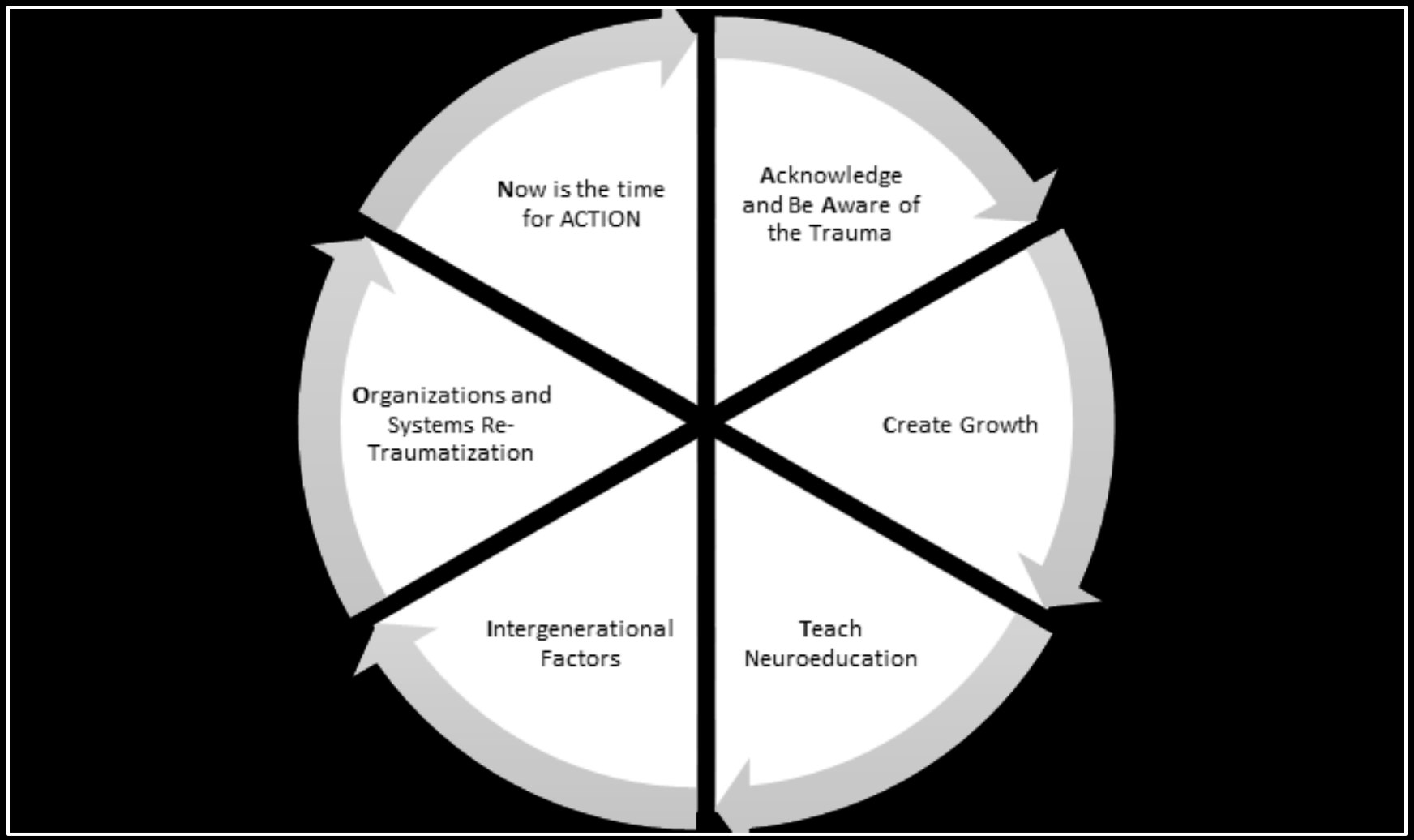
   _____ Yes _____ No

5. Gut issues, such as constipation, bowel movement accidents, or soiled underwear (encopresis)?

   _____ Yes _____ No

6. Urinary accidents (enuresis)?

   _____ Yes _____ No



ACTION-from-Trauma Approach (Gibbs, 2020)

The Substance Abuse and Mental Health Service Administration provides the following examples of complex child hood trauma (SAMHSA, 2019):

- Psychological, physical, or sexual abuse
- Community or school violence
- Witnessing or experiencing domestic violence
- Commercial sexual exploitation (including sex trafficking)
- Refugee or war experiences in the military
- Family-related stressors (e.g., deployment, parental loss or injury)
- Neglect
- Life-threatening illness

Trauma Risk Factors Checklist

- **"Minority" status**. Those from underrepresented racial and ethnic groups are more likely to experience trauma.
- **Acute stress**. Exposure to ongoing stressful events and crisis may diminish the ability to cope in the presence of trauma.
- **Childhood adversity**. Living in an impoverished or violent community, domestic violence parental neglect, lack of cohesion within the family system, parental physical or mental illness, parental stress, and parental substance abuse can all result in a child experiencing trauma.
- **Physiological characteristics**. Certain biomarkers, such as low heart rate variability and low cortisol levels have been found to correlate with the ability to cope in the presence of trauma.
- **Chronic or life-threatening health conditions** (experienced by the client or a loved one). A diagnosis such as cancer, progressive neurological are stressful life crisis which are also traumatic.
- **Low socioeconomic status.** Poverty leads to chronic stress, exposure to violent unhealth environments, lack of access to healthcare, impacts the ability of parents to properly care for their children, and can curtail growth and development.
- **Lack of education.** As a social determinant of health, education has a direct correlation to health outcomes, socioeconomic status, and life expectancy. These factors align with the trauma risk factors mentioned above.
- **Genetics and family trauma.** Some people are predisposed to trauma and have difficulty coping secondary to intergenerational trauma. There is a genetic connection in the DNA passed along to offspring from the biological parents.
- **History of trauma.** Having prior exposure to trauma may increase the likelihood of future exposure. This is due to a possible accumulation of stress and resurfacing of symptoms from traumatic events.
- **Domestic violence.** Physical and emotional harm results in a stress, anxiety, fear, and threatens one's safety. The chronic and persistent threat has long term effects for the victim and those witnessing the abuse.

A:

Acknowledge and be Aware of Trauma

ACTION Risk Factors

- Maternal exposure to physical, mental, or emotional abuse
- Maternal malnourishment
- Racism and oppression
- Poverty
- Homelessness
- Being incarcerated as a minor
- Incarceration of a parent
- Living in the foster care system
- Intergenerational transmission of trauma

Clinical Symptoms

The clinical symptoms of PTSD span across four main categories of symptoms (APA, 2013):

Intrusive thoughts and repeated memories, dreams, or flashbacks of the traumatic event. These symptoms present challenges to various areas of life such as sleep hygiene, social interaction, and caring for oneself and others.

Avoidance of reminders of the trauma. This may involve avoiding people, places, activities, and certain interactions that can lead to unwanted memories including physical sensations reminisce of the trauma.

Negative thoughts and feelings. Symptoms can include, negative self-appraisal, loss of interest in things previously enjoyed, Shame, blame, loss of memory related to the trauma, isolating oneself from other people.

