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BALANCE AND VESTIBULAR REHABILITATION THERAPY

Five Indications For Therapy

1) **Specific Interventions for BPPV** (Benign Paroxysmal Positional Vertigo)
   - The Epley maneuver and the Semont maneuver
   - The Brandt-Daroff exercises
   - Log roll exercises

2) **General interventions for vestibular loss**
   - Unilateral loss, such as for vestibular neuritis or acoustic neuroma
   - Bilateral loss, such as for Gentamicin toxicity and related conditions

3) **Persons with fluctuating vestibular problems**, not necessarily dizzy at the time of the 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

4) **Empirical treatment for situations where the diagnosis is unclear**
   - Post-traumatic vertigo
   - Multifactorial disequilibrium of elderly

5) **Psychogenic vertigo for desensitization**
   - Brandt-Daroff exercises for phobic postural vertigo
   - Other situations where there is irrational fear of situations in which balance is challenged
Treatments Offered In Vestibular Rehabilitation

Gaze Stabilization Exercises

Gaze stabilization exercises are especially appropriate for persons with bilateral vestibular loss, although in a blinded study, strengthening exercises worked as well as more specific exercises (Krebs, 1991). Physical therapy has been reported to cause no change in the risk of falling or the use of assisted devices (Brown, Whitney et al 2001).

An example of a gaze stabilization exercise would be the “Business Card Exercise”, where a business card is held at the patient’s eye level, informing them to look straight ahead at the card. While keeping the business card in the same location, the patient should then be instructed to move their head 45 degrees to the right, keeping their eyes focused on the card. The same should be instructed with their head moving 45 degrees to the left.

Gaze stabilization exercises are also a reasonable procedure for persons with unilateral vestibular disturbances such as vestibular neuritis or persons who have had tumors of the 8th nerve removed. This exercise should be “progressed” to a more difficult one as it is mastered.

Visual Dependence Exercises

It is not unusual for vestibular therapists to propose other treatment maneuvers. For example, therapists might have patients smear their glasses with Vaseline. The rationale is to reduce "visual dependency", which is an inappropriate reliance on visual input, in situations where it might be better to use somatosensory or vestibular inputs. In certain situations, this seems like a good idea. Does smearing Vaseline on glasses reduce visual dependency? Nobody knows. If we had a reliable method of measuring visual dependence, perhaps we could relate it to interventions. At this writing, posturography seems to be the closest to being a measure of visual dependency. Virtual reality training might offer a better method of reducing visual dependency. However, this promising technology is in its infancy right now, and research studies are needed to validate it.

Somatosensory

Following the same train of thought as the visual dependency exercises, it might be beneficial for someone to practice maintaining their balance in situations where somatosensory (ankle and pressure) input is either reliable or simply not there. Somatosensory input can be distorted using tilt-boards, rails, slabs of foam, or just by walking on the beach. Forcing someone to do this might encourage them to recalibrate and rely to a greater extent on their vestibular or visual sensory inputs. Is this a good idea? Based on experience, it probably is; however, further studies are needed.
Ocular Tracking Exercises

Patients may be urged to track objects that are moving in counterphase to their heads, generally moved by themselves. This procedure might encourage patients to use both visual tracking and vestibular stabilization in tandem. Similarly, patients may be asked to track moving objects with their heads. This procedure might encourage patients to turn off their vestibular system. This might, in theory, be useful for persons with vestibular imbalances such as those with Meniere's disease. It would be unlikely to be helpful in persons who already have their vestibular system turned off (i.e. persons with bilateral vestibular loss).

Posturography

Posturography procedures involve a moving platform linked to a computer monitor. The patient is asked to keep their center of pressure within a box on the screen or to track a visual target by shifting their weight on the platform. Typically two sessions are given per week over several weeks. This procedure seems unlikely to promote neuroplasticity or adaptation (because it is too short), but it might assist individuals in forming internal models of their body and the outside world. Forming and recalibrating internal models is certainly a worthwhile endeavor, critical to recovery from lesions. It seems likely to occur in time whether or not a device like this is available, but the progress of revising an internal model might be accelerated through guided practice.

Virtual Reality Training

Virtual reality can be viewed as a method of treating people with inappropriate visual dependence. It seems a lot more likely to work than smearing Vaseline on one’s glasses (see above). Persons with visual dependence are the people who get sick from looking at ceiling fans, or going to the Omnimax. However, virtual reality is quite new, but in the near future may help significantly with assisting in increasing abnormally low vestibular ocular reflex gain (Virre and Sitarz, 2002).

Information provided by Timothy C. Hain, M.D.

Citing & References:


Why Might Vestibular Therapy Be Useful?

