Guidelines for Vestibular Treatment
Developed by Vestibular Special Interest Group, Neurology Section, APTA
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Group 1: Facilitated by Terry Shea
Disease Category: Central Vestibular Dysfunction

Problem List:

1. Ataxia/Gait dysfunction
2. Coordination
3. Postural Set
4. Falls
5. Motion Sensitivity-Positional, Visual
6. Visual Acuity-Gaze Stability (VOR)
7. Autonomic dysfunction
8. Cognition-attention, memory
9. Anxiety/Depression
10. Balance Confidence
11. Knowledge deficit of condition
12. Sleep dysfunction
13. Occupational limitations
14. Psycho-Social limitations
15. Recreational limitations
16. Self-care/home management

Interventions:

1. Balance training with different environmental conditions
2. Sensory Integration
3. Coordination training
4. Gait training
5. Motion Sensitivity training
6. Gaze stabilization training
7. Adaptive equipment and Environmental modification
8. Education of patient and family
9. Resources provided-community, health professionals
10. Behavioral modification-Motivation, Confidence

Group 2: Facilitated by Debbie Struiksma
Disease Category: Multisensory Dysequilibrium

1. Problem Identification - Patients typically have
    a. Severe loss of 1 system with general loss of others
    b. Difficulty with contrast sensitivity
    c. Fear of falling
    d. Not educated about physical conditions
    e. Changes in hearing
    f. Difficulty with multitasking
    g. Impaired functional independence
2. Interventions
    a. For loss of 1 system
        i. Somatosensory impairment
            1. eyes closed activities such as weightshifting
            2. seated with sensory stimulation on feet with eyes closed, such as counting lentils, or rolling a bumpy dog toy underneath feet
            3. obscuring vision duting activities
            4. compensatory strategies such as using lights or assistive devices
            5. new ideas:
                a. using vibration on feet
                b. anodyne product to increase circulation to lower extremities
                c. trunk sensors
        ii. Visual impairment
            1. patient education and resources through low vision websites
            2. eyes closed activities such as weightshifting
            3. activities over large uneven surfaces
    b. Difficulty with contrast sensitivity
        i. Use of edge markers
        ii. Using well-lit areas
        iii. Patient education
    c. Fear of falling
        i. Do activities in a deweighting harness
    d. Lack of education
        i. Patient education on impairment and how it affects function and disability
    e. Changes in hearing
        i. New experimental technique: therapeutic listening
        ii. Tinnitus retraining
    f. Difficulty with multitasking
        i. Doing multitask activities with safety considerations such as counting backwards during gait

g. Impaired functional independence
    i. Gait training with head turns to scan environment
    ii. Gait training in complex environments

Group 3: Facilitated by Sapan Palkhiwala
Disease Category: Bilateral peripheral vestibular hypofunction.

1. Assumption: Patient has partial sparing of vestibular function.

2. Common Problem list/ subjective complaints of a patient with bilateral vestibular hypofunction.
    a. Complaints of oscillopsia with activities. Neck stiffness secondary to not moving head due to instability.
    b. Dynamic Standing balance causing severe disequilibrium, i.e. gait with head turning, squatting or stooping down to pick up objects.
    c. Difficulty with complex visual environments i.e. grocery store, shopping malls, sporting events, driving, computer work, IADL's.
    d. Possible long term usage of gentamycin.
    e. Unable to perform tandem stance.
3. Objective problems.
    a. Impaired V.O.R.
    b. Positive bilateral head thrust.
    c. DGI score of <19 or difficulty with head movement activities.
4. Diagnostic Results.
    a. (+) ENG results bilaterally with > 25% loss.
    b. (+) Rotatory Chair results.
    c. Abnormal findings on Sensory Organization Test (conditions 5,6)/ Modified CTSIB (condition 4)

5. Treatment options
    Week 1
    a. Education on safety measures to take at home, place a flashlight next to bed at night, use nightlights when sleeping. Stop to examine new environments to avoid hazardous areas. Remove clutter from walkways at home, etc.
    b. X1 or X2 viewing in sitting in a quite and non-visual stimulating environment, if some vestibular function is spared. Use a big target and use big objects (toys-big trucks with wheels, rolling right and left for X2 viewing exercises).
    c. Surface orientation exercises- sitting with eyes open/eyes closed, if tolerated progress to standing eyes open/closed.
    d. Possible issuance of assistive device, if needed.
    e. Initiate walking program with supervision (caregiver, family) and/or device.
    f. Neck stretching exercises if applicable.

    Week 2-4 (and if patient does not respond to gaze stability exercises.
    a. Work on exercises that bias proprioceptive, somatosensory activities.
    b. Visual fixation activities for substitution
    c. Get shoes that may give auditory feedback, tap shoes.

d. Gait on uneven surfaces, stop and analyze the environment that is being negotiated.
e. Diagonal visual tracking exercises with a big target, i.e. beach ball.
f. Playing catch with bean bags, or bigger objects.

6. Possible Future intervention
    a. Vibratory insoles to increase proprioception system sensitivity.
    b. Palate stimulation, Increase Background noise of somatosensory system.
    c. Tactile feedback training with trunk, etc.

