

Vestibular

The movement and balance sense

The vestibular sense allows us to understand our own movement and position against gravity and to recognise the movement of others and objects within our environment. It senses if we are moving, when we speed up or slow down and influences how awake/alert we feel.

This sensory system is a unifying system that uses our eyes to track, allowing us to develop smooth coordinated physical movements.

It's our balance system that is important in all postures and positions. It informs us of our head position/ our body's position in relation to other things and gives us our internalised sense of gravity.

It can help with:

- Organisational skills
- Visual tracking skills
- Posture and tone
- Co-Ordination
- Eye-hand coordination skills
- Self-regulation

Types of movement that use the vestibular system:

- **Linear** is one plane e.g. up and down, side to side and backwards and forwards. This can be calming and organising
- Smooth regular movements such as slow rocking and tapping are calming.
- **Rotational** – spinning, travelling around in tight circles. This can be exciting and alerting, it can be disorganising e.g. causing dizziness
- Irregular movement is stimulating and alerting

Think!

'Movement breaks' ***not*** 'stopping breaks': - CYP who need to move in order to maintain the 'just right' level of alertness need more movement breaks than their peers. They might not finish work in the set timescales, it ***is not*** of benefit to stop them going out at break time in order to catch-up on their work as what they ***really need*** to do is to ***move*** to become more focused. For these CYP expectations of shorter periods of focused activity might be more realistic and more productive.

Time out area - an allocated space where the CYP can go where it is quiet or away from the busy environment. This space will offer opportunities for the CYP to regroup and refocus. 'Time out' should not be viewed as a punishment. Use a card to allow the CYP to discretely indicate the need to withdraw, have agreed time scales e.g. 2/5 minutes in time out **but allow the CYP to extend this if they need to**. It is rare for a CYP to overuse this kind of time out once they are confident with their ability to access it but the simple use of a visual timer will help give parameters to this strategy. 'Time out' can also be a movement break opportunity allowing the CYP to take the register back to the office or engage in 'heavy work' activity such as to taking something heavy to another room and bringing something back can help the CYP to regulate and become reorganised if the environment is becoming challenging or they need to raise their alertness levels.

What you Might See As described in the 'What you might see' overview

If a CYP is **seeking** more vestibular stimulus they may:

- struggle to sit still for developmentally appropriate amounts of time
- like to jump excessively
- climb excessively
- enjoy changes head position
- dangle upside down
- run/pace when watching TV or watching other children play etc.
- spin without getting dizzy
- rock their head or body repetitively
- enjoy being thrown in the air
- love fairground rides

If a CYP is **under responsive** to vestibular sensory stimulus they may:

- not notice changes in position when they are moved
- not get dizzy when spun around
- be unable to distinguish between slow and fast movements and/or direction of movements

If you think a CYP has had too much vestibular movement - use some deep pressure activities and/or 'heavy work' (refer to ['activities to balance sensory systems'](#))

Quick examples:

- Head presses
- Therapy ball squashes
- Press ups
- Pushing against a wall with hands
- Carrying objects / moving equipment







The vestibular system needs to be treated with care, as if overused, it can cause distress for the CYP with over stimulation.

Sometimes a CYP that is seeking more vestibular based movements can be excitable. You will need to think about ways to calm the system using deep pressure and weight bearing activities ([refer to the 'activities to help balance the sensory systems'](#))

Be aware that the effects of over-stimulation can happen hours after a vestibular rich activity.

The activity will usually have had an irregular and/or rotational element to it

You can support these **under-responsive vestibular** sensory processing needs by using some of the following activities:

