Introductions

DRIVING CHANGE 2023
THE URGENT CARE CONVENTION

- Emergency Physician of 25yrs
- Practiced medicine on all 7 continents
- Former physician practice owner in both EM and UC
- Large Health System Chief Medical Executive of 3 years
- Now oversee all contracted outpatient services for Vituity nationwide.

Goals of this session

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- Identifying Central vs Peripheral Vertigo
- Understanding basic pathophysiology
- Review treatment options
- Know when to refer for higher level of care
- ***Disclosures: The presenter has no relevant financial or nonfinancial relationships to disclose.***

Case #1

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- 57yr old Female presents with acute onset room-spinning dizziness that started abruptly after bending down to pick up her wallet. The dizziness is most severe with head movement and resolves gradually once still. +Nausea. No headache. Mild tinnitus. Only notable history is that she recently recovered from a cold and has sinus congestion.

  BP 147/75

  HR 85

  RR 16

  O2Sat 98%RA

  Temp 98.6

Peripheral vs Central Vertigo

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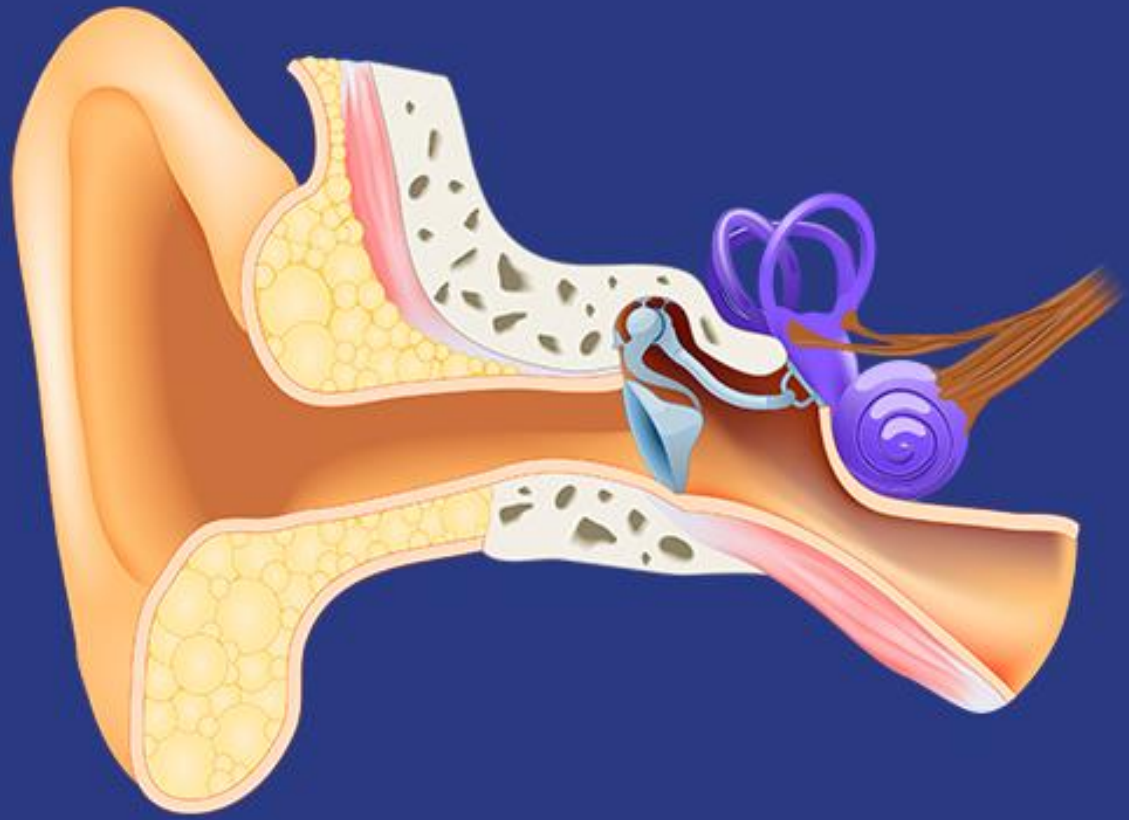
	Peripheral	Central
Onset	Sudden	Gradual or Sudden
Intensity	Severe and tapers over time	Mild in most cases. Severe in cerebellar stroke or multiple sclerosis.
Duration	Momentary episodes	Constant for weeks-months
Nystagmus	Lateral in the direction of the affected ear. Can be torsional in labyrinthitis.	Vertical or torsional
Reproducibility	Consistently reproducible with head positioning	Not changed with head position
Gastrointestinal	Severe nausea/vomiting is typical	Mild nausea
Neurologic symptoms	None	Other symptoms typically present

