LEDucation
Trade Show and Conference

Designers Lighting Forum

I Can't Hear You Because the Lights are Flickering: Managing Sensory Needs in Neurodivergent People

Cana Sarnes, MA

Date

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Learning Objectives

At the end of this course, participants will be able to:

1. Participants will be able to identify the brain structures responsible for sensory processing and describe how those processes work

2. Participants will be able to identify the causes of sensory distress in people, especially as it pertains to lighting design

3. Participants will be able to workshop solutions to sensory distress in people, both from a lighting perspective and from a systemic conference-wide perspective

I Can't Listen to You Because My Shirt is Too Itchy: Sensory Needs of Neurodivergent People

Cana Sarnes, MA
The Neurodiversity Collective, LLC

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Welcome!

Who am I?

What are our goals today?

- Overview on sensory processing / disorder (SPD)
- Examples of neurodivergent brains (ADHD, Autism, Gifted/2e, SLD)
- Workplace adaptations

Slides

Questions

Exercise

Sensory Areas

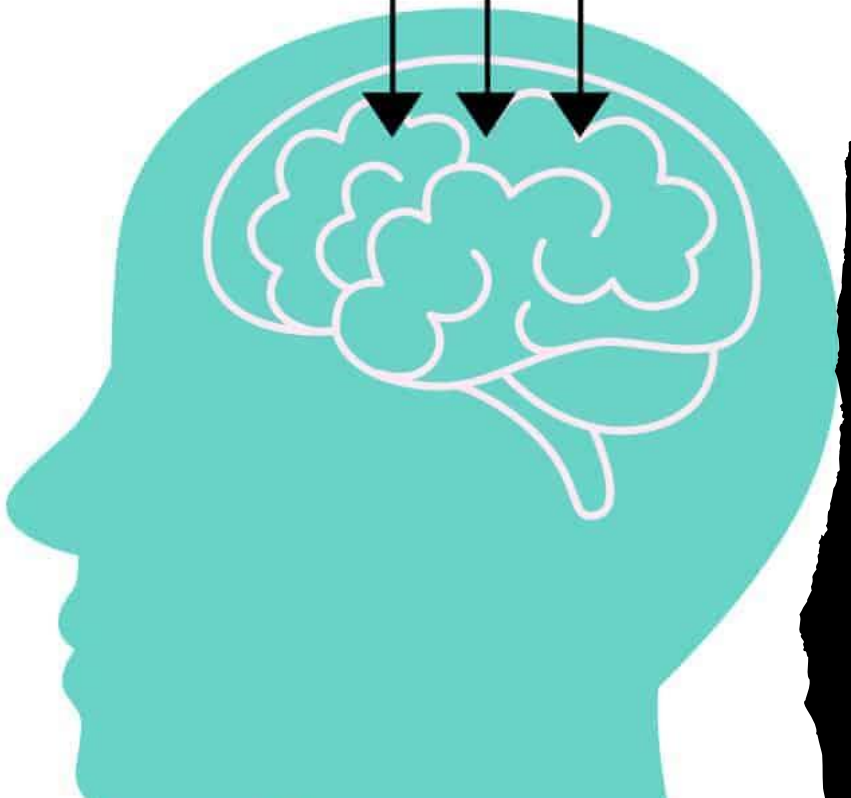
- Sight
- Hearing
- Taste
- Tactile/Touch
- Smell
- Proprioception – body location
- Vestibular – smooth movement
- Thermoception – temperature
- Equilibrioception – balance
- Nocioception – pain

Sensory Processing

- "the neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment”
  - Anna Jean Ayres (1972)
- Our brain is constantly taking in sensory information
- Disorder - a condition where multisensory integration is not adequately processed in order to provide appropriate responses to the demands of the environment
  - DSM-5-TR? ICD-11?

SENSORY ISSUES ARE A RESULT OF...

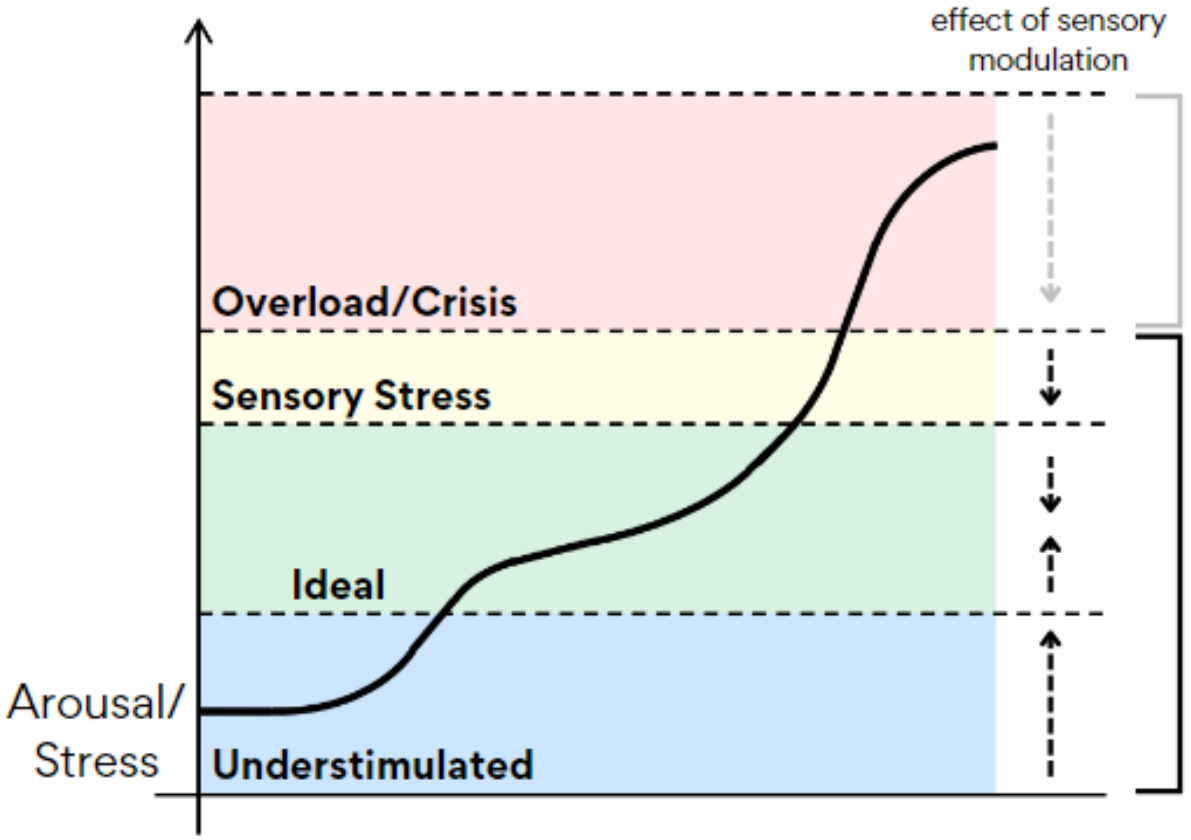
- Overprocessing sensory input
- Underprocessing sensory input
- Sensory input is lost in transit (low registration)



Where do the Problems Happen?

What Is Sensory Overload?

