

Guidelines for Vestibular Evaluation

Developed by Vestibular Special Interest Group, Neurology Section, APTA

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Group 1: Facilitated by Annamarie Asher

Patient problem: Patient comes to PT evaluation with dizziness and unsteadiness

Question: When should patient be referred for formal vestibular function testing and/or referred to neurologist/otologist or ENT who specializes in vestibular disorders

Caveat: this list does not necessarily preclude initiation of treatment

Conditions/Findings, which indicate a need for referral:

1. Unexplained neurological signs
2. CNS signs
3. Hearing loss (unexplained or unilateral)
4. Inconsistencies in clinical exam of vestibular function (see below), history, physical exam (gait/stance), dynamic visual acuity, motion sensitivity or positional tests
5. Exam does not reveal cause of patients problems
6. No improvement after 30 day treatment period
7. Dead falls on dynamic posturography conditions 5 and 6, or foam EC

Components of clinical exam of vestibular function:

1. Extraocular ROM
2. Smooth pursuit
3. Voluntary saccades
4. Spontaneous nystagmus (with and without fixation)
5. Gaze-evoked nystagmus (with and without fixation)
6. VOR to slow rotation
7. Rapid head thrust
8. Post-Head shaking without fixation

Group 2: Facilitated by Debbie Struiksma

Patient problem: Patient comes to PT evaluation with dizziness and unsteadiness

Question: What “red flags” discovered during the evaluation should lead to a referral?

1. Lightheadedness – potential causes – whom to refer
 - a. Cardiac dysfunction – cardiologist
 - b. Vertebro-basilar insufficiency – neurologist
 - c. Diabetes or systemic disease – PCP
 - d. Orthostatic hypotension – cardiologist
 - e. Polypharmacy – PCP
2. Dysequilibrium without dizziness or specific diagnosis
 - a. Undiagnosed central cause – neurologist
3. Sudden onset hearing loss
 - a. Acoustic neuroma – neurologist
4. Drop attacks
 - a. Cardiopulmonary – cardiologist
 - b. Neurological – neurologist
5. Neck pain/instability
 - a. Cervical ligament instability – PCP
6. No treatment effect after 30 days
 - a. Acoustic neuroma – neurologist
 - b. PCP
7. Facial Numbness
 - a. Acoustic neuroma – neurologist
 - b. Undiagnosed CNS disease – neurology
8. Vertigo with signs of vertical nystagmus on downward gaze, impaired smooth pursuit
9. Urgent referrals back to physician
 - a. Unexplained unilateral hearing loss
 - b. Orthostatic hypotension or Neurocardiogenic syncope
 - c. Unexplained drop attacks
 - d. Cervical ligamentous instability
 - e. Suspected vertebrobasilar insufficiency not previously worked up
 - f. Unexplained neurological signs or cranial nerve dysfunction
 - g. Unexplained vertigo with vertical nystagmus on downward gaze, impaired smooth pursuit

Group 3: Facilitated by Laura Morris

Patient problem: Patient comes to PT evaluation with dizziness of central origin

Question: What elements of evaluation should be performed to decide if problem is central versus peripheral in origin?

1. Differential Diagnoses for suspected dizziness of central origin
 - a. Traumatic brain injury (may also have BPPV, perilymphatic fistula)
 - b. Cerebellar
 - c. Stroke
 - d. Multiple sclerosis
 - e. Tumors
 - f. Migraine-related vertigo
 - g. Parkinsons disease
2. History
 - a. Previous tests, symptoms, etiology
3. Vestibular function exam
 - a. VOR
 - b. dynamic visual acuity
 - c. VOR cancel
 - d. Head thrust
 - e. Head shaking
4. Oculomotor
 - a. Smooth pursuit
 - b. Saccadic saccades
 - c. Spontaneous nystagmus
 - d. Gaze evoked nystagmus
5. Hallpike-Dix test
 - a. If have positional dizziness
6. Musculoskeletal exam
7. Sensory exam
8. Tests and measures
 - a. Depends on functional level
 - b. Objective and reliable
 - c. e.g. – Berg, DGI, TUG
9. Coordination tests
 - a. Rapid alternating movements, finger to nose
10. Gait
11. Sensory integration in balance
12. Central screen: cranial nerve testing, sensory testing (vibration, light touch), deep tendon reflexes, manual muscle testing, tone
13. Positional testing for motion sensitivity: symptoms tend to be cumulative- test as much as pt. is able to tolerate, may not test all positions

Group 4: Facilitated by Jim Cavanaugh

Patient problem: Patient comes to PT evaluation with diagnosis of unilateral vestibular hypofunction

Question: What elements of evaluation should be included?

