

Vestibular Rehabilitation: Rehabilitation Options for Patients with Dizziness and Imbalance

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Nurses in rehabilitation settings help patients with disabilities adapt to their disabilities, achieve their greatest potential, and work towards productive, independent lives. The annual direct and indirect costs of fall-related injuries are estimated to reach \$54.9 billion by the year 2020. Data from the National Health and Nutrition Examination Survey found that those with symptomatic vestibular dysfunction have a 12-fold increase in the odds of falling.

An exercise-based programme designed to promote central nervous system compensation for inner ear deficit therapy for dizziness and imbalance, also called “vestibular rehabilitation” (VRT), or more generally, “balance rehabilitation”. Vestibular rehabilitation for dizziness is a simple treatment that may be suitable for primary nursing care setting or in patient teaching in home management.

Vestibular Rehabilitation - How it Works?

Vertigo results when the brain believes the false signal and acts accordingly. The basis for the success of VRT is the use of existing neural mechanisms in the human brain for adaptation, plasticity, and compensation. The extent of vestibular compensation and adaptation is closely related to the direction, duration, frequency, magnitude, and nature of the retraining stimulus. Specifically designed VRT exercise protocols take advantage of this plasticity of the brain to increase sensitivity and restore symmetry. This results in an improvement in vestibuloocular control, an increase in the gain of the vestibuloocular reflex (VOR), better postural strategies, and increased levels of motor control for movement.

Goals

By improving vestibular function and promoting mechanisms of central adaptation and compensation. VRT aims to do the following:

- > Improve balance
- > Minimise falls
- > Decrease subjective sensations of dizziness

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- > Improve stability during locomotion
- > Reduce over dependency on visual and somatosensory inputs
- > Improve neuromuscular coordination
- > Decrease anxiety and socialisation due to vestibular disorientation

Benefits

1. Reduces fall risk level
2. Decreases feelings of dizziness and unsteadiness
3. Eliminates spinning sensation and positional vertigo
4. Improves mobility
5. Increases safety and independence

Indication for vestibular rehabilitation

1. Stable lesions of peripheral or central vestibular system in unilateral and bilateral loss
2. Person with fluctuating vestibular problems not necessarily dizzy at the time of therapy. The objective here is to prepare the person for anticipated dizziness rather than to make any permanent change in their present vestibular situation.

Meniere's syndrome

Perilymphatic fistula

3. Empirical treatment for situation where diagnosis is under post-traumatic vertigo or multi-factorial disequilibrium of the elderly.

4. Psychogenic vertigo and desensitisation

Phobic postural vertigo

Other situation of irrational fear in which balanced is challenged

Vestibular rehabilitation approaches

Adaption, which will reset the VOR

Substitution- This will strengthen the vestibular system by reducing other inputs

cushions are used or exercises are done with eyes closed

Canalith Repositioning - If there is BPPV on top of

Labyrinthitis, the specialist may prefer to perform this procedure which helps get the calcium crystals back into the correct inner ear canal.

Vestibular Rehabilitation Exercises Programme

The cornerstone of vestibular rehabilitation relies on the plasticity of the central nervous system, which enables reorganisation of the mechanisms subserving balance and “symptomatic vestibular compensation”. When supervising servicemen’s rehabilitation during the Second World War, Sir Terence Cawthorne, an ENT surgeon, and Dr Harold Cooksey, a rheumatologist, observed that soldiers with balance disorders after head injury improved more rapidly if they were active and mobile, than if they were inactive and bedridden. They therefore empirically devised the vestibular exercise regimen known as the Cawthorne-Cooksey exercise.

One of the first “general” interventions for vestibular problems were the Cawthorne-Cooksey (CC) exercises, as shown below

Cawthorne Cooksey Exercises

A. In bed or sitting

a. Eye movements - at first slow, then quick up and down from side to side focusing on finger moving from 3 feet to 1 foot away from face.

b. Head movements at first slow, then quick, later with eyes closed, bending forward and backward turning from side to side.