Individuals with sensory needs are more susceptible to becoming **overwhelmed** and entering a **crisis** state



Once in overload or crisis, sensory modulation is much less effective

Sensory modulation allows patients to maintain ideal sensory stimulation and successfully self-regulate

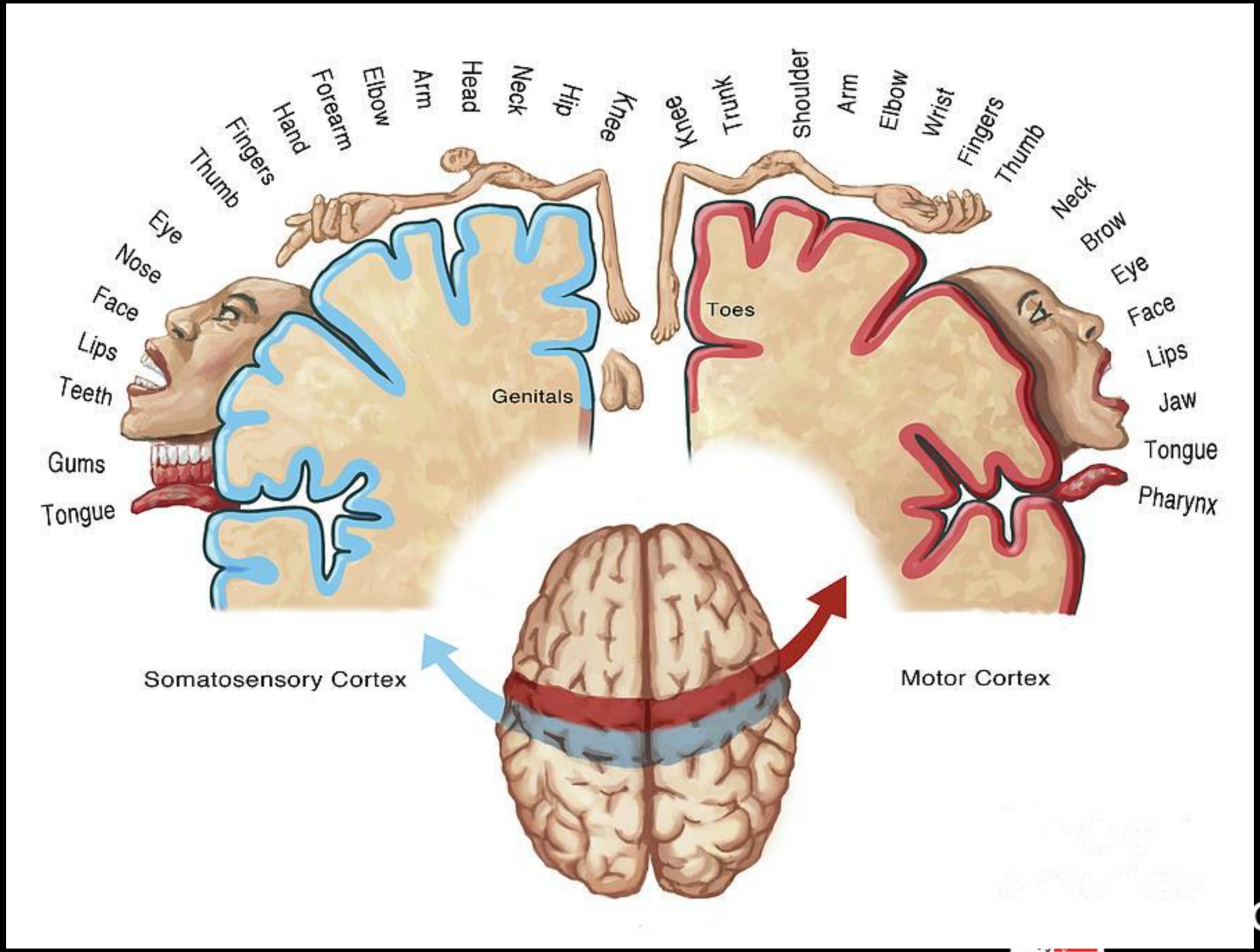
This is why the best approach is to **prevent sensory crisis** through sensory-informed care, rather than focus on managing sensory crises using more extreme and potentially traumatic measures (restraining, sedation, etc.)

adapted from:
Adams-Leask 2018, *Australasian Psychiatry*
Champagne 2011, *Sensory Modulation and Environment*

Case Example: Helen

Parietal Lobe

- Integrates sensory information across brain
- Spatial sense and navigation – proprioception
  - Homunculus – “little man”
- Mechanoreception – major sensory inputs from skin (touch, pain, temperature, location)
- Language processing (Wernicke’s area)
  - Apraxia
  - Dyslexia
  - Dyscalculia
  - Agnosia


Eye
Nose
Face
Lips
Teeth
Gums
Tongue
Thumb
Fingers
Hand
Forearm
Elbow
Arm
Head
Neck
Hip
Knee
Genitals
Toes
Knee
Trunk
Shoulder
Arm
Elbow
Wrist
Fingers
Thumb
Neck
Brow
Eye
Face
Lips
Jaw
Tongue
Pharynx
Somatosensory Cortex
Motor Cortex

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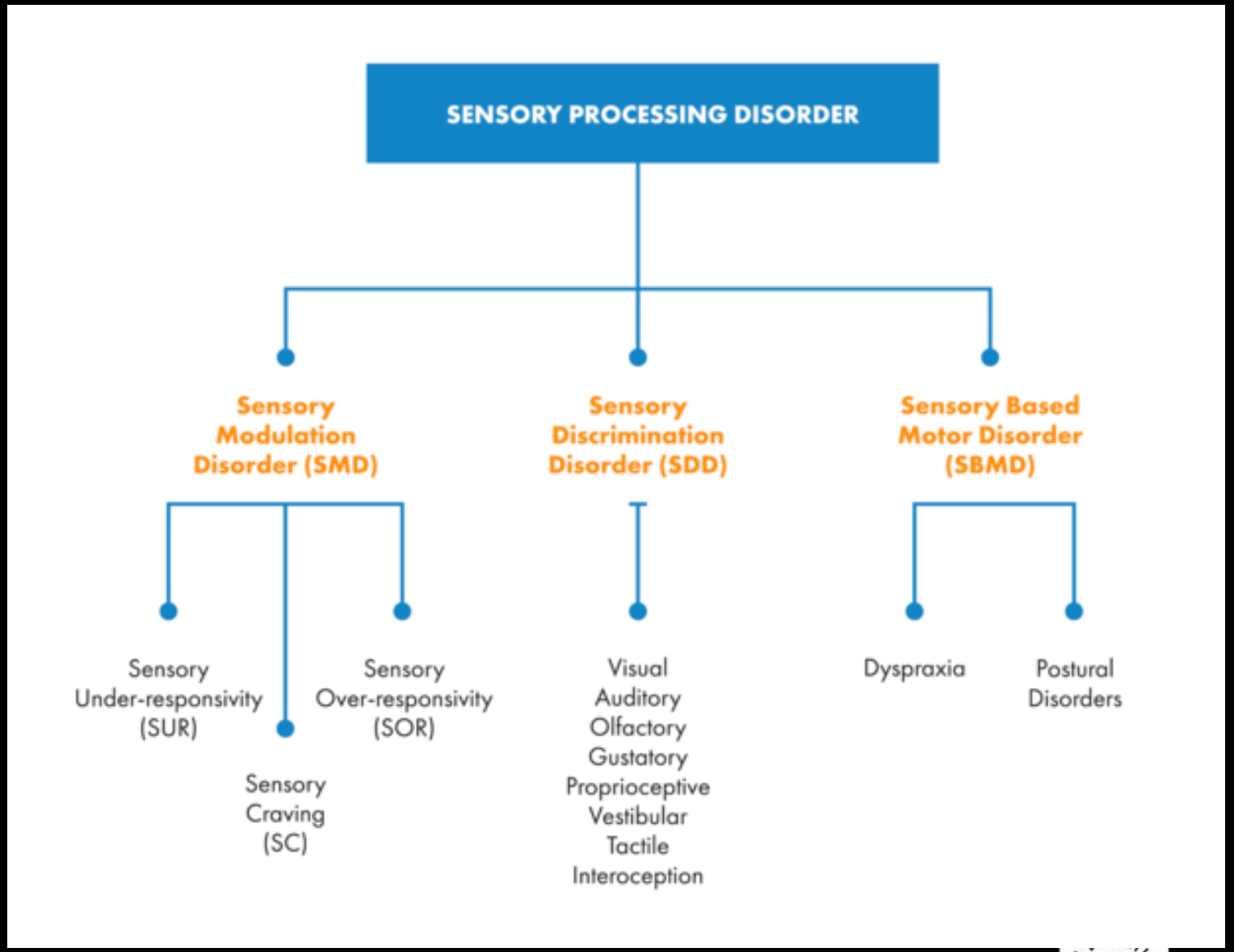


Examples

THE FORK

ORDER A PIZZA

Who has sensory needs?