Hyperarousal. Exposure to trauma leads to lack of concentration, challenges modulating arousal levels, hypervigilance, impulsivity, aggression and difficulty sleeping.

Categories of Trauma and Their Impact

Categorization of Traumatic Experiences*	Examples of Impact		
	Early Childhood and School Age	Adolescence	Adulthood and Older Adulthood
Expected (e.g., passing of a loved one who was ill)	An expected trauma may lead to significant **complex trauma**. For example, a child who is living in foster care and who is returned to their biological family as planned may respond with maladaptive behaviors, such as challenges with learning, sleeping, toileting, and engaging with others.	In adolescence, the passing of a loved one who was ill may lead to changes in personality, challenges at school, and difficulty engaging or socializing with others.	Expected trauma may greatly impact anyone regardless of their age. For example, a person with Type I Diabetes Mellitus may be aware of a prognosis requiring a lower limb amputation. Such an event can change how they socialize, challenge their ability to work, and impact their roles such as caring for others.
Unexpected (e.g., sudden departure of a family member)	The unexpected passing or departure of a loved one due to incarceration can lead to maladaptive behaviors, such as detachment, aggression, and challenges in academics.	The unexpected move from their childhood community secondary to parental divorce can lead to maladaptive behaviors, such as detachment, leaving home, aggression, and challenges in academics.	Unexpected traumatic events may greatly affect well-being. For example, the sudden loss of employment can lead to anxiety, depression, substance use, aggression, and a poor outlook on life.

Isolated (e.g., single incident, such as a sexual assault)	Depending on developmental stage, an isolated traumatic event, such as a car accident, could lead to changes in personality or behavior requiring intervention. **Physical trauma** may result, such as hypersensitivity, even if the effects are temporary.	An isolated traumatic event, such as a sexual assault could lead to changes in personality or behavior requiring intervention. **Physical trauma** may result, such as hypersensitivity, even if temporary.	An isolated traumatic event, such as a home invasion for an older adult living alone, could lead to changes in personality or behavior requiring intervention. **Physical trauma** may result, such as hypersensitivity, even if temporary.
Pervasive (e.g., ongoing, such as repeated physical abuse or homelessness)	Pervasive trauma can have significant implications on development. For example, a child living in poverty or experiencing ongoing abuse may have **structural trauma** as a result, leading to **complex trauma**.	This may be a form of **complex trauma** that has significant implications on an adolescent's outlook on life. For example, ongoing abuse or sex trafficking may result in **structural trauma** and lead to challenges with establishing future goals.	Adults may experience **complex trauma** in the form of ongoing domestic violence, which can have cause **structural trauma** and interfere with their ability to establish future goals.

Intentional (e.g., neglect from a parent, physical or sexual assault)	Intentional trauma, such as the neglect from a parent, may lead to social-emotional issues, such as lack of trust in others, and detachment from others. **Structural trauma** may lead to **physical** and **complex trau ma**.	Adolescents who experience bullying by their peers may exhibit social emotional issues, such as lack of trust, and risk-taking behaviors. **Structural trauma** may lead to **physical** and **complex trauma**.	Spousal abuse or caregiver abuse of an older adult may lead to social-emotional issues that manifest as acute anxiety, distorted expectations, and detachment from others. **Structural trauma** may lead to **physical** and **complex trauma**.
Unintentional (e.g., natural disaster or pandemic)	Certain unintentional traumatic events represent a form of **social or cultural trauma**, such as pandemics or natural disasters, which can be very frightening to children due to a sense of loss of security. Feelings of helplessness and uncertainty becomes anxiety and stress. Acute stress can lead to PTSD if unaddressed. Children may display aggression, have problems sleeping, and difficulty concentrating.	Adolescents who experience unintentional forms of traumatic events, such as pandemics or natural disasters, can experience acute stress in response to the event. The effects of this type of **social or cultural trauma** may be revealed in changes in personality and behaviors such as detachment, avoidance, and aggression.	Systematic and organizational culture and policies can result in re-traumatization. This may be revealed in changes in personality and behaviors. Adults may also experience feelings of insecurity, guilt, and shame in response to this **social or cultural trauma**.

Directly experienced (e.g., poverty due to loss of employment)	Directly experiencing abuse, neglect, or exposure to a traumatic event has very strong implications of impacting development. It can impact typical brain development, affect emotional regulation, and lead to dysfunction in sensory processing.	In adolescence, the direct experience of trauma such as living in unsafe environments, experiencing abuse and neglect, or exposure to a traumatic event can negatively impact development and the establishment of future goals. The adolescent may isolate themselves, be aggressive, and have difficulty with academics.	There are several implications of directly experiencing trauma, such as abuse, loss, illness, isolated events, and poverty. Adults may have challenges with their activities of daily living, self-care, properly caring for others, and social interaction.
Indirectly experienced (e.g., shared experienced of a parent or observing the impact of injustices, such as unjustified killings)	Vicarious trauma can be a form of **intergenerational trauma**, such as living with a parent who experienced sexual abuse by a family member. For example, the parent may reveal aggressive and overprotective behaviors as a result of fear their child would experience the same abuse. These behaviors are based on the caregiver's personal experiences and views.	**Intergenerational, trauma** can impact an adolescent based on how their caregiver interacts with them. For example, a parent may reveal strict and aggressive behaviors towards the child secondary to their personal struggles with systemic racism and a history of violent attacks on family members. These behaviors are based on the caregiver's personal experiences and views.	**Intergenerational, or vicarious trauma**, can impact one's experiences and interactions with the world. For example, adults may reveal certain fears grounded in stories or norms set by their family, which are based on historical events. Family members can pass on a lack of trust, shame, and anxiety to their offspring.

Table 2. Examples of Distress and Eustress

Examples of Distress	Examples of Eustress
Financial stressors Work-life imbalance Illness or death Divorce Abuse/neglect	Work to complete a desired degree Marriage/wedding planning Birth Caring for a loved one Creating such as working on a desired project
Add your personal examples (consider both internal and external factors):	Add your personal examples (consider both internal and external factors):

ACTION ACUTE STRESS SCREENING TOOL ©

CHECK ALL THAT APPLY TO YOUR CLIENT/CAREGIVER FOLLOWING YOUR SESSION. ANALYZE YOUR RESULTS TO CONSIDER NEXT STEPS BASED ON CLINICAL REASONING AND TOOLS WITHIN THE WORKBOOK.

NAME:

DOB: DATE:

PARTICIPATION

THE CLIENT / CAREGIVER

- ☐ HAD DIFFICULTY RECALLING FROM MEMORY OR ANSWERING QUESTIONS
- ☐ APPEARED DETACHED/WITHDRAWN
- ☐ PRESENTED AS IRRITABLE OR HYPERVIGILANT

COMMUNICATION

THE CLIENT/CAREGIVER

- ☐ REPORTED INCREASED PAIN/DISCOMFORT
- ☐ SHARED RECENT STRESSORS OR TRAUMATIC EVENT
- ☐ REPORTED DISTURBANCES IN SELF-CARE SUCH AS SLEEP OR DIET

NONVERBALS

THE CLIENT/CAREGIVER

- ☐ STARTLED EASILY OR APPEARED UNCOMFORTABLE
- ☐ PRESENTED WITH REPETITIVE MOVEMENTS (E.G. TWITCHING, ROCKING, OR EXCESSIVE EYE BLINKING)
- ☐ PRESENTED WITH SENSORY SENSITIVITY OR SENSORY SEEKING BEHAVIORS

C: Create Growth

ACTION-from-Trauma approach promotes the use of *respect and empathy language,* as well as *gratitude and growth statements*.

