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Dizziness and Vertigo: Outpatient Care Protocol

Introduction:

This document summarizes evidence from available Indian and International guidelines/ published reviews in clinical journals and medical books. It aids physicians and other caregivers in making appropriate diagnostic and therapeutic decisions in an outpatient setting. It provides a framework for managing patients with particular symptom or condition. It covers diagnosis, clinical assessment, alarm features, clinical management, and investigations at outpatient level and referral management to inpatient facility/ hospital.

Scope and objective:

- To provide evidence backed recommendations for the identification and care of patient population with dizziness and vertigo at an outpatient clinic
- To give physicians a practical approach and guide to the care of patients with dizziness and vertigo
- To develop a tool that can be used with medical documentation and therefore promote compliance with best practice to standardize clinical care for patients with dizziness and vertigo in an outpatient setting.

Target population:

Patient population with existing and new onset of symptoms of dizziness and vertigo

Target Users:

- General Physicians
- Nurses
- Other health care professional
- Outpatient Clinics

The clinical protocol cover critical elements of patient care from patient's first visit to a physician, outpatient management, through to follow up and referral to inpatient facility/ hospital. The Clinical team can refer to these protocols and bibliography for detailed information.

Exclusions:

Patient population suffering from known underlying pathology has been excluded from the scope of this tool.

Disclaimer:

The clinical protocol are designed to be used by medical professionals licensed to practice in India as a guide and are not intended to substitute for informed medical decisions or judgment by a licensed medical professional.

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Dizziness and Vertigo: Outpatient Care Protocol

1. Introduction / definition *B1*

Dizziness is a subjective sensation of feeling faint/ light headed/ weak or unsteady. When dizziness creates a sensation of spinning of surroundings or self it is called vertigo. It can be caused by a wide range of benign and/or serious underlying conditions.

The patient may use the word 'dizzy' nonspecifically to describe vertigo, syncope, presyncope, unsteadiness, generalized weakness, or falling. The aim of examining the patient with dizziness should be to identify whether the patient has true vertigo or any other cause of dizziness. And true vertigo should be further distinguished between peripheral and central vertigo.

2. General presentation

A person may present at the outpatient clinic with the following symptoms:

- Dizziness , spinning or falling sensation
- Nausea, vomiting
- Feeling of lightheadedness or faintness
- Loss of balance
- Dizziness accompanied with blurred vision
- Hearing loss

3. Alarm features *J1*

In the presence of any of the alarm features the person should be assessed by the physician carefully and referral management along with supportive treatment should be initiated. These include:

- Severe headache
- Hearing or visual loss
- Fever of more than 101 F
- Problems with speech
- Weakness of arms or legs
- Difficulty walking
- Collapse, or periods of unconsciousness
- Numbness in areas of body
- Chest pain
- An abnormally slow or fast pulse
- An irregular pulse
- Recurrent or persistent vertigo
- When otoscopy findings are abnormal

4. Clinical types of Dizziness and Vertigo *B3*

Dizziness is a vague and nonspecific symptom whereas vertigo is a specific type of dizziness that is defined as spinning or rotatory sensation. Vertigo could be either from a peripheral (labyrinth and vestibular nerve) cause or a central cause (central nervous system). Therefore, dizziness can be classified into six general categories:

- Vertigo (Peripheral and central)
    - Vertigo due to peripheral lesions: Vestibular neuronitis, labyrinthitis, miniere's disease, benign positional vertigo
    - Vertigo due to central lesions: Tumors, vascular disease, multiple sclerosis, migraine, trauma.
- Presyncopal dizziness: It is caused by temporary pancerebral ischemia. Common causes include orthostatic hypotension, vasovagal attacks, cardiac abnormalities (dysarrythmias, aortic stenosis).
- Hypoglycemic dizziness: It is usually due to the complications of insulin or oral hypoglycemic medications in patients with diabetes mellitus but also can be caused by insulin secreting tumors and alcoholism.
- Psychophysiologic dizziness: It is usually seen in patients with panic attacks, anxiety with hyperventillation
- Drug-induced dizziness: Drugs such as aminoglycosides, anticonvulsants, transquilizers, salicylates and alcohol may cause dizziness.

  Presyncopal dizziness may be caused by antihypertensives or diuretics, which induce orthostatic hypotension.
- Disequilibrium: It is a feeling of unsteadiness or imbalance. Usually due to ototoxicity, peripheral neuropathy, visual loss, cerebellar degeneration and advanced age.