- Sensory challenges occur when the brain is not able to properly respond to the external stimulation of the world
- The brain is typically able (and designed) to be able to respond to sensory stimuli
- Challenges are more common in neurodivergent individuals – people with different brains (i.e., ADHD, gifted, Autistic, dyslexic)

SENSORY SEEKING VS. SENSORY SENSITIVE

I could bounce on a trampoline &
spin in circles on the tire swing all day long

I like to smell things

I love having my hair brushed or played with

I love to play with the lights and turn them on and off

I chew on everything in sight. I love crunchy foods

I enjoy making lots of noise – the louder the better

I love being tickled and massaged

I don't notice if my clothing is disheveled or not on right

I hate wearing shoes

Tackle me, roll on the floor with me, give me bear hugs

I love taking risks, jumping from high up and crashing into things

I am scared of trampolines,
monkey bars or to swing high

I dislike having my hair brushed

I hate certain food textures so I'm a picky eater

I close my eyes in bright lights

I cover my ears to loud noise

I'm very sensitive to smells

I take out the tags in my clothes and there's some fabrics I won't wear

I don't like being tickled

Don't touch me

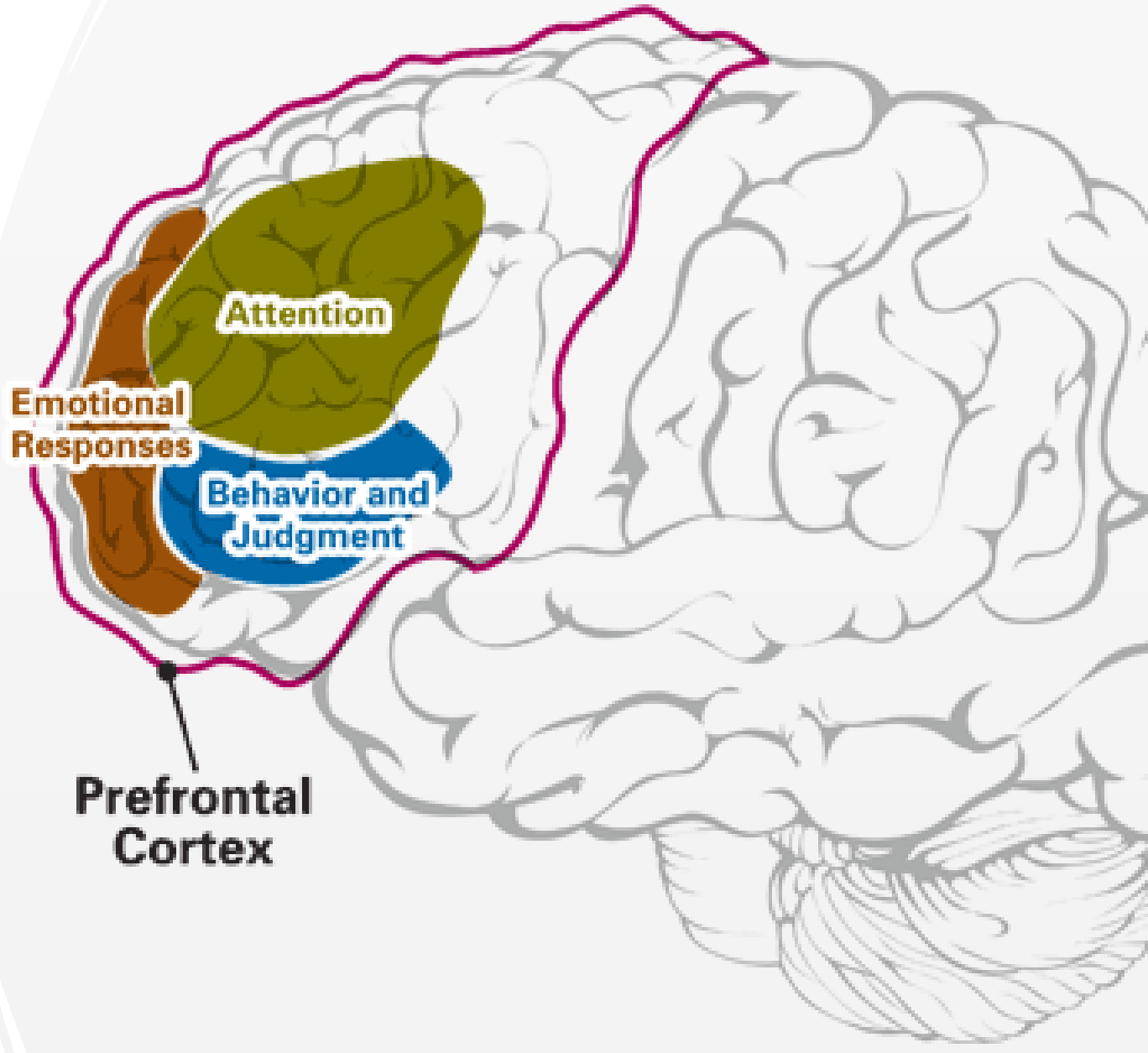
I'm really cautious with every step I take

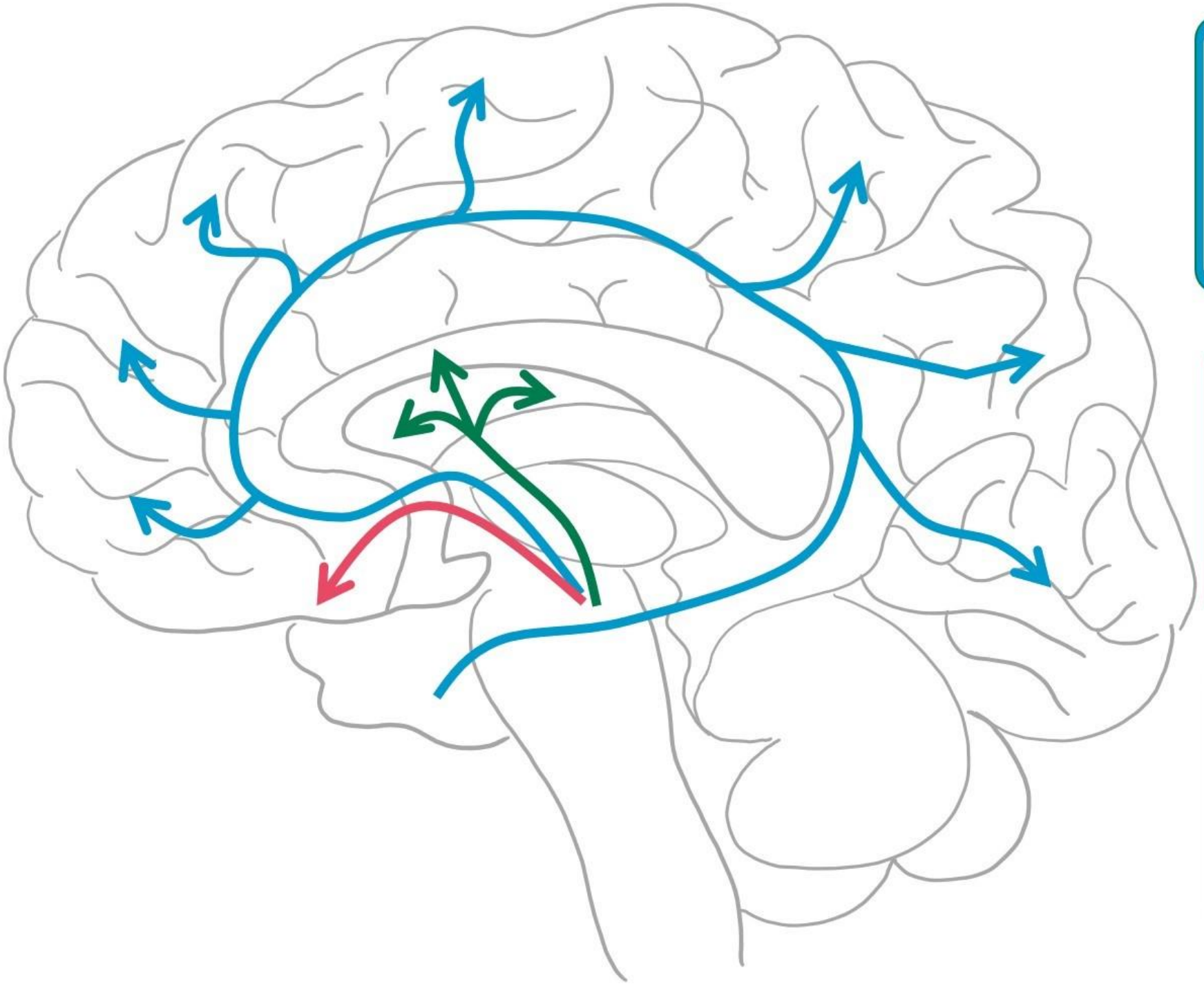
I hate being barefoot

Miracle Maker Mom

Prefrontal Cortex (PFC)