PERIPHERAL VERTIGO

Inner ear troubles



Peripheral Vertigo DDX

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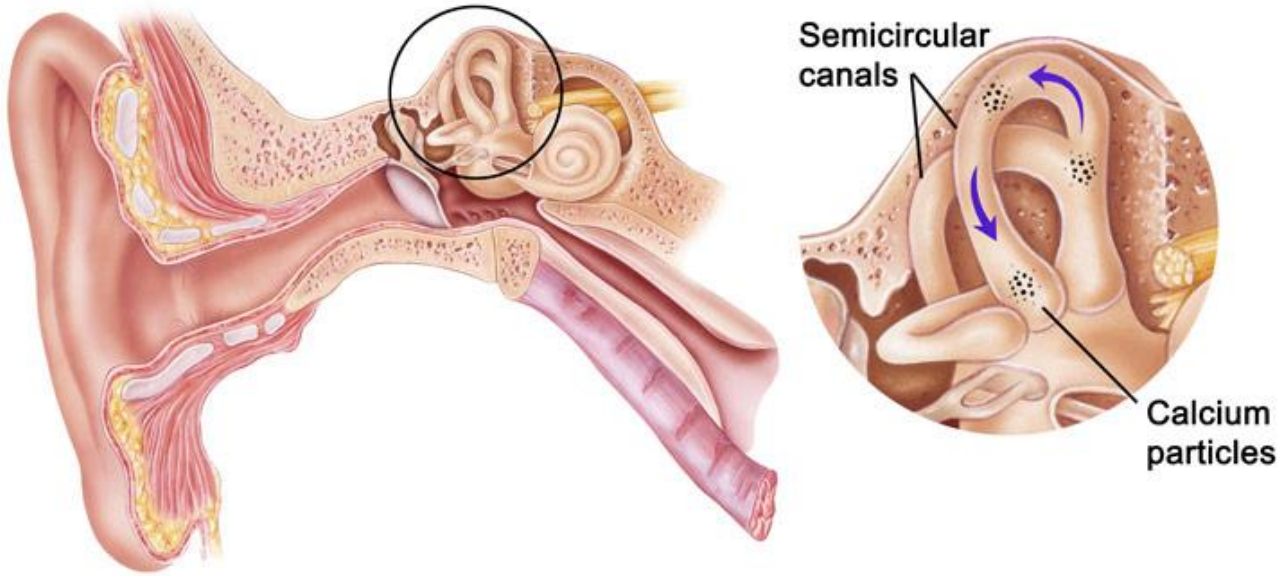
Duration	With Auditory Symptoms	Without Auditory Symptoms
Seconds	Perilymphatic Fistula	Benign Paroxysmal Positional Vertigo
Hours	Meniere's Disease Syphilis	Recurrent Vestibulopathy Vestibular Migraine
Days	Labyrinthitis	Vestibular Neuronitis
Months	Acoustic Neuroma Ototoxicity	Head Trauma