Respect and Empathy Language	Gratitude and Growth Statements
Children	
• "What do you need?" • "Do you need a break?" • "How can I help?" • "All done? Or do you need more?" • "I want to help you." • "What you experienced is not okay. What support do you need?"	• "Thank you!" • "I like your hard work!" • "Wow! Look at how you grew today by finishing your work!" • "You have grown so much!"
Adolescents, Adults, and Older Adults	
• "That is really challenging, and I see you are upset. Can I suggest some strategies to assist with your anxiety?" • "Would it be okay for us to discuss how that made you feel?" • "While it may not have been the best choice, your response matches how you felt." • "How can I help you grow from here?" • "Did that make you feel uncomfortable? That was not my intent." • "I see that may not have been the best way to phrase that. What I meant was…"	• "That was brave of you." • "Your sharing shows your strength." • "Look at all you have done since and despite of…" • "That is a tough to talk about. I appreciate your openness and trust."

CLIENT WORKSHEET

ACTION GROWTH CHART

Age Range: Children

Objective: To highlight gains and progress toward growth

Directions: Based on the child's Growth Plan, list their ACTION goals on this sheet or on another document. Reflect on the progress the child has made toward these goals in a given time frame, such as during one class or therapy session, daily, or monthly. Write in the action the child performed that moved them toward their goal in each gardening box, moving from left to right. Adults can complete this worksheet on behalf of the child, but the child should be involved as much as possible. For younger children, you also need to consider caregiver goals. Use this chart to check in whenever you see opportunities for growth throughout the day. This activity is not meant to focus on any negative events or failures. Highlight even small gains!

ACTION goals for growth:

1. _____
2. _____
3. _____
4. _____
5. _____

ACTION Need Assessment Worksheet

Objective: To acknowledge trauma and identify areas of need and resources to support treatment planning

Directions: The first step toward growth is not instant healing. It is acknowledging where the person and family are in the given moment. Are they able to acknowledge their trauma? Do they focus through a trauma lens impeding their ability to acknowledge areas of strength and resilience? Are their necessary supports and resources you can assist in obtaining? Upon re-assessment, return to this worksheet to determine growth.

Acknowledgment of strength, resilience, support, and available resources	**Acknowledgment of the trauma** List all types and categories of trauma, as well as what support is needed	**Interdisciplinary Team** Who is needed to move toward balance?

- **<u>Client Activity</u>**
- **A-G-E Breathing**
  - **A**wareness
  - **G**athering
  - **E**xpanding

Age Range: All

- **Objective:** To practice narrowing and expanding the focus of mindful awareness

Directions: Envision the following figure is an hourglass. Just like an hourglass expands at the top, narrows in the middle, and expands again at the bottom, you will follow three steps to widen the focus of your attention, narrow it, and then widen it again. Start by bringing your attention to the present moment. Broaden the focus of your attention to acknowledge anything you are experiencing in this moment, including any thoughts, sensations, or feelings (*awareness*). Next, narrow the focus of your attention by bringing your attention to your breathing. Focus on the inhale and exhale of each breath (*gathering*). Finally, expand the focus of your attention once more and become aware of your whole body, recognizing the sensations throughout your body, face, and head (*expanding*).

T: Teaching Neuro!

Reticular Activating System and Attention

- Helps to regulate central nervous system activity- Mostly all sensory information goes through the RAS
- Regulates how much stimulation goes into the brain- Impacts arousal
- Modulate what comes out of the brain-reflexive responses, and attention
- One of the CNS's filtering mechanisms
- Sends incoming information to be processed to generalize with current knowledge or reject to produce a "behavior"

What Impacts the RAS?

Light	Light and the Pineal Gland (Melatonin)
Sound	Sound and Movement the Semi-circular Canals (Vestibular and Auditory Systems)
Touch	Touch, Deep Pressure, and the alertness (Tactile and Proprioception)

Test Your Reticular Activating System

How well do you filter out unnecessary information?

Can you filter out too much information?

How was your arousal after watching and listening to the video?

RAS and Dysfunction

Lack of Filtering

- Possibly under-developed RAS
- Overloading the Brain with too much stimulation
- Impulsive reactions
- High threshold (requires a lot of stimulation to project to the areas for attention and memory)
- Potential connection to ear infections and damage to the semi-circular canals
- Seeking of movement and sensory stimulation = “Staying awake”

Overactive Filtering

- Possibly over-developed RAS
- Poor attention to task (blocking out most external stimulation to focus on internal thoughts and desires)
- Low registration
- Lacks engagement
- Arousal could be high secondary to sensory overload
- Low threshold (limited tolerance to process stimulation at once)
- Avoids movement and sensory stimulation= “Desiring to shut down”

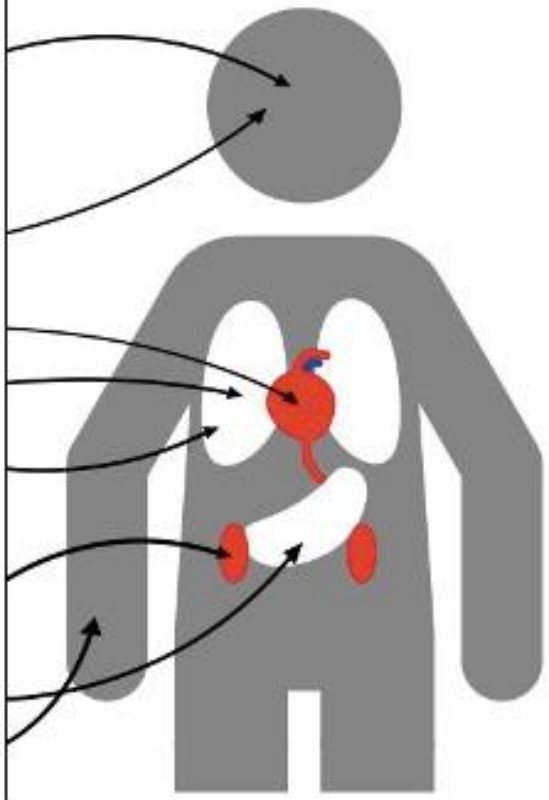
What Happens When We Feel Threatened or Unsafe?

