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Sensory Processing Problems: Information for Primary Care

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Summary: Sensory processing problems arise when a person's brain is wired differently and has problems with regulating and modulating sensory input. Individuals may be 1) Hypersensitive (Sensory Over-Responsive); 2) Underresponsive (Sensory Under-Responsivity); 3) Sensory craving/craving (SS) with excessive seeking of certain types of sensory input. Sensory processing problems are common in conditions such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), learning disabilities and anxiety, but can also occur in individuals who otherwise appear neurotypical with no other issues. Family physicians can play a key role in recognizing sensory processing problems and suggesting resources for families such as referrals to occupational therapy (OT) for further assessment and management.

Case, Part 1

- Marie is a 5-year-old girl being seen in your office for her annual check-up.
- She has just started school recently and her parents report that the transition has been difficult.
- She tries on multiple outfits before school each morning before finding one that is comfortable, and they have had to cut the tags off all her clothing.
- At school, she has been crying and throwing tantrums when the volume in the classroom gets loud or when other students jostle her.
- She complains about and refuses to eat most of the foods that her parents pack for her lunch.
- Her parents are concerned and don’t know what to do.
- Mother asks, “We’ve tried a reward system for her behaviours, but nothing seems to work. Is this just bad behavior, or is it something else?”

What is SPD?

- Sensory processing disorder (SPD) is a condition in which the nervous system is unable to properly process sensory input, and as a result, the patient can become easily overwhelmed (or underwhelmed) in the presence of ‘normal’ levels of sensory input. SPD can lead to problems with attention, learning, behavior and moods (such as anxiety, anger, aggression and frustration).
- Sensory processing problems can occur alone, or be part of conditions such as ADHD, learning disabilities, or autism spectrum conditions.
- Terminology

- Sensory integration” is the original term for this condition, which has been replaced by “sensory processing disorder”.

Epidemiology

- 5-16% of elementary school-aged children (Ahn, Miller et al., 2004; Ben Sasoon et al., 2009)
- 40-60% of children with attention deficit hyperactivity disorder (ADHD) also have SPD
- 70-90% of children with autism spectrum disorders (ASD) also demonstrate SPD and the DSM-5 includes over and under sensitivity to sensation as possible diagnostic criteria for ASD.
- Between 58% to 75% of those with SPD do not have other disorders (Carter al., 2011; Van Hulle et al., 2012)

Signs and Symptoms

The three most common types of sensory processing problems are the following:

1. Sensory modulation disorder (SMD), which is further divided into
   - Sensory Overresponsivity: Individuals are extremely sensitive to sensory input
   - Sensory underresponsivity: Individuals seem oblivious to sensory input
   - Sensory seeking/craving: Individuals seek out continual sensory input

	1. Sensory Over-responsivity (Sensory Defensive, or ‘Hypersensitive’)	2. Sensory Under-responsivity	3. Sensory Craving
Definition	Increased sensitivity to sensory input, and as a result, tends to become overwhelmed by sensory input	Decreased sensitivity to sensory input, and as a result, often seem oblivious to sensory input	Craves more sensory input than other people ; **may become extremely disorganized with sensory input**
Typical Behaviours	Exaggerated response to sensory input Aggressive, irritable, impulsive when overwhelmed Cautious with new experiences Troubles with changes/transitions in activities (as these are changes in sensory input)	Doesn’t notice touch, pain, or need to use the bathroom Quiet, withdrawn, difficult to engage Slow to respond to directions Prefers sedentary activities Often do not notice pain with bumps, falls, cuts or scrapes	Constantly moving and talking Jumping, spinning, swinging, rocking Seeks out constant sensory input
Symptoms by Sensory System			
Vestibular (Movement)	Gets car sick easily; doesn’t like swings or rides Problems with changes in head posture; doesn’t like escalators	Not notice fast movement on amusement park rides or high movement on swings May have troubles being aware of when falling, and thus difficulties protecting oneself when falling	Able to spin without getting dizzy, constantly fidgets, trouble sitting still-constantly craves movement
Visual	Sensitive to bright/fluorescent lights	Loses place when reading; eyes become easily tired	Attracted to light, moving /shiny objects

Auditory	Sensitive to/easily distracted by noise	Does not respond when name is called; may self-stimulate by humming while doing tasks	Seeks out noisy situations, or makes noise
Taste	Sensitive to food textures, brushing teeth	Doesn't notice if foods are spicy or bland	Seeks strong tasting foods, sucks on objects
Smell	Easily distressed by smells	Does not notice even good smells such as cookies baking	Seeks out all types of smells even items that others do not think have a smell such as doorknobs
Touch	Bothered by clothes/tags on clothing, responds aggressively to unexpected touch	Not aware of being touched. Need auditory cue to notice someone is trying to get their attention	Craves and never tires of messy activities such as finger painting or movement activities

Other subtypes of SPD are:

- Sensory discrimination disorder
- Dyspraxia
- Postural Disorder.

