Background

About vertigo

Vertigo involves a false sensation that the patient or their surroundings are moving or spinning, usually accompanied by nausea and loss of balance. Causes of vertigo can be differentiated into:

➢ **Central** – involving cerebral cortex, cerebellum, brainstem e.g. cerebrovascular disease, multiple sclerosis, diplopia, alcohol intoxication.

➢ **Peripheral** – involving vestibular labyrinth, semicircular canals, or vestibular nerve e.g. viral/vestibular labyrinthitis, vestibular neuronitis, benign paroxysmal positional vertigo (BPPV), Ménière’s disease, motion sickness, ototoxicity, acoustic neuroma, migraine, syphilis, perilymph fistula, mal de débarquement (disequilibrium after being on a boat).

Red flags

- Unable to stand or walk without assistance
- Symptoms of stroke or transient ischemic attack
- Vertigo associated with barotrauma
- Bacterial labyrinthitis

Assessment

1. Determine if episode is vertigo:

   - Gain an **accurate description**

Accurate description

**Dizziness means different things to different patients. Get a precise description by asking:**

➢ onset of symptoms – what brings it on

➢ tempo of symptoms – specific length of spinning symptoms rather than just length of malaise

➢ if the room spins around (vertigo)

➢ if they feel:

   - unsteady (disequilibrium)
   - like they might faint (presyncope)
   - lightheaded
   - room bouncing (oscillopsia)

Vertigo is an illusion of movement, often horizontal and rotatory. Associated nausea and vomiting indicates a peripheral rather than central cause. Studies show that about a third of cases of dizziness are vertigo.

Disequilibrium occurs when the brain receives inadequate information about the body’s position from the somatosensory, visual, and vestibular systems. It may result from peripheral neuropathy, eye disease, or peripheral vestibular disorders.

Presyncope is caused by cardiovascular disorders reducing cerebral perfusion.
Lightheadedness is non-specific and hard to diagnose. It may result from panic attacks with hyperventilation.

- Check for associated nausea, vomiting, earache, hearing loss, and tinnitus.

2. Assess for other associated symptoms of anxiety, depression, panic attack, and neck pain.

3. Determine if the patient is experiencing **central or peripheral causes of vertigo**.

### Central and peripheral vertigo

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Peripheral vertigo</th>
<th>Central vertigo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>Sudden</td>
<td>Insidious or sudden</td>
</tr>
<tr>
<td>Clinical picture</td>
<td>Paroxysmal</td>
<td>Continuous</td>
</tr>
<tr>
<td>Intensity</td>
<td>Intense</td>
<td>Less intense</td>
</tr>
<tr>
<td>Duration</td>
<td>Minutes/hours</td>
<td>Days/weeks</td>
</tr>
<tr>
<td>Nystagmus</td>
<td>Horizontal or torsional</td>
<td>Vertical nystagmus common (present in quiet sitting)</td>
</tr>
<tr>
<td>Position related</td>
<td>Aggravated with position change</td>
<td>Not position related</td>
</tr>
<tr>
<td>Tinnitus, deafness</td>
<td>Common, new onset</td>
<td>Absent</td>
</tr>
<tr>
<td>Associated symptoms</td>
<td>Nausea and vomiting</td>
<td>Ataxia, facial numbness or weakness, diplopia, dysphagia, hemiparesis Difficulty walking, skew deviation</td>
</tr>
<tr>
<td>Examples</td>
<td>Benign positional paroxysmal vertigo (BPPV)</td>
<td>CVA, haemorrhage, Vertebrobasilar insufficiency (VBI), TIA, MS, neoplasm, migraine</td>
</tr>
<tr>
<td></td>
<td>Ménière’s disease, viral labyrinthitis,vestibular neuronitis</td>
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</table>

- If central vertigo, the cause is likely to be neurological. Examine for **cerebellar signs** and **brainstem signs** and consider a stroke.

### Brainstem signs

- Vertigo, nystagmus, diplopia, dysarthria, dysphagia, and ocular skew deviation.

**Skew deviation**

While focused on a fixed target, each eye is alternately covered. As the cover is moved from one eye to the other, the now-uncovered eye must correct for the misalignment and will look up (or down) to focus back on the target.

- Hemiparesis, facial weakness or numbness.
## Cerebellar signs

- Ataxia
- Difficulty standing or walking

- If peripheral vertigo without new unilateral hearing loss:
  - consider **common causes of vertigo**.

