
“Why is the room spinning?”

A Look at Dizziness

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As presented at the Southern Alberta Regional CME Conference (May 22, 2003)

The assessment of the dizzy and imbalanced patient is often complex.

The first task is to determine if the balance problem is sensory, integrative, or motor in nature. While taking a good history is important (Table 1), it does not always separate benign from serious disease. Also, the description of symptoms cannot be overemphasized (Table 2). It is also important to determine if symptoms occur with head movement while sitting, or only while ambulating.

With an ongoing or recurrent problem, a description of the initial episode, followed by a description of a typical or most recent episode should be done (Table 3). The following is not meant to be an exhaustive description, therefore the reader is referred to *Practical Management of the Dizzy Patient*, a book by Dr. Joel Goebel.

What physical exams can be done?

Examination for nystagmus can be incorporated into the routine neurologic exam (Table 4). While examining the fundus with an ophthalmoscope, remember that the vestibulo-ocular

Molly's case

Molly, 42, complains of vertigo, often aggravated by movement and menses. When asked to describe her symptoms, she describes “a weird swimming feeling.” A throbbing headache sometimes follows, but not as severe as her previous migraines.



An otolaryngologist and a neurologist found no abnormality, and a magnetic resonance imaging exam to exclude multiple sclerosis was normal. The neurologist suggested sumatriptan for the more severe migraine headaches.

For a discussion, see page 69.

reflex (VOR) maintains retinal stability during head movement.

What are the common clinical syndromes?

Vestibular neuritis

This syndrome may be a catastrophic episode of vertigo with vomiting and imbalance, but no

Table 1

Checklist for history exam

Describe the symptom

- When it first started
- How it has progressed
- Recent viral infection

Associated features

- Nausea
- Headache
- Hearing loss
- Imbalance
- Sensory symptoms (vision, speech slurring, etc.)

What provokes/worsens symptoms?

- Medication
- Allergies
- Patient history of migraine or family history of hemiplegic migraine or ataxia
- Sleep problems
- Stress

hearing loss. There is a history of a preceding viral infection. Treatment with intravenous dexamethasone may rapidly improve the clinical situation. If there is no preceding viral illness and the patient has vasculopathy risk factors or is over 55, always rule out an intracranial cause. Diagnosis often becomes clear only if the patient recovers or develops further symptoms or signs. Support and continued followup are necessary.

More often, however, the patient has milder symptoms. These symptoms can be

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Table 2

What does the patient mean by "dizzy"?

- Vertigo: An illusion of movement where none exists
- Dizziness: Has many synonyms, including lightheadedness, fainting, cognitive dysfunction, disorientation
- Oscillopsia: Blurring of the visual world with head movement
- Imbalance: May be described as dizziness, but only when the patient is ambulating

controlled by systemic antiemetics or sublingual lorazepam, but should be discontinued once the severe nausea and vomiting settles. The patient should be encouraged to increase activity, and, if possible, to begin a therapy program with a qualified physical therapist.

Benign paroxysmal positional vertigo (BPPV)

BPPV occurs as a degenerative phenomenon after trauma, ear infection, or vestibular neuritis. The patient complains of vertigo when lying down, rolling over, or with head extension. Symptoms with sitting or getting up only should alert the physician to orthostatic hypotension. The classic rotary and upbeat nystagmus in the Dix-Hallpike test or head hanging position occurs after a latency of five to 30 seconds. After the nystagmus stops and the patient is sitting up, the nystagmus beats in the opposite direction. Repeated positioning should lead to lessening of the symptoms and nystagmus. Habituation exercises, which involve repetition of the provocative position, are simple and effective in most cases.

Down or upbeat nystagmus with no latency, failure of the nystagmus to reverse, or failure to fatigue with repeated positioning is less likely to be peripheral and a central cause should be excluded.

Endolymphatic hydrops (Meniere's syndrome)

This syndrome is an episodic vertigo, accompanied by unilateral, low, roaring tinnitus or unilateral, low frequency hearing loss lasting two to eight hours. If the symptoms are bilateral, accompanied by headache, sensory symptoms of tingling around the mouth, and dysarthria, basilar migraine or vertebro basilar insufficiency should be considered. Fluctuating bilateral hearing loss with vertigo can be seen as an autoimmune phenomenon, and those patients with a documented autoimmune disease may respond to steroids.