- Children who avoid stimulation may have discomfort and become anxious in unpredictable environments
- Children who seek stimulation may also have discomfort hence why they seek preferred sensory input for comfort and fear it being taken away
- Children who have poor motoric output (retained primitive reflexes) may have anxiety around their challenges and fear social interaction or engaging in required tasks

"FIGHT OR FLIGHT"

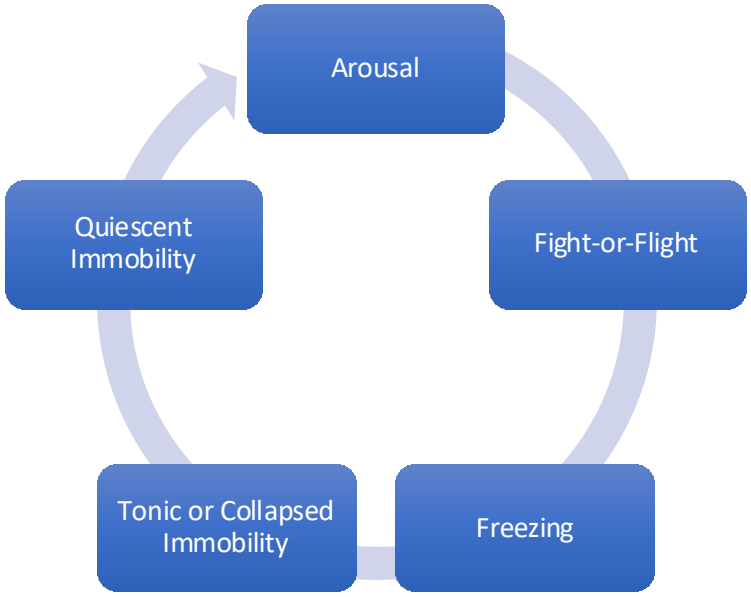
ACUTE STRESS RESPONSE

- Increased blood pressure
- Increased blood flow to brain
- Dilation of pupils
- Bronchial dilation
- Increased blood flow to extremities
- Slowing of digestion
- Increased production of neurotransmitters, stress hormones, and catecholamines



- Increased breathing
  Increased heart rate
- Heightened senses
- Hypervigilance
- Increased perspiration
- Decreased production of saliva
- Increased blood flow to ski
- Changes in body temperatu
- Improved short-term memo
- Increased alertness

Fear Conditioning Defense Cascade



- When fear conditioning occurs, individuals can present with *physical trauma* even in the absence of a true threat or injury. They perceive the need to protect themselves.
- They may have a reduced reflex threshold secondary to pain and exhibit enhanced nociceptive reflexes (e.g., blinking, enhanced limb withdrawal reflex).
- They may also exhibit exaggerated startle responses, physical aggression, and elopement or escape behaviors.
- Children in particular may manifest these behaviors by scratching, biting, or rolling on the ground, kicking, and screaming. (They may also run away from home.)

(Darwin, 1872; Wallwork, Grabherr, O'Connell, Catley, & Moseley, 2017; Gibbs & Harley, *In Press*.)

“BEHAVIOR IS THE MANIFESTATION OF FEAR AND ANXIETY”

What it Might Look Like

ACTION-
FROM-
TRAUMA
APPROACH

THE FIVE DIMENSIONS OF TRAUMA MODEL

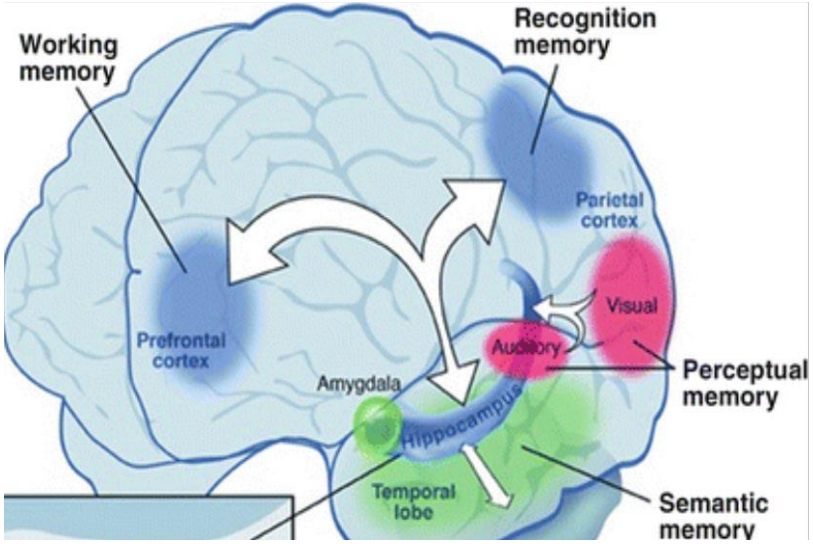
The condition of trauma is dynamic. An individual, population, or community can be exposed to various forms of trauma. Ultimately, the exposure and experience impacts neurological functioning. Hence, this model proposes that structural trauma (i.e., changes on the neurological level) occurs as a result of the other forms of trauma.

The more exposure to the various forms of trauma, the severity of structural trauma increases.

Each form of trauma has secondary conditions as revealed in the model. Acknowledgment of the complexity provides a platform for addressing the needs of the individual, population, or

Trauma and Memory

The Sensory Aspects of the Brain Are Involved in the Storage of Perceptual and Recognition Memories



Trauma and Memory Cont'd

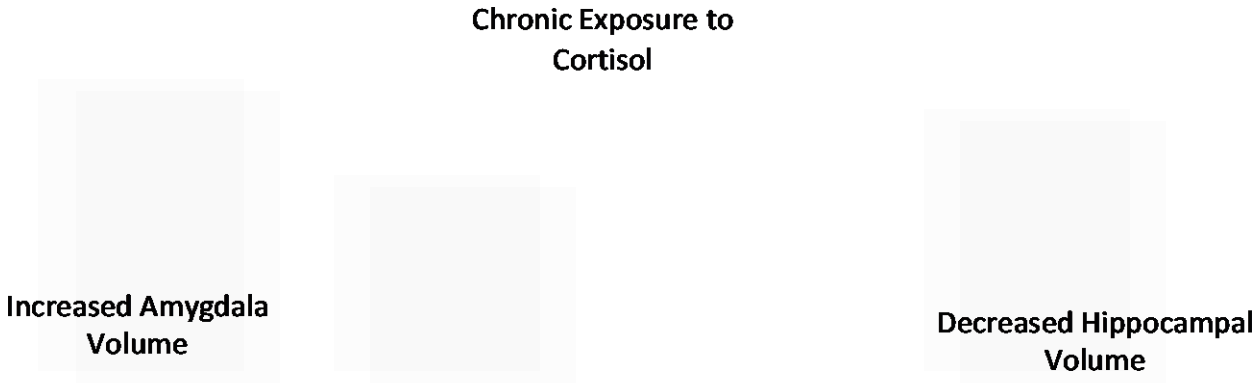
- Given that trauma can also result in hyperactivity in the lateral and posterior parts of the brain**, trauma can impact working memory** as well, which is required for day-to-day tasks.

- With decreased activation of the anterior portions of the brain, individuals with a **trauma history can be easily triggered by sensory stimuli and contextual factors**—all the while lacking explicit details of traumatic events.

Stress and the Brain

- As the body is exposed to prolonged levels of stress hormones, the hippocampus decreases in volume, and the amygdala increases in size.
- The brain, body, and sensory systems become overwhelmed in the presence of prolonged stress.