Table 1. Differences between peripheral and central vertigo *J6*

Characteristics	Peripheral vertigo	Central Vertigo
Onset	Acute, sudden , often violent onset	Insidious onset
Severity of vertigo	Severe	Mild
Associated symptoms		
Nausea, Vomiting	May be severe	Rare. If present, it is less severe.
Auditory symptoms such as hearing loss, tinnitus, sensation of	Common	Rare (cerebrovascular event involving the internal auditory

fullness in ear or ear pain		artery or anterior inferior cerebellar artery
Neurological symptoms such as headache, aura, visual, sensory or motor symptoms	Rare	More suggestive of central vertigo
Postural instability	Able to walk; unidirectional instability	Falls while walking; severe instability
Nystagmus	Horizontal and rotational. Lessens or disappears when patient focuses the gaze. Usually triggered by some provoking factor.	Purely horizontal, vertical or rotational. Does not lessen when patient focuses the gaze. Persists for a longer period.
Duration of Nystagmus	Usually < 1 min	Usually >1 minute
Fatigability (response remits spontaneously as position is maintained)	Yes	No
Habituation (attenuation of response as position repeatedly is assumed)	Yes	No
Common causes	Benign paroxysmal positional vertigo Miniere's disease Acute labyrinthitis Vestibular neuronitis Acute or chronic otitis media Trauma (perilymphatic fistula, labyrinthine concussion)	Posterior fossa tumors Cerebellar infarct / hemorrhage Acoustic neuroma Temporal lobe epilepsy Basilar artery migraine Multiple sclerosis Trauma (central vestibular nuclei injury)
Physical findings	Abnormal vestibuloocular reflex (VOR) Positive dix-hallpike maneuver* (latency of symptoms and nystagmus 2 to 40 sec)	Abnormal neurological examination such as diplopia, dysarthria, aphasia, weakness and sensation abnormalities. Cerebellar abnormalities such as dysmetria on finger- to – nose testing,

		dysdiadochokinesia.

** Dizziness with specific eye movements that occur when one is made to lie on their back with the head turned to one side and tipped slightly over the edge of the examination bed.*

Note: The combination of a positive Dix-Hallpike maneuver and a history of vertigo or vomiting suggest a peripheral vestibular disorder.

If the maneuver provokes purely vertical (usually downbeat) or torsional nystagmus without a latent period of at least a few seconds, and does not wane with repeated maneuvers, this suggests a central cause for vertigo such as a posterior fossa tumor or hemorrhage.

5. Risk factors

- Certain medications such as sedatives, tranquillizers and anti seizure drugs
- Middle ear infections or vestibular disease
- Travelling may cause motion sickness
- Dehydration
- Severe blood loss
- Diabetic autonomic neuropathy or multi-system atrophy
- Abnormal heart rhythms
- Heart block
- Anxiety
- Depression

6. Clinical diagnosis

The evaluation of dizziness and vertigo requires a careful review of medical history, a physical examination, and occasionally diagnostic testing.

6.1. History *J1, J2, B1*

If vertigo is vestibular in origin it is typically experienced as a spinning sensation and gives a sense of tumbling or of falling backward or forward. It should be distinguished from imbalance, light-headedness and syncope, all of which are non-vestibular in origin.

Ask for

- **Vertigo/dizziness sensation details** *J1, J2, J3, B1, B2*
  - Elicit the precise meaning of dizziness to the patient. Ask questions such as:
    - Does the room spin around? (vertigo)

- Do you feel unsteady? Do you feel you might fall? (Disequilibrium. Could be from peripheral neuropathy, visual loss, or peripheral vestibular disorders)
- Do you feel like you may faint or feel giddy or light headed? (Presyncope. could be from cardiovascular disorders reducing cerebral perfusion, postural hypotension)
- Do you feel dizzy? (Nonspecific. Could be from panic attacks with hyperventilation.)

  - Onset and progression of symptoms (slow and insidious or acute)
  - Duration of sensation
  - Frequency of sensation (continuous or episodic)
  - Intensity of sensation
  - Ask for triggers (e.g. high salt diet in case of meniere's disease); stress; bright lights (e.g. migraine associated dizziness).
  - Provoked by changing position or turning head? (Benign intracranial hypertension)

- **Vertigo details**
  - Onset of symptoms (Onset is sudden in peripheral vertigo but gradual in central cause)
  - Durations of vertiginous events is key to diagnosis (seconds, minutes to hours or days)
  - Frequency of symptoms
  - Severity of vertigo (Vertigo from peripheral origin is usually so severe that the patient is unable to walk or stand).

- **Associated symptoms**
  - Nausea and vomiting indicate a peripheral rather than central cause
  - Imbalance is more pronounced in central cause than peripheral cause
  - Nystagmus is common in acute vertigo
  - Hearing loss
  - Tinnitus (provides strong support for peripheral (ie, otologic) origin
  - Visual disturbances
  - Headache
  - Diplopia or dysarthria or facial paresthesia, or extremity numbness or weakness (think of a vascular event such as TIA)

- **Associated history of present illness**
  - Ho alcohol intake
  - H/o upper respiratory infection or flu-like illness preceding the onset of vertigo.
  - H/o diabetes
  - H/o epilepsy
  - H/o head injury or trauma (barotrauma during airflight, scuba diving)
  - H/o ear pain, infection, surgery

- H/o degenerative cervical spine disease
- H/o syphilis
- H/o neurologic disorders (CVA/TIA, migraine headache, multiple sclerosis, tumor of brainstem or cerebellum)
- Screen for primary or reactive anxiety and depression.