What you see	Initial activities	When?/How long for?/ techniques	What to be aware of!	Image
CYP struggles to sit still for focussed sessions	Playground breaks Swings, slides, climbing, self-propelling roundabouts where there are combinations of movements and planning needed	Always try and combine movement with resistance so that both vestibular and proprioceptive systems are engaged	Some CYP can become over stimulated by extended play on swings and roundabouts	
CYP needs more movement within the session/day than their peers Unable to sit for developmentally appropriate periods of time	Activities that plan and use visual tracking to challenge the CYP Moving and catching, tracking a ball, swinging to catch a ball	As part of timetabled movement breaks and when CYP needs movement input		
CYP needs more movement within the session/day than their peers Unable to sit for developmentally appropriate periods of time	Activities providing fast linear movement Supervised trampoline use	Short bursts as part of timetabled movement breaks and when CYP needs movement input	Limit use! CYP can over stimulate on an activity that has opportunity for irregular movements	! 
CYP needs more movement within the session/day than their peers Unable to sit for developmentally appropriate periods of time	Therapy ball work Rolling over a peanut ball on tummy touching floor with hands and then feet	May require a programme devised by therapy staff As part of timetabled movement breaks and when CYP needs movement input	Can over stimulate, so limit time and be specific with planned activities	
CYP wobbles on seat, rocks on chair legs	Use a move and sit or wobble cushion	During seated times when CYP is unable to sit for developmentally appropriate periods of time	If there is too much movement CYP can become over excited. Trial for short period and see if concentration improves	! 
CYP seems to be constantly on the go	Slow linear movements which are calming such as: Slow swings, slow rocking movements, row the boat etc	When CYP requires movement in order to self-regulate Use this as a calming option	Avoid rotary and irregular movements	

What you Might See

As described in the 'What you might see' overview

When a CYP has an **over responsive** vestibular system or needs to calm from over stimulus they may:





- have a change in pallor following movement-based activity
- become sweaty/cold clammy to touch following movement-based activity
- have an abrupt change in mood following movement-based activity
- become distressed/unwell by regular amounts of movements
- suffer with nausea/motion sickness
- avoid movement-based activities preferring static activities
- startle if moved by someone else
- have a fear of heights, even very small ones

Think!



- Look for over stimulation
- Mix vestibular with muscle-based work to reduce over-stimulation
- Let the CYP lead especially when you are overcoming vestibular overload or movement insecurity
- Little and often and in response to the CYP needing a movement break
- The activities must be safe and supervised

For more activities refer to the additional vestibular activities sheet.

You can support these **over responsive vestibular** sensory processing needs by using some of the following activities:

What you see	Initial activities	When? how long for?/techniques	What to be aware of!	Image
CYP demonstrates levels of anxiety	Provide a 'safe haven' within a larger space, so the CYP feels secure	This needs to be used when needed, not as a set routine		
CYP is distracted/distressed by movement of others in close proximity	CYP may need a specific place within the room for their seat where they can see everyone and be confident no one is going to move behind them and 'threaten' their stability	At all times		
CYP is not aware of/engaged in physical activity presented	Prepare for movement and help to organise/desensitise to movement using proprioception 'heavy work' activities with push and pull first	To be used before a movement activity if CYP needs to 'wake up'/alert the body	Never force movement upon a CYP who does not want it...move at the CYPs pace	
CYP showing signs of over stimulation e.g. dizziness, sweaty, clammy	Use an activity that engages core muscles and has high level of proprioceptive input	Until CYP recovers See calming ideas sheet	Try to encourage CYP to choose options they enjoy	
CYP finds imitating movements difficult	Plan movement before starting Allow the CYP time to process and complete the movement			

You can support these **over responsive vestibular** sensory processing needs by using some of the following activities:

What you see	Initial activities	When? how long for?/techniques	What to be aware of!	Image
<p>CYP has difficulties with motor planning and coordination</p>	<p>Obstacle courses – under/ over/ through</p>	<p>Regular timetabled opportunities to plan and move</p>	<p>Must be at CYP’s level of skill and CYP led</p>	
<p>CYP is using vision to support their balance and negotiate environments with care</p> <p>e.g. struggling to negotiate obstacles in their path/changes to furniture layout</p>	<p>Plan and demonstrate/practice how CYP is going to move around their space</p>	<p>Encourage CYP to do one process at a time and learn to avoid distractions</p>	<p>Safety awareness: Make sure this CYP is not trying to carry hot/sharp or heavy items in situations where they may not be able to avoid being distracted</p>	
<p>CYP seems ‘clumsy’ and uncoordinated in their movements</p> <p>CYP has poor core strength/skills</p>	<p>Physical literacy activities to support core skills development</p>	<p>Break the movement into smaller steps</p> <p>Practice in a quiet environment avoiding busy spaces</p>	<p>Slow down and look for quality of movements rather than speed</p>	

Vestibular additional activities sheet

These lists are by no means definitive but a good starting point to discover what does and does not work for individuals. It is important to bear in mind age and appropriateness to setting when choosing activities from the lists. Some activities will be more appropriate for younger children and others for young adults whereas some will be more appropriate for home, nursery, school, outdoors etc.