(Krugers et al., 2010)

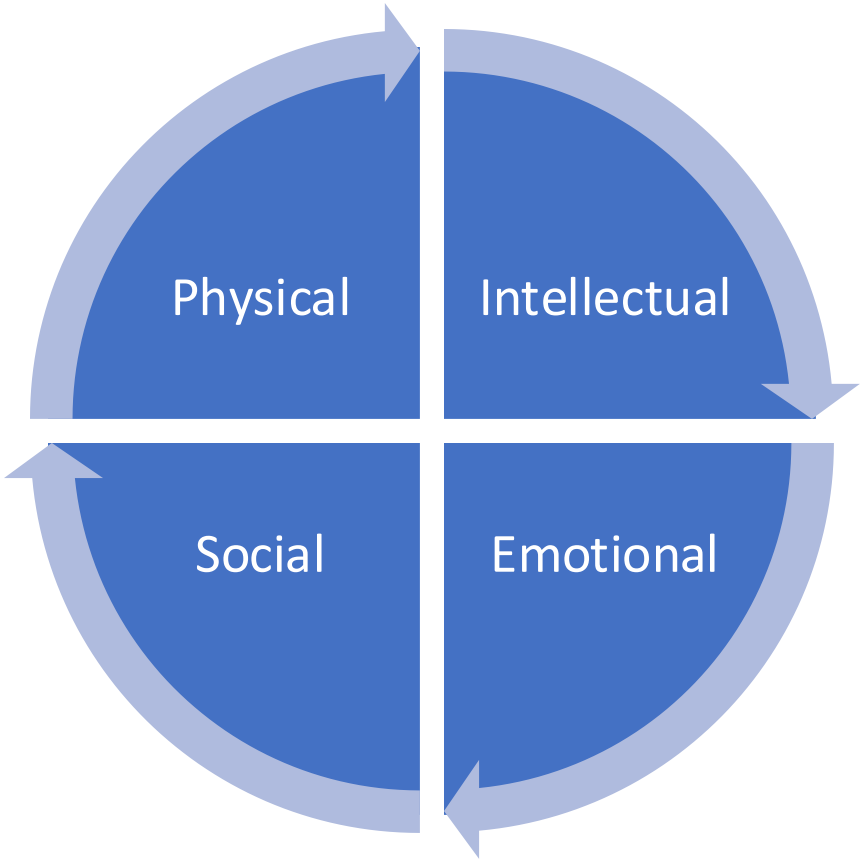


The Emotional Brain Take-Over

Teaching Younger Children About Their Brain

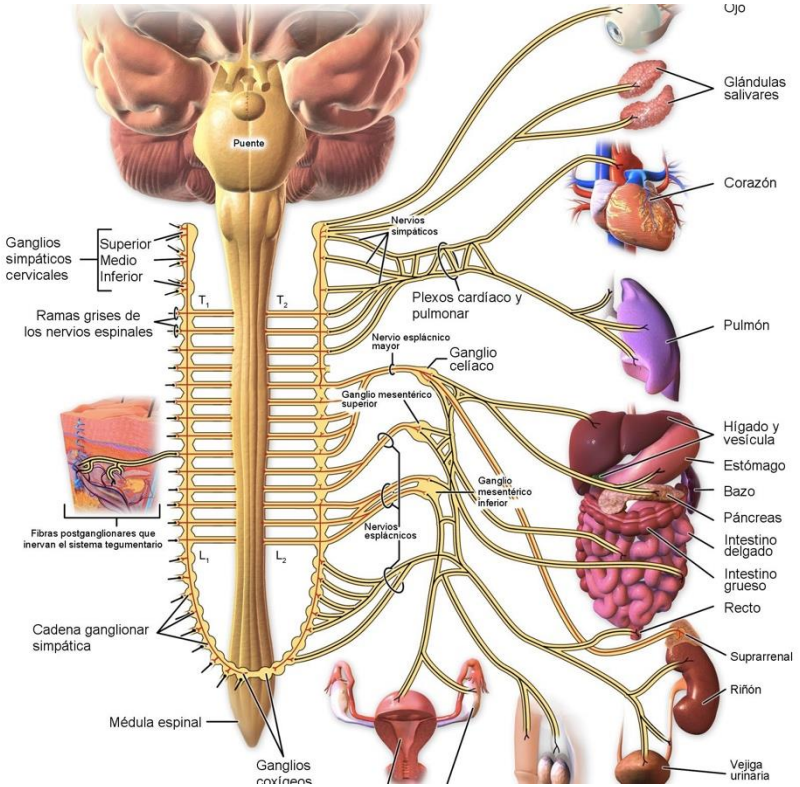
- There is a part of our brain that is really smart and playful, kind of like a small dog.
- Sometimes, things happen that make that part of our brain angry, mad, sad, or afraid. It has trouble listening, playing, or learning. We do not feel like ourselves. That little dog starts to get really loud and active.
- That part of your brain tries to get happy and will run around, bark, or jump—whatever it takes to get happy! It loves feeling good!
- Like having a small dog as a pet, you have control. Not only can you train that part of your brain to feel good, but you can feel good too! You have a leash and other training tools we will share.

PIES: Reactions to Dysregulation, Stress, and Trauma



Physical Reactions

- Sleep
- Diet
- Hypersensitivity
- Physical Aggression
- Feeling ill (unexplained or actual sickness)



Sensory Dysfunction

Atypical:

- Auditory processing
- Atypical Visual processing
- Vestibular processing
- Proprioception processing
- Tactile processing
- Interoception
- Thermoreception

Gustatory Sensitivity

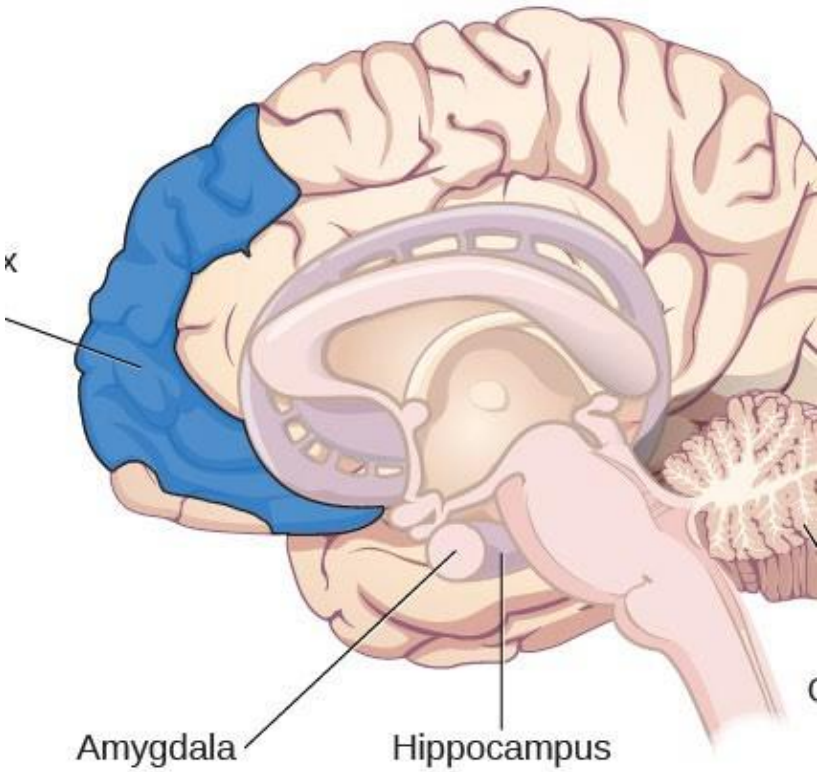
Olfactory Sensitivity

Increased nociception

Intellectual Reactions

- Front Part of the Brain versus Reptilian brain

- Challenges with:
  - Concentration
  - Problem Solving
  - Remembering



Emotional Reactions

- Anxiety
- Emotional outbursts (anger, sadness, fear, etc.)
- Challenges trusting others
- Fear of being apart from family members
- Distortions (unexplained or warranted fear)
- Challenges making goals for the future

