Pediatric Occupational Therapy: Movement and Sensory Integration

As occupational therapists working with children, we often hear, "You're a pediatric occupational therapist? So you help kids get jobs?" What a great question! Just what does a pediatric occupational therapist do? In a very real sense we do help kids with their jobs—the job of being a kid. Here we will be discussing the key areas of pediatric occupational therapy, including Sensory Integration and motor skill development, and how occupational therapy can help children to reach their highest potential. We will also discuss the basics of Sensory Integration, the five familiar senses, and introduce a few key senses, which may not be as familiar to you.

Growth, learning, skill acquisition, these are all part of the job of being a kid. How do young children learn, grow, and gain new skills? They do it through play. It is this exploratory play--learning to walk, run, and climb, learning to take apart and put together-- which pushes the child's muscles and neurological system to develop and meet the challenges of daily life. Many children, however, do not learn to play properly. By this we mean they do not play in a way that enhances their growth and learning. They may have an illness, injury, extreme fear, or even attentional difficulties, which limit their play repertoire. For example, a child with poor balance and a fear of falling may not develop good motor skills because he engages only in sedentary play. Later, in grade school, he might exhibit poor self-esteem because of his reduced performance in sports or gym.

So, how does an occupational therapist help a child in his "job performance?" We work with the child at his or her developmental level and help him build the groundwork for higher-level skills. This is especially important for children who have been identified with a delay, because there is a tendency to try to teach them the age-appropriate skill, say handwriting, without addressing the fundamental deficit(s), which could be poor hand-eye skills, weak muscles, or even difficulty paying attention. If we do not address these basic concerns, it is unlikely the child will develop the higher-level skill without tremendous difficulty and frustration; or the child may not develop the skill at all.

Underlying even the most basic motor skills is the processing of sensory information. Our sense of sight, sound, taste, touch and smell provide us with important information about the world around us. Our sense of balance, position, and movement tell us where we are in relation to the objects around us, and are critical to developing the motor coordination necessary to perform even the most basic activities. Taking in and processing this sensory information to produce a meaningful response is called Sensory Integration.

What problems exist with sensory integration (technically know as *Sensory Integration Dysfunction*) and how it can affect the behavior and development of your child? We are all familiar with the five senses of sight, sound, taste, touch, and smell. Sensory integration dysfunction most often manifests itself in the form of increased or decreased sensitivity to certain types of stimuli (sounds, smells, textures, etc.). Technically, this is known as *hyper* (high sensitivity) and *hypo* (low) sensitivity. When considering the five common senses, children are

most often referred to OT for hyper, rather than hyposensitivity. It is the job of the OT to work with the parent to tease out the child's "sensory profile" and work accordingly to improve the child's sensory processing skills.

A child who is hypersensitive to sounds, may perceive the hum of a refrigerator or the buzz of florescent lights as though they were the piercing wail of a police siren. Such a child may appear to block his ears and cry or wince for no apparent reason—but this is because we are not sensitive to the sounds that are so obviously affecting him. In some cases, a child may not be able to get used to, or *habituate* to, background noises so that they are a constant distraction; he cannot "tune out" these sounds, and it prevents him from attending to his schoolwork. For the child who is sensitive to touch (known as tactile sensitivity, or in the extreme, tactile defensiveness), gently stroking the head or the arm may elicit a startle or even a scream, because such light touch is misperceived as painful. This type of child often dislikes hugging and cuddling, and consequently experiences difficulty bonding with her parents. Later, she may also exhibit delayed fine-motor skills because she avoids touching the manipulatives at school. Sticky, slimy things such as glue or play-dough, may be particularly aversive. Still another child with taste or smell sensitivities, may gag or vomit when exposed to perfumes, or even mild cooking smells. Some children who are tactually sensitive in and around the mouth will only tolerate certain textures in their food and refuse any variation, making proper nutrition a challenge. In extreme cases, such a child may not tolerate tooth brushing or any touching of the area around the mouth. This is known as oral hypersensitivity, and is really a type of tactile defensiveness. In other cases, a child may be extremely sensitive to light (photosensitive), or patterns and movement in the area around him may distract him. In fact, some experts feel that mild to moderate visual and auditory hypersensitivity may constitute the basis for attention deficit disorder (ADD).

In our clinic any child referred for OT is automatically screened for sensory problems and a questionnaire regarding sensory behaviors is sent to the parents. In our Early Intervention program, all children are observed for signs of sensory problems. In this way we are able to identify potential problems and apply therapeutic strategies to help eliminate them. If you suspect your child has a problem with sensory integration or is exhibiting any of the behaviors mentioned above, please ask your therapist for a sensory questionnaire and set up an appointment to speak with the occupational therapist in the office.

There are two lesser known, but absolutely critical "hidden" senses of which most people are unaware, but which are vitally important to a child's development. These senses are necessary to coordinate balance, body position, and movement. The first of these two hidden senses is known as *proprioception*. Proprioception is the sense of our own bodies, how our body parts relate to one another, and by extension, how we relate to the objects in the environment around us. When a baby plays with her feet, she is learning about where her feet are and how they relate to the rest of her body. Through experience, over time, a child forms an internal "body map," which allows her to know exactly where any body part is and what it is doing at any point in time. This is why you can easily touch your finger to your nose with your eyes closed--or find and scratch an itch without having to look for it with your eyes. A more complex and functional example might be

climbing a jungle gym while talking to a friend on the ground. Proprioception allows the child to know where his body is at all times, and therefore perform many motor tasks automatically and without relying on vision.

Children with poor proprioception are often seen as clumsy or uncoordinated. Because they have an underdeveloped body map, and are not fully aware of how their own body parts relate to one another, they also have difficulty negotiating the environment around them. If a child is not automatically aware of how far he is extending his leg when he walks, he will not properly gauge the distance to objects and may trip on them. Such a child may frequently fall or bump into things. Moreover, because proprioception also involves a sense of touch pressure, incoordination might be exacerbated by pushing too hard or too softly (think a what happens when you attempt to pick a box you think is heavy, but turns out to be empty). These children might over or under reach when catching or kicking a ball, break delicate objects by squeezing too hard, and often have difficulty with fine motor tasks such as handwriting and manipulating small objects. For this reason their motor milestones may be delayed (see www.cslot.com for a list of motor milestones).

Because the receptors for proprioception—aptly named "proprioceptors," are mainly located in the muscles and joints, poor body awareness is often seen together with low muscle tone. Although these children have average strength, their muscles are often excessively lax at rest, often resulting in "loose" joints, which hyperextend, or bend backwards quite a bit (a good way to observe this is to have the child extend his arms to the side with the palms up, see if the elbow joint bends backwards excessively). These children appear to be "floppy," or like a "wet noodle." They tend to lean on objects and people for support because, in a resting state, their muscles are not holding them up properly.

If your child fits this profile, or if he is significantly delayed in his motor milestones, an occupational therapy evaluation may help to pinpoint specific difficulties, and to provide a comprehensive plan of treatment. For some children, direct services are recommended, for others, a home program is all that is needed. Please speak with the occupational therapist in your clinic for more information.