

Proprioceptive System

The proprioceptive system are parts of our muscles, joints, and tendons that tell us what position our body is in. Another dimension of proprioception is praxis or motor planning. This is the ability to plan and execute different motor tasks. So that this system works properly, it must rely on obtaining accurate information from the sensory systems and then organizing and interpreting this information efficiently and effectively.

Signs of proprioceptive processing difficulties:

- Stiff movements, locks joints
- Uncoordinated
- Prefers sedentary activities
- Squeezes self into small places (in order to get more proprioceptive input)
- Self-injurious behaviors (in order to get more proprioceptive input)
- Excessive clapping, crashing, banging
- Poor posture
- Leans against things, or props oneself up against things
- Poor body awareness
- Bumps into things
- Difficulty staying in one place
- Decreased strength
- Tires easily
- Seeks deep pressure hugs

Movement (Vestibular System)

Our vestibular system includes structures in our inner ear (semi-circular canals) that let us know how our body is moving, and what position it is in. When these systems are working properly, we know how to move our body properly in different situations such as:

- “Gross” or large body movements such as walking, sitting, and running etc.
- “Fine” or smaller body movements such as using our hands to write, use forks and spoons, tie shoelaces, or button a shirt.

Children with severe difficulties with coordination may have a condition known as Developmental Coordination Disorder, which benefits from proper assessment and treatment by an Occupational Therapist (OT).

Movement (Vestibular) Hypersensitivity

Behaviours of someone with vestibular hypersensitivity may include:

- Gets distressed by, or avoids movement
- A person can be upset by movement in one direction (up/down), but tolerate movement in other directions (e.g. back/forth)
- E.g. Dislike of riding in cars, or gets car sick easily
- E.g. Avoids rides, or swings
- E.g. May get anxious when there is lots of movement
- E.g. Fear of elevators
- May get anxious when feet are off the floor
- Often appear uncoordinated and unable to perform skills requiring sequencing and timing
- Child may appear fearful of heights

Strategies for the child who is hyper-responsive to movement

- Limit unnecessary movement
- Slowly introduce different movements into the child's life in a safe way
- Teach the child self-regulation strategies to assist with staying calm

Movement (Vestibular) Under-sensitivity

Behaviours of someone who is under responsive to proprioceptive and vestibular input may include:

- Child appears clumsy
- Child has a lack of awareness of body position in space, odd body posturing, minimal crawling when young
- Difficulty manipulating small objects (buttons, snaps)
- Eats in a sloppy manner
- Resistance to learning new motor movement activities.
- Difficulties standing in line without touching others
- Generally unaware of how much force they use when touching other people or handling everyday objects (hold hands too tightly, break toys accidentally)
- Poke holes in their paper while writing or erasing
- Loves rough and tumble play
- Rocks frequently, moves constantly

- Jumps on furniture. Has difficulties “sitting still and listening”
- May have troubles with visual tracking

Strategies for the child who requires increased proprioceptive/vestibular input:

- Give the student an opportunity to move as much as possible, e.g. allowing for washroom breaks, or asking the student to do errands as fetching things, being a messenger, cleaning the blackboard, etc.
- Alternate “thinking activities” with movement activities
 - o thinking activities for 10-20 minutes, followed by
 - o movement such as a “Body Break” session of 2-5 minutes of physical movement, e.g. jumping jacks, squeezing a stress ball, push-ups against a wall.
- Letting the student stand up and wiggle around whenever possible
- Allowing the student to switch seats
- Chair push ups
- Have the students pretend they are popcorn cooking in a popper
- Tell the students to use their hands and feet to push their bodies up and down
- The teacher can use hand signals to direct the students through the “popcorn cooking” process
- Consider the use of special seating which gives hyperactive students an opportunity to move and thus receive sufficient stimulation so that they can stay focused, without having to wiggle in a standard seat.

