Sensory Processing with all seven of our senses (via our central nervous system) is something that is present in everyone at birth. It's there even before birth, as we move in utero, starting as an immature system, and developing as we learn and grow. We use our sensory systems (vision, hearing, touch, taste and smell) along with the two lesser-known senses, the vestibular sense (that detects gravity and movement) and the sense of proprioception (that deals with muscle and joint awareness). We use all our senses simultaneously to help plan and carry out purposeful and functional movement. We use them to guide, modify, learn and adapt movement to achieve a desired task.

Think back to when you learned to drive a car. Initially it was hard to coordinate all the new individual components and sequences needed. But, over time and with practice, driving became a much more automatic skill. You didn’t have to consciously think about all the components anymore. That is an example of good sensory processing and how we modify and adapt to learn a new skill.

Sometimes we notice children (and adults) who are having difficulty with certain activities. They often avoid those activities and do things that are more familiar and comfortable. Sometimes a nervous system can be very inefficient. What tends to happen is that all our senses may not be very efficient at working together, and can effect how children experience their world. They may experience sensory input as uncomfortable; for example, sticky things upset the nervous system and feel uncomfortable on the skin. Or, it may be difficult for children to accurately feel input through their muscles and joints; they may jump a lot, or seem clumsy, or use extra force when they are doing things like giving hugs. These things help them feel how and where their muscles are moving.

Children usually do the best they can and they typically want to fit in with others. Young children are always challenging themselves and practicing new skills which build the efficiency of their nervous systems. Children build their systems through vestibular activities, such as swinging, sliding, dancing, and challenging their balance on curbs and tables. They are constantly using their tactile systems by exploring new textures and materials such as sand, play-dough and finger-paint. They also build their proprioceptive systems with activities such as jumping or pushing heavy toys. Typically it looks like play, which is truly a child’s “job.” If there are areas they strongly avoid it may mean that they are very uncomfortable engaging in that specific activity.
The tactile system functions in two ways. It helps us to protect ourselves and to understand things in our world through touch. The protective component plays an important role in survival and general awareness of our environment. It detects temperature, light touch and general skin contact. If the tactile system is always aroused it can make you extra sensitive to touch. This is the system that detects a spider on your arm and allows you to react by brushing off the spider.

The discriminative component becomes more developed over time. It allows us to be aware of different textures and forms through touch. For example, when your hand is in your pocket you can pull out a quarter rather than a chapstick without looking, just by discriminating its form. Light touch is often uncomfortable for children and deep pressure is much easier to tolerate.

Tactile activities:
- Sitting in a small box, pool, or laundry basket filled with balls, dried beans, macaroni or rice—you could also have these items in a box to touch and explore
- Playing with oobleck (cornstarch and water mixture), play dough, or gack
- Having a feely box or sock (hiding items inside for children to use touch rather than vision to identify)
- Using a vibrating pen or massager
- Having a sandbox encourages use of digging and pouring
- Rolling in grass, making mud pies, raking and picking up leaves
- Finger painting
- Cooking (hand rolling cookie dough, making taffy)

An inefficient system will present itself in many ways, but common problems include difficulty sequencing fine motor tasks, general clumsiness (bumping into things), avoiding being too near other children (but adults may be okay, as they are often more predictable), difficulty with dressing and undressing, and/or avoidance of getting their hands messy with things like glue or finger-paint. Talking requires an efficient nervous system and is also an area that is often problematic for children with sensory processing problems.