- Located in the Frontal Lobe
- Executive Functioning Skills
  - Planning
  - Follow through
  - Task initiation/completion
  - Self-regulation (emotional)
  - Time management
  - Attention
- Behavioral Inhibition





MESOCORTICAL

Cognition, Memory, Attention, Emotional Behavior, & Learning

NIGROSTRIATAL

Movement & Sensory Stimuli

MESOLIMBIC

Pleasure & Reward Seeking Behaviors; Addiction, Emotion, Perception

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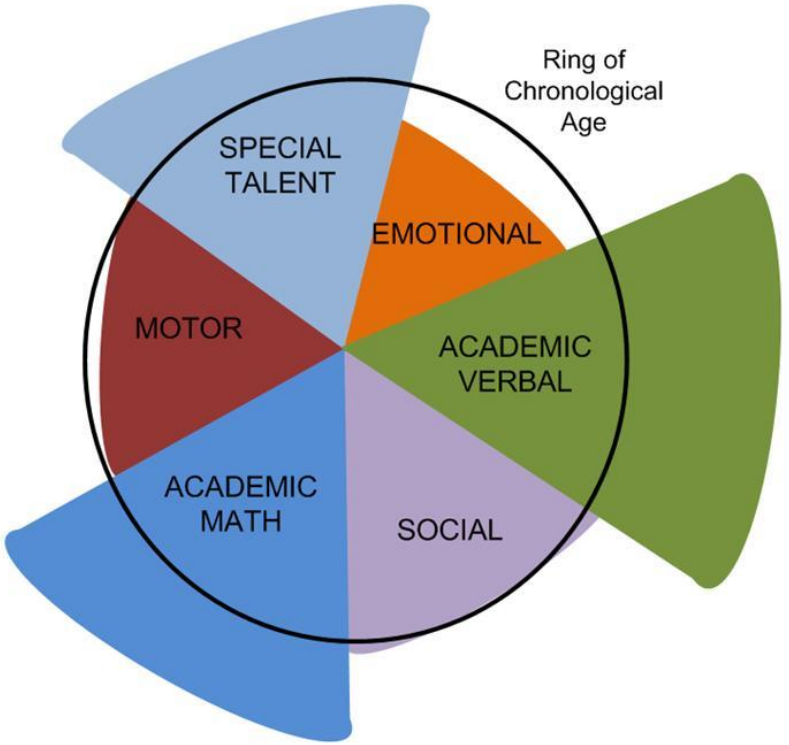
Asynchronous Development

Areas of Development



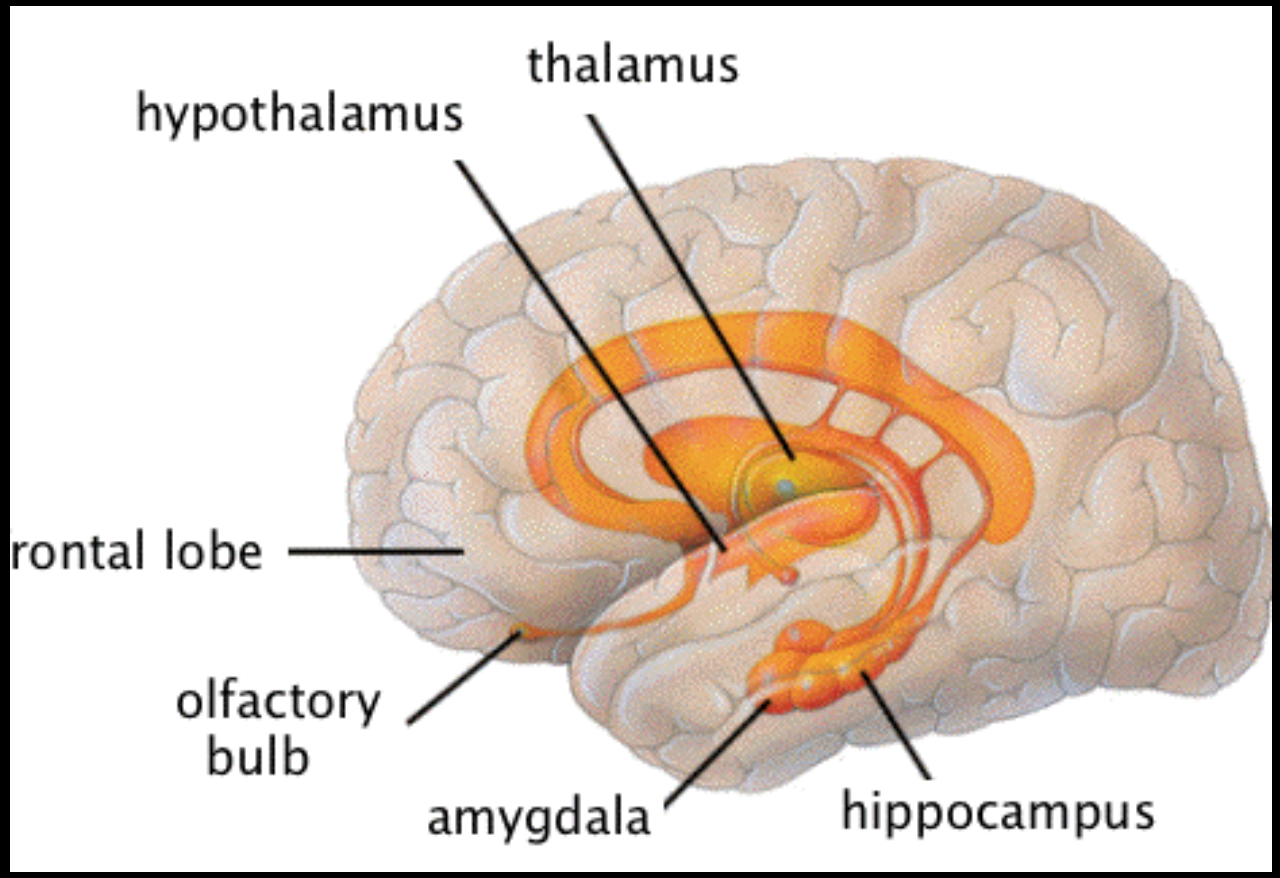
- Academic - Math
- Motor (fine or gross)
- Academic - Verbal
- Social
- Special talent
- Emotional

Motor Skills

- Psychomotor Skills often develop differently in neurodivergent people
- Think about the skills that are most valued by peers, especially outside of work and socially
- Struggles with processing vestibular and proprioceptive stimuli can appear as:
  - gross and fine motor problems
  - awkwardness in running
  - poor posture and core body strength
  - difficulties with fine motor (handwriting