History / Interviewing

- Start with everyone in the room, i.e. parents and child
- With young children, direct questions to the parents first, and see whether or not the child has anything else to add
- With adolescents, direct questions to the adolescent first, and see whether or not parents have anything else to add

Examples of possible questions to ask:

Introduction: "We're going to ask some questions about your child's sensory systems, like hearing, touch, taste."

Vision	Any sensitivity to light, such as fluorescent light or bright light? Any problems with reading?
Auditory	Any sensitivity to loud noises?
Taste	Any troubles being a fussy eater? Any foods that are avoided because of the texture or temperature?
Touch	Any sensitivity to touch? Any problems with being touched by people? Any problems with tags on clothing? Any problems with doing daily hygiene routines? Any trouble feeling touch or pain?
Smells	Any sensitivity to smells? What sorts of smells are overwhelming? Any need to seek out smells, even smells that others might find disgusting?
Vestibular	Any issues with getting car sick easily? Any problems with swings, rides or escalators?
Function	Do these issues affect daily routines or activities?

Diagnostic Criteria

- Sensory processing problems are not currently recognized as a unique disorder in the DSM-5

- Nonetheless, they are included in the diagnostic criteria for autism spectrum disorder (ASD), and are recognized in ICDL's Diagnostic Manual and the Diagnostic Classication: Zero to Three (DC: 0-3R)

DDx and Comorbid Dx

Consider screening for sensory processing problems in children/youth with diagnoses such as:

Oppositional Defiant Disorder	Oppositionality such as resistance to routines and activities, may be a child trying to avoid sensory stresses and sensory overload If a parent tells you that the child is oppositional, ask: “Tell me more about those times when your child is being oppositional… What happens from start to finish?”
Mood Disorders (MDD, bipolar) / Anxiety	Sensory issues may directly contribute to the child’s stresses, and thus lead to depressed or anxious moods
Attachment Disorders	Because attachment such a critical development step, problems with attachment can result in a myriad of issues such as sensory processing issues
Attention deficit hyperactivity disorder (ADHD)	ADHD is quite common in children/youth with sensory processing problems Nonetheless, they are unique disorders with distinct symptoms and brain imaging findings For example, children with ADHD tend to be more impulsive and are able to habituate to a stimulus, while those with SPD cannot habituate to sensory stimuli
Autism Spectrum Disorder (ASD)	Most children with ASD also have SPD, however, the converse is not the case, i.e. most children with SPD do not have ASD
Developmental coordination disorder (DCD)	Sensory and motor development are intimately tied together; it is not surprising if there are sensory issues that a child may also have motor issues and vice versa (some clinicians call this Dyspraxia)
Learning disorders	Sensory issues are commonly seen in children with LD and sensory issues can contribute to learning problems, e.g. distractibility from the noise and light of a fluorescent light makes it hard for the child to learn
Fetal alcohol spectrum disorder (FASD)	Is there a history of alcohol use in the mother prior to delivery?
Tourette’s and Tic Disorders	Are there any involuntary movements such as tics?

Physical Exam (Px)

- Rule out any particular sensory problems such as
  - Vision problems
  - Hearing problems

Investigations

There are no diagnostic tests for sensory processing problems in the **primary care setting**, other than investigations that might be useful to rule out contributory conditions.

Note: Western Psychological Services is standardizing a new performance measure called the Sensory Processing Three Dimensions (SP-3D) scale by Miller, Schoen and Mulligan expected to come out early 2017, meant to be completed by occupational therapists (OT).