If a child’s nervous system is inefficient it is possible to assist her with a variety of activities that can slowly make a difference. You are probably already doing many of the activities. Below is a description of the three major sensory systems, along with activity ideas. It is possible to add more input within everyday activities, such as allowing the child (in a safe way) to open a heavy door instead of doing it yourself. It does take a little creativity and imagination to incorporate these strategies, but over time it becomes easier as your awareness of these systems increases. Since we cannot truly isolate any of our senses, most activities have all three systems involved, but one system is usually being stimulated more than the others.
THE VESTIBULAR SYSTEM
The vestibular system is our sense of movement and gravity. It is through this system that we develop a relationship with the earth. It is how we know when we are right side up, upside down, left, right, horizontal, and vertical. Vestibular information tells us whether or not we are moving, how quickly we are moving and in what direction. It provides us with a sense of safety when we have our feet firmly planted on the ground. If children have an inefficiency with this system, it may appear that they are either afraid of being off the ground (on jungle gyms, swings, etc.) or have the opposite effect (excess of movement, risk taking behaviors, etc.).

Vestibular activities:
- Riding scooter boards while positioned on your stomach
- Going down a slide on your stomach
- Swinging on a tire or a hammock
- Using teeter-totters
- Rocking on a horse or in a chair
- Rolling back and forth over a ball
- Twirling around in snow saucers
- Riding merry-go-rounds
- Spinning in an office chair
- Doing somersaults, rolling down a hill, or rolling in a barrel
- Standing and twirling around and around

THE PROPRIOCEPTIVE SYSTEM
Proprioception is the unconscious information we get from our muscles and joints. It tells us information about our body position, how fast we are moving, and the amount of pressure and stretch we need to perform tasks. For example, when we reach to pick up a very full styrofoam cup of hot coffee, without thinking, we prepare our body to do this activity. We adapt the speed at which our arm moves so that we don’t spill the coffee; and the amount of pressure we use to pick up the cup, so that we don’t squish it by squeezing too hard. We constantly adapt our muscles depending on the activity. Children with difficulty in this area may have trouble “grading” their muscles, and use too much force or not enough force with activities.

Proprioceptive activities:
- Carrying heavy items (buckets of water, groceries, phonebooks)
- Jumping on a trampoline or a bed
- Using a hippity-hop ball
- Dancing
- Having a pillow fight
- Playing “wheelbarrow,” or pushing each other in wagons or laundry baskets
- Pulling each other on blankets
- Playing catch with a heavy ball,
- Hammering wooden sticks into styrofoam or nails into wood
SUMMARY

It is not always a simple process to engage children in activities that they do not want to do or that make them feel uncomfortable. They may require a safe way to engage in a difficult activity, such as providing hand-over-hand assistance. It is always a good idea if possible to have a “calming activity” (one that relaxes the nervous system) prior to a difficult task or even during the task. For example, deep pressure is usually calming to the nervous system. During a challenging task, you could provide deep pressure by having the child stand or sit in front of you, while you put your hands on the child’s shoulders, rub her back firmly, or let her lean against you. Nice comforting deep pressure and encouragement (like a hug) goes a very long way towards helping a child do something that is uncomfortable. Our nervous systems respond constantly to our environment. It is also possible to provide deep pressure by having a child jump or roll over a large exercise ball to calm the nervous system. This may make the adverse sensory input easier to accept.

Adults are constantly being bombarded by sensory input from our own bodies and from the environment. But as adults, we automatically know what we need to do to calm ourselves when we are stressed. We might take some time out for a few minutes, listen to calming music, eat something (chewing is calming), and/or avoid things that irritate our nervous system (loud music, itchy fabrics, etc.). Children have trouble knowing how to calm themselves in appropriate ways; so their behaviors may look like they are “acting up” (tantrums, aggression, hyperactivity, etc.) or they can be labeled “lazy,” “picky” or “shy.” A child may be doing fairly well in child care and at home, but have more difficulty in a structured, faster paced environment like kindergarten. Sometimes just observing children can show us what they need to calm and focus their bodies. By looking at how children behave after they are given some sensory input, you can tell if the activity is meeting their needs. It is important to remember to make these activities fun; when an activity (learning) is fun (and successful) you want to keep on doing it!

Remember: It is important to understand that not all activities and modifications will work with all children. You may need to get further assistance for the child. There are resources available. If you have questions, please contact your physician, your school district, or the local resource and referral agency.

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