Sensory Seeking and Under Responsive

- Trim Trail
- Ropes and bars (PE equipment)
- Bang flat hands onto drum/therapy ball
- Crashing on mats/cushions
- Skipping
- Swimming
- Row the boat
- Leap frog
- Hopscotch
- Bouncy hopper races
- Seesaw with a friend
- Sliding down slide on tummy
- Parachute games
- Batting balloon to partner
- Monkey bars
- Horse riding
- Cycling
- Scootering
- Climbing wall
- Sitting on gym ball and throwing beanbags at a target
- Power walking
- Crawling - this uses the same reciprocal movement and core strength as climbing walls.
- Bilateral movements
- Sitting to standing games
- Marching
- Eye-hand activities – threading; rolling; pressing; sewing; model making; jigsaws; weaving; painting (with fingers; glue spreaders; sticks; straws; etc.) making bead jewellery; moving objects with tweezers; moving objects with spoons; painting with water; pushing pipe cleaners through the holes in a colander; etc.

Over Responsive

- Slow down movements
- Provide touch screen IT rather than mouse and keyboard (reducing amount of stimuli received from looking between screen and desk)
- Avoid unnecessary movement and never move from behind without notice
- Avoid lifts, escalators and hoists where possible and provide warning, calming resources and extra time when unavoidable

Gentle desensitisation program

CYP should be offered access to desensitisation activities at their own pace with open access to disengage as they feel appropriate.

On floor:

- Pulling along a rope while lying on tummy on the floor or on scooter board. This requires the same reciprocal movement and upper body strength as climbing vertical ropes
- Crawling e.g. set up an obstacle course to crawl under, over and through obstacles
- Carrying beanbag on back while crawling from one end of room to target at other end
- Lying on tummy on a bench and pulling self along
- Scooter board – this improves core strength, upper limb strength and motor planning. Begin by pulling along a rope course to limit amount of unexpected movement on route
- Activities lying on tummy and propping up on elbows e.g. rolling a ball to a partner, rolling a ball to skittles
- Commando crawling i.e. pulling self along floor on tummy under nets etc. for added fun
- Lying on tummy over gym ball and maintaining balance through arms. Start with a smaller ball which enables them to touch the floor with both hands and feet

Sitting:

- Row the boat
- Reaching up, to sides and in front while sitting on floor
- Reaching to pick up item and move to another position e.g. pick up ball from side and place in box at feet
- Dancing on bottom
- Bottom shuffling to travel
- Balancing on a gym ball. Start by sitting on a gym ball with feet on the ground and work towards lifting feet to achieve greater balance
- Reaching to each side whilst sat on gym ball (e.g. to throw beanbag to a target)
- Scooter board in sitting, again pull along a rope pathway initially

Kneeling:

- Activities in half kneeling position e.g. throwing and catching a ball, throwing a ball to a target
- Activities in tall kneeling position e.g. throwing and catching a ball, throwing a ball to a target
- Clapping games in kneeling
- Tug of war in kneeling
- Reaching and transferring items as above in kneeling
- Scooter board in kneeling

Standing:

- Balance activities on the ground to provide a firm base of support e.g. standing on one leg, hopping, walking tiptoe along a line taped to the ground
- Once more confident walking along lower equipment with a wide surface e.g. a PE bench
- Jumping on a small trampette or trampoline, initially may need to hold onto a bar or hand for support
- Couples dancing
- Ring games

To work towards tolerating travel in buggy/car seat/wheelchair:

- 'Pack in' to reduce unnecessary movement, use weighted/heavy teddy/blanket to provide calming stimuli.
- Reduce visual/vestibular stimuli by using pram hood / rain cover / parasol / sun blind / peaked cap etc.
- Gradually increase travel time on smooth surface and build in change of surfaces as appropriate