Acetazolamide will decrease endolymphatic fluid production, but meclizine on a regular basis may be preferred. Sublingual lorazepam or dimenhydrinate may be used for acute or infrequent episodes if long-term drug therapy is not practical.

Multisensory dizziness/imbalance of the elderly

Dizziness may be the heralding symptom of stroke, neurodegenerative disease, or Parkinson's disease. Cerebellar degeneration and peripheral neuropathy should be excluded if symptoms only occur while ambulating.

Commonly, a decrease in function of the vestibular end organs and visual problems lead to a general sensation of disorientation and imbalance. Medications used for vertigo do not help primary balance symptoms, and sedative side-effects may be dangerous.



Ototoxicity

Aminoglycoside antibiotics remain life-saving in septic conditions. However, even meticulous blood level monitoring will not predict ototoxicity. Ototoxicity is increased in septic or hypovolemic shock, neutropenia, and renal failure. The need for aminoglycosides should be reassessed every seven days.

Note that bilateral ototoxicity does not produce vertigo, but oscillopsia. Therefore, ask patients if they notice visual blurring

Dizziness

Table 3

The 10-minute exam of the dizzy patient

	<u>Action</u>	<u>Normal</u>	<u>Abnormal</u>
Spontaneous nystagmus	Target fixation in neutral gaze, Frenzel goggles	No nystagmus or excessive saccades	Jerk nystagmus: direction fixed; Frenzel goggles: peripheral; direction changing: central; pendular: central
Gaze nystagmus	Hold eccentric gaze 20-30 degrees for 10 seconds in horizontal and vertical planes	Physiologic end gaze or no nystagmus	Jerk nystagmus: central; downbeat nystagmus in lateral gaze: central
Smooth pursuit	Track finger moving 60 degrees through 60-degree arc (horizontal and vertical)	Smooth pursuit movements	Saccadic pursuit: central; irregular tracking: acuity, age, medications, attention
Saccades	Alternate gaze between finger	Rapid, accurate, conjunctive eye movements	Overshoot, undershoot: central; slow saccades: central; late saccades: central; disconjugate: central
Head thrust test	Thrust head 20-30 degrees while fixating on target	No loss of fixation	Refixation saccade: peripheral
Headshake test	Shake head for 20 seconds at 2 Hz (horizontal and vertical) with eyes closed, then open (Frenzel goggles) and observe for nystagmus	No nystagmus	Unidirectional nystagmus in plane of headshake: peripheral; vertical nystagmus after horizontal headshake: central
Dynamic visual acuity test	Have patient read eye chart with head still, then with 0.2 Hz headshake	< 3 line drop in acuity with headshaking	> 3 line drop with headshaking: peripheral
Fixation suppression test	Have subject fixate on own thumb while rotating body in exam chair	No nystagmus	Nystagmus in direction of rotation: central
Position tests	Place the head in left/right Hall pike, left/right lateral, supine	No nystagmus	Torsional nystagmus with upbeat and ageotropic horizontal components: BPPN; horizontal paroxysmal nystagmus: BPPN; horizontal, sustained nystagmus: peripheral
Cerebellar limb tests	Finger to nose, heel-shin, rapid alternating motion	Accurate movements	Dysmetria, dysdiadochokinesia: central
Posture tests	Romberg test, sharpened Romberg test, eyes closed foam	Minimal sway; no falls	Excessive sway, falls on Romberg: variable/aphysiologic; falls on foam eyes closed: peripheral/mixed/aphysiologic
Gait tests	Observation of gait, Fukuda step test	Normal gait < 45 degree rotation on Fukuda test	

Modified from: *Practical Management of the Dizzy Patient*. Goebel JA (ed.). Lippincott Williams & Wilkins, Philadelphia, 2001, p. 385.

with head movement, and test by asking them to fixate on a printed page while gently nodding their head. Keep the corrective glasses on during the exam for retinal slip. If the patient complains of visual blurring, review the need for continued aminoglycoside. Aminoglycoside eardrops may also cause ototoxicity in some susceptible patients, therefore, monitoring is necessary. If there is no acceptable alternative, the patient should be told of the risk of imbalance and oscillopsia, and the discussion should also be documented in the patient's file.

Migraine vestibulopathy

Migraine is common and vertigo may occur as an aura without headache. If significant neurologic and otologic diseases have

been excluded, a trial of migraine prophylaxis can be used empirically. Prophylactic medications should be started at a low dose and increased gradually. Tricyclics or divalproex sodium are usual first-line prophylactics.

