

## Differential Diagnosis of Dizziness

### 1. History

- a. Tempo:
  - i. Symptom onset <3 days? Onset >3 days? Episodic?
- b. Symptoms:
  - i. Ask patient to describe dizziness using own words. Component of movement? Related to head movement/sensation? Other symptoms besides dizziness? Falls?
- c. Circumstances: spontaneous? Are there triggers or events that exacerbate symptoms?

### 2. Systems Review

- a. Eyes: diplopia, recent change in visual acuity or new visual aids
- b. Ear: hearing loss (especially unilateral or unexplained), tinnitus, increased pressure, history of ear disease
- c. Cardiopulmonary: palpitations, syncope, chest pain, LE swelling, dyspnea, orthopnea
- d. GI: nausea, vomiting, dysphagia, pain
- e. MSK: pain, swelling, joint limitation (especially cervical), hx of traumas or concussions
- f. Neurological: presence of other neurological symptoms, including migraines, drop attacks
- g. Psychological: history of psychiatric screen/treatment

- 3. **Medication review:** prescriptions, over the counter, herbal medicines. Look for polypharmacy, medications that can induce vestibular disorders and vestibular suppressants.

### 4. Physical Examination

- a. Dizziness VAS, Modified Borg for Dizziness, Vertigo symptom scale (VSS), Subjective Visual Vertical (SVV)
- b. Vital signs: HR, BP, oxygen saturation, assessment of orthostatic hypotension and hyperventilation
- c. Vestibular and oculomotor exam
  - i. Smooth pursuit, voluntary saccades
  - ii. Cranial Nerve VIII screen, extraocular muscles (CN III, IV, VI)
  - iii. Nystagmus: spontaneous, gaze evoked (30deg off center), head shaking; all with fixation and without fixation (tested using frenzel goggles or infrared goggles).
  - iv. VOR tests: VOR with slow head rotation, Rapid Head Thrust, Dynamic visual acuity (complete static acuity first), VOR cancellation
- d. Dix-Hallpike maneuver, and other positional tests if indicated
- e. Motion Sensitivity Quotient
- f. Somatosensory: proprioception, vibration and light touch
- g. Cerebellar: rapid alternating movements, heel to shin, finger to nose
- h. Reflexes
- i. Musculoskeletal: posture, cervical, UE, and LE screens, ROM, and MMT.
- j. Balance
  - i. Sitting balance
  - ii. Static standing balance: Romberg, sharpened Romberg, SLS (foam, eyes open, eyes closed), perturbations
  - iii. Dynamic balance: standing reach, CTSIB with foam, BESTest, TUG
  - iv. Gait: velocity, observed amount of head movement (esp with turns), DGI, FGA
- k. May need to refer to MD, AuD, ENT for further tests e.g. imaging, blood work, audiogram, caloric study, ENG or VEMP.

*\*See Part 2 of Module "Differential Diagnosis of Dizzy Patient" for details and references for above information\**

## **Physical Therapy Interventions for Unilateral Peripheral Vestibular Hypofunction**

1. **Patient education:** explanation of impairment, diagnosis, prognosis and rationale for treatment. Explain that it is normal to experience increase in symptoms during and up to 15 minutes after some of the exercises because the vestibular system can take time to adapt.
2. **Repositioning maneuvers:** if BPPV is occurring in addition to unilateral hypofunction.
3. **Gaze-stabilization:** repetitive retinal slip during head movement creates an error signal and increases VOR gain during that movement.
  - a. VORx1, VORx2
    - i. Start with patient sitting or standing. Complete exercises for 1 minute with target 3 feet away against solid background at ~2 Hz, 2x a day.
    - ii. Incorporate frequent but short rest periods during training.
    - iii. Progress by changing: duration, background/distraction, patient position, speed, frequency of exercises each day and distance from target/using imaginary targets. Progress to incorporate into ADLs, community and work activities.
  - b. Optokinetic stimulation: “low tech” examples include visual motion DVD and online youtube videos (e.g. Grand central station time lapse).
4. **Motion sensitivity, Visual vertigo**
  - a. Choose 4 movements from Motion Sensitivity Quotient completed during assessment. Patient performs 2-3 reps of each movement, 2-3 times a day. Progress by increasing speed, varying position and difficulty of activity.
  - b. Cawthorne-Cooksey exercises, or components of these exercises. (Refer to supplemental materials)
  - c. Optokinetic stimulation: see above.
5. **Dynamic Postural instability**
  - a. Visual variation exercises: performing exercises with eyes closed, using full-field background, incorporating head movement, and/or decreasing lighting.
  - b. Somatosensory variation exercises. Vary support surface: conforming (foam, wobble board, trampoline, balance beam), uneven (grass, gravel, ramps) or moving (treadmill, escalator). Change base of support (feet apart, together, tandem, SLS).
  - c. Force use of remaining function of vestibular system: walking backward, sidestepping, braining with eyes closed, marching on foam with eyes open and closed, walking across foam in dark, and/or incorporate head movements.
  - d. Dual tasking: cognitive tasks and/or ball tossing/catching during balance exercises.
  - e. Instability during gait: obstacle course navigation and pivoting and initiation of, stopping of, forward and backward ambulation upon command.

**6. Physical deconditioning**

- a. Walking program: 15-20 minutes. Progressed to 30 minutes with gradual incorporation of head turns.
- b. Also progress by varying terrain and visual stimulation in environment (grocery store or shopping mall).
- c. Progressive resistance exercise to address muscle weakness.
- d. Return to normal sport activities within tolerance and safety.

**7. Home Exercise Program**

- a. Integral part of VR
- b. Exercises generally performed 3-5x per day (but patient specific).
- c. Re-educate that it is normal that symptoms might worsen with performance of exercises. As long as they diminish within 15-30 minutes and are mild-moderate, this is normal.
- d. Follow up and be assessable to patients during initial weeks of VR to answer questions and address patient concerns.

***\*See Part 3 of Module “Etiologies, Efficacy, Treatment of UPVH” for details and references for above information\****