When and Where to Refer

If you suspect sensory issues, consider referral to occupational therapy (OT), which may be:

- Through the school: If the student is attending school, consider writing a letter to the school requesting a referral to the school OT; or if you are pressed for time, consider simply recommending “OT referral for sensory processing problems” on a prescription pad, which the parents can take to the school.
- Privately: There may be a shortage of school OT’s, and if the family has sufficient means, consider seeing an OT in private practice.
- Note
    - Prior OT: Even if occupational therapy (OT) has already been involved with a child’s care, this does not always mean sensory issues have been addressed, due to the fact that school OTs are often only able to focus on motor issues especially handwriting.
    - Even if the patient has previously been seen by mental health professionals, because awareness of sensory process is not universal, this also does not mean that sensory issues have already be addressed

Management: Patient Education

- The following resources can be provided to patients and families:
    - eMentalHealth.ca handout on SPD
      http://www.ementalhealth.ca/8890
    - Sensory Processing Disorder Foundation
      http://spdfoundation.net/

Management: Medication Treatment

- There are no medications to treat SPD per se
- Nonetheless, if there are comorbid conditions that are treatable, ensure that those conditions are adequately treated

Management: Home / School Accommodations

Each patient with SPD will have a unique profile of sensory needs depending on their symptoms, but the following are some general management principles:

- Develop a “sensory lifestyle”
- Help parents problem solve and learn to think through the sensory input that can help children in advance of a child’s responsivity (see “No Longer A SECRET” for more about strategies and solutions by Bialer and Miller).
- Create a personalized activity plan that provides the sensory input needed by the child which includes regular calming and/or alerting activities to maintain optimal alertness
- If the child is overloaded, adapt sensory expectations and encourage self-modulation technique
- E.g. massage, stretching
- Give advance warning about transitions

Some examples of specific school accommodations include:

Visual	Dimmed or natural lighting Tinted glasses Allow patient to avoid eye contact when answering questions

Auditory	Earplugs or earphones with noise cancellation options Listen to soothing music or nature sounds
Oral	Having ice or candies to suck on Crunchy foods Foods that require effort to suck such as yogurt or applesauce
Touch	Allow child to be at front or end of line to avoid jostling
Movement	Sitting and rocking in a rocking chairs or using gliders. Doing home work while gently swinging in a lycra swing
Relaxation techniques	Give the student a space to practice muscle relaxation and deep breathing

Case, Part 2

- Marie is a 5-year-old girl being seen in your office, who is having extreme difficulties with various daily routines
- You note that she is easily overwhelmed by sensory input such as touch, sound and lights
- You mention the possibility of a sensory processing disorder and recommend some reading materials as well as suggest that they see a private practice occupational therapist (OT)
- When they return to see you a few weeks later, you notice that the patient is now wearing a baseball cap, which mother explains helps with fluorescent lights
- They report seeing a private practice OT who confirmed sensory processing issues, and is working with them to develop a sensory lifestyle
- As you leave the office that day, your receptionist tells you about the mother that asked to turn off the radio in the waiting room, and that other patients commented on how they preferred a quieter waiting room too!

References

Ahn, R. R., Miller, L. J., Milberger, S., & McIntosh, D. N. (2004). Prevalence of parents' perceptions of sensory processing disorders among kindergarten children. American Journal of Occupational Therapy, 58, 287–293.

Carter, A.S., Ben-Sasson, A., & Briggs-Gowan, M.J. (2011). Sensory over-responsivity, psychopathology, and family impairment in school-aged children. Journal of the American Academy of Child & Adolescent Psychiatry, 50(12), 1210-1219.

Van Hulle, C.A., Schmidt, N.L., & Goldsmith, H.H. (2012). Is sensory over-responsivity distinguishable from childhood behavior problems? A phenotypic and genetic analysis. Journal of Child Psychology and Psychiatry, 53(1), 64-72.

Recommended Books for Families

Sensational Kids, 2nd edition (Miller, 2014)
No Longer a SECRET: Unique Common Sense Strategies for Children with Sensory or Motor Challenges (BIaler and Miller, 2008)

Raising a Sensory Smart Child: The Definitive Handbook for Helping Your Child with Sensory Processing Issues (Biel and Peske, 2009).

The Out-of-Sync Child (Kranowitz, 2006)

The Everything Parent's Guide to Sensory Processing Disorder (Mauro and Clark, 2014).

The Sensory Child Gets Organized: Proven Systems for Rigid, Anxious, or Distracted Kids (Dalgliesh, 2013).

Weblinks

The Sensory Therapies and Reseach (STAR) Center has an excellent overview of SPD and subtypes of SPD http://spdstar.org/what-is-spd/

About this Document

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