

Sensory Processing Issues and Their Hidden Effects on Mental Health

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What you'll learn:

1. What sensory processing is and how it affects mental health
2. What to look for to identify sensory processing issues in kiddos
3. Ways to help

Office Name Whole Family Chiropractic

Today's Date Tuesday, October 18, 2022

Practitioner [Redacted]

Please rate what changes you have noticed in your health since beginning care here. We have had a tremendous year so far at school. He recently got an A on a math test and has a new environment for reading.

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HAPPIER, CALMER, AND LIVING BETTER!



MINNESOTA ASSOCIATION FOR children's mental health





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SECTION 1: SENSORY PROCESSING AND MENTAL HEALTH



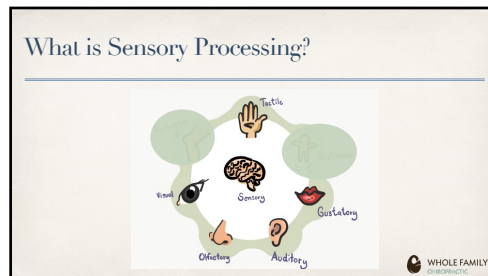
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What is Sensory Processing?

- ✦ From the neurological perspective, over the diagnosis
- ✦ We all do sensory processing



5



6

What is Sensory Processing?

✦ Is it TOO LOUD?



✦ Is it Too Quiet



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What is Sensory Processing?

✦ Are we doing it in a way with which we can engage and feel safe in the world, or...

✦ "Sensory processing disorder is thought to occur when sensory information is perceived and interpreted in a disorganized way so that the person's ability to interact with their environment is impaired." (Miller, 2006)

✦ Sensory processing allows us to interact, rather than disconnect. The broader the range of sensory input we can interact with, the more we can engage.

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What is Sensory Processing?



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Association areas (combine multiple senses)



11

- ❖ Smell skips the thalamus (e.g. coma, sleeping, stronger emotions & memories)



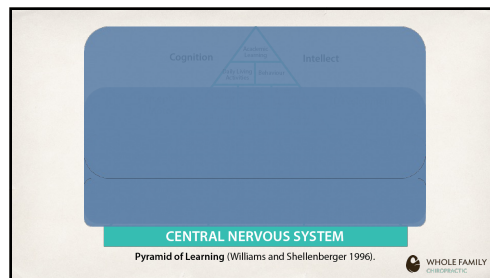
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13



15



16

How Many Kids?

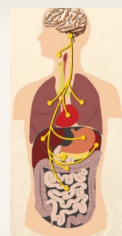
- ✦ Estimated 5-16% of kids have sensory issues in the "disorder" category
 - ✦ <https://psychiatryonline.org/doi/10.1176/appi.aip-ri.2022.170405>
- ✦ "Approximately 5-10% of the non-disabled population and 30% of children with disabilities experience atypical responses to sensory stimuli that interfere with their ability to fully participate in home, school, and community activities"
 - ✦ <https://www.frontiersin.org/articles/10.3389/fnint.2010.00004/full>
- ✦ Autism often most extreme version



17

Vagus Nerve is Critical (Brake Pedal)

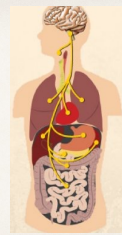
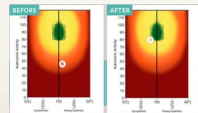
- ✦ **Dorsal vagus (non-myelinated, older branch)**
 - ✦ Affects organs (heart rate, breathing, digestion)
 - ✦ Supports immune system
 - ✦ Decreases inflammation
 - ✦ "Freeze" mode (e.g., trauma)
- ✦ **Ventral vagus (myelinated, newer branch)**
 - ✦ Active in social engagement
 - ✦ Controls muscles of face
 - ✦ Determining facial expression, empathy, bond, communicate, relate to
 - ✦ Allows us to seek and initiate social contact, which activates parasympathetic (relaxed and calm) or "Freeze"
 - ✦ Overide fight/flight tendency to flee from close proximity to other creatures



18

Vagus Nerve is Critical

- ✦ "Vagal tone" measures how well the vagus nerve can respond
- ✦ More vagal tone means better range of sensory input we can adapt to



19

The Vagus Nerve and Sensory Processing Disorder

- Children with the most severe sensory issues had the lowest vagal tone
- These results provide preliminary evidence that children who demonstrate severe SMD may have physiological activity that is different from children without SMD, and that these physiological and behavioral manifestations of SMD may affect a child's ability to engage in everyday social, communication, and daily living skills.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC289884/>



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The Vagus Nerve and Sensory Processing Disorder

