

# Dizziness, Vertigo, and Syncope: Assessment and Treatment

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## Disclosure

- No real or potential conflict of interest to disclose.
- No off-label, experimental or investigational use of drugs or devices will be presented.

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## Objectives

- Having completed the learning activities, the participant will be able to:
  - Differentiate among causes of syncope, near syncope, vertigo, and ataxia including adverse drug effects.
  - Analyze differences between central and peripheral vertigo.
  - Evaluate management strategies for the disorders presented.

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## Assessment of Dizziness

- Ataxia
  - Inability to maintain balance
- Near-syncope
  - A sense of “sinking” without actual loss of consciousness

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## Assessment of Dizziness

(continued)

- Vertigo
  - Sense of the rotational movement of self or surroundings
- Syncope
  - Actual loss of consciousness

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## Ataxia

- Balance and coordination are first affected.
- Other symptoms occur later.
  - Loss of fine motor coordination
  - Slurred speech
  - Difficulty swallowing
- Both hereditary and spontaneous forms exist.

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## Hereditary Forms

### Autosomal Dominant

- Spinocerebellar ataxia includes
  - Cognitive defects
  - Dementia
  - Neuropathy
  - Extrapyramidal features
- Adult onset forms exist

### Autosomal Recessive

- Friedreich's ataxia includes
  - Cerebellar sx
  - Corticospinal sx
  - Sensory loss
  - Wheelchair dependence
  - Average death age 38 years

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## Sporadic Ataxia

- Diagnosis of exclusion
- SCA is ruled out.
- Adult onset
- No family history
- Symptoms less severe than SCA

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## Transient Forms

- Short-lived as name implies
- Result from insult to the cerebellum
- Alcohol or drug intoxication are leading differentials
- Infection – viral, meningitis, Creutzfeldt-Jacob
- Metabolic imbalance
- Abnormalities in PTH
- Vit E malabsorption

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## Identifying Ataxia

- When the chief complaint is “dizziness” the evaluation proceeds to differentiate among actual symptom type.
- When the primary problem is ataxia, the diagnostic evaluation should proceed to rule out hereditary vs. sporadic vs. transient causes.

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## Pharmacologic Implications

- Drugs that can produce ataxia
  - Antiepileptics
  - Dextromethorphan
  - Fibrin acid derivatives
  - Metformin
  - Levodopa
  - Methotrexate
  - Thiazide diuretics

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## Near-syncope

- Patients may be describing near-syncope when the chief complaint is “dizziness.”
- Near-syncope is generally the result of transient, decreased blood flow to the brain.
- Patients describe a general sense of “sinking” or “almost fainting” or “fainting.”

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## Near-syncope

(continued)

- Characteristic (but not prerequisite) in the description of symptoms is that it occurred when the patient was upright and resolved when they went supine/prone.

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## Near-syncope

(continued)

- Causes of near-syncope break down into four different categories.
  - Cardiogenic
  - Neurocardiogenic
  - Neurologic
  - Psychiatric
- The diagnostic evaluation is directed by your impression of category

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## Vertigo

- Described by the patient as the sense of the patient or the room “spinning”
- Often accompanied by other symptoms
- Occurs in any position
- Is the cardinal symptoms of vestibular disease
- Virtually always exacerbated by head movement and never continuous.

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## Diagnostic Evaluation of Vertigo

- Vertigo is almost always evaluated effectively by the history.
- Rule out systemic/metabolic causes.
  - Medications
  - Psychogenic
  - Infection
  - Hypoxia

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## Drugs that Cause Vertigo

- Similar to those causing ataxia
  - AEDs
  - Sedative hypnotics
  - Narcotic analgesics
  - Antibiotics
  - Salicylates
  - Miscellaneous

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## Central or Peripheral

- After ruling out metabolic causes, need to determine whether vertigo is central or peripheral
- Consider the statistics
  - 50% of vertigo is benign paroxysmal positional vertigo (BPPV).
  - 25% of vertigo is vestibular neuronitis.
  - 10% of vertigo is Meniere's disease.
- 85% of vertigo will be peripheral

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## Central Vertigo

- Cerebellar disease accounts for most cases of central vertigo.
- Brain stem ischemia
- Multiple sclerosis

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## Central Vertigo

(continued)

- Associated symptoms increase likelihood of central disease.
  - Hiccups in coordination
  - Visual or sensory loss
  - Diplopia
- Neoplastic disease accounts for only 1%.
  - Onset is insidious.

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## Central Vertigo

(continued)

- Vascular disease accounts for remainder of central vertigo.
  - Other symptoms of vascular disease are usually present.
  - Onset of vertigo more acute and lasts for minutes.
  - Other neurologic symptoms may be present.

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## Central Vertigo Associated Findings

- Diplopia
- Autonomic symptoms
- Nausea
- Dysarthria
- Dysphagia
- Focal weakness

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## Central Vertigo Associated Findings (continued)

- Unable to ambulate during acute episodes
- Dysdiadochokinesis (DDK or ataxia in cerebellar disease)
- Sensory/motor symptoms in CNS disease

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## Peripheral Vertigo

- A variety of conditions that are external to the brain stem and cerebellum are considered peripheral vertigo.