- **Treatment history**

  - Review the current medication list. Antihypertensive agents are the most common causes.
  - Any exposure to ototoxic medication such as aminoglycosides and antineoplastic drugs especially cisplastin.

Table 2 Diagnosis of peripheral and central vertigo *J6*

Duration of episode	Provoking factor	Symptoms	Type of hearing loss	Suggested diagnosis
Two days to 1 week or more, (episodes of late stages of acute vestibular neuronitis may last for a second.)	Spontaneous episodes (i.e. no consistent provoking factor: Recent upper respiratory viral illness.	Imbalance	None	Acute vestibular neuronitis
Hours	None	Aural fullness Ear/ mastoid pain Facial weakness Headache Hearing loss Tinnitus	Progressive unilateral sensorineural	Acoustic neuroma
Hours (episodes of late stages of Ménière's disease may last for a second.)	Spontaneous episodes (i.e. no consistent provoking factor.	Aural fullness Hearing loss Tinnitus	Sensorineural, initially fluctuating, initially affecting lower frequencies; later in course: progressive,	Ménière's disease

			affecting higher frequencies	
Several seconds to 1 minute. Or several minutes to 1 hour. Or last for few hours.	Changes in ear pressure, head trauma, excessive straining, loud noises	Hearing loss	Progressive, unilateral	Perilymphatic fistula
Several seconds to a few minutes	Changes in head position	Nausea, visual disturbance, rotatory (torsional) nystagmus- which has a latency and can be fatigued i.e when the patient places himself in the position to cause vertigo the symptoms should lessen each time.	None	Benign positional paroxysmal vertigo
Days	Spontaneous episodes (i.e. no consistent provoking factor.	Focal neurologic findings, hearing loss	Sudden onset, unilateral	Cerebrovascular disease(stroke/TIA)
A few seconds	Immunosuppression (e.g., immunosuppressive medications, advanced age, stress) in Herpes zoster oticus	Ear/Mastoid pain, facial weakness, hearing loss,	Subacute to acute onset, unilateral in Herpes zoster oticus (i.e., Ramsay Hunt syndrome)	Acute middle ear disease (e.g., otitis media, herpes zoster oticus)

Days	Changes in head position; Spontaneous episodes (i.e. no consistent provoking factor.	Focal neurologic findings	None	Multiple sclerosis
Days	Stress; Spontaneous episodes (i.e. no consistent provoking factor.	Headache, Phonophobia, photophobia	None	Migraine
A few seconds	None	Hearing loss	Progressive, conductive	Otosclerosis
A few seconds	None	Hearing loss	Progressive, unilateral, conductive	Cholesteatoma
Weeks	Stress	None	None	Psychogenic (constant vertigo lasting weeks without improvement)
Hours	Changes in head position	Focal neurologic findings, imbalance	None	Cerebellopontine angle tumor
A few seconds	Changes in head position	Tinnitus	None	Acute labyrinthitis

6.2. Physical examination *J1, J5, J8*

Physical examination is a critical step in establishing diagnosis and management thereon.

- **Check for:**
  - Vital Signs such as pulse (to diagnose arrhythmia), blood pressure and orthostatic hypotension test.

- Cranial Nerves examination – Eye movements (C.N. III, IV, and VI), corneal reflex (C.N. V), and facial movement (C.N. VII)
- Check vestibular and cochlear function (C.N. VIII) – Examination of cochlear system involves three steps:
  - 1st step- Pure tone hearing loss: Compare the sensitivity of the patient's ears or compare the patient's ears with your own, using a ticking watch or the sound of your fingers rubbing together.
  - 2nd step- Sensory neural vs. Conductive hearing loss: Sensory neural hearing loss, i.e. a neurologic problem, or a conductive hearing loss, i.e. a disorder in the middle ear interfering with the functions of the ossicles. This can be determined by Rinne test.

    Rinne Test: Bone and air conduction are compared by placing the vibrating tuning fork first over the mastoid bone and then in front of the ear. Then ask the patient which is louder. If the patient says latter is louder then air conduction is better than bone conduction. This finding, along with hearing loss, tells you unequivocally that there is a sensory neural problem.
  - 3rd step- Cochlear vs. Retro cochlear hearing loss: This step is needed only once sensory neural loss is confirmed. This is done to confirm whether the sensory neural deficit is from the end organ (cochlear) or from the peripheral or central neural disease (Retrocochlear). At this stage the patient should be referred to an ENT specialist.
- Examine vestibular aspect of VIII cranial nerve by testing for nystagmus.
  - First, ask the patient to sit on the end of the examining table and to look about 45° to the right and to the left.
  - If nystagmus develops when the gaze is directed to 45°, note the direction of the fast phase, the direction of the slow phase, and in what position of the eyes they occur.
  - .
- Dix Hallpike's maneuver will confirm benign paroxysmal positional vertigo (BPPV). The Dix–Hallpike test is performed with the patient sitting upright with the legs extended. The patient's head is then rotated by approximately 45 degrees. The clinician helps the patient to lie down backwards quickly with the head held in approximately 20 degrees of extension. This extension may either be achieved by having the clinician supporting the head as it hangs off the table or by placing a pillow under their upper back. The patient's eyes are then observed for about 45 seconds as there is a characteristic 5-10 second period of latency prior to the onset of nystagmus. Once position testing has been done, look for:
  - In which direction the world seems to be spinning
  - In which direction the patient seems to be falling when the vertigo develops
  - The directions of the fast and slow phases of the nystagmus

    Key diagnostic points for BPPV:

Repeated stimulation via Dix Hallpike's maneuver, cause the nystagmus to fatigue or disappear temporarily.

1. Rotatory / torsional nystagmus present.

2. Latency of onset: delay in onset of nystagmus by several seconds.

3. Paroxysmal: nystagmus peak in 20-30 seconds and then decay

4. Habituation: nystagmus complete resolves while the patient maintains the same head position.

5. Fatigability: nystagmus remits while the patient is brought back to the sitting position.

6. Geotropic: nystagmus beats in geotropic i.e. towards the ground fashion.

7. Nystagmus lasts for 2-40 sec.

- Check cerebellar function (past pointing, dysdiadochokinesia).
- Testing vibration sense (a 128 Hz tuning fork on the ankle) is useful for screening for peripheral neuropathy
- Romberg testing – Loss of balance when standing with eyes closed is positive in spinal column disease
- Otoscopy in case patient complains of hearing loss, earache or ear discharge.
- Ophthalmic: Visual aciuty
- Neck examination: to recognize carotid artery disease and range of motion.
- Cardiovascular system examination: Auscultation for heart sounds.
- Hyperventilation for 30 seconds may assist in ruling out psychogenic causes of vertigo associated with hyperventilation syndrome.

7. Investigations *B1, B2, J5, J8*

7.1. Routine investigations

To diagnose dizziness, physicians must use the essential tools of history, clinical examination, and follow-up.
Routine investigations are usually not required for dizziness and vertigo unless other co-existing vestibular or audiological pathology is suspected. Few investigations that might be needed are:

- Hemoglobin: to rule out anemia
- Random Blood glucose: to check diabetes
- ECG with rhythm strip: to detect any cardiac disease in elderly patients or with history suggestive of cardiac dysfunction

7.2. Additional investigations

In cases of persistent vertigo or when CNS disease is suspected, additional investigations as follows may be indicated.

- X-ray of cervical spine: if there is history suggestive of cervical spondylosis.

Note: Radiographic imaging, vestibular testing, or both in patients diagnosed with BPPVis not recommended unless indicated. J8

8. Differential diagnosis *J1,B1*

8.1 Physician should rule out other causes / conditions which are responsible for vertigo:

- Labyrinthitis - Viral labyrinthitis may have other symptoms of a viral infection such as a sore throat, flu symptoms, or a cold. Typical vertiginous episodes lasts for days and auditory symptoms are present.
- Vestibular Neuronitis – Typical vertiginous episodes lasts for days. Auditory symptoms are absent.
- Benign paroxysmal positional vertigo (BPPV) - Sudden episodes of vertigo that last just a few seconds or minutes. Each episode typically occurs when the patient moves the head in a certain way such as turning in bed or getting up from bed in morning.
- Ménière's disease - episodes of vertigo, hearing loss, and tinnitus. Each episode can last from 20 minutes to several hours. Permanent hearing loss and tinnitus may eventually develop.
- Migraine - Each episode of vertigo due to migraine can last from several hours to several days. Auditory symptoms are absent.
- Acoustic neuroma – H/o progressive hearing loss is positive. Typical vertiginous episodes can last for months. An audiogram and CT is confirmatory.
- Uncommon causes like stroke or multiple sclerosis. Typical vertiginous episodes can last for months. Auditory symptoms are absent.
- Perilymphatic fistula – duration of typical vertiginous episodes lasts for seconds. Auditory symptoms are present.
- Cervical vertigo – Vertigo episodes lasts for seconds and auditory symptoms are absent. There may be complaints of neck pain. A cervical X ray is confirmatory.
- Temporal lobe seizures arising from trauma, tumors, or prior strokes can, as one of their manifestations, produce vertigo.

8.2 Physician should rule out other causes / conditions which are responsible for dizziness like symptoms:

- Orthostatic hypotension- a major drop in systolic BP can occur after standing or sitting up too quickly and leads to presyncope.
- Anaemia – Visible from skin and mucus membrane pallor

- Arrhythmias and other heart problems such as atherosclerosis, cardiomyopathy leads to presyncope.
- Anxiety – Panic attacks leads to feeling of light-headedness.
- Hyperventilation – This also leads to a feeling of light headedness.
- Medication - Anticonvulsants, sedatives and some sleeping pills leads to disequilibrium.
- Peripheral neuropathy – this can lead to disequilibrium.

9. Management of dizziness and vertigo *J1, J8*

9.1. Principles of management

- Explanation and Reassurance
- Symptomatic treatment
- Drug therapy for underlying pathology and other symptomatic treatment
- Vestibular rehabilitation exercises and canalith repositioning maneuver (Epley maneuver)
- Referral management to an ENT specialist if condition worsens or in presence of alarm features

9.1.1. Explanation and reassurance

It is important to reassure the patient and allay his fears. Educate the patient on the possible causes and its prevention. Advice against sudden standing up from a position of sitting or lying down. In those with BPPV patients should be counseled regarding the impact of BPPV on their safety, the potential for disease recurrence, and the importance of follow-up.

9.1.2. Symptomatic treatment

- For presyncopal dizziness due to orthostatic hypotension advice slowly getting up from a position of sitting or lying down. Advice adequate fluid intake, avoid alcohol and use of compression stockings
- For dizziness due to vasovagal attacks advise to avoid triggers, a fruity drink such as lemonade before an impending attack is helpful, so as to maintain blood flow to the brain ask a patient to lie down with legs raised with the help of a cushion or pillow
- Simple exercise such as asking patient to make the muscles of the body, arms and legs tense is effective for vasovagal syncope
- Hypoglycemic dizziness can be treated by immediately giving the patient 1 tbsp of sugar / honey or 15 gm of glucose gel. Blood sugar should also be assessed by a glucometer after 15 mints. Repeat treatment until blood sugar comes to 70 mg/dl or above. Relaxation techniques and counseling for those with psycho physiologic dizziness.
- Antibiotics for dizziness or vertigo due to ear infection
- Review or stoppage of medications in those with dizziness due to medications

Note: Referral to a specialist or hospital for those who have associated deafness, BPV, arrhythmias, suspicion of cancers or acoustic neuroma and for deep seated ear infections.

9.1.3. Drug therapy in dizziness and vertigo

9.1.3.1. Medications

The goals of pharmacotherapy are to relieve vertigo, reduce morbidity, and prevent complications.

Most cases of dizziness are self-limiting and generally no medication is necessary. Treatment is required in cases of true vertigo.

Vestibular suppressants and anti-emetic drugs are the mainstay of treatment of vertigo. Vestibular suppressants consist of three major drug groups- anticholinergics, antihistamines and benzidiazipines. Physicians should emphasize on the following elements when prescribing:

- Vestibular suppressants:
  - Anti-cholinergics- belladonna alkaloids (scopolamine, atropine) increase motion tolerance. It includes drugs like glycopyrrolate, scopolamine.
  - Antiserotonin and anti-histamine type- meclizine, dimenhydrinate prevent motion sickness All the antihistamines in general use for control of vertigo also have anticholinergic activity.
  - Benzodiazipines – lorazepam, diazepam, clonazepam
- Anti-emetic drugs: Phenothiazine, dopamine antagonist, 5HT3 antagonist.

  Anti-emetic drugs are used orally for mild nausea. Suppositories are commonly used in outpatients who are unable to absorb oral agents because of gastric atony or vomiting. Injectables are used in the emergency room or inpatient settings. The new agents are used when all else fails.

  Meclizine has both vestibular suppressant and anti-emetic properties. When an oral agent is appropriate, this agent is generally the first to be used, because it rarely causes adverse effects any more severe than drowsiness.

  Phenothiazines with antihistamine properties such as prochlorperazine and promethazine, are effective antiemetics.

Note: Routinely treating BPPV with vestibular suppressant medications such as antihistamines or benzodiazepines is not recommended. J8

9.1.2.2. Other Drugs *J4*

- Anti-migrainous therapy - Topiramate reduces the frequency of vertigo attacks.

  Flunarizine, valproic acid, acetazolamide is effective in familial hemiplegic migraine and episodic ataxia; triptans.
- Antibiotics in case of bacterial labyrinthitis if the patient is febrile or has symptoms of bacterial infection. Antibiotics should be started after a culture and sensitivity test.

Note: Intravenous medications are used only in those who cannot tolerate orally due to persistent vomiting.

Table 1. Drug therapy in dizziness and vertigo *B5, N1*				
Indication	**Category**	**Drug of choice**	**Dosage**	**Contraindications**
Vertigo (Mild symptoms)	Vestibular suppressants - Anti-histamines	Meclozine http://www.mims.com/Page.aspx?menuid=mng&name=meclozine&brief=false&CTRY=IN#Dosage	**Adult:** 25 mg orally every 4-6 hour. Upto 100 mg daily in divided doses. **Pediatric** <12 years: Not established >12 years: Administer as in adults **Most effective if** used 'as needed' for 2-3 days with episodes of true vertigo. **Motion sickness:** **Adult:** 25-50 mg 1 hr before travelling and repeat every 24 hr if needed. **Interactions:** May increase toxicity of CNS depressants, neuroleptics, and anticholinergics	Documented hypersensitivity **Use with caution in:** Pregnancy, lactation, angle-closure glaucoma, prostatic hypertrophy, pyloric or duodenal obstruction, and bladder neck obstruction, elderly.
		Dimenhydrinate http://www.mims.com/Page.aspx?menuid=mng&name=dimenhydrinate&brief=false&CTRY=IN#Dosage	**Adult** 50-100 mg orally/IM every 3-4 hours or 100-mg suppository every 8 hours. **Pediatric** Avoid in children in less than 2 years. Above 2 years – 5mg/kg/day 6-8 hourly. **Motion sickness:**	Documented hypersensitivity; lactation- administration to neonates (IV products may contain benzyl alcohol, which has been associated with fatal gasping syndrome in premature infants and low-birth-weight infants) **Precaution:** pregnancy; Do not treat severe emesis with antiemetic drugs alone; may contain either sulfites or tartrazine, which may cause