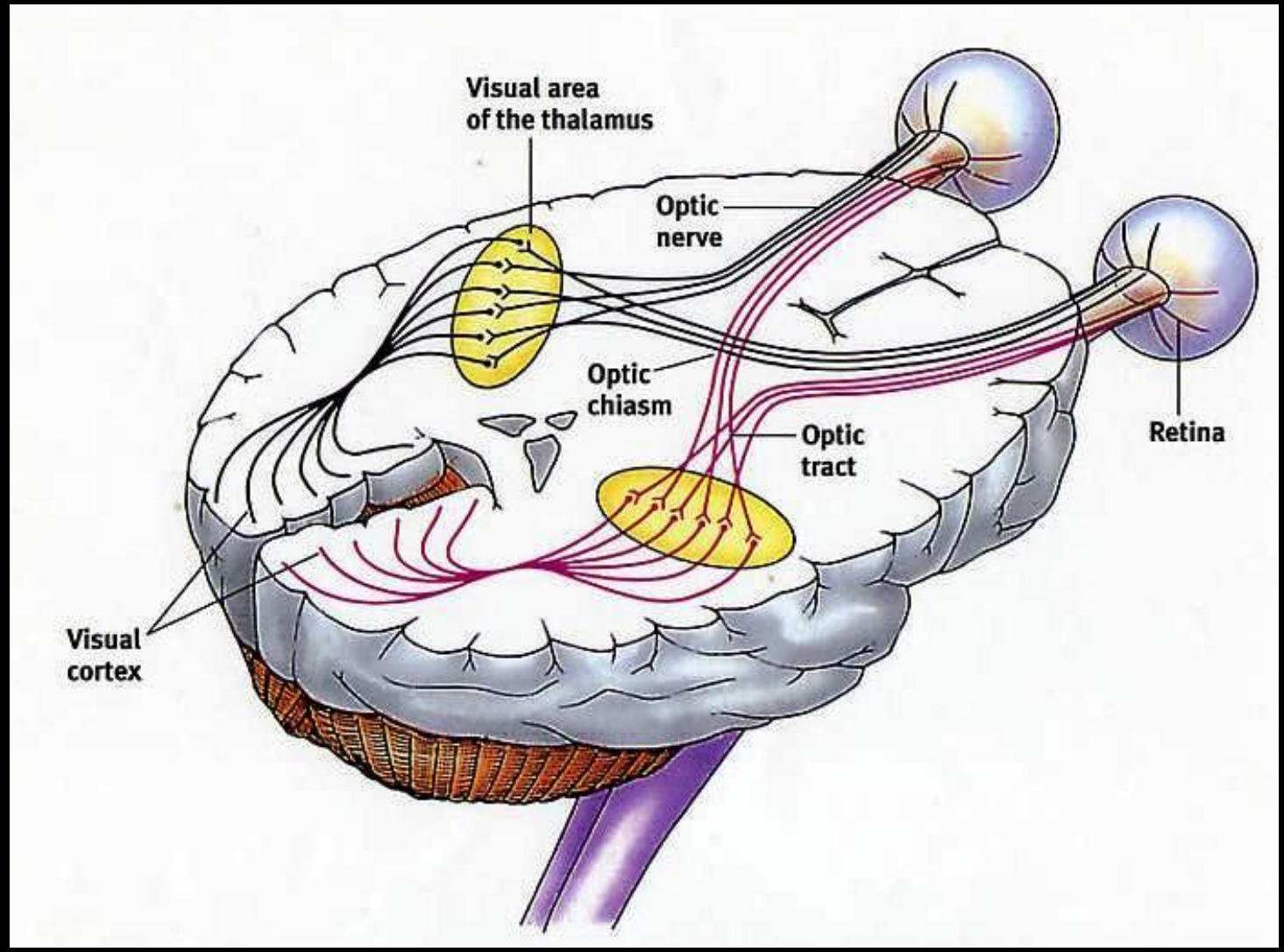
Limbic System

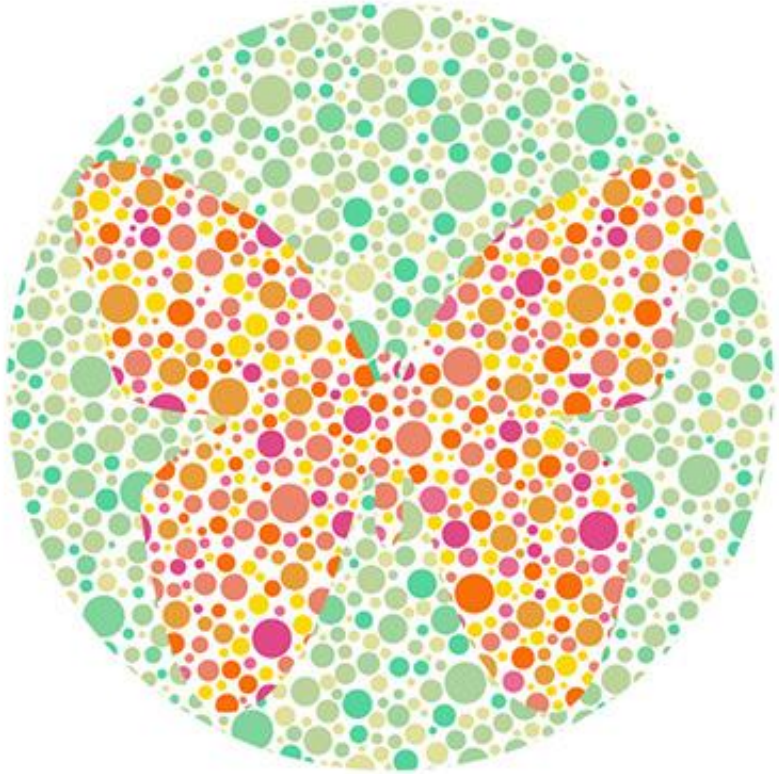
- Responsible for regulating emotion
- A system of related brain structures working together
  - Thalamus – relay center for information; pain
  - Hypothalamus - homeostasis
  - Hippocampus - memory
  - Amygdala – emotional response
  - Basal Ganglia – reward and repetition
- Monitoring the environment for threats = ANXIETY

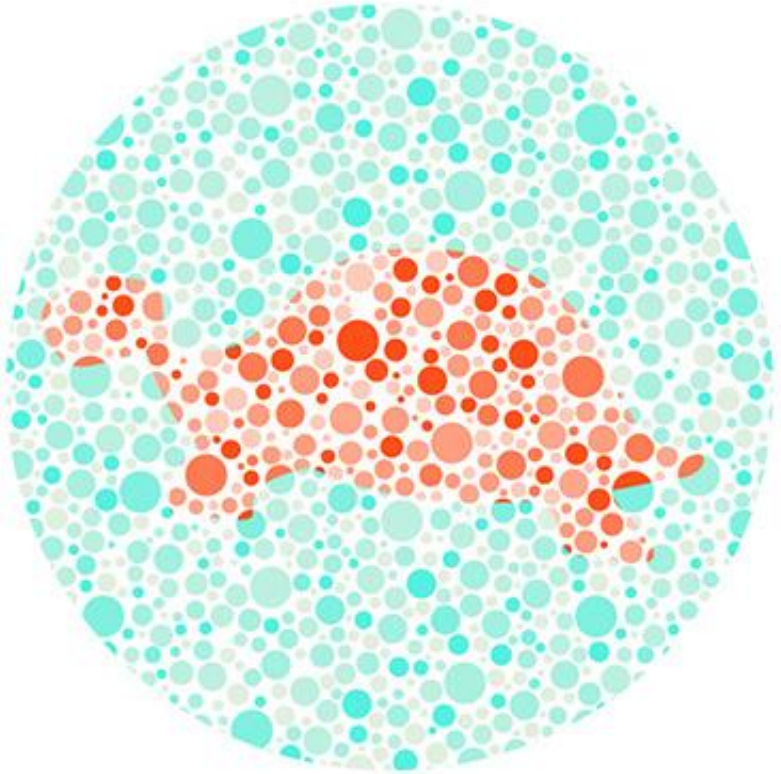


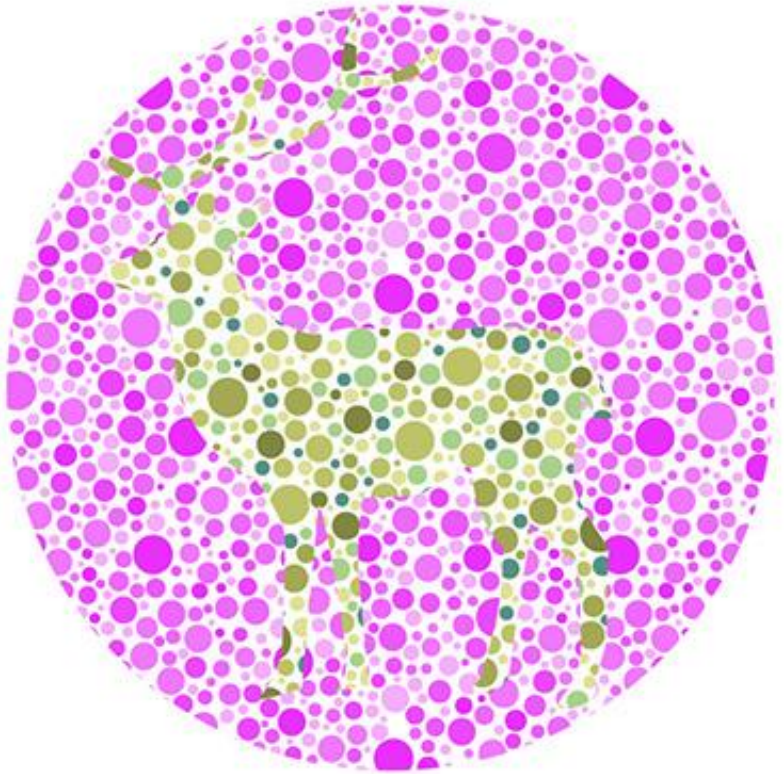
Occipital Lobe

- Processes all our visual information, including movement and light
- Directly impacts our nervous system via optic nerve
  - Stress response
  - Stamina
  - Pain?
- Functions
  - Depth perception
  - Object recognition
  - Color processing
  - Spatial processing