1. Assumption
 - a. Practicing in an outpatient setting
 - b. Known vestibular pathology
 - c. Greater than 1 month post onset
2. Question for PT: how well compensated is patient?
3. History
 - a. Time since onset
 - b. Do you fall
 - c. Co-morbidities
 - d. Modifiers: anxiety, alcohol
4. Subjective
 - a. Outcomes: DHI, ABC, symptom list, disability score (0-4), symptom score (visual analog)
 - b. Other: housing, stairs, functional limitations, work capacity, driving
5. History and subjective used to cater examination
6. Objective
 - a. Oculomotor: head thrust, dynamic visual acuity
 - b. Provocational
 - c. Standing balance
 - d. Walking control/balance
7. Functional measures to measure progress (if patient to return)
 - a. Dynamic visual acuity
 - b. CTSIB
 - c. DGI
 - d. TUG

Group 5: Facilitated by Sue Whitney

Patient problem: Patient comes to PT evaluation with dizziness of unspecified cause

Question: What elements of eval to include for evaluation of multisensory dysequilibrium

1. History
 - a. Symptoms
 - b. Functional complaints
 - c. Vision, use of glasses
 - d. Past medical history
2. Falls risk
 - a. Polypharmacy (greater than 4 meds)
 - b. Injury severity scale
 - c. How they fall, when they fall, environment
 - d. Number of falls in last 6 months
 - e. Use of assistive device
3. Visual exam
 - a. Static Acuity – [Snellen chart](#)
 - b. Dynamic visual acuity
 - c. Find out lens type
4. Somatosensory exam
 - a. shoe wear
 - b. vibration sensation
 - c. proprioception
 - d. pain and temperature
 - e. educate about sensory loss
 - f. possible referral for NCV/EMG
5. Vestibular exam
 - a. Central vs. peripheral ([see previous topics](#))
 - b. Oculomotor exam
 - c. Verbal description of symptoms: constant/intermittent/motion provoked
 - d. SOT/CTSIB: condition 4 and 5 or fall on foam with eyes open/closed
 - e. Fukuda step test
 - f. Hallpike-Dix test
 - g. Refer for ENG, rotational chair, and dynamic Posturography
6. [Neurological Exam](#)
 - a. [Cranial nerve assessment](#)
 - b. [Deep tendon reflexes](#)
 - c. [MMT](#)
 - d. [Tone](#)

Group 6: Facilitated by Kathy Gill-Body

Patient problem: Patient comes to PT evaluation with diagnosis of bilateral vestibular hypofunction

Question: What elements of evaluation should be included?

1. Assumptions
 - a. Patient referred to therapy without vestibular diagnosis
 - b. Practice in an outpatient setting with no specialized vestibular assessment equipment
2. History: Features of history include the following:
 - a. clinical complaint usually that of unsteadiness or difficulty walking, rarely dizziness or vertigo.
 - b. functional limitations often include problems reading, walking in the dark, turning in small or crowded spaces, showering and washing hair (closing eyes), reaching or bending and keeping balance.
 - c. Medical history may include use of vestibulotoxic medications, such as gentamicin or some cancer drugs; some patients have been on dialysis.
 - d. Changes in speech, memory, flexibility, strength or sensation associated with onset of imbalance would not be expected.
3. Subjective
 - a. descriptions of symptoms and functional limitations (stairs, work capacity, driving)
 - b. Dizziness Handicap Inventory
4. Exam
 - a. Oculomotor exam of EOMs, saccades, pursuit, gaze holding should be normal
 - b. Rapid head thrusts should be positive bilaterally
 - c. Dynamic visual acuity should be impaired
 - d. Static Balance exam of Romberg eyes open/closed, Tandem Romberg eyes open/closed, and Foam Romberg eyes open/closed should show impairment in eyes closed tests.
 - e. Patient's perception of dizziness and imbalance (0-10 scale) is helpful in showing improvement in symptoms. In patients with severe imbalance, widening base of support may be necessary.
 - f. Gait assessment, including with head turns
 - g. Functional measures could include Berg or Dynamic Gait Index as patient able to perform, TUG. Fall risk assessment is indicated.

Do we want to include a table with comparisons like this? This is a quick first draft so please feel free to comment.

Assessment tool	<u>Expected results if central vestibular dysfunction</u>		
	<u>central vestibular dysfunction</u>	<u>Unilateral vestibular dysfunction</u>	<u>Bilateral vestibular dysfunction</u>
<u>Ocular Motor testing</u> <u>Smooth Pursuit</u> <u>Saccades</u> <u>Spontaneous Nystagmus</u>	<u>Frequently abnormal</u> <u>Frequently abnormal</u> <u>Frequently abnormal:</u> <u>Non-fatiguable</u> <u>Direction changing</u> <u>Gaze evoked</u> <u>Downbeat</u>	<u>Typically normal</u> <u>Typically normal</u> <u>Acute: frequently abnormal or present</u> <u>Chronic: typically normal</u>	<u>Typically normal</u> <u>Typically normal</u> <u>Typically normal</u>
<u>Vestibular Ocular Reflex Testing</u> <u>Active and Passive VOR</u> <u>Head thrust</u> <u>Head Shaking</u> <u>VOR cancellation</u>	<u>May be abnormal</u> <u>Usually normal</u> <u>Usually normal</u> <u>May be abnormal</u>	<u>Abnormal if acute</u> <u>Abnormal with head movement in direction of lesion if acute</u> <u>Abnormal if acute</u> <u>Usually normal – may increase symptoms</u> <u>Abnormal if acute</u>	<u>Usually abnormal</u> <u>Usually abnormal bilaterally</u> <u>Usually normal</u> <u>Usually normal</u>
<u>Dynamic Visual Acuity</u>	<u>Usually normal</u>		<u>Abnormal</u>
<u>Dix-Hallpike Test</u>	<u>May see non-fatiguable nystagmus, downbeat nystagmus</u>	<u>May see non-fatiguable horizontal nystagmus if acute</u>	<u>Usually negative</u>