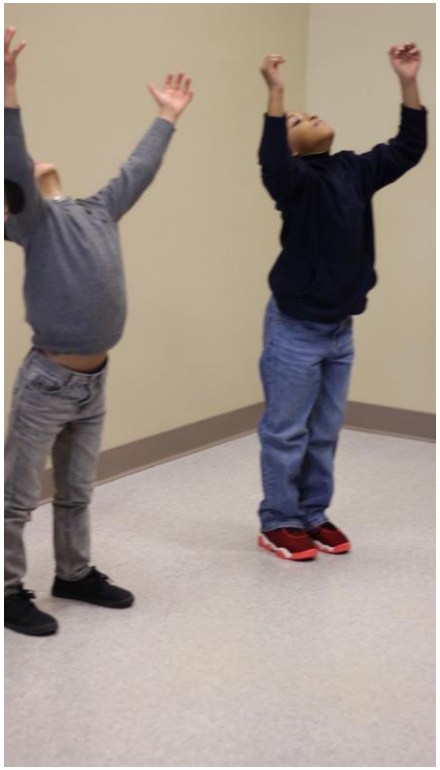
Social Reactions

- Isolating oneself
- Lack of interaction or engagement
- Attention seeking
- Outbursts and disagreements with others
- Regression (earlier stage of development)
- Challenges with change

Physical Interventions

- Diaphragmatic Breathing
- Powerful Iliopsoas Stretches
- Ear and Eyelid massage
- Eye Yoga
- Acupressure Tapping
- Valsava Maneuvers
- Inversion
- Rhythmic Activity

(Gibbs, 2017; Greeson, Juberg, Maytan, James & Rogers, 2014; Shearer, Hunt, Chowdhury & Nicol, 2016; Cresswell, 2017)



Hands On Activities to Address Stress

The Dopamine Connection

Crossing off lists

Crumbling the to-do sticky notes

Gratitude List

Body Scanning

Intellectual Interventions

- Schedules
- Routine
- Assistive Technology (apps)

