



## VESTIBULAR PROCESSING & ASTRONAUT TRAINING

### WHAT IS VESTIBULAR PROCESSING?

The vestibular system helps us understand the position of our head and body in space. It gives us information about which way is up and which direction we are traveling in. It helps us with balance, spatial awareness and maintaining a stable visual image, even when we are in motion. It is a movement detection system and consists of gravity receptors in our inner ear that inform us about rotary and linear movement.

From when we are infants, we gain important information from the vestibular system about gravity as we begin to move through space. From laying down, to rolling over, to crawling, to pulling up on objects to stand, and taking our first steps, we are using our vestibular system. As we grow and learn to run and jump, roll, and spin, we are still demonstrating skills that rely on our vestibular function.

The vestibular system works with our auditory and visual systems to support us to operate in our environment. When these systems work together, it can be referred to as the 'Vestibular-Auditory-Visual triad'. With proper functioning of the Vestibular-Auditory-Visual triad, the sights and sounds of our worlds become meaningful and invite us to move, explore and engage within our environment.

### WHY?

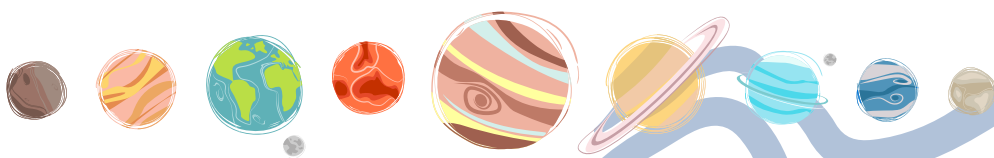
Our vestibular system is critical for our survival and for us to be able to engage in our activities of daily living. We often see vestibular deficits in children with delayed motor development, perceptual and attentional deficits, learning disabilities, emotional regulation challenges, language disorders, and autism.



### WHAT IS ASTRONAUT TRAINING?

Astronaut training is a therapeutic protocol that is used to support and strengthen an individual's vestibular function. Astronaut training can be used with people of all ages. Astronaut training uses the Vestibular-Visual-Auditory triad to support vestibular function.

Some children may have difficulty linking their Vestibular-Auditory-Visual triad which can be demonstrated in many behaviours such as poor concentration, fine and gross motor challenges, balance issues, or poor coordination to name a few.



Astronaut training is a program that aims to form a strong link between the Vestibular-Auditory-Visual triad. Similarly, when astronauts go to space, they are put through extensive training to optimise their vestibular function, so that they can withstand the burdens of weightlessness, free falling and other disorienting aspects of space travel.

## WHAT'S INVOLVED?



1

The protocol will start with a brief observational assessment of the participant completing a sequence of movements.

2

If the participant is deemed appropriate, the OT will then take the participant through 4-6 preparation exercises. These exercises are designed to activate all of the vestibular receptors in our inner ear and include linear, angular and rotational movements. These exercises can make people feel dizzy, so practising these for a period might be necessary before moving on to the next part of the protocol.

3

The Rotary component is completed next. This step involves sitting the participant on a specialised board that rotates and gently rotating the person in sync with a specific sound. Reflexive eye movements are noted to support volitional eye movement control. And to assist this, a set of specific eye movements are executed shortly after the rotation is finished. This sequence is completed by spinning both left and right in an upright position, and then again in a side-lying position.

4

Eye Movements are completed as part of the next step in the protocol. These include: Horizontal-vertical- diagonal saccades, smooth pursuits, and horizontal, vertical and circular head movements, near and far eye teaming, and peripheral vision.

5

The final step of the protocol involves a sequence of movements/games/activities that engages our linear vestibular receptors.