- Stimulating the vagus nerve with sensory input helped regulate it
- <https://iopscience.iop.org/article/10.1088/1741-2552/ab0b64/pdf>
- "These results demonstrate, for the first time, the feasibility of utilizing specific patterns of VNS to rapidly improve sensory processing"
- Suggested that vagal nerve stimulation could potentially be used to treat the sensory processing dysfunction linked with ADHD

<https://iopscience.iop.org/article/10.1088/1741-2552/ab0b64/meta>

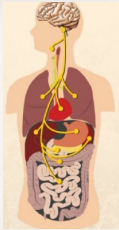


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Vagus Nerve is Critical

- Stephen Porges, PhD (found of Polyvagal Theory) says:
- If you study trauma you realize that people who are traumatized often don't like to be in public places because noise or sounds bother them and they have great difficulty extracting human voice from background activity. Well, that's the same thing with autism. Over 60 percent of autistic individuals have auditory hyper-sensitivity. And they suffer from what is often called an auditory paradox, and that is they're hypersensitive to sound but have great difficulty in extracting human voice. And this becomes explained between nature and trauma. You'll see the same thing in depression, schizophrenia, all these disorders have both an underlying state regulation disorder, an underlying flatness of affective tone on the face, an underlying lack of proximity in their voice – and they also tend to be represented in a different autonomic state, meaning they tend to have higher heart rates and less vagal activity.*



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Sensory Processing and Mental Health

- ❖ Exposure to ACEs and effects on sensory systems
 - Verbal abuse affects part of brain for speech
 - Witnessing domestic violence affects the connection between visual and limbic systems
 - Sexual abuse associated with thinning of somatosensory input from genital field
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6131660/>



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How Sensory Processing Can Affect Mental Health Summary

- ❖ Too much stressful input = fight/flight/freeze
 - Freeze – Shut down, withdraw, hide, stubborn, controlling, anxious, not wanting to try something new (first time takes a lot of energy)
 - Fight/flight – Not able to decipher/filter out input - Distracted, can't focus, high energy, always moving on to the next thing
- ❖ Too little good input, can go either direction
 - Crave more, so move more and seek more (especially when too little calming input going in)
 - Lethargic/depressed because too much effort (too little stimulation going in to wake up the brain and feel like engaging in the world)
- ❖ Diagnoses such as anxiety, depression, ADHD, ASD
 - Looking more broadly – may affect mood, self-esteem, social interactions, influences our perception of the world

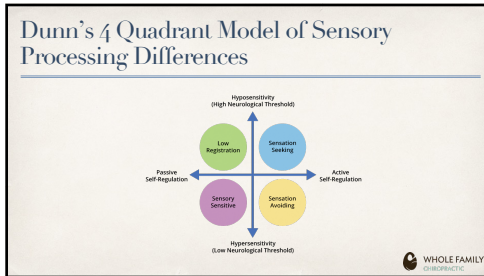
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SECTION 2 WHAT TO LOOK FOR

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26

How about you?

- ♦ Avoiding = Anything you notice "worse" or "more annoying" when tired?
- ♦ Seeking = Anything you crave more of?


?


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27

What to look for in kiddos:

- ♦ Does something look out of the ordinary?
- ♦ Do they seem stubborn, unwilling, scared about something that should be "normal?" (Can be tough for a kiddo to describe)
- ♦ If so...what sense does it involve?



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28

Short Sensory Profile (38 Questions) - Dunn

Use the following to mark your responses:

ALWAYS	When presented with the opportunity, your child always responds in this manner, 100% of the time.
FREQUENTLY	When presented with the opportunity, your child frequently responds in this manner, 75% of the time.
OCCASIONALLY	When presented with the opportunity, your child occasionally responds in this manner, 50% of the time.
SELDOM	When presented with the opportunity, your child seldom responds in this manner, 25% of the time.
NEVER	When presented with the opportunity, your child never responds in this manner, 0% of the time.

❖ "Sensory behavior questionnaire" for more in depth

• E.g. 140 questions - <https://www.integra.co.uk/wp-content/uploads/2020/03/sensory-questionnaire.pdf>

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Tactile

Item	Tactile Sensitivity
1	Express distress during grooming (for example, fights or cries during haircutting, face washing, fingernail cutting)
2	Prefers long-sleeved clothing when it is warm or short sleeves when it is cold
3	Avoids going barefoot, especially in sand or grass
4	Reacts emotionally or aggressively to touch
5	Withdraws from splashing water
6	Has difficulty standing in line or close to other people
7	Rubs or scratches out a spot that has been touched

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Tactile



Today's Date Thursday, March 4, 2021

Name Caitie **DOB**

Please note what changes you have noticed in your health since beginning care here
More open to tactile stress. Seems like her body is less stressed, less on "tic". She likes to be touched by me now, when she used to shrink away. She's using her words to express her feelings. Can do more self-adv.