			For prevention of motion sickness, 1st dose to be given at least 30 minutes before traveling. **Interactions:** Alcohol or other CNS depressants may have additive effect; caution with concurrent antibiotics that may cause ototoxicity; may mask ototoxic symptoms caused by certain antibiotics (irreversible damage may result) **Food interactions:** May be taken with or without food.	allergic-type reactions in susceptible persons; may impede diagnosis of conditions such as brain tumors, intestinal obstruction, and appendicitis; may obscure signs of toxicity from overdosage of other drugs
Vertigo, Motion sickness and meniere's disease	Antihistamine	Cinnarizine http://www.mims.com/Page.aspx?menuid=mng&name=cinnarizine&brief=false&CTRY=IN#Dosage	**Adult:** 30mg tab 3 times daily. Should be taken with food.	Children and neonates, in those with COPD or cardiovascular disease and prostrate hypertrophy. Caution in pregnancy and lactation.
Vertigo due to anxiety or panic disorder	Vestibular suppressants - Benzodiazipine	Diazepam http://www.mims.com/Page.aspx?menuid=mng&name=diazepam&brief=true&CTRY=IN&searchstring=diazepam	**Adult** 5-10 mg orally/IV/IM every 4-6 hours **Pediatric** <6 months: Not recommended >6 months: 0.05-0.3 mg/kg/dose IV/IM over 2-3 min, repeat in 2-4 hours as needed. 0.12-0.8 mg/kg/d orally divided every 6-8 hours; not to exceed 10 mg/dose.	Documented hypersensitivity; pregnancy, lactation.

		Lorazepam http://www.mims.com/Page.aspx?menuid=mng&name=lorazepam&brief=false&CTRY=IN#Dosage	**Adult:** 1-6 mg in 2-3 divided doses daily or adjust accordingly	Severe hepatic impairment; respiratory depression; acute narrow-angle glaucoma; pregnancy and lactation.
		Clonazepam http://www.mims.com/Page.aspx?menuid=mng&name=clonazepam&brief=true&CTRY=IN&searchstring=+clonazepam	**Adult:** 250 mcg twice daily. Max: 4 mg/day. May be taken with or without food.	Hypersensitivity to benzodiazepines, acute pulmonary insufficiency, acute narrow angle glaucoma. Special precaution in pregnancy and lactation.
Vertigo due to motion sickness	Vestibular suppressants - Anti cholinergics	Glycopyrrolate http://www.mims.com/Page.aspx?menuid=mng&name=glycopyrronium+bromide&brief=false&CTRY=IN#Dosage	**Adult** 1-2 mg orally bid/tid **Pediatric** <12 years: Not established >12 years: 40-100 mcg/kg/dose orally tid/qid	Documented hypersensitivity; narrow-angle glaucoma, tachycardia, ulcerative colitis, paralytic ileus, or acute hemorrhage. Precaution in pregnancy. **Not recommended for:** children <12 y or patients with Down syndrome
vestibular neuronitis		Scopolamine http://www.mims.com/Page.aspx?menuid=mng&name=hyoscine&brief=false&CTRY=IN#Dosage	**Adult** 300 mcg 30 min before a journey, then 300 mcg every 6 hr if required. Max: 3 doses in 24 hr. Or 0.5 mg Transdermal for 3 days. **Pediatric** 3-4 yr: 75 mcg 20 min before a journey, repeated if needed. Max dose: 150 mcg in 24 hr. 4-10 yr: 75-150 mcg, >10 yr: 150-300 mcg.	Documented hypersensitivity; primary glaucoma (including initial stages); pyloric obstruction; toxic megacolon; hepatic disease; paralytic ileus; severe ulcerative colitis; renal disease; obstructive uropathy; myasthenia gravis Precaution in Pregnancy, lactation;