Benign Paroxysmal Positional Vertigo



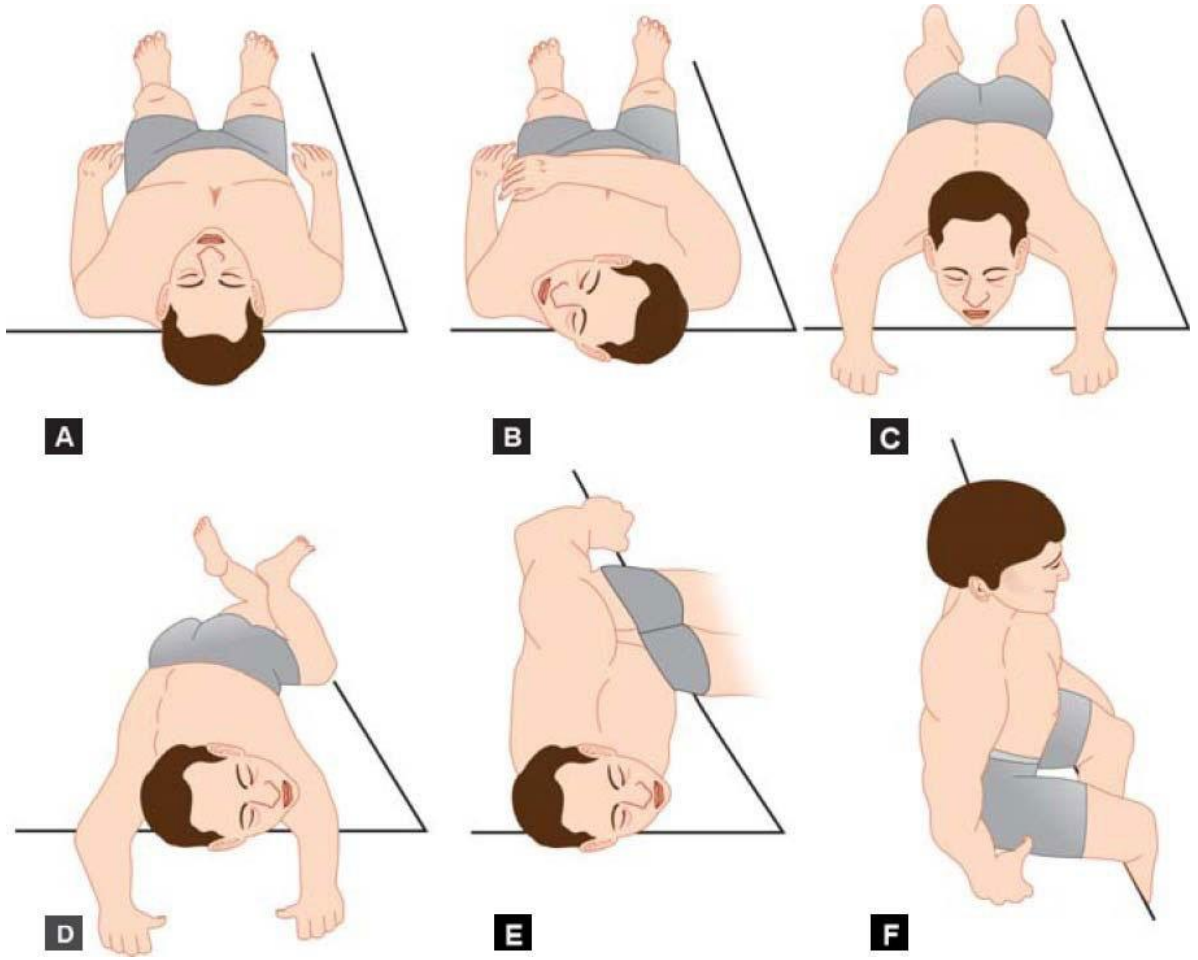
- **<u>The single most common cause of dizziness</u>**
- Lifetime prevalence is 2.4%
- Recurrence is common in up to 56% of individuals
- Prevalence increases with age
- More common in Women than in Men (2:1 and 3:1 in studies)