## Common causes of vertigo

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Tempo</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPPV</td>
<td>&lt; 1 minute</td>
<td>Nausea and vomiting, May be history of head injury, No tinnitus, No hearing loss</td>
</tr>
<tr>
<td></td>
<td>Settles if head is kept still</td>
<td>Latency (10 to 15 seconds) of onset of vertigo after movement</td>
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<tr>
<td></td>
<td>Resolves in days</td>
<td>Provoking positions: Lying supine, Rolling in bed, Squatting down then coming up</td>
</tr>
<tr>
<td>Ménière’s disease</td>
<td>20 minutes to 24 hours</td>
<td>Vertigo nausea, vomiting, hearing loss (variable initially but worsens with time), tinnitus, aural fullness</td>
</tr>
<tr>
<td>Viral labyrinthitis (infection affects vestibular and cochlear nerve)</td>
<td>&gt; 24 hours</td>
<td>Often preceding viral infection, Hearing loss with vertigo, nausea, and vomiting</td>
</tr>
<tr>
<td></td>
<td>Sudden severe episode followed by dysequilibrium.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constant crisis for 4 days</td>
<td></td>
</tr>
<tr>
<td>Vestibular/viral neuronitis (infection affects vestibular nerve)</td>
<td>&gt; 24 hours</td>
<td>Often preceding viral infection, Vertigo, nausea, vomiting, and no hearing loss</td>
</tr>
<tr>
<td></td>
<td>Sudden severe episode followed by dysequilibrium.</td>
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<tr>
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<td>Constant crisis for 4 days</td>
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- Make a diagnosis of benign positional paroxysmal vertigo (BPPV) by performing the **Dix-Hallpike test**.
Dix-Hallpike test

➢ Undertake a bidirectional nystagmus test before the Dix-Hallpike test.

➢ Bidirectional nystagmus test
  o If flicking eye movements detected upon lateral gaze to the left and right, consider a central lesion.
  o If this test is positive, a Dix-Hallpike is not indicated.
  o Dix-Hallpike test needs to be performed as a left and right sided test.

➢ The examiner extends head in the upright position and asks patient to turn head toward examiner as far as comfortably tolerated and keeping eyes open, then allows patient to move to supine position.

➢ The examiner supports head in the upright position and asks patient to turn head away from examiner as far as comfortably tolerated and keeping eyes open, then allows patient to move to supine position.

➢ A positive test will invoke the fast phase of horizontal nystagmus toward the affected ear. If there are bilateral signs, the more prominent nystagmus becomes the affected side.

➢ Local experience supports use of a pillow on the bed at the shoulder position, allowing the head to remain over the bed at the end of the test as the more controlled method rather than having the head over the end of the bed as in this video: Dix-Hallpike Manoeuvre from BMJ Learning.

4. Consider medications or persistent postural perceptual dizziness (PPPD) as a cause.

Persistent postural perceptual dizziness (PPPD)

➢ Unsteadiness or dizziness lasting 3 months in:
  o challenging environment (e.g. shopping centres, crowds), or
  o tasks requiring a precise visual focus (e.g. reading, using a computer)

➢ Often associated with anxiety and depression

Medications that may cause vertigo

Drugs which can cause dizziness include:

➢ antihypertensives
➢ anticonvulsants
➢ antide pressants
➢ sedatives.

The dizziness occurs either through postural hypotension or direct effects on the central or peripheral vestibular system.
Drugs that have been reported to cause vertigo or dizziness as an adverse drug reaction:

<table>
<thead>
<tr>
<th>Drug class</th>
<th>Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesics</td>
<td>• Paracetamol</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>• Amitriptyline</td>
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<td></td>
<td>• Doxepin</td>
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<td></td>
<td>• Mianserin</td>
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<td></td>
<td>• Mirtazapine</td>
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<td></td>
<td>• Paroxetine</td>
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<td></td>
<td>• Sertraline</td>
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<tr>
<td>Antiepileptics</td>
<td>• Eribulin</td>
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<td></td>
<td>• Gabapentin</td>
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<td></td>
<td>• Perampanel</td>
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<td></td>
<td>• Phenytoin</td>
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<tr>
<td>Antihypertensives</td>
<td>• Amlodipine</td>
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<tr>
<td></td>
<td>• Enalapril</td>
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<tr>
<td></td>
<td>• Irbesartan</td>
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<tr>
<td>Anti-infectives</td>
<td>• Aminoglycosides (amikacin, gentamicin, kanamycin, tobramycin)</td>
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<tr>
<td></td>
<td>• Macrolides (azithromycin, clarithromycin, erythromycin)</td>
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<tr>
<td></td>
<td>• Acyclovir</td>
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<tr>
<td></td>
<td>• Amphotericin B</td>
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<td></td>
<td>• Chloroquine</td>
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<td></td>
<td>• Cycloserine</td>
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<td></td>
<td>• Ciprofloxacin</td>
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<td></td>
<td>• Fluconazole</td>
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<td></td>
<td>• Itraconazole</td>
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<td></td>
<td>• Mefloquine</td>
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<td></td>
<td>• Minocycline</td>
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<tr>
<td></td>
<td>• Nitrofurantoin</td>
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<td></td>
<td>• Valcyclovir</td>
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<tr>
<td>Antineoplastic drugs</td>
<td>• Pomalidomide</td>
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<tr>
<td></td>
<td>• Thalidomide</td>
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<tr>
<td>Diuretics</td>
<td>• Ethacrynic acid</td>
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<tr>
<td></td>
<td>• Frusemide</td>
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<td></td>
<td>• Hydrochlorothiazide</td>
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<tr>
<td>Heavy metals</td>
<td>• Arsenic</td>
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<tr>
<td></td>
<td>• Cis-platinum</td>
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<td>• Mercury</td>
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</tbody>
</table>
**Immunomodulating drugs**
- Abatacept
- Certolizumab
- Hydroxychloroquine
- Infliximab

**NSAIDs**
- Aspirin
- Celecoxib
- Diclofenac
- Ibuprofen
- Indomethacin
- Ketorolac
- Naproxen

**Parkinsonian drugs**
- Bromocriptine
- Levodopa/carbidopa

**Psychotropic drugs**
- Chlorpromazine
- Clozapine
- Lithium

**Statins**
- Atorvastatin
- Simvastatin

Seek advice from a drug information service if required.

5. Assess for **other causes of dizziness**.

### Other causes of dizziness

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Tempo</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Postural hypotension</strong></td>
<td>Episodic</td>
<td>• Faint, dizzy</td>
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<tr>
<td></td>
<td></td>
<td>• Occurs when moving from supine/sitting to standing, or prolonged standing</td>
</tr>
<tr>
<td><strong>Vertebrobasilar insufficiency VBI/post-circulation TIA</strong></td>
<td>Episodic 1 to 8 minutes</td>
<td>• Vertigo with rotation of neck</td>
</tr>
<tr>
<td><strong>Vestibular migraine</strong></td>
<td>Minutes to hours</td>
<td>• Vertigo, motion sensitivity, dizziness.</td>
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<tr>
<td></td>
<td></td>
<td>• May be no associated headache</td>
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<tr>
<td></td>
<td></td>
<td>• Previous migraines</td>
</tr>
</tbody>
</table>
Management

1. If patient suspected of having a stroke, call 000 and send to the Emergency Department by ambulance for immediate neurology assessment.

2. Arrange appropriate specialist assessment based on vertigo type:
   - If debilitating vertigo, post barotrauma vertigo, or bacterial labyrinthitis, arrange immediate ENT assessment.
   - If central vertigo, arrange urgent or routine neurology assessment.

3. Provide explanation and reassurance, as anxiety exacerbates symptoms.

   Discuss the driving implications, especially if Ménière’s disease with sudden or severe attacks.

Driving implications

- The law requires drivers to report to the Driver Licensing Authority any permanent or long-term illness that are likely to affect their ability to drive safely.
- Health professionals also have an obligation to public safety, so if a health professional believes that a patient is not heeding advice to cease driving, he or she may report directly to the Driver Licensing Authority.

4. Manage any underlying condition e.g:
   - BPPV

BPPV management

Once a diagnosis of BPPV has been made, the Epley Canalith Repositioning Procedure can be performed.

- This can be readily performed in primary care and will be successful in about 80% of cases.
- Epley’s manoeuvre will cause vertigo in the patient and may be unpleasant. The manoeuvre is specific for right sided and left sided origin of symptoms.

   **Epley’s manoeuvre**
   - The patient is first moved into the Dix-Hallpike position toward the side of the affected ear.
   - The patient remains in that position until the nystagmus ceases.
   - Rotate the patient’s head slowly through toward the unaffected side. The patient stays in this position until the nystagmus stops. If there is no nystagmus remain in position for approximately 20 seconds.
   - The patient is then rolled to a side-lying position with the head turned 45 degrees down (towards the floor) and kept in that position for 20 seconds. Must not lift head during roll; keep nose down.
   - Finally, keeping the head deviated toward the unaffected side and pitched down, the patient slowly sits up.

   **Video of Epley’s manoeuvre**
   BMJ Learning – Vertigo: Epley Manoeuvre from BMJ Learning [video, 2 minutes 13 seconds]

- The Epley Manoeuvre can be repeated if there are persisting symptoms after 1 week.
- If the Epley manoeuvre is not successful, usually the episode is short-lived. If not, consider referring for vestibular physiotherapy or audiology, falls and balance services, or urgent or routine ENT assessment.
• **Vestibular neuronitis**

- Corticosteroid treatment may hasten clinical recovery but long term outcomes are unclear. Consider giving prednisone 1 mg/kg (up to 100 mg) daily in the morning for 5 days, then taper over 15 days and cease.\(^2\)
- Give symptomatic treatment for nausea and vomiting, using prochlorperazine for the shortest time possible.
- Recommend mobilisation to speed up adaptation process once acute symptoms have subsided.
- If symptoms persist beyond 2 weeks consider referring for vestibular physiotherapy or audiology or **urgent or routine ENT assessment**.

• **Meniere’s disease**

- Recurrent episodes of rotatory vertigo lasting for hours with associated unilateral hearing loss, tinnitus, and ear pressure.
- Acute attacks may need antiemetics e.g. prochlorperazine (intramuscular), promethazine (oral), or ondansetron (oral or intramuscularly).
- Prophylactic management can involve the use of thiazide diuretics to reduce the frequency or severity of attacks e.g. hydrochlorothiazide.
- Betahistine failed to show benefit in a 2016 clinical trial on Meniere’s disease but its use is still cited in the literature and in information from peak bodies.\(^3\)
- Low salt, low caffeine diets reduce the vertigo component of Ménière’s disease.
- Steroids do not have any role in the management of Ménière’s disease.
- If frequent or difficult to manage Meniere’s disease refer for **urgent or routine ENT assessment**.
- Advise on hearing aids and **tinnitus management**.
- Advise about driving.

• **Sudden sensorineural hearing loss** with vertigo

**Sensorineural hearing loss**

- Abrupt onset of unilateral sensorineural hearing loss (< 10 days) with associated vertigo.
- Manage according to **Asymmetrical Sensorineural Hearing Loss** pathway.

**Referral**

- Call **000** and send any patient suspected of having a stroke to the Emergency Department by ambulance for **immediate neurology assessment**.
- Refer for **immediate ENT assessment** if:
  - debilitating vertigo or post barotrauma symptoms.
  - bacterial labyrinthitis.
- If central vertigo, refer for **urgent or routine neurology assessment**.
- If peripheral vertigo and vestibular rehabilitation indicated, refer for vestibular physiotherapist, or a falls and balance clinic.
➢ If persistent vertigo or diagnostic uncertainty, and patient has trialled vestibular physiotherapy, refer for urgent or routine ENT assessment or urgent or routine neurology assessment.

➢ If Ménière’s disease is frequent or difficult to manage, refer for urgent or routine neurology assessment.

Information

For health professionals

Further information

➢ Australian Family Physician:
  o Epley Manoeuvre for Benign Paroxysmal Positional Vertigo
  o Vertigo Part 1: Assessment in General Practice
  o Vertigo Part 2: Management in General Practice

➢ Austroads – Health Professionals Responsibilities

➢ House Ear Institute – Epley Manoeuvre: Right Side manoeuvre

➢ The Medical Journal of Australia – Dizziness on Head Movement

For patients

Further information

➢ Benign Paroxysmal Positional Vertigo

➢ Labyrinthitis and Vestibular Neuritis

➢ Ménière’s Disease

➢ BPPV

➢ Ménière’s

➢ Vestibular Neuronitis and Labyrinthitis

Sources

References


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