			Max dosage: 3 doses in 24 hours. **Transdermal** may be most effective agent for motion sickness. **Adult:** As patch delivering 1 mg over 3 days: Apply 1 patch at least 4 hr before exposure to motion. To be applied behind the ear. Use in treatment of vestibular neuronitis is limited by slow onset of action.	
Nausea and vomiting	Phenothiazine	Promethazine http://www.mims.com/Page.aspx?menuid=mng&name=promethazine&brief=false&CTRY=IN#Dosage	**Adult** 25 or 50 mg PO/IM/PR every 4-6 hours. Max: 100 mg daily. **Pediatric** <2years: Contraindicated 5-10 yr: 12.5-37.5 mg daily. **For Motion sickness:** 20-25 mg to be taken the evening before traveling followed by a similar dose in the morning if needed.	Documented hypersensitivity; children younger than 2 y (incidences of death due to respiratory depression).pregnancy, lactation.
		Prochlorperazine http://www.mims.com/Page.aspx?menuid=mng&name=prochlorperazine&brief=false&CTRY=IN#Dosage	**Adult** 5-10 mg orally/IM every 2-3 hours 25-mg suppository PR every12 hours. **Pediatric** 2.5 mg Orally/PR every 8 hours or 5 mg Orally/PR every12 hours as needed; not to exceed 15 mg/d. 0.1-0.15 mg/kg/dose IM; change to Per Oral	Documented hypersensitivity; bone marrow suppression; narrow-angle glaucoma; severe liver or cardiac disease; pregnancy, lactation. **Precautions:** Drug-induced Parkinson syndrome or pseudoparkinsonism frequent; akathisia most common extrapyramidal reaction in elderly; lowers seizure threshold; caution in

			when possible. **Interactions:** Co-administration with other CNS depressants or anticonvulsants may cause additive effects; administration with epinephrine may cause hypotension	history of seizures.
Nausea and vomiting, migraine	Dopamine antagonist	Domperidone http://www.mims.com/Page.aspx?menuid=mng&name=domperidone&brief=false&CTRY=IN#Dosage	**Adult**: 10-20 mg 4-8 hourly. 20 mg 4 hourly in migraine **Pediatric:** 0.2-0.4 mg/kg /dose every 4-8 hours. Should be taken on an empty stomach. (Take 15-30 mins before meals)	GI haemorrhage, obstruction and perforation, patients with prolactin releasing pituitary hormone, chronic admin or routine prophylaxis of postoperative nausea and vomiting.
	5HT3 antagonist	Ondansetron http://www.mims.com/Page.aspx?menuid=mng&name=ondansetron&brief=true&CTRY=IN&searchstring=Ondansetron	**Adult:** 8 mg stat and if needed.	Children below 4 years.

Table 4. Management for underlying pathology

Indication	Drug therapy	Rehabilitation	Other measures
Vestibular neuronitis	Antiemetic and vestibular suppressant in the acute phase, but should be withdrawn as soon as possible to facilitate the process of central vestibular compensation.	Early vestibular rehabilitation is important.	

Benign paroxysmal positioning vertigo (BPPV)	Medications are not effective in the treatment of BPPV.	Canalith repositioning from the affected canal to the vestibular using Epley maneouver	
Ménière disease	Conservative therapy is most effective along with salt restriction and diuretics. To stabilize active disease- Corticosteroids, given orally or intratympanically. Intratympanic gentamicin (chemical labyrinthectomy) is a minimally invasive procedure for treating the disabling vertigo of Ménière disease	No role	Salt restriction and diuretics
Migraine	Topiramate and rizatriptan benzoate are associated with excellent control of vestibular migraine.	None	Trigger factors should be eliminated and patients should be encouraged to follow healthy diet and lifestyle

9.1.2.2.1. Adverse reactions:

Table 5. Adverse reactions of drug therapy in dizziness and vertigo	
Drug	**Adverse reactions**
Meclizine	Drowsiness, thickening of bronchial secretions, dry mouth, fatigue, blurred vision.
Dimenhydrinate	Sedation, dry mouth, thickened respiratory tract secretions, tightness of chest, bradycardia followed by tachycardia and arrhythmias, blurred vision, urinary retention, constipation, GI disturbance, blood dyscrasias.
Diazepam	Psychological and physical dependence with withdrawal syndrome, fatigue, drowsiness, sedation, ataxia, vertigo, confusion, depression, GI disturbances, changes in salivation,
Lorazepam	Drowsiness, headache, dizziness, confusion; blurred vision; nausea; weakness; unsteadiness, respiratory depression.
Clonazepam	Neonates, chronic pulmonary insufficiency, hepatic/renal dysfunction, porphyria, elderly; pregnancy and lactation.
Glycopyrrolate	Dry mouth, constipation, bloating

Scopolamine	Fatigue, headache, memory loss. Dry skin, erythema, increased sensitivity to light, rash. Bloatedness, constipation, dry throat, dysphagia,
Promethazine	Dryness of mouth, blurring of vision, retention of urine, constipation, glaucoma, tachycardia, headache, hypotension, tinnitus.
Prochlorperazine	dry mouth, blurring of vision, glaucoma, urinary retention, constipation, orthostatic hypotension
Domperidone	Drowsiness, extrapyramidal reactions, galactorrhoea, gynaecomastia; constipation or diarrhea, lassitude, decreased libido, skin rash, itch.
Ondansetron	Headache, malaise/fatigue, constipation; drowsiness

9.1.3 Vestibular Rehabilitation Exercises and Epley maneuver *B4, J7, J8*

This includes a series of exercises aimed at encouraging eye, head, and body movements to facilitate recalibration of the vestibulo-spinal and vestibuloocular reflexes that have been developed. Refer to an otolaryngologist (ENT specialist) or an audiologist for these exercises.