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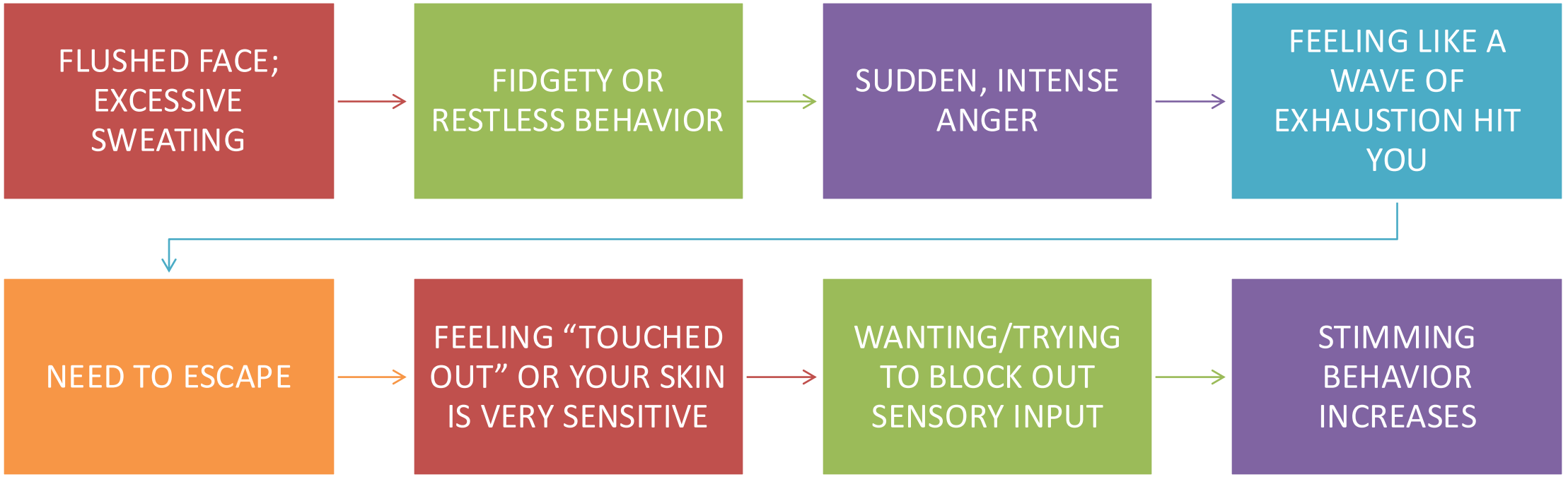
Signs of sensory overload



Sensory Therapy

Sensory integration therapy is driven by four main principles:

Just right challenge (the child must be able to successfully meet the challenges that are presented through playful activities)

Adaptive response (the child adapts his behavior with new and useful strategies in response to the challenges presented)

Active engagement (the child will want to participate because the activities are fun)

Child directed (the child's preferences are used to initiate therapeutic experiences within the session)

Sensory Diet

A sensory diet is a means to adjust sensory input in relation to an individual's needs.

Just as a healthy diet consists of a variety of foods, a sensory diet is a balanced set of sensory information that allows an individual to function.

ANY person can (and will) benefit from a sensory diet

A sensory diet is specific about *timing*, *frequency*, *intensity*, and *duration* of sensory input.

Sensory Diet Template

Item	Time of Day	Texture	Temperature	Initial Feedback	Later Impression

Supporting Sensory Needs at Home

Foods – preferred vs. not preferred; when to challenge and when to accommodate (make your own)

What are the preferred sensory experiences/items?

Noise-cancelling headphones

“Go bag” – emergency clothes, snacks, activities

Lighting, temperature, background noise – how unique?

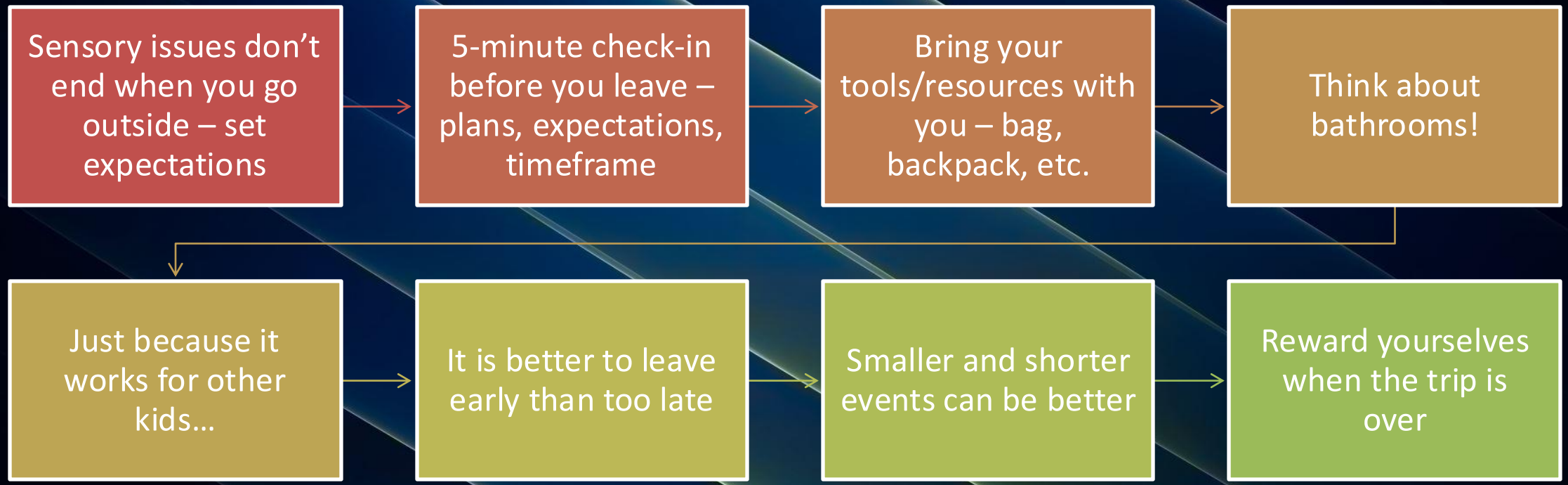
Setting expectations for visitors

Laundry day – what do we need to be successful here?