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## Peripheral Vertigo (continued)

- Causes
  - Benign paroxysmal positional vertigo (BPPV); otoliths
  - Meniere's disease
  - Recurrent vestibulopathy
  - Labyrinthitis
  - Traumatic vertigo
  - Perilymphatic vertigo

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## Peripheral Vertigo (continued)

- Associated symptoms contribute to diagnosis.
  - Hearing loss
  - Pain in the ear
  - Tinnitus

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## Characteristics of Peripheral Vertigo

- Sudden onset and vivid memory of vertigo usually a product of inner ear etiology
- Onset and time course help distinguish among peripheral causes.
- Associated or exacerbated with head or body movement, position changes.

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## BPPV (Otoliths)

- The most common cause of vertigo.
- Calcium crystals are inappropriately displaced into the semicircular canals of the labyrinth of the inner ear.
- When detached, head movement causes otoliths to move; this stimulates hair cells.
- Result is vertigo

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## Meniere's Syndrome

- Clinical diagnosis of *vertigo, hearing loss, tinnitus*
- Cause is unknown.
- Distention of the endolymphatic compartment of the inner ear
- It is chronic.
- Sensorineural hearing loss

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## Recurrent Vestibulopathy

- Meniere's syndrome without the auditory symptoms
- Most patients will go on to develop the auditory symptoms.
- Increased incidence in migraine sufferers

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## Labyrinthitis

- Transient vertigo
- Acute and short-lived
  - Typically a matter of days
- Often associated with bacterial or viral infection
- Associated tinnitus and hearing loss
- Rapid head movement will provoke vertigo for weeks.

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## Less Common Causes of Peripheral Vertigo

- Positional vertigo
  - Vertebrobasilar insufficiency
  - Triggered by position change – Sx occur 10–60 seconds later
- Traumatic vertigo – Follows fx
- Periphymphatic vertigo
  - Linked to head trauma, barotrauma, Valsalva maneuver

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## Remember...

- Vertigo is never continuous.
- Vertigo is always exacerbated by head movement.
- If both of these are not present, the patient is not having vertigo.

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## Physical Examination

- Romberg test
- Evaluate gait
- Nystagmus
- Vision/hearing
- Provoking maneuvers
  - Valsalva maneuver
  - Nylen-Barany maneuver

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## Nystagmus Assessment

- Description of nystagmus should include
  - Provocative factors
  - Direction
  - Latency
  - Fatigue
  - Suppression by visual fixation
  - Accompanying vertigo

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## Nystagmus

- Peripheral vertigo
  - Usually rotary
  - Jerk nystagmus
  - Most evident by removing visual fixation
  - Can fatigue if elicited by head movement
  - Does not change direction with change of gaze
  - Diminishes with fixation

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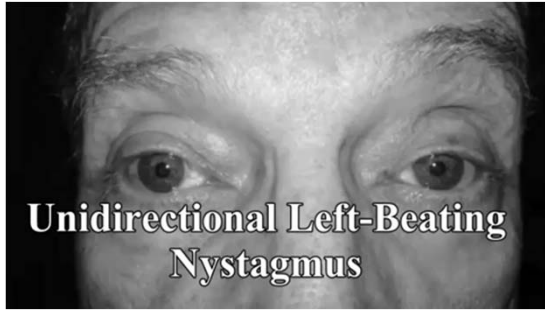
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## Nystagmus (continued)

- Central vertigo
  - Purely horizontal or vertical; vertical nystagmus is considered specific to central vertigo
  - Not suppressed by visual fixation
  - Can change direction with gaze

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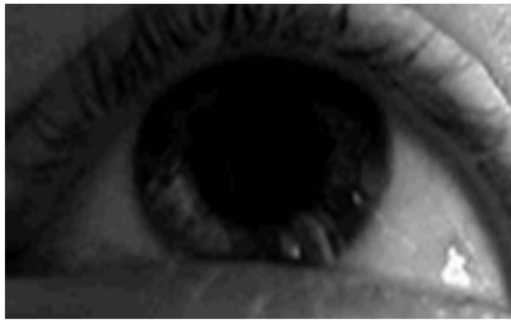
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## Vertical Nystagmus



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## Hallpike Maneuver

- Nystagmus and vertigo occur when diseased side turned downward.
- Peripheral nystagmus fatigues with repeated maneuvers.
- Central nystagmus does not change with repeated maneuvers.