Benign Paroxysmal Positional Vertigo

Benign Paroxysmal Positional Vertigo

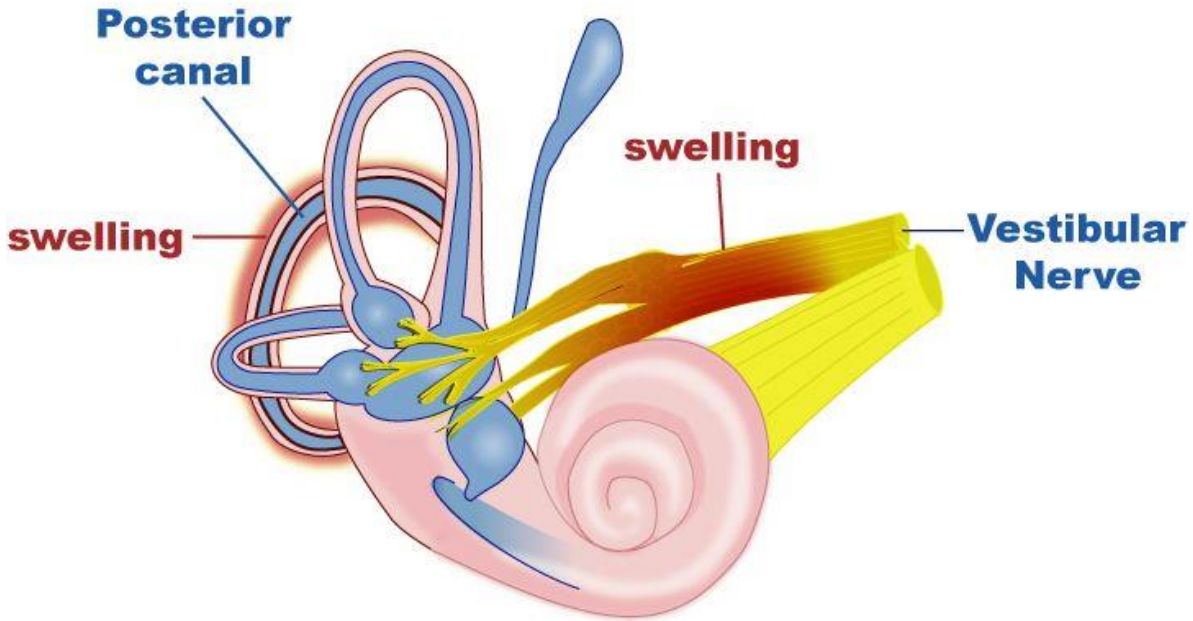
Treatment:

- Vestibular Rehabilitation
  - Epley Maneuver
  - Semont
  - Foster (Half-Somersault)
  - Brandt-Daroff



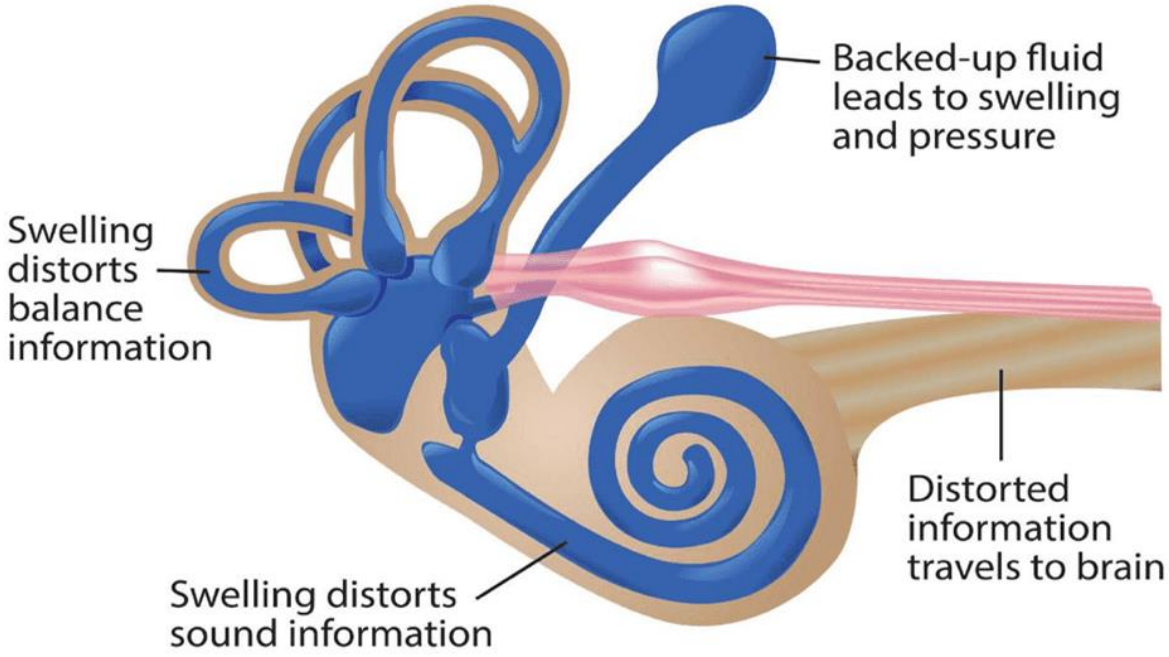
Vestibular Neuronitis & Labyrinthitis

- Second most common cause of Vertigo
- Auditory loss differentiates diagnosis
- Prevalence: 15/100,000
- Inflammation of vestibular nerve (CN VIII)
- Usually viral or post-viral and self-limited
- Supportive measures only