- **Plasticity.** Changes in central connections to compensate for peripheral disturbances. It would be nice if plasticity could handle everything. Unfortunately, there appear to be limits on how much the brain can compensate. Although conventional wisdom holds that older persons are less adaptive than younger, a recent study suggests that there is no difference in benefit of vestibular rehabilitation according to age (Wriseley et al, 2002).

- **Formation of Internal Models.** A cognitive process where one learns what to expect from ones actions. Internal models are critical for predictive motor control, which is essential when one is controlling systems that have delays.

- **Learning of Limits.** Another cognitive process involved with learning what is safe and what is not. Someone who does not realize that, for example, they can’t figure out which way is up, may drown in a swimming pool.

- **Sensory Weighting.** A cognitive process in which one of several redundant senses is selected and favored over another. Classically, selection occurs between vision and vestibular somato-sensation inputs when one is attempting to balance. People with unreliable vestibular systems, such as those in Meniere’s disease, sometimes seem to not be able to switch off their visual reliance, causing them distress in certain situations where vision is an incorrect reflection of body movement (i.e. in the movies) (Lacour et al, 1997).
Physician Fax Referral for Balance Therapy

Patient: ________________________ Phone: ________________________
Diagnosis: _______________________________________________________
Precautions: _____________________________________________________

Diagnostic testing indicates (check all that apply):

☐ Vestibular dysfunction ☐ CNS dysfunction ☐ Mixed Vestibular & CNS
☐ Postural dysfunction ☐ BPPV ☐ Other

Treatment Plan Requested:

☐ Vestibular / Balance Therapy evaluation and treatment
☐ Neurological rehabilitation (Parkinson’s / CVA)
☐ Gait Training
☐ BPPV
☐ Consult for home exercises
☐ Other (please specify): ______________________________________________

I certify that these rehabilitation services provided under my care are necessary and the patient is informed of their condition.

Physician’s Signature: _____________________ Date: _________________

Dear Physician, please sign and fax to:
Conferences & Workshops

**Differential Diagnosis & Treatment of Dizziness & Balance Disorders**
Ft. Lauderdale, Florida
Instructor: Bridgett Wallace, PT
The Dogwood Institute, Inc.
(800) 533-2440 or (770) 751-9571; [http://www.dogwoodinstitute.com](http://www.dogwoodinstitute.com)

**Advanced Competency in the Evaluation and Treatment of Complex Balance Disorders**
Las Vegas, NV
Instructor: Fay Horak, PhD, PT
North American Seminars, Inc., (800) 300-5512; [www.healthclick.com](http://www.healthclick.com)

**Vestibular Rehabilitation, Balance Retraining, and Program Development**
New York, New York
Instructor: Gaye Cronin, MHE, OTR
Therapeutic Services, Inc., (888) 743-7279; [info@therapeuticservices.com](mailto:info@therapeuticservices.com)

**Vestibular Rehabilitation**
The American Institute of Balance
Clearwater/St. Petersburg, Florida
Faculty: Richard E. Gans, PhD, FAAA
Louise Strouse, Program Coordinator, (800) 245-6442; [edu@dizzy.com](mailto:edu@dizzy.com); [www.dizzy.com](http://www.dizzy.com)

**Auditory and Vestibular Pharmacology**
(In conjunction with the Society for Neuroscience Annual Meeting)
The Kresge Hearing Research Laboratory and
L.S.U.H.S.C. Dept. of Otolaryngology
Robert Moore (504) 568-4789, x241; [mailto:rmoore4@lsuhsc.edu](mailto:rmoore4@lsuhsc.edu)

**Vestibular Rehabilitation for Dizziness and Balance Disorders**
Chicago, Illinois
Instructor: Fay Horak, PhD, PT
North American Seminars, Inc. (800) 300-5512; [www.healthclick.com](http://www.healthclick.com)

**Vestibular Rehabilitation: A Comprehensive Clinical Approach for Positive Functional Outcomes**
Seattle, Washington
Instructor: Georgia Groomer, PT
North American Seminars, Inc. (800) 300-5512; [mailto:meghanw@healthclick.com](mailto:meghanw@healthclick.com);
[www.healthclick.com](http://www.healthclick.com)
Vestibular Assessment and Management
The American Institute of Balance
Clearwater/St. Petersburg, Florida
Faculty: Richard E. Gans, PhD, FAAA
Louise Strouse, Program Coordinator, (800) 245-6442; edu@dizzy.com; www.dizzy.com

Vestibular Dysfunction: Successfully Treating the Dizzy Patient
St. Louis, Missouri
Instructor: Bridgett Wallace, PT
The Dogwood Institute, Inc.
(800) 533-2440 or (770)751-9571, http://www.dogwoodinstitute.com