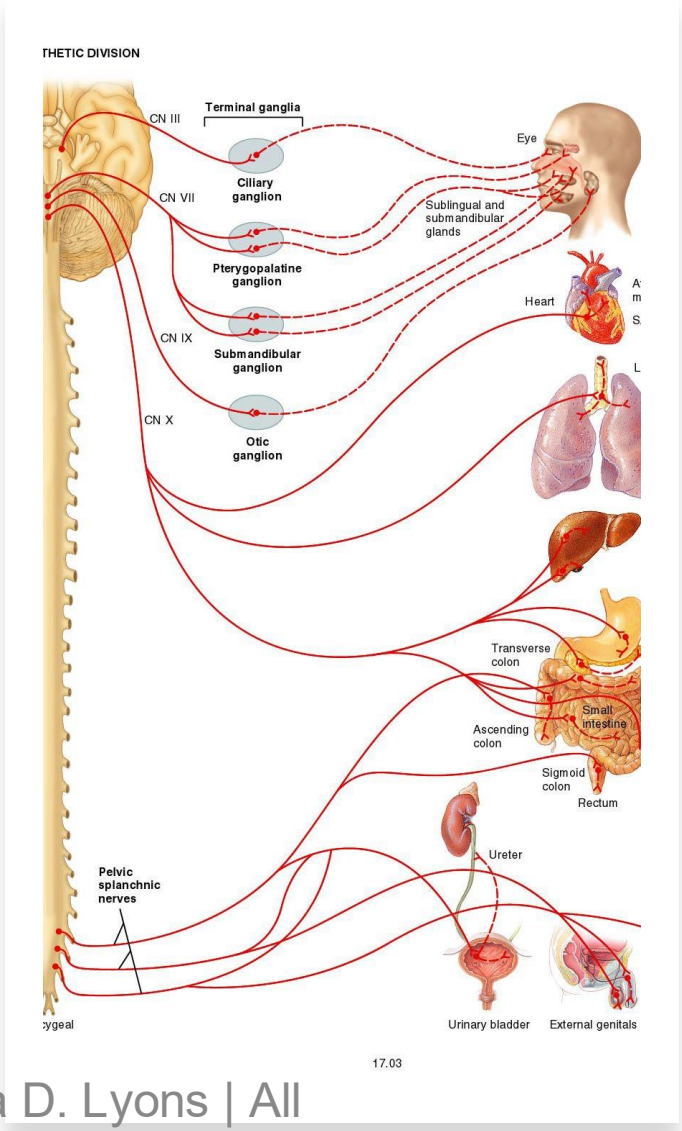
Emotional Interventions

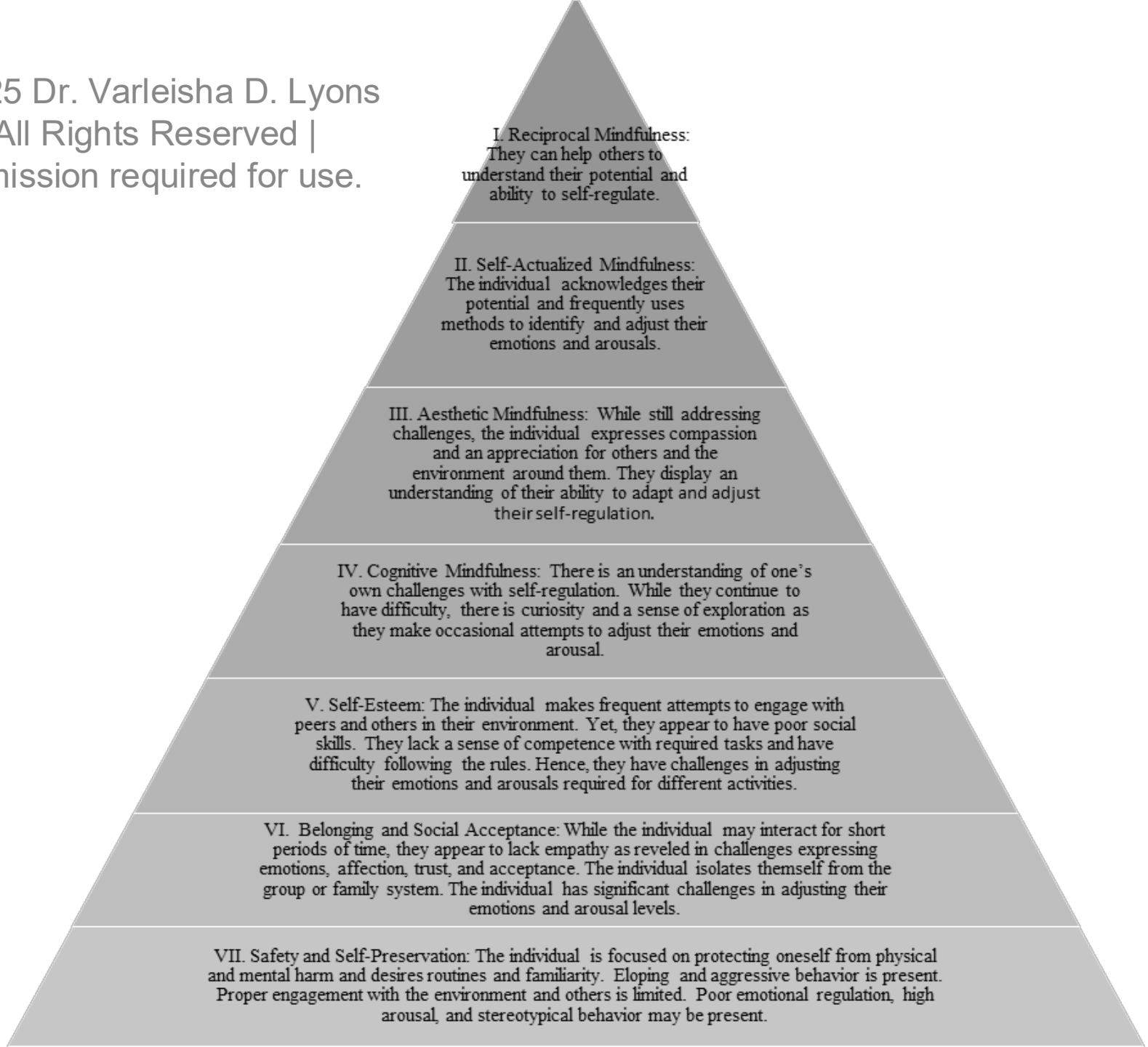
- Transition planning: Preview
- Self-Regulation and Mindfulness
- Mindfulness vs. Meditation
- Emotional Freedom Technique
- Social Stories

Social Interventions

- Virtual lunch hours
- Social meetups
- Check in and Check out (in person or virtually)
- Peer Check-ins (for staff & parents; peer buddies for students)
- Physical Distancing Meetups

Gibbs Self-Regulation and Mindfulness Approach





Seven-Level Self-Regulation and Mindfulness Hierarchy Across the Lifespan

Level	Neural Functioning	Considerations for Interactions and Interventions
Levels 6–7: Foundational level	Brainstem Level Functioning: Reactive versus responsive engagement with others and their environment **Body Signals and Actions:** • Protective flexion positions • Arms and legs close to the body • Eloping behaviors • Hiding (e.g., wearing a hooded jacket with head covered or sunglasses indoors) • Preferring specific clothing, food, and ridged routine • Unsafe risk-taking behavior • Aggression • Repetitive and stereotypical movements	Activities should be body-focused and less top-down. At this level, the person primarily utilizes neurological structures for arousal and safety preservation. Decrease environmental stimulation (including overuse of verbal directives) and consider using gestures or simple verbal cues to communicate. Provide sensory rich activities, ensuring safe boundaries and exits due to eloping behaviors, and develop safe, comfortable spaces. **Provider/Caregiver/Educator Considerations:** At this level, it is difficult to listen and follow directions, especially when other things are occurring around in the environment. Try to decrease noise and clutter in the environment, avoid speaking too loudly, and don't offer too many activities. They may need your help to provide or identify sensory input to calm and engage. This may include input to the skin, deep pressure to the muscles, controlled movement, aromatherapy, rhythmic music, and activities. Be careful to set expectations and open communication for scheduling and changes in plans.

Purpose:
To track application of the daily targets for the SAM program. Take a tally of activities performed.

Child's Name: _____ Person Completing Sheet: _____

Setting (i.e. school, home, clinic): _____ Date: _____

TARGET	AM	LUNCH	AFTERNOON	PM (if applicable)	BEDTIME (if applicable)	NOTES
• TOUCH AND HEAVY WORK						
• HYDRATION AND ORAL MOTOR						
• METRONOME AND TIMING						
• RIGHT AND LEFT BRAIN INTEGRATION						
• PATTERNS AND REPETITION						
• BREATH AND VALSALVA						

Connection of the ANS

- Vagus, Vagus, Vagus!
- Longest CN in the Body
- Sensory and Motor
- Vagovagal reflex
- Has both Parasympathetic and Sympathetic divisions

Innervation

- **Organs**
- Pulmonary Plexus
- Esophageal Plexus
- Cardiac
- Stomach
- Gall Bladder
- Pancreas
- Small Intestine
- External Ear
- Part of the brain meninges
- Connection to extraocular motor muscles via connection to the trigeminal nerve; oculocardiac reflex

- **Muscles**
- Cricothyroid muscle: Tensor muscle of pharynx for phonation
- Levator veli palatini muscle: Elevates soft palate to prevent food in pharynx
- Salpingopharyngeus muscle
- Palatoglossus muscle: Muscle of the tongue; not Hypoglossal but Vagus nerve
- Palatopharyngeus muscle: Pull up pharynx to cover food while eating
- Superior, middle and inferior pharyngeal constrictors
- Muscles of the larynx: ;**Speech**

(Dutschmann , Bautist, Mörschel, & Dick, 2014)

Self-Regulation Through PNS Activation!!!

- Valsalva Maneuver
- Oculocardiac Reflex
- Outer Ear Stimulation
- Cold
- Diving Reflex
- Inversion
- Neck Extension Exercises

And massage (Proprioception)

- Gargling, Singing, and 'Om'!!!!

(Fanselow, 2013)

THE SAM BOX

"TURN DOWN THE VOLUME"

Tap into the Vagus Nerve and the System for Regulation

1. Pretzel Squeezes: (You can use a metronome with all of the four exercises)

Tap into the Vagus nerve through the ears. Cross your arms in front of the body. Grab as much of the the lower half of the ear as possible, primarily on the lobe. Place thumbs towards the front. Gently pull down counting slowly to 10. Repeat 3 times.

2. Blow your trumpet:

Trigger a Parasympathetic Response through a Valsava. Place your the tip of your thumb into your mouth. Without letting any air escape, fill your cheeks as if you were going to blow your trumpet (your thumb). Hold for 5-10 seconds. Repeat 3 times.

3. Hibernate:

Sitting on the floor, or even in your chair, bring your chest and knees close together. Wrap your arms around your legs and squeeze. Hold for 10 seconds counting and breathing slowly.

