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 vestibuulo-ocular 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...
Dizziness

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 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.

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Dizziness

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.
### The 10-minute exam of the dizzy patient

<table>
<thead>
<tr>
<th>Action</th>
<th>Normal</th>
<th>Abnormal</th>
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</thead>
<tbody>
<tr>
<td><strong>Spontaneous nystagmus</strong></td>
<td>Target fixation in neutral gaze, Frenzel goggles</td>
<td>No nystagmus or excessive saccades</td>
</tr>
<tr>
<td><strong>Gaze nystagmus</strong></td>
<td>Hold eccentric gaze 20-30 degrees for 10 seconds in horizontal and vertical planes</td>
<td>Physiologic end gaze or no nystagmus</td>
</tr>
<tr>
<td><strong>Smooth pursuit</strong></td>
<td>Track finger moving 60 degrees through 60-degree arc (horizontal and vertical)</td>
<td>Smooth pursuit movements</td>
</tr>
<tr>
<td><strong>Saccades</strong></td>
<td>Alternate gaze between finger</td>
<td>Rapid, accurate, conjunctive eye movements</td>
</tr>
<tr>
<td><strong>Head thrust test</strong></td>
<td>Thrust head 20-30 degrees while fixating on target</td>
<td>No loss of fixation</td>
</tr>
<tr>
<td><strong>Headshake test</strong></td>
<td>Shake head for 20 seconds at 2 Hz (horizontal and vertical) with eyes closed, then open (Frenzel goggles) and observe for nystagmus</td>
<td>No nystagmus</td>
</tr>
<tr>
<td><strong>Dynamic visual acuity test</strong></td>
<td>Have patient read eye chart with head still, then with 0.2 Hz headshaking</td>
<td>&lt; 3 line drop in acuity with headshaking</td>
</tr>
<tr>
<td><strong>Fixation suppression test</strong></td>
<td>Have subject fixate on own thumb while rotating body in exam chair</td>
<td>No nystagmus</td>
</tr>
<tr>
<td><strong>Position tests</strong></td>
<td>Place the head in left/right Hall pike, left/right lateral, supine</td>
<td>No nystagmus</td>
</tr>
<tr>
<td><strong>Cerebellar limb tests</strong></td>
<td>Finger to nose, heel-shin, rapid alternating motion</td>
<td>Accurate movements</td>
</tr>
<tr>
<td><strong>Posture tests</strong></td>
<td>Romberg test, sharpened Romberg test, eyes closed foam</td>
<td>Minimal sway; no falls</td>
</tr>
<tr>
<td><strong>Gait tests</strong></td>
<td>Observation of gait, Fukuda step test</td>
<td>Normal gait &lt; 45 degrees rotation on Fukuda test</td>
</tr>
</tbody>
</table>

Dizziness

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

<table>
<thead>
<tr>
<th>Exam for retinal slip</th>
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<tbody>
<tr>
<td>1. The patient should wear corrective lenses.</td>
</tr>
<tr>
<td>2. Examine fundus, or shine light into one eye to abolish visual fixation (for one minute).</td>
</tr>
<tr>
<td>3. Examine opposite fundus for nystagmus by observing blood vessel.</td>
</tr>
<tr>
<td>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.)</td>
</tr>
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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.
**Dizziness**

**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](http://www.vestibular.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 worsen.

**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-concussion 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 saccular portion of the otolith.

Suggested Readings