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## Medical Management of Central Vertigo

- Histamine<sub>1</sub> receptor antagonists
  - Decreases excitability of inner ear labyrinth and blocks conduction in inner ear vestibular-cerebellar pathways
- Anticholinergic agents
  - Blocks action of acetylcholine at parasympathetic sites in CNS
  - Antagonizes histamine and serotonin action

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## Medical Management of Central Vertigo

(continued)

- Benzodiazepines
  - Potentiate effects of (GABA) and facilitates inhibitory GABA neurotransmission and other inhibitory transmitters
- Phenothiazines
  - Blocks postsynaptic mesolimbic dopaminergic receptors in brain and reduces stimuli to brainstem reticular system

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## Medical Management of Peripheral Vertigo

- Medications not always recommended; depends upon the type
- Acute vertigo – Bedrest
- Chronic vertigo – Activity

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## Medical Management of Peripheral Vertigo

(continued)

- Vestibular neuronitis
  - Vertigo without auditory symptoms, lasts several days to one week; frequently followed by several weeks of BPPV
  - 1/3 of patients develop chronic sx
  - Likely of viral etiology

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## Medical Management of Peripheral Vertigo (continued)

- Vestibular neuronitis (cont.)
  - Brief course of antiemetics and vestibular suppressant in acute phase
  - Corticosteroids can improve long-term outcomes.

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## Medical Management of Peripheral Vertigo (continued)

- BPPV
  - May be symptomatic of another condition or idiopathic
  - Brief vertigo with position change
  - Treatment involves dispersing otoliths.
  - Treated with Epley's maneuver

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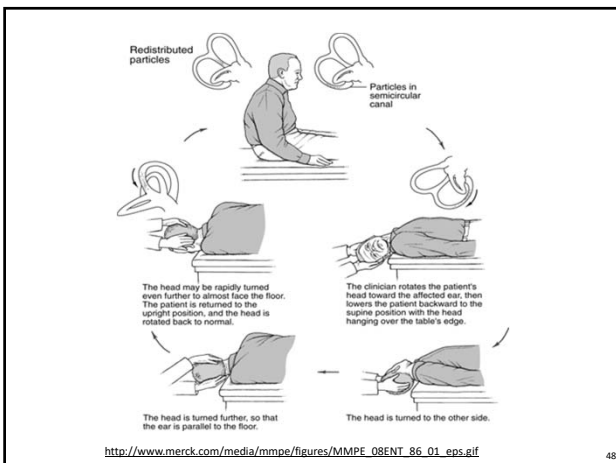
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## Medical Management of Peripheral Vertigo (continued)

- The traditional cocktail for symptom management
  - Benzodiazepine
  - Antiemetic
  - Antihistamine

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## Management of Peripheral Vertigo

- Meniere's disease
  - Low salt diet and diuretics helpful for 80% of patients.
    - Thiazides are the most common type used.
    - No strong evidence-based support for efficacy of diuretic therapy

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## Management of Peripheral Vertigo (continued)

- Meniere's disease (cont.)
  - Alcohol, caffeine, nicotine avoidance
  - Corticosteroids for severe episodes
  - Injection of gent/bicarb only in ear with no serviceable hearing
  - Surgical therapies very controversial

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## Syncope

- Multiple causes of syncope
- Generally divided among four categories
  - Neurological/neurogenic
  - Cardiogenic
  - Postural
  - Others

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## Neurogenic Syncope

- Need to rule out seizure
  - Post episode disorientation
  - Bowel/bladder incontinence
  - Tongue biting
- Small cerebral bleeds/infarcts
- Assess for focal neurological deficits
- Not affected by position

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## Cardiogenic Syncope

- Generally characterized by an absence of premonitory symptoms
- Can include any cardiogenic cause of decreased cerebral blood flow
  - Dysrhythmia
  - Valvular disease
  - Atrioventricular block

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## Postural Causes

- Hypotension
  - Consider new vasoactive meds
- Baroreceptor abnormalities
  - Common in the elderly
- Dehydration
- Neurocardiogenic syncope (vasovagal)
  - Emotional factors
  - Physiologic factors

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## Syncope Risk Factors

- Cardiovascular disease
- Diabetes
- Offending drug therapy
- Age
- Neurologic disease

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## Signs and Symptoms

- Loss of consciousness is the significant one.
- Presence of a prodrome suggests neurocardiogenic.
- Signs and symptoms of predisposing disease may be present.

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## Diagnostic Studies

- Dictated by the history of the event
- Positive tilt test suggests autonomic dysfunction
- More invasive procedures as indicated when cause remains elusive

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## Management of Syncope

- When organic cause identified, treat as appropriate
- Therapies for recurrent neurocardiogenic syncope
  - Non-cardioselective beta blockade
  - Fludrocortisone (Florinef®)
  - SSRIs
  - Disopyramide phosphate (Norpace®)
- Adjust medications that may be offending

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## References

- Friedman, M. and Hamid, M. Dizziness, vertigo, and imbalance. (2015)
  - <http://emedicine.medscape.com/article/2149881-overview>
- Lüscher M, Theilgaard S, Edholm B. Prevalence and characteristics of diagnostic groups amongst 1034 patients seen in ENT practices for dizziness. (2014) *J Laryngol Otol*, 128(2):128–33.

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## References

(continued)

- Sacco RR., Burmeister DB., Rupp VA, Greenberg MR. Management of benign paroxysmal positional vertigo: A randomized controlled trial. (2014) *J Emerg Med.* 46(4):575–81

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