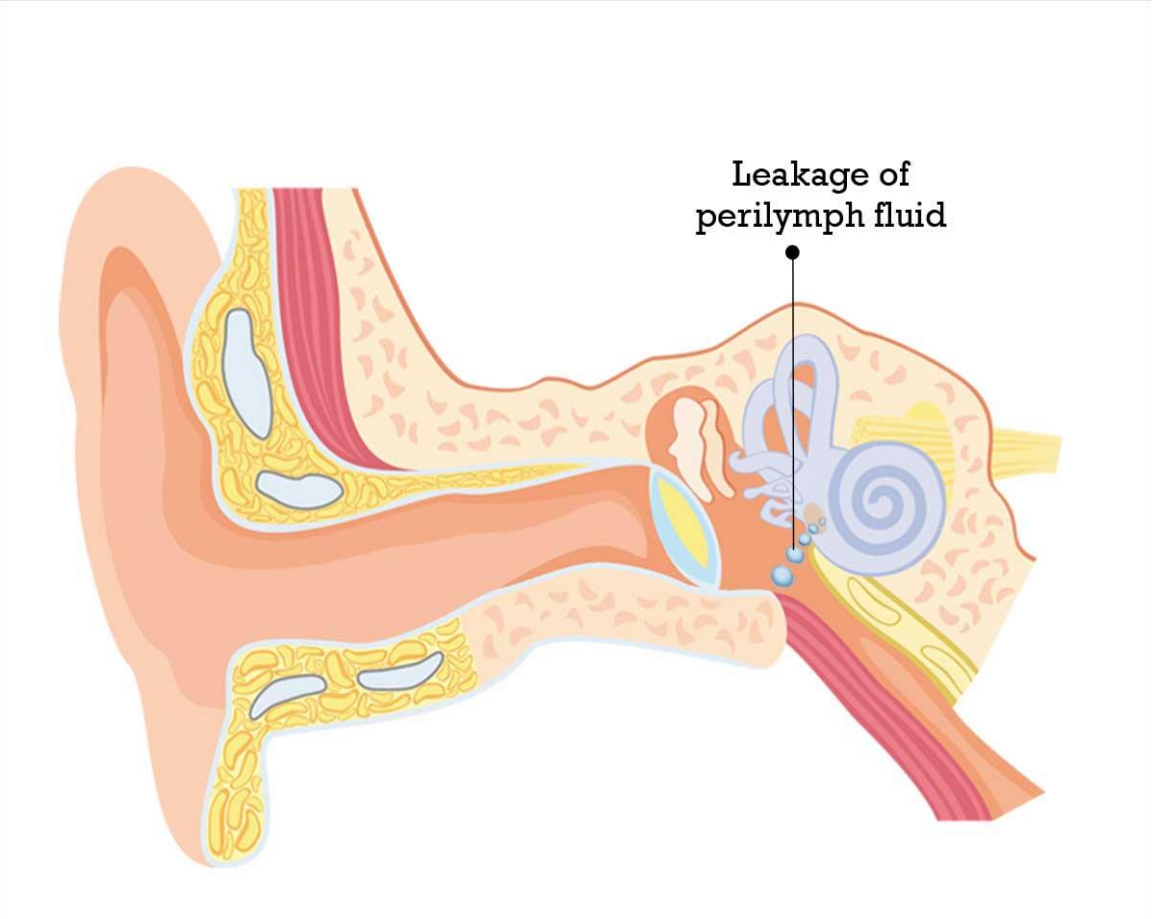


Meniere's Disease

- AKA: Endolymphatic Hydrops
- Rare cause of vertigo (10-150/100,000)
- Tinnitus common. Usually also with associated hearing loss.
- 10-50% of patients develop bilateral disease.
- MRI can be helpful in diagnosis and help to rule out alternative diagnoses.
- Treatment includes lifestyle management (tobacco, salt, caffeine, alcohol)