Cleaning


PETUNIA

Supporting Sensory Needs in the Community



How to Manage Sensory Overload at Work

Determine sensory triggers

Recognize signs of sensory overload

Create a sensory kit

Reduce scents

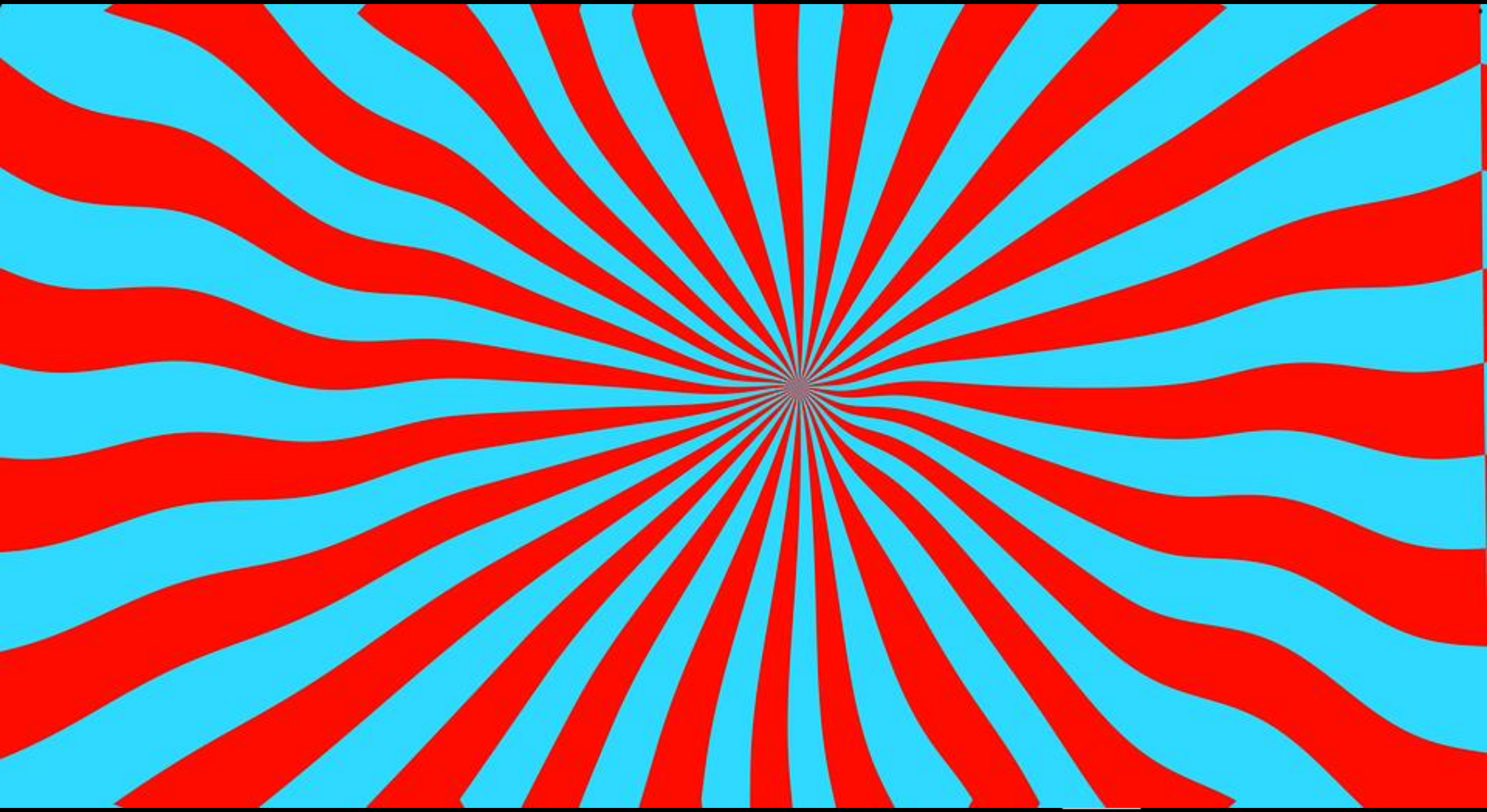
Schedule alone time

Create a sensory-friendly desk

Take movement breaks

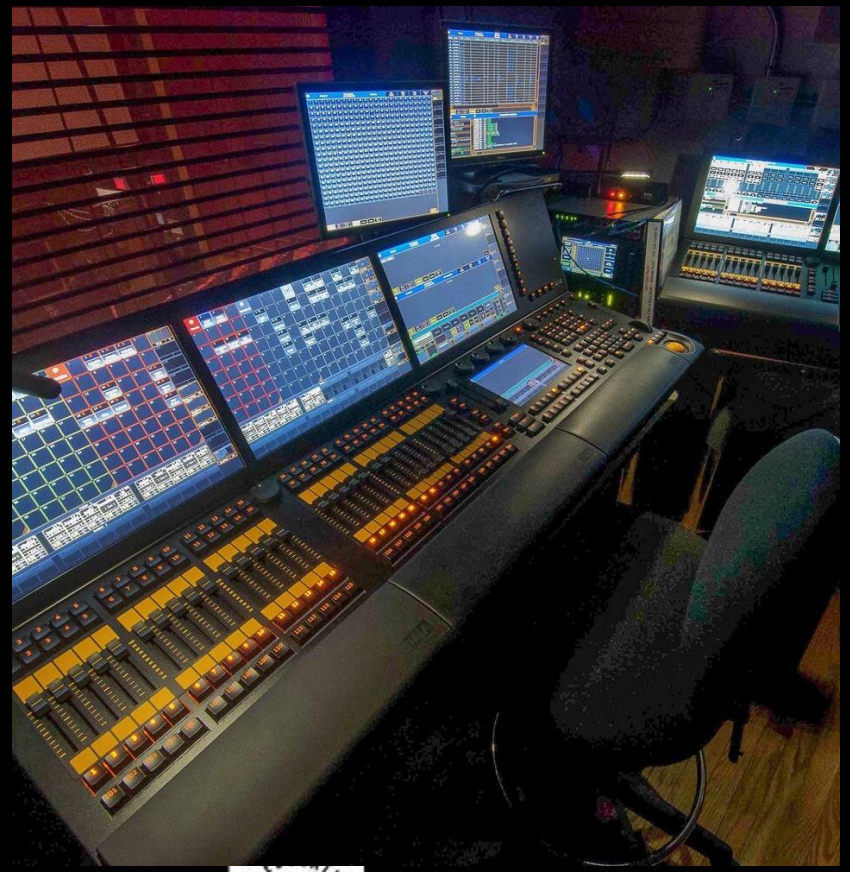
Identify safe spaces

Sensory Friendly Solutions

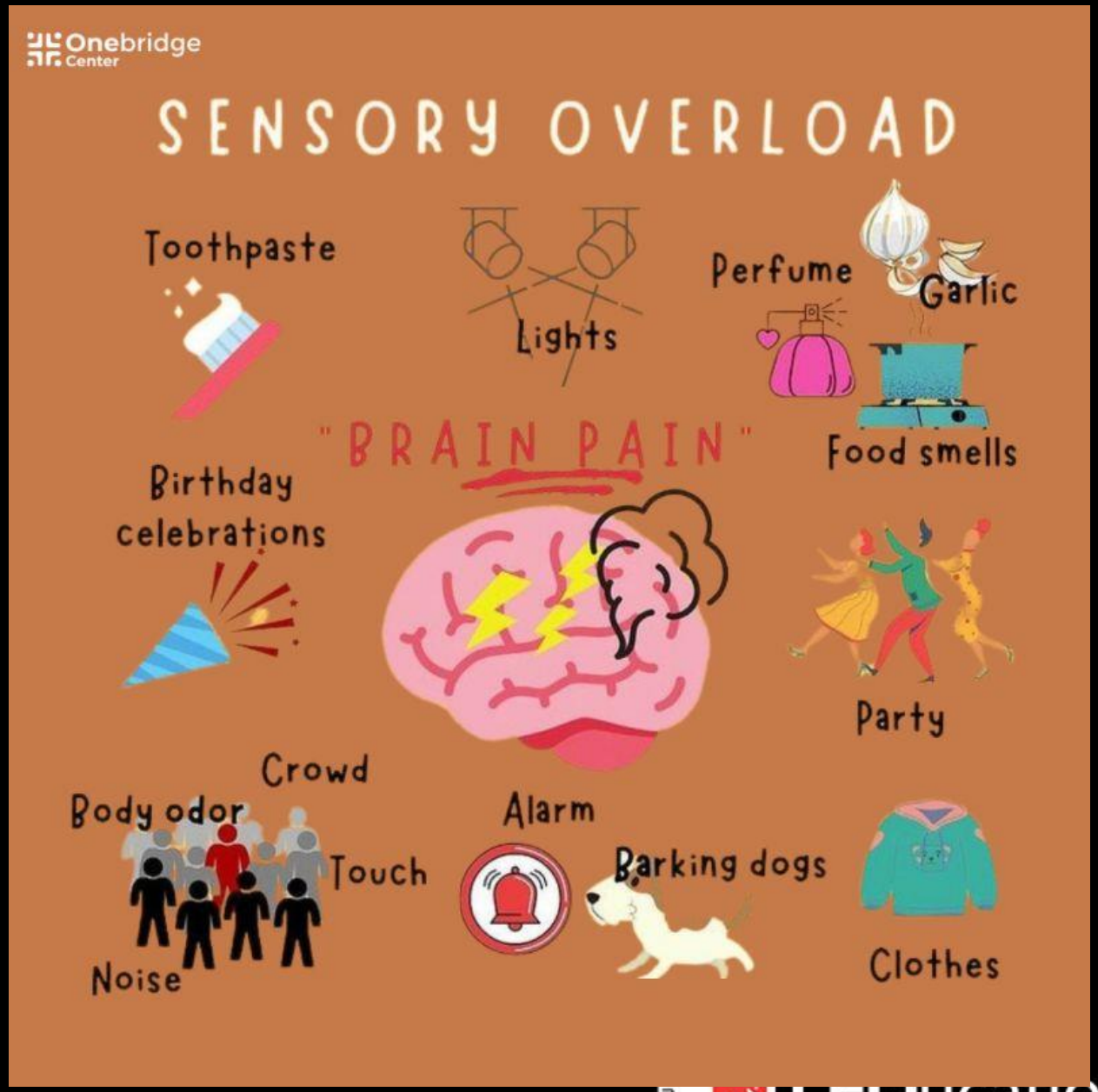


Strategies

- **Dimmers:** Use dimmer switches to adjust light intensity as needed.
- **Soft lighting:** Opt for soft, diffused lighting sources like lamps instead of harsh overhead lights.
- **Color temperature control:** Choose cooler tones for daytime activities and warmer tones for relaxation.
- **Natural light:** Utilize natural light whenever possible, as it can be more soothing, especially for passing time and/or breaks.
- **Sensory lighting solutions:** Explore specialized lighting options like color-changing lights or fiber optic lights to provide controlled visual stimulation



It’s not a sign of weakness



Questions? Comments?