Epley maneuver The Epley maneuver is also called the particle repositioning or canalith repositioning procedure. It involves sequential movement of the head into four positions, staying in each position for roughly 30 seconds.(See figure 1) The recurrence rate for BPPV after these maneuvers is about 30 percent at one year, and in some instances a second treatment may be necessary.

This maneuver is used to treat benign positional vertigo by returning displaced otoliths to the utricle. If vertigo occurs during any of the positions, that position is held until the vertigo subsides. Occasionally such symptoms are caused by compression of the vertebral arteries, and if one persists for a long time, a stroke could occur.

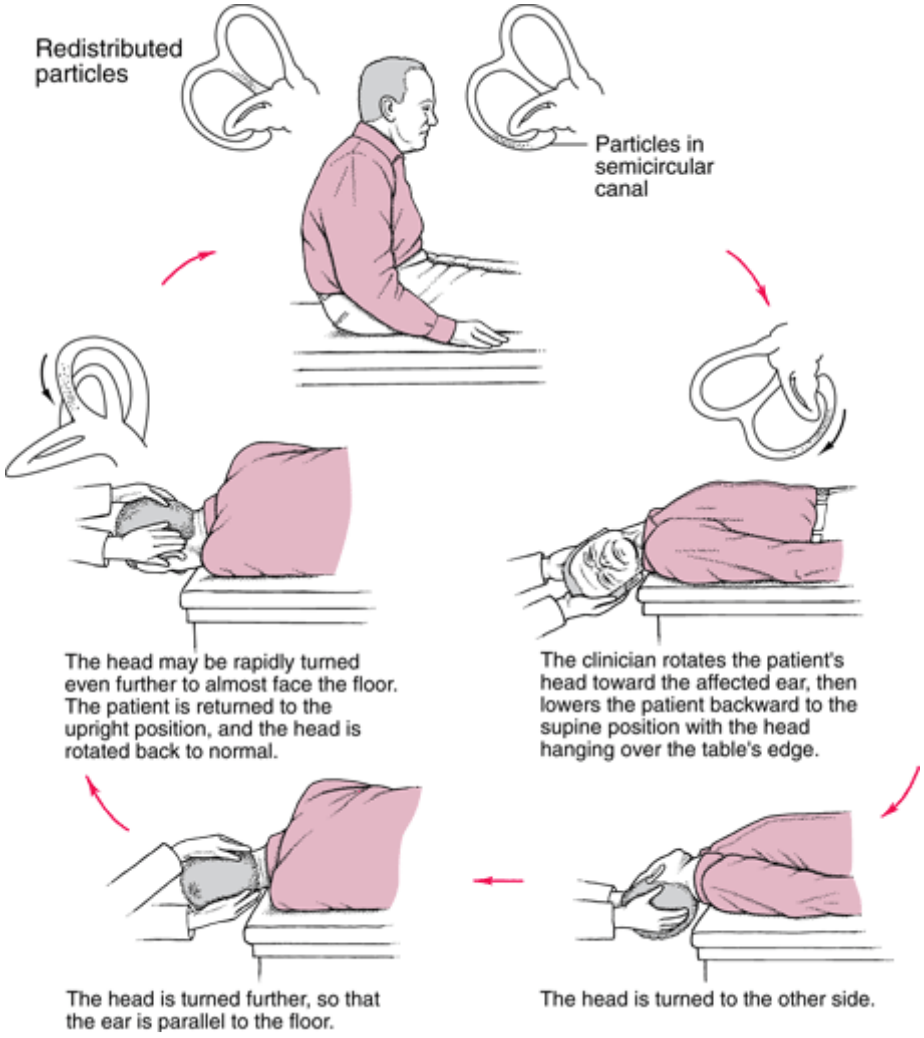

Figure1. Epley maneuver

9.1.4 Referral management *J1*

In the presence of any one of the alarm features mentioned in the previous section, referral management should be initiated. Physician should consider referral to an ENT specialist or subspecialist such as - otolaryngologist, head and neck surgeon, neurologist, neurosurgeon.

10 Follow up

- Educate the person to immediately return to the physician if warning signs appear (Refer to patient advisory).
- Inform about the next timely follow up visit *(Refer to patient advisory).*

11 Quality indicators

The quality indicators that are important in documenting the adherence to policy in the management of dizziness and vertigo are:

- Antihistamines and benzodizepins avoided as first line treatment in BPV
- Radiology tests only if indicated
- Referral management for alarm features
- Antibiotics used only for bacterial labyrinthitis after a culture and sensitivity test
- Education on safety measures given.

12 **Patient advice:**

Patient education must be reinforced about the disease, its causes, alarm features, prevention, treatment and when to seek help.

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