Perilymphatic Fistula



- Caused by trauma/barotrauma
- Rare: 1.5/100,000 incidence rate
- May be congenital vs acquired
- Hearing loss in all cases
- Diagnosis by CT/MRI, audiometry, cervical vestibular evoked myogenic potential (cVEMP), electrocochleography, and the fistula test, videonystagmography
- Treatment: Conservative, blood patch or surgical grafting

Peripheral Vertigo Treatment

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Medication	Dosage	Sedation	Antiemesis	Pregnancy Category
Meclizine (Antivert)	12.5 to 50 mg orally every 4 to 8 hours	++	+	B
Dimenhydrinate (Dramamine)	25 to 100 mg orally, IM, or IV every 4 to 8 hours	+	++	B
Diazepam (Valium)	2 to 10 mg orally or IV every 4 to 8 hours	++	+	D
Lorazepam (Ativan)	0.5 to 2 mg orally, IM, or IV every 4 to 8 hours	++	+	D
Metoclopramide (Reglan)	5 to 10 mg orally or by slow IV every 6 hours	+	+++	B
Prochlorperazine (Compazine)	5 to 10 mg orally or IM or by slow IV every 6 to 8 hours or 25 mg rectally every 12 hours	+	+++	C
Promethazine (Phenergan)	12.5 to 25 mg orally, IM, or rectally every 4 to 12 hours	+++	++	C

Central Vertigo

Central Vertigo DDX

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- Stroke / Vertebrobasilar Insufficiency
- Multiple Sclerosis
- Acoustic / Vestibular Neuroma
- Ototoxicity
- Vestibular Migraine
- Syphilis/Meningitis

Stroke

Table 2. Most Common Symptoms and Signs of Posterior Circulation Stroke

Symptom or sign	*Prevalence (%)*[8]
Symptoms	
Dizziness	47
Unilateral limb weakness	41
Dysarthria	31
Headache	28
Nausea or vomiting	27
Signs	
Unilateral limb weakness	38
Gait ataxia	31
Unilateral limb ataxia	30
Dysarthria	28
Nystagmus	24

Information from reference 8.

- Dizziness is a relatively uncommon symptom of stroke and is present in only 13% of patients.
- Most associated with posterior circulation strokes.

Stroke

Look at the eyes…

- Nystagmus
- Dix-Hallpike Maneuver

If the clinical presentation is just not convincing for peripheral vertigo,

escalate to higher level of care.

Table 3. Bedside Predictors of Stroke and Other Central Etiologies in Patients with Acute Vestibular Syndrome

Bedside diagnostic predictor	*Test description*	*Sensitivity (95% CI)*	*Specificity (95% CI)*	*LR+ (95% CI)*	*LR– (95% CI)*
Normal result on horizontal head impulse test	Turn the patient's head laterally 10 to 20 degrees while observing his or her eyes. A normal result is for the eyes to stay fixed on a target. An abnormal result is for the eyes to rapidly move back to the target once head movement stops. The test also may be performed by turning the patient's head back to center from 10 to 20 degrees off-center.[20]	0.85 (0.79 to 0.91)	0.95 (0.90 to 1.00)	18.39 (6.08 to 55.64)	0.16 (0.11 to 0.23)
Direction-changing nystagmus	Nystagmus in the setting of acute vertiginous syndrome is normally unidirectional, with the fast beat of nystagmus away from the affected side and a slow return toward the affected side. Nystagmus is enhanced when the eye moves toward the side of the fast beat and decreases or disappears when the eye moves toward the side of slow beat. With central lesions, the fast beat of nystagmus may change directions toward the direction the eyes are moving, hence the term "direction-changing nystagmus."[20]	0.38 (0.32 to 0.44)	0.92 (0.86 to 0.98)	4.51 (2.18 to 9.34)	0.68 (0.60 to 0.76)
Skew deviation	Normally during the cover-uncover test there is no eye movement. Upward or downward movement on the cover-uncover test (refixation) indicates skew deviation and is associated with a central lesion.[20]	0.30 (0.22 to 0.39)	0.98 (0.95 to 1.00)	19.66 (2.76 to 140.15)	0.71 (0.63 to 0.80)
HINTS positive	HINTS positive is a normal head impulse test result, direction-changing nystagmus, refixation on cover test (skew deviation), or any combination of these findings.[18]	96.8 (92.4 to 99.0)	98.5 (92.8 to 99.9)	63.9 (9.13 to 446.85)	0.03 (0.01 to 0.09)