Please email me at
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Website:
www.theneurodiversitycollective.com

Additional Resources

https://www.davidsongifted.org/gifted-blog/sensory-issues-in-gifted-kids/

https://www.parentingforbrain.com/asynchronous-development/

https://www.gro-gifted.org/neuroscience-of-giftedness-greater-sensory-sensitivity/

https://www.aoa.org/healthy-eyes/caring-for-your-eyes

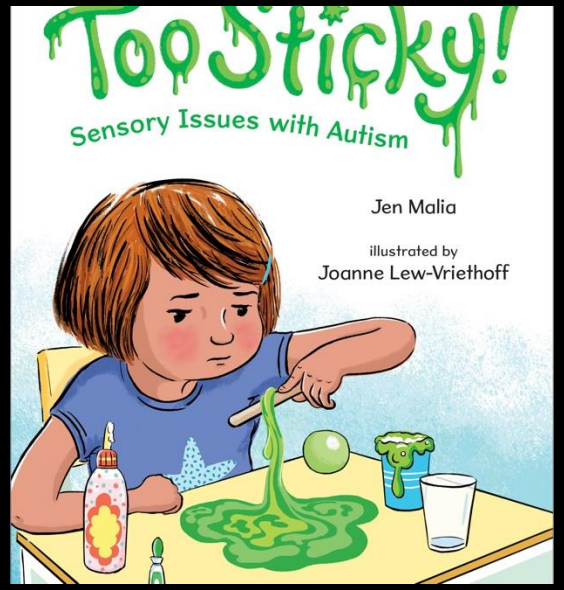
https://www.betterup.com/blog/human-senses

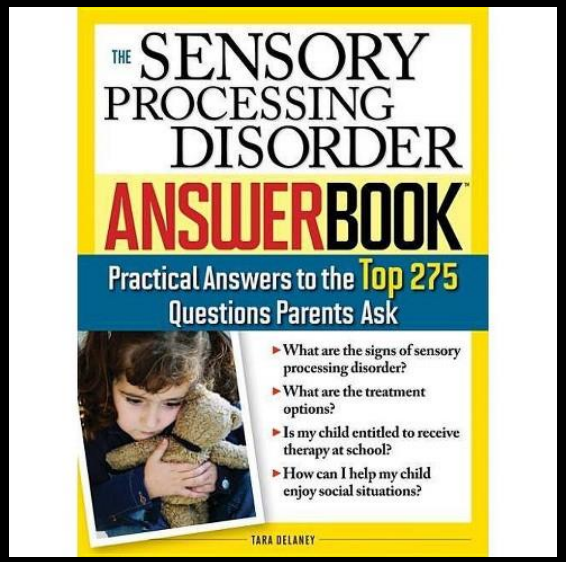
https://embracingmomlife.com/best-classroom-sensory-tools-and-quiet-fidget-toys/

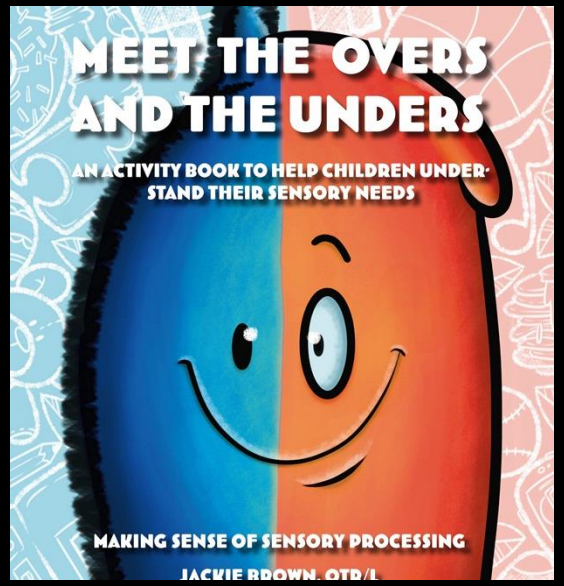
https://www.coachhub.com/blog/overstimulation-how-to-handle-sensory-overload-at-work/

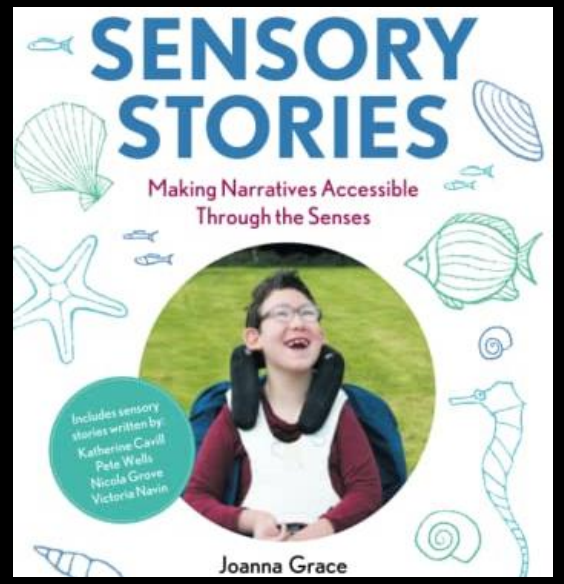
https://hushoffice.com/en-us/how-to-prevent-sensory-overload-in-open-plan-offices/

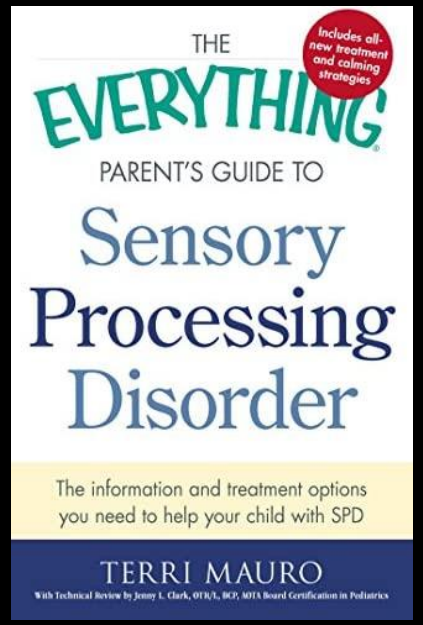
https://covey.org/sensory-lights/

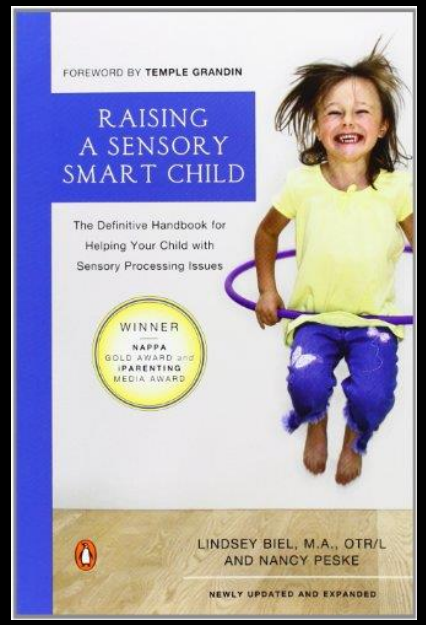












Books

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