Please make any additional comments here
Caitie is initiating saying "I love you" which is new for her to say to Ma(Juan). She usually says she hates Ma.

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Taste/Smell

Item	Taste/Smell Sensitivity
8	Avoids certain tastes or food smells that are typically part of children's diet
9	Will only eat certain tastes (list: _____)
10	Limits self to particular food temperatures/textures (list: _____)
11	Picky eater, especially regarding food textures

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Auditory

Item	Auditory Filtering
22	Is distracted and has trouble functioning if there is a lot of noise around
23	Appears to not hear what you say (for example, does not "tune-in" to what you say, appears to ignore you)
24	Can't work with background noise (for example, fan or refrigerator)
25	Has trouble completing tasks when the radio is on
26	Doesn't respond when name is called but you know the child's hearing is OK
27	Has difficulty paying attention

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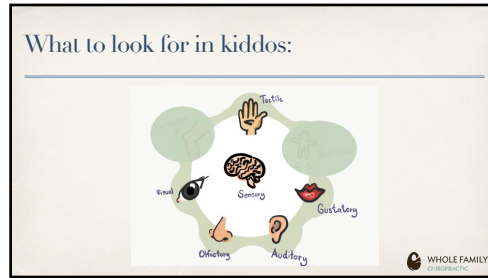
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Auditory & Visual

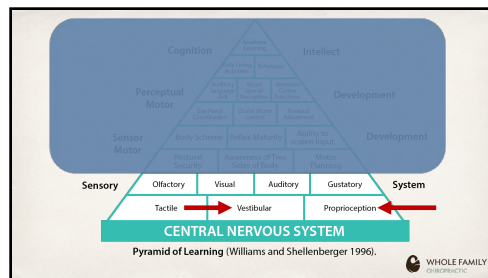
Item	Visual Auditory Sensitivity
34	Responds negatively to unexpected or loud noises (for example, cries or hides at noise for vacuum cleaner, dog barking, hair dryer)
35	Holds hands over ears to protect ears from sound
36	Is bothered by bright lights after others have adapted to the light
37	Watches everyone when they move around the room
38	Covers eyes or squints to protect eyes from light

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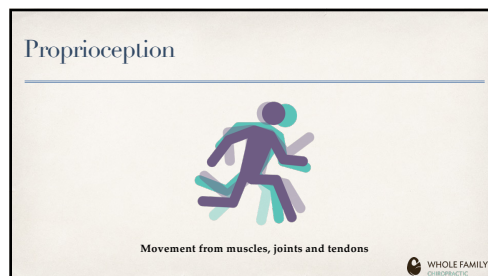
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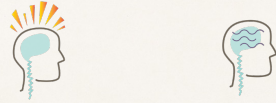


36



37

Proprioception



Nociception = Metallica Proprioception = Kenny G

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Vestibular

- Vestibular system **balances autonomic activity** by stimulating vagal system and inhibiting sympathetic system.
- Dorsal raphe nucleus (DRN) is a **major source of serotonin** and modulation of serotonin levels. Indeed several direct and indirect connections exist between vestibular nucleus and DRN, **further supporting the role for vestibular stimulation in activating DRN and regulation of emotions.**
- The vestibular system is **extensively networked with the limbic system**, and hence vestibular stimulation can **influence emotional behavior** by regulating several higher centers in the central nervous system and autonomic nervous system.



<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC333381/>

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Movement

Item	Movement Sensitivity
12	Becomes anxious or distressed when feet leave the ground
13	Fears falling or heights
14	Dislikes activities where head is upside down (for example, somersaults, roughhousing)

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Underresponsive/Seeks Sensation

Item	Underresponsive/Seeks Sensation
15	Enjoys strange noises/seeks to make noise for noise's sake
16	Seeks all kinds of movement and this interferes with daily routines (for example, can't sit still, fidgets)
17	Becomes overly excitable during movement activity
18	Touches people and objects
19	Doesn't seem to notice when face or hands are messy
20	Jumps from one activity to another so that it interferes with play
21	Leaves clothing twisted on body

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41

Low Energy/Weak

Item	Low Energy/Weak
28	Seems to have weak muscles
29	Tires easily, especially when standing or holding particular body position
30	Has a weak grasp
31	Can't lift heavy objects (for example, weak in comparison to same age children)
32	Props to support self (even during activity)
33	Poor endurance/tires easily

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42

Is it Behavior or Dysregulation?

Behavior/tantrum

Dysregulation from overwhelmed sensory system

Why sometimes and not other times?