B. Sitting

Eye movements and head movements as above

Shoulder shrugging and circling

Bending forward and picking up objects from the ground

C. Standing

Eye, head and shoulder movements as before

Changing from sitting to standing position with eyes open and shut

Throwing a small ball from hand to hand (above eye level)

Throwing a ball from hand to hand under knee

Changing from sitting to standing and turning around in between

D. Moving about (in class)

Circle around a person at the centre, who will throw a large ball and to whom it will be returned

Walk across room with eyes open and then closed

Walk up and down steps with eyes open and then closed

Any game involving stooping and stretching and aiming such activities as bowling and basketball

Other Vestibular Rehabilitation Exercises

I. Gaze stability and ocular control exercise

A. Head-eye coordination exercise

While seated, hold a target at arm’s length in front of you, and move your head first side to side, then up and down, while keeping target in focus all the time, gradually increasing velocity and repetitions to tolerance level.

Focus on a hand-held moving target and move the target in the opposite direction of head movement in horizontal and vertical directions.

B. Visual-ocular control exercise

While seated in front of wall, holding head still, jump-move your eyes to extreme established target points on the wall in horizontal and vertical panes within your visual field.

Adaptation / Habituation Exercise for Motion-provoked Symptoms

Lie flat on your back with eyes open, then quickly come to sitting position, wait for 10 seconds, back to supine with head turned to right, wait for 10 seconds. Repeat the same manoeuvre with head turned to the opposite side.

Sensory Substitution-promoting Exercise

Stand on one leg with support and eyes open for 30 seconds, then with eyes closed. Progressively increase challenges by standing on foam or with head movement

Postural Strategy Practicing Exercise

Standing on flat surface, rock back and forth about the ankle without bending at the hip first with eyes open and then with eyes closed for 30 seconds.

Repeat the above standing on foam surface.

General Conditioning Exercise

Self-performed exercise programme to improve flexibility and strength if deficit is identified.

Functional Activity Training

Walking programme: Start with 5 minutes and progress 2 minutes each week until you can walk for 30 minutes.

Visual Dependence Exercise

Virtual reality training and Optokinetic stimulation are helpful in visual dependency. These make use of busy background or disco balls to stimulate visual system.

Somato-Sensory Dependence Exercise

Somatosensory input can be disturbed using tilt-boards, rails, slabs of foam or just walking on the beach.

Otolith Recalibration Exercise

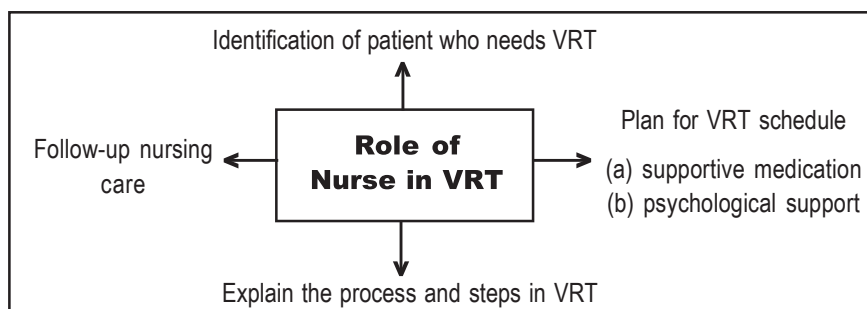
This includes bouncing on Swiss balls or mini-tramps which are advocated to build up the otolith ocular reflex as well as otolith-postural reflex.

Role of Nurse in Vestibular Rehabilitation Therapy (VRT) has been depicted in the Chart.

Conclusion

Vestibular rehabilitation therapy (VRT) is a form of physical therapy that uses specialised exercises that result in gaze and gait stabilisation. It has been a highly effective modality for most adults and chil-

dren with disorders of the vestibular or central balance system. In a number of studies, customised VRT programmes were significantly more effective than generic exercises in resolving symptoms.



References

1. American Nurses Association & Association of Rehabilitation Nurses. Rehabilitation Nursing: Scope of Practice, Process and Outcome Criteria for Selected Diagnoses. Kansas City, MO: American Nurses Association, 1988
2. Badke MB, et al. Outcomes after rehabilitation for adults with balance dysfunction. *Arch Phys Med Rehabil* 2004; 85(2): 227-33.
3. Dix MR, Hood JD (ed). Vertigo. Wiley and Sons, Chinchester, 1984
4. Geiger RA, Alien JB, O'Keefe J, Hicks RR. Balance and mobility following stroke: Effect of physical therapy interventions with and without bio-feedback/forceplate training. *Physical Therapy* 2001; 81(4): 995-1005
5. Hoeman SP. Rehabilitation Nursing: Process, Application, & Outcomes. 3rd edn, St Louis, MO: Mosby, 2002

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