Group 4: Facilitated by Laura Morris
Disease Category: Migraine-related dizziness

Problem List

- Episodic Symptoms with possible baseline
- Photosensitivity/Phonosensitivity
- Space and Motion Discomfort including:
    - Patterm
    - Edge
    - Environmental movement
- Movement sensitivity
- Postural instability
- Gait instability
- Avoidance behaviors
- Anxiety
- Deconditioning
- Possible Vestibular function test abnormalities:
    - Directional Preponderance on Rotational Chair Test
    - Caloric reductions, although less common
- Possible upper cervical spine involvement

Intervention

- Extensive patient education, including:
    - Nature of migraine related dizziness
    - Migraine management, including dietary issues with migraine
    - Rationale for treatment, progression
    - Importance of good physical health, including general exercise, to tolerance
- Coordinate medical management
- Intervention according to symptoms- overall less intense than other populations
    - Habituation, but slower rate of progression
    - Postural control
    - Sensory organization training
    - Visuo-vestibular training, eye-head coordination training
        - Primarily for habituation rather than to correct an impairment in this system
    - Gaze stabilization- proceed with caution
    - Possible upper cervical spine work

Group 5: Facilitated by Annamarie Asher
Disease Category: BPPV

BPPV – Problem List

1. Positional dizziness, disrupted vision
2. Nausea
3. Imbalance
4. Falls and secondary injury
5. General motion intolerance
6. Reduced independence

BPPV Interventions

1. Canalith repositioning (aka modified Epley, particle repositioning)
2. Brandt-Daroff exercise
3. Semont Liberatory maneuver
4. Patient education re: condition, risk of recurrence and possible exercise to decrease recurrence and/or self administered repositio ning
5. Post maneuver instructions (no rapid head movements for 24 hours, try to avoid positions which would provoke the symptoms for 24 hours)

Group 6: Facilitated by Colin Grove
Disease Category: Unilateral Vestibular Hypofunction:

Possible Problems:

- Acute vertigo, dizziness, and/or lightheadedness
  - Spontaneous, episodic, and/or position provoked
- Chronic symptoms may persist long after acute episode has resolved
- Possible associated unilateral hearing loss and/or tinnitus
- Oscillopsia
  - Degradation in vision with head movement
- Disequilibrium, ataxia, and/or imbalance
  - Static and dynamic
- Space and motion sensitivity
  - Exacerbation of symptoms with movement of self or environment
- Fatigue
  - Secondary to deconditioning
- Neck pain and/or stiffness
  - Secondary to restricted head movement
- Anxiety and/or depression
  - Fear of recurrence of acute symptoms
  - Avoidance of specific activities thought or known to provoke symptoms

Interventions:
The primary intervention strategies for patients with UVH involves exercises to promote adaptation within the vestibular-ocular (VOR) and vestibulospinal (VSR) pathways; however, depending on patient-specific characteristics, strategies to promote habituation, substitution, and/or behavioral modification may also be implemented. Additionally, since BPPV is sometimes associated with UVH, canalith repositioning may also be included in the treatment plan. Interventions follow a problem-based approach and are driven by the patient's goals and results of the physical therapy examination.

Intervention is typically initiated following resolution of the acute symptoms. Most interventions will address chronic dizziness and disequilibrium, either directly or indirectly.

The first order of intervention is patient education. Patients and their families should be educated regarding their diagnosis, prognosis, and the process of vestibular rehabilitation. Many resources are available, including those provided by the Vestibular Disorders Association (VEDA).

Oscillopsia is addressed through visual-vestibular exercises such as VOR x 1 and VOR x 2 viewing. Due to extreme motion sensitivity in rare cases, patients may need to work on oculomotor exercises prior to initiating VOR (gaze stabilization) exercises.

Exercises to promote equilibrium include sensory organization during sitting, standing, and walking via manipulation of sensory feedback available to the patient; stance postural

control activities via manipulation of the base of support; and postural response correction exercises, typically emphasizing the use of a hip strategy for balance. In addition to manipulating the base of support, other variables, such as head movement, may be controlled to promote stability in dynamic contexts. Activities during gait include walking with a decreased base of support, walking while turning the head horizontally and/or vertically, and walking while stabilizing vision.

Space and motion sensitivity are addressed through oculomotor, visual-vestibular, and positional exercises designed to induce habituation of symptoms.

A walking program or stationary cycling program are examples of strategies to combat fatigue secondary to deconditioning.

Soft tissue mobilization, manual therapy, therapeutic exercise, and/or neuromuscular re-education techniques may be used to address neck pain and cervical spine dysfunction associated with muscle guarding used avoid head movement.

Patients should be encouraged to begin to resume normal activities within their tolerance and safety limitations. Avoidance strategies should be minimized or eliminated.

Patients who show signs of anxiety or depression may be screened for these psychological disorders. If significant problems are suspected, patients should be encouraged to seek out personal and professional support and intervention via family members, friends, a faith community, and/or health psychology.