

- Animal walks (bear walks, crab walks, donkey kicks, duck walks, etc.)
- Chewy foods
- Crunchy foods
- Chewing tool

The **Vestibular Sensory System** is the sense of movement and balance, and uses the receptors in the inner ear and allows the body to orient to position in space. The vestibular system is closely related to eye movements and coordination. Vestibular sensory input is a powerful tool in helping children with sensory needs. Adding a few vestibular activities to the day allows for long-lasting effects. Every individual requires vestibular sensory input in natural development. In fact, as infants we are exposed to vestibular input that promotes a natural and healthy development and integration of all systems.

The sensory vestibular activities listed in this book are playful ways to promote performance and tolerance to movement activities. They are also challenges against gravity to help kids with difficulties in equilibrium, balance, self-regulation, and adjusting to typical sensory input. The vestibular system operates through receptors in the inner ear and in conjunction with position in space, input from the eyes, and feedback from muscle and joint receptors, is able to contribute to posture and appropriate response of the visual system to maintain a field of vision. This allows an individual to detect movement and changes in the position of the head and body. Dysfunction in the vestibular system may result in hypersensitivity to movements or hyposensitivity to movements.

The receptors of the vestibular sensory system

are actually hair cells that are found in two structures in the inner ear:

Receptors on the otolith organs within the ear respond to linear movement, gravity, and head tilt.

Receptors on the semicircular canals within the ear respond to angular movement of the head and quick movement changes.

These receptors provide information to the central nervous system about the body's position in space and project information to several areas:

- * **Cerebellum**- Information received in the cerebellum is used to control posture, eye, and head movements.
- * **Oculomotor nuclei**- Information received here help to correct the eyes with head and body movements.
- * **Spinal cord**- Information received here helps with muscle tone and postural adjustments.
- * **Thalamus and cortex**- Information received here helps with perception of motion and spatial orientation and integrates somatosensory information.





Problems with the Vestibular Processing System

There are many common features that may present in the child with vestibular sensory difficulties. These can be considered red flags, or warning signals of vestibular processing problems:



- Poor visual processing
- Poor spatial awareness
- Poor balance
- Difficulty with bilateral integration
- Sequencing deficits
- Poor visual-motor skills
- Poor constructional abilities
- Poor discrimination of body position
- Poor discrimination of movement
- Poor equilibrium
- Subtle difficulties discerning the orientation of head
- Trouble negotiating action sequences



- Prone swinging
- Seated swinging
- Standing swinging
- Linear movements
- Vertical movements
- Rotary movements
- Angular movements
- Upside down movements
- Horizontal movements
- Challenges to balance
- Inverted head
- Unstable base of support
- Starts and stops in motion
- Changes in direction
- Changes in speed

When providing vestibular input as an intervention strategy for sensory needs, various movement patterns should be considered. Depending on the individualized needs of the child, activities can be designed to include movements such as: