

SPECIAL NEEDS: REALIZING POTENTIAL

Sensory Processing Disorder

It's been more than 40 years since occupational therapist and neuroscientist A. Jean Ayres coined the term "sensory integration dysfunction" as part of her theory that deficits in processing sensation from the body and the environment lead to sensorimotor and learning problems in children. The theory is widely acknowledged, but also has generated tremendous controversy.

Some contend that sensory processing disorder is a distinct and valid diagnosis, while others argue that differences in sensory responsiveness are features of other diagnoses. Atypical responsiveness to sensory stimuli may be as high as 95% in children with autism, but also has been reported in fragile X syndrome and ADHD, all of which helps to fuel the debate.

In 2007, the Sensory Processing Disorder Foundation submitted an application for recognition of sensory processing disorder (SPD) in the DSM-V edition (to be published in 2012). The DSM committee has requested that additional studies be submitted before the disorder, which disrupts the lives of 1 in 20 children and adults, can be recognized.

Sensory processing disorder is recognized by both the Diagnostic Manual for Infancy and Early Childhood (DMIC) of the Interdisciplinary Council on Developmental and Learning Disorders (ICDL) and the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood, Revised

(DC:0-3R). Three primary diagnostic groups have been categorized within this global umbrella term to describe children who have difficulty regulating and organizing responses to sensory input: sensory modulation disorder, sensory discrimination disorder, and sensory-based motor disorder.

Sensory modulation disorder has three subtypes: sensory overresponsivity, sensory underresponsivity, and sensory seeking. Children with sensory overresponsivity register sensations too intensely and for a longer duration than typically developing children, and may react to sensory input by pulling away, screaming, or avoiding input. Often these

children try to keep it together at school where they are exposed to multisensory input, only to melt down at home.

Children with sensory underresponsivity tend not to respond to input, and may be withdrawn or seem to be in their own world.

Sensory seeking has not been proposed for the DSM-V classification system, but describes children who tend to crave intense or an unusual amount of sensory input. They may be constantly on the move, bang their heads against windows or walls, or fall repeatedly in an effort to gain appropriate sensory information.

The other two primary diagnostic groups, also not proposed for the DSM-V classification system, include sensory discrimination disorder or difficulty deciphering or interpreting qualities of sensory information, and sensory-based mo-

tor disorder, in which children tend to appear uncoordinated because of faulty processing of sensory input.

Research is focusing on describing the symptoms at the behavioral and physiological level for each of these phenotypes. A diagnosis of SPD is not made unless the condition significantly affects a child's daily life.

Because the DSM requires a "gold standard" assessment of the disorder, work continues on the Sensory Processing Disorder Scale in order to have a reliable and valid measure of subtypes.

The Sensory Integration and Praxis Test (SIPT), developed by Dr. Ayres, is currently considered the gold standard, but is limited to children aged 4-8 years. Efforts are underway to expand its target age group and make it more portable, but insurance often will not reimburse for it. There are several parent-report questionnaires, such as the Short Sensory Profile (SSP) or Sensory Processing Measure (SPM), that can be helpful to gain initial insights into how a child responds to sensory stimuli and how this affects his or her performance in daily activities. If SPD is suspected, a referral to an occupational therapist is warranted.

Research is accumulating to support the use of occupational therapy using a sensory integration approach in children with SPD, although scientific rigor has been lacking in studies conducted prior to 2007.

This therapy is based on the theories of neural plasticity and environmental enrichment, and uses enhanced sensory experiences within a safe and playful, goal-directed context to produce successful

responses to environmental challenges.

The first randomized controlled trial of occupational therapy in children with sensory modulation disorder showed that those receiving occupational therapy made significant gains on the attention subset and the cognitive/social composite of the Leiter International Performance Scale-Revised, compared with active and passive placebo (Am. J. Occup. Ther. 2007;61:228-38).

Although the SPD landscape is rapidly changing, pediatricians can play an integral role in helping children with this disorder.

These children often have an extremely difficult time living in an unpredictable world in which they are constantly bombarded with stimuli. It also can be overwhelming for parents and families, who often struggle with their child's SPD behaviors for years before receiving the correct diagnosis or a therapeutic intervention.

It is important for pediatricians to listen to parents and explore what is going on, even if the physician is skeptical. ■

For more information on SPD, contact the Sensory Processing Disorder Foundation (www.spdfoundation.net) or the Kennedy Krieger Institute (www.kennedykrieger.org).

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BY JOANNE FLANAGAN

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The Child With a Suspicious Cough

A thorough differential diagnosis, primarily based on history and physical examination, is essential when a child presents with a suspicious cough. Certain imaging modalities are also useful for diagnosis.

Identification of an underlying cause is crucial. When doing your history and physical exam, look for something that does not fit a routine presentation. For example, a cough in the presence of a constitutional change, such as weight loss, can indicate a more serious problem. In addition, a cough with a relatively sudden onset or one associated with labored breathing can be worrisome. Also, a choking episode followed by sudden cough, for example, can indicate the presence of a foreign body.

Asthma is the most common cause of chronic cough in the pediatric population, but also consider less common eti-

ologies such as tracheoesophageal fistula, cystic fibrosis (CF), and bronchopulmonary dysplasia. Failure to thrive, clubbing, cardiac signs, and persistent stridor suggest alternative diagnoses.

Patient age offers some guidance in your differential diagnosis. In a neonate (younger than 28 days), persistent cough might suggest an infection or a congenital anomaly such as compression of the esophagus and trachea by a vascular ring. Infectious etiologies include rhinovirus, adenovirus, respiratory syncytial virus, and pertussis.

In preschool children, think upper or lower respiratory tract infection, rhinitis, postnasal drip syndrome, gastroesophageal reflux, an irritant source (such as passive smoking or air pollution), and, of course, asthma.

Among school-age children and adolescents, consider the same possibilities, but add inhalant or other substance abuse

to your list of possible irritant causes. In addition, these older children can develop psychogenic or "habit" cough, one that is absent during sleep, distraction, or periods of concentration. Vocal cord dysfunction, also known as laryngeal wheeze, is another possibility in this group.

General pediatricians commonly treat children with a cough that lasts 5-10 days in the context of an upper respiratory tract illness, such as a cold. If a child still coughs incessantly after other cold symptoms have resolved, I would be concerned. This is not necessarily a call to refer the patient to a specialist, but this scenario is a call to do further diagnostic evaluation.

If the child already is diagnosed with asthma and develops a cough, determine whether the patient is taking the appropriate medication and/or is compliant with therapy. Also, ask about the child's environment, particularly the presence of passive smoking, dust, and pets.

In terms of allergy testing, I recommend a radioallergosorbent allergen-specific IgE antibody assay. This is indicat-

ed if a child has other lateral symptoms, such as eczema, and/or during peak times for seasonal allergies.

It is helpful when pediatricians do spirometry for a child with a suspicious cough. Nationwide, about 20%-25% of general pediatricians do pulmonary function testing. Pediatric pulmonologists like me would like to see more pediatricians perform these tests. Sinus x-rays also can be helpful, and are within the purview of the general pediatrician. Some might consider this an unnecessary test, however, or one for which you need a high index of suspicion before ordering.

A test that is generally unnecessary is a sweat test for cystic fibrosis. A lot of pediatricians get this test, and I would not tell them not to because often the child with CF has other symptoms that are more diagnostic. ■

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