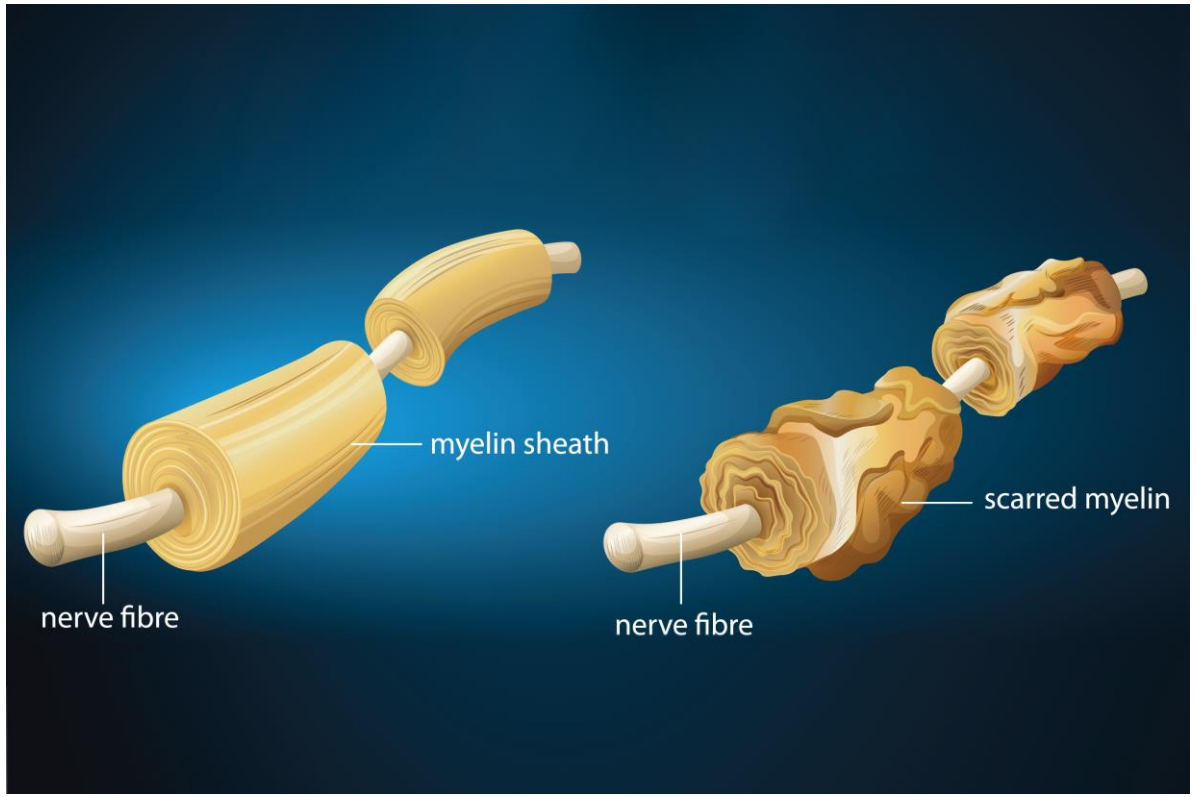
NOTE: *The analysis included patients with diagnoses other than stroke, including demyelination, brainstem hemorrhage, and other causes comprising a minority of the diagnoses.*[18,19]

CI = confidence interval; HINTS = head impulse, nystagmus, test of skew; LR+ = positive likelihood ratio; LR– = negative likelihood ratio.