Acoustic neuroma or posterior fossa tumour

Tumours may mimic any of the above conditions, and if the tumours are slow-growing, the patient may adapt to the vestibular symptoms. Magnetic resonance imaging remains the "gold standard" of diagnostic tests. Referral to specialist is necessary if patients present with progressive symptoms.



Table 4

Exam for retinal slip

1. The patient should wear corrective lenses.
2. Examine fundus, or shine light into one eye to abolish visual fixation (for one minute).
3. Examine opposite fundus for nystagmus by observing blood vessel.
4. Gently, and with small amplitude horizontal shake of head, observe vessel for movement. (Note: This may take time; encourage patient to keep eye still and blink as little as possible.)

Case discussion

In migraine patients, the incidence of dizziness, lightheadedness, and unsteadiness is 72%, and the incidence of vertigo is 33%. The vertigo can occur during the aura, during the headache phase, or in the headache-free period.

While a diagnosis of exclusion, migraine prophylaxis as an empiric trial is very helpful in many patients. Often patients have had years of medication for "inner ear problems," or vestibular physiotherapy for the perceived movement-induced symptoms, with no long-term benefits.

Frequently Asked Questions

1. When should I be concerned enough to revoke a dizzy patient's driving license?

It is unusual for patients to be instantly disabled, but if patients cannot move their head quickly without significant symptoms, or if they cannot adequately assess their blind spot, then they should not be driving.

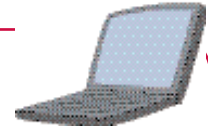
2. Isn't all hearing loss with dizziness considered Meniere's?

No. Patients may have hearing loss that predates the dizziness. While this may be a peripheral vestibular dysfunction related to the hearing loss, the hearing loss, severe vertigo, and tinnitus, *etc.*, should occur together. It may be better to treat with an antihistamine than a diuretic.

3. Who should I refer my patient to?

As a general rule, patients with dizziness accompanied by any cranial nerve symptoms, headache, or visually induced/or isolated imbalance (especially progressive) should be referred to a neurologist.

Surf your way to...



1. Vestibular Disorders Association of America:
www.vestibular.org
2. The National Headache Foundation (search: Migraine):
www.headaches.org

Does exercise work?

Exercise to improve the patient's tolerance to movement-induced symptoms has been used since the '40s. It is well described in patients who have a stable vestibular loss. However, exercise should not be used for fluctuating symptoms, and there is still some controversy in the literature regarding its use in central dizziness and dizziness after head injury.

Well-motivated patients may succeed with a home program, but often the help of a properly trained physical therapist is invaluable. It is important to remember that not all dizziness or imbalance syndromes respond to exercise. In some post-traumatic conditions, such as perilymph fistula, exercise may wors-



Take-home message

What should I look for?

- Obtain an accurate description of the symptoms and associated features.
- A clinical exam confirms history.
- Do not diagnose on history alone.
- Nystagmus is more easily seen with magnification. Frenzel's lenses can be used, but a pair of reading glasses of the highest magnification (found in most pharmacies) is a useful alternative. The glasses are worn by the patient!


What treatments are available?

- For short-term treatment of vomiting and severely ill patients, treat with intravenous dexamethasone (if vestibular neuritis).
- Treat with antihistamines if symptoms are protracted (*e.g.*, bonamine).
- Treat with migraine prophylactics if migraine vestibulopathy is suspected.
- Assign exercise for clinical syndromes, such as BPPV.
- For severe, but infrequent attacks, use sublingual lorazepam.

en symptoms. Further, in some post-concus- sion patients, recovery may be hampered if exercise therapy is started too soon. If the physician is unclear of the indications for exercise, referral to an ear, nose, and throat specialist is suggested.

What are the testing procedures?

There is no one exam which tests the whole vestibular system. Electronystagmography or videonystagmography to assess the VOR may not assess the fast responses of the vestibular system. Computerized dynamic posturography assesses posture control, but not site of lesion. Posturography does, however, have usefulness in directing rehabilitation therapy, and refining diagnosis in vestibular visual mismatch syndromes.

More recently, the vestibular evoked myogenic potential test is used to assess the sacular portion of the otolith. 



Suggested Readings

- 1. Goebel JA: Practical Management of the Dizzy Patient. Lippincott, Williams & Wilkins, 2000.
- 2. Selby G, Lance J: Observations on 500 cases of migraine and allied vascular headaches. J Neurol Neurosurg Psychiatry 1960; 23(2):23-32.

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