4. Eyelid Massage:

End by taking two or more fingers. Close your eyes and gently press and move your fingers in a circular pattern 5 times both directions. Be sure to count slowly and take deep breaths.

Progressive Muscle Relaxation

Age Range: Children

Objective: To decrease stress and pain within the body

Directions: In this exercise, clients will practice tensing and relaxing various parts of their body as they work from their head down to their feet. You can use the following script to guide clients through the exercise or have them complete the steps on their own. Use precautions for any injuries. Do not perform if contraindicated.

1. Have the child get into a comfortable position, such as lying down.
2. Place a soft stuffed toy on their belly. Ask them to take a slow, deep breaths—as if they were going to smell a cupcake with a candle on top. Then have them "blow out" the candle. Do this a couple of times to start.
3. Provider Script

Inversion!!!

- Stimulate glands, lymphatic drainage, and digestion
- -> Improved immune system
- Blood flow and oxygen to the brain
- Input to the spine
- Decreases SNS Response
- Activates Vagus nerve
- Increase relaxation and muscle release
- Improved sleep

Why Mindfulness?

Case Study

- Some activities are preparatory for occupation-based activity!
- Two videos
- Cole: **“Trumpet” blowing and belly breathing**

RAS Modulation: Why Movement and Music Can Help Learning

ACTIVITY

https://drive.google.com/file/d/0BzEdaK9aEVWbdWpvNm14R1lGekE/view?usp=sharing&resourcekey=0-YKbpFZKZLiUHWwdGaERI7g

The SAM Box

SAM
BOX

Quick Intervention

Lava Lamp

Aim: To decrease hyperactivity and inattentive behaviors and provide an organizing activity to enhance functional participation

Suggested Starting Hierarchy Level: Midlevel to high

Appropriate Arousal Level: High (energetic or overreacting)

Appropriate Threshold Level: High (hyperactive) or low (hypervigilant)

To start, you will need:

- Cooking oil
- Food coloring
- A water bottle full of water
- A funnel
- An antacid or other fizzing tablet

How to Make A Smell Sac

Items needed:

- A small organza bags
- Essential oils (lavender and wood smells to calm, citrus smells to alert)
- Dry rice
- Coffee beans

Directions:

1. Place the dry rice inside the organza bag.
2. Sprinkle a few drops of the essential oils inside.
3. Be selective with the scents you choose based on the child's arousal level and threshold.
4. You can use multiple bags to explore the child's preferences.
5. Have the child smell coffee beans in between smelling the various oil-scented bags.

Contextual Sensory Intervention

PROVIDER HANDOUT

ACTION CONTEXTUAL SENSORY INVESTIGATION

Scan the environment, starting with the floor and then moving to the perimeter, ceiling, and finally the space within the room. What does the client prefer? What do they need to perform at their optimal level? It may not be what you desire. They might require noise to focus and attend, or they might need visual stimulation or movement to have a prolonged conversation. What changes can you make in accordance with these preferences? Consider the following from their perspective by asking guiding questions or observing their reactions.

- Is the artificial lighting too bright? Can you use natural light or a floor lamp?
- Are there decorative items on the ceiling that may be a distraction or irritant?

- What electronics are in the space and in use?
- Are the screens producing high levels of blue light?
- What is the volume level in the space? Is it preferable?

- What decorations are on the walls? Are they visually distracting or stimulating?
- Does the room feel closed-in and lack ventilation?
- What other individuals are in the space? Do they provide support or distraction?

- Does the room feel comfortable?
- Does the positioning of the seats allow them to feel safe (e.g., facing the foor versus having their back to the door; sitting to see the location of others)?
- Are there a lot of objects of furniture?
- Does it feel too sterile?
- What smells are in the space?
- Are the smells comforting, or could they cause distress (e.g., perfume/cologne, natural odors, air fresheners)?

- What type of flooring is in the room?
- Does it produce an echo or loud noise when walking or moving chairs?
- When doing floor-based activities, does the flooring produce discomfort or irritation?

Light and Arousal

Supportive Environment? Or overstimulating?

Amazon.com

Classroom Sensory Nooks

Contextual Organization

Clients can decrease stress and improve efficiency by having the environment set up and organized for each activity they need to complete. For example, if a parent needs to assist their child with homework, or a child needs to perform their own homework, they can have all the necessary items (e.g., pen, paper, highlighter, calculator, etc.) in a drawer near their desk or within specific containers. The containers can be inexpensive, such as shoe boxes.

That way, they can avoid having to search for the items when needed. Similarly, contextual organization can support successful completion of for morning self-care tasks. For example, identify clothing to wear the night before. Then, place needed items for the morning in convenient locations for quick access (e.g. hanging them on the closet door). Utilize a similar method for other needed items for the next morning (e.g. locate your keys and wallet and place on a tray). In the kitchen, continue such organizing methods. Consider putting things on the counter as visual reminders and plan meals ahead. This could include meal prepping. In addition, you can place shopping lists, recipes, and reminders on cork boards or stickies on the wall nearby.

Case Example:
Appraise your Knowledge

Does the child have sensory dysfunction? Explain

Does the context/environment support his needs or challenge him? How?

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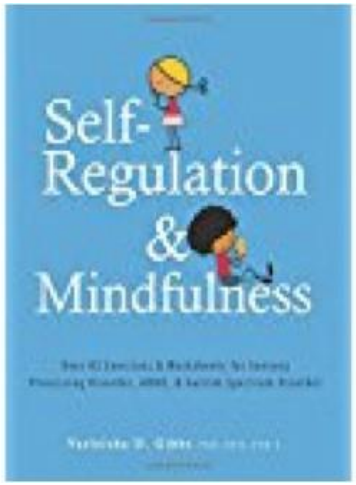

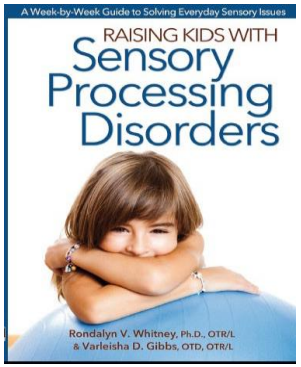

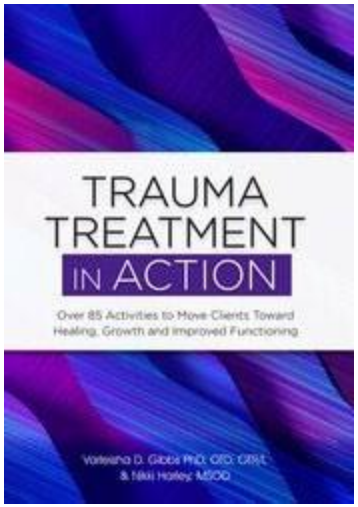

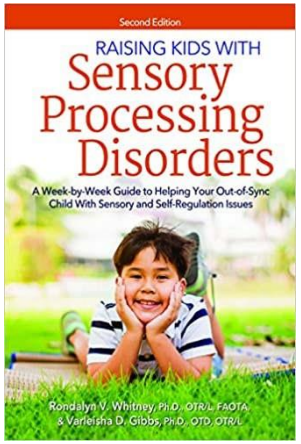

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