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43

Is it Behavior or Dysregulation?⁹



- ♦ What can cause a cup to overflow more easily?
 - More external stimulation
 - A cup that already has a lot in it
 - Growth spurts
 - Teething
 - Tests
 - Low sleep
 - Immune system fighting something
 - Lots of transitions/busy – little down time
 - Low blood sugar

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44

SECTION 3 WAYS TO HELP

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Ways to Help

- ♦ Talk to parents and help them understand
- ♦ YouTube – “Sensory Systems MN – Dr. Tyre Moore” – Playlist to help explain more
- ♦ Assess surroundings and environment
 - Visual
 - Is it cluttered, messy, disorganized?
 - Lots of movement – kid sitting next to them, tapping pencil or rocking their leg
 - Get out in nature (Calmest visually and sandwich is great)
 - Auditory
 - Tapping pencil, light buzzing, A/C humming on, whippers of clutter, barking timer
 - Silence
 - Olfactory
 - Lavender, lemon calming scents
 - Create sensory safe zone (e.g. fidget toy, weighted blanket, noise cancelling headphones)
 - Take a “sensory break”



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Ways to Help

- ❖ Tune in to the child
- ❖ **Looking for signs of fight/flight/freeze**
 - ❖ Eyes darting, big pupils, tense body, startle/flinch easily, avoiding (turning away, refusing to cooperate, running away, dropping to the floor, retaliating)
 - ❖ Saying they don't like things, don't want to participate, calling something "stupid" or "dumb" may be self-protection mechanism



47

Ways to Help



- ❖ **Proprioception is very calming (Kenny G)**
 - ❖ Hugs, weighted blanket, squeezing wrists or ankles, patting back, walking, log rolls (vestibular tool), stomp the ground, hit a bean bag, squish under a pillow
 - ❖ Chew toys, gum (jaw has a lot of proprioception)
 - ❖ Move Mindfully app - <https://move-mindfully.com/move-mindfully-app/>
- ❖ **Vestibular**
 - ❖ Bear walk, spin, go to the park (swing, slide, etc.), repetitive motion (e.g. rocking)
- ❖ **Vagus**
 - ❖ Breathing (breath out longer than breath in)
 - ❖ Singing, humming, drinking through a straw
 - ❖ Mindfulness (meditation, Qigong, Tai Chi, yoga)



48

Ways to Help



49

Ways to Help

- ♦ **Predictability** creates safety for the brain
 - ♦ Talk about new experiences ahead of time
 - ♦ "Dose"
 - ♦ Transitions can be most difficult
 - ♦ Give 1 minute warning
 - ♦ Be present, slow down
 - ♦ Sing song – "It's time to brush our teeth..."



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Ways to Help

- ♦ **Professionals**
 - ♦ Good news...it can change!
 - ♦ Sensory based OTs
 - ♦ Good at eval
 - ♦ Help with strategies and activities of daily living
 - ♦ Can help integrate primitive reflexes
 - ♦ Neurologically-based chiropractic
 - ♦ Help body activate vagus nerve on its own (activate brake pedal)
 - ♦ Take stress off the nervous system (less stress going in [less Metallica], more ability to stay calm)
- ♦ <https://pxdocs.com/px-docs/>



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51

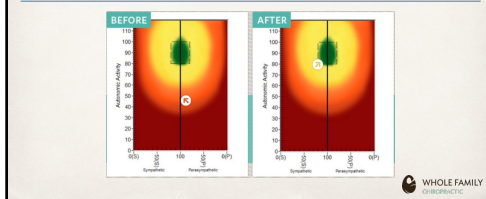
Fix the hose




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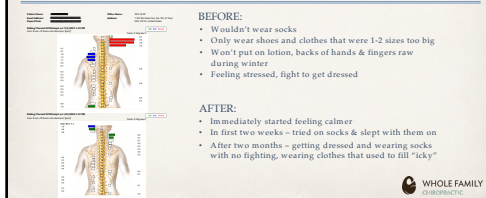
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Heart Rate Variability Vagal Tone



53

Neuro-Based Chiro SENSORY 7 years old



54

Thermal Scan

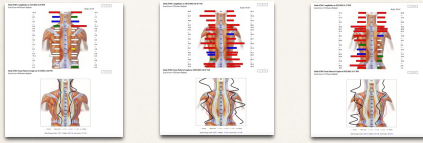
❖ Thermal asymmetry: "The degree of asymmetry is a quantifiable indicator of dysfunction."

❖ Departments of Neurosurgery and Psychiatry at The Johns Hopkins Medical Institutions



55

EMG (Muscle Energy) 3 CATEGORIES



"Disorganized" "Raging" "Disorganized + Raging"

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56

Our 3-Step Clinical Process:

1. We listen 🎧 and dive deep into your child's case history 📖
2. Neuro-Sensory Stress Scans (Insight) 📊
3. Report of Findings 📄 and Care Plan 📋



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57

Let's Connect!

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