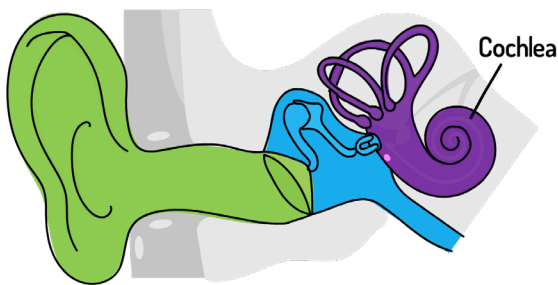




The Vestibular System

Definition:

- The vestibular system is the most sensitive and one of the most important sense organs. It is stimulated by movement of fluid in the structures of the inner ear, in response to movement by the head.



- It is all about balance and movement.
- The vestibular system provides us with information about where our body is in space and whether the movement is up, down, fast, slow or angular.
- Even when our eyes are closed we know the position of our head. The vestibular system also allows us to keep our balance with our eyes closed.
- It has a very close relationship to gravity, safety, survival, arousal, and attention .

Why is the Processing of Vestibular Information Important?

- Input to the vestibular system is important for regulating muscle tone, joint stability, bilateral integration, spatial awareness, eye movements and balance and equilibrium mechanisms. These all affect our ability to maintain good sitting posture and to sit still i.e. at a desk.

Research has identified this system as playing a critical role in modulating the other sensory systems, i.e. our **'volume control' to other sensations'** hence its role in assisting self-regulation and allowing us to maintain appropriate levels of arousal. An intact vestibular system means you know what 'being still' feels like and can keep still when needed. If children cannot keep still it is an indicator for weaknesses within this system.

- When your child has an under developed vestibular system, their brain is not getting the correct information from their eyes, ears, the sense of gravity or movement in their bodies. This in turn makes their brain and body feel unsafe. When they do not feel safe, their arousal level, attention, and survival mode responses kick in.

Functional Implications of Poor Vestibular Processing:

Over-responsive vestibular system:

The child who perceives too much movement information.

- Gravitational insecurity: excessive fear of falling / of heights / and of feet leaving the ground
- Overly frightened by movement / dislikes playground activities
- Difficulty mastering environmental obstacles such as stairs or uneven terrain, appearing clumsy or uncoordinated
- Intolerance or adverse reactions to movement, motion sickness, nausea, giddiness

Under-responsive vestibular system:

The child who is not processing enough movement information and therefore seeks movement.

- Craves movement, swinging, rocking, hanging upside down
- Runs instead of walks
- Moves excessively, using momentum to compensate for poor balance reactions
- Does not get dizzy until they have had an enormous amount of movement
- Poor bilateral integration and co-ordination
- For these children try activities with eyes closed as this heightens vestibular input

Activity Suggestions to Help Improve Vestibular Processing

Slow and rhythmical movements (like swinging or rocking) in one direction are usually calming and organising.



Swinging / rolling / rocking / swaying / Hammock / Rolling on tummy slightly on therapy ball (the best effects are gained when these activities are self-activated, i.e. let the child swing / spin him / herself)

Vertical movement (like jumping/bouncing) is usually alerting.

- Jumping on a trampoline
- Space Hopper
- Pogo Jump or Pogo Stick

Rotation or Spinning can be alerting, but unfortunately this can also be disorganising.

- Rotation should be done in short bursts only – no longer than 5 minutes at a time. Do not repeat within 6 hours. Make sure the child stops and changes direction regularly.
- Use of a Dizzy-Disc Junior or Sit 'n' spin
- Tyre Swing attached to a tree
- Roundabout
- Spinning around a post / in a chair

Inverted (Head Upside Down) can be calming or alerting. However, it should not be used if the child has known epilepsy.

- Laying on a large therapy ball on their tummy and rocking right over until the head is below the feet.
- Hanging upside down on the 'monkey bars' or climbing frame.

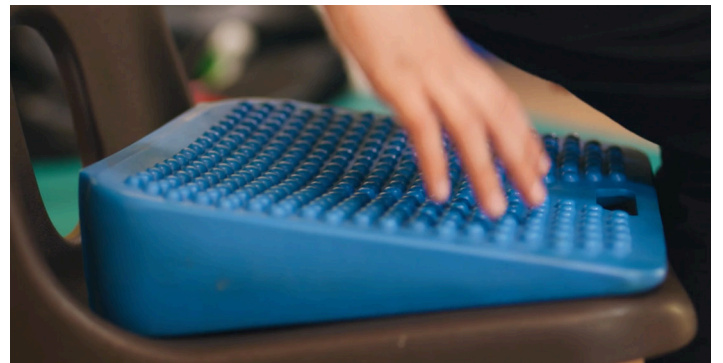
The child can place their hands on the floor to stop themselves from going too far forwards. This can be turned into a game, so that as you push them forwards over the ball, using their legs the child pushes backwards, using their hands on the floor. This resistance provides proprioception as well.

Other Movements

- Rolling down a grassy hill. A blanket can also be used to facilitate a similar rolling movement on a flat surface. Let the child lie parallel to one side of the blanket. Lift the blanket on the side where the child is lying and let the momentum help the child roll over. Make sure the child rolls in both directions.



- Going down a ramp on the scooterboard, sledging or rolling down a hill, using a balance board.
- Sitting on a movement Cushions i.e. a Move'n'sit Cushion or a Disc-o-sit Cushion.



Movement stimulation stays in the system much longer than stimulation from other sensory systems - potentially up to 4 hours, even longer in some cases.

To cool down after heavy work activities, lie on the floor and roll/rock body, or roll gently with therapy ball/mat. Alternately have a big hug or sit with weighted blanket. Deep pressure is calming.