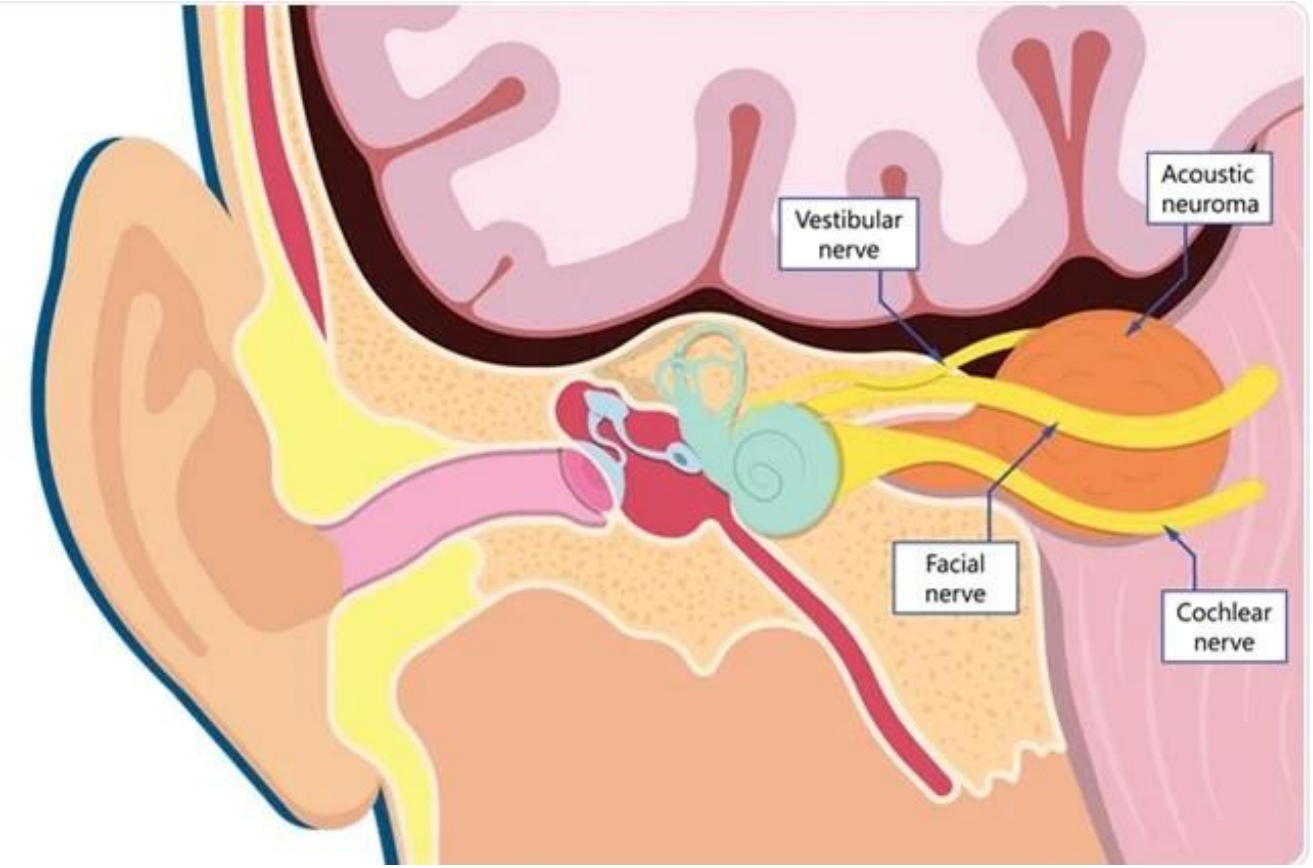
Information from references 18 through 20.

Multiple Sclerosis

- Autoimmune demyelination and axonal degeneration disorder
- Females > Males (2:1)
- Young > Old (Onset: 15-45yrs old)
- Other potential factors:
  - Viruses (Epstein-Barr Virus)
  - Vitamin D
  - Tobacco/Obesity/Geography
- Diagnosis:
  - MRI (Brain and Spinal Cord)
  - CSF (oligoclonal bands)
- Treatment: Glucocorticoids



Acoustic Neuroma



- Tumor of Vestibular Nerve (CN VIII)
- AKA: Vestibular Schwannoma
- Rare: 1/100,000
- MRI
- Observation vs. Surgical resection vs. Radiation Therapy

Other Causes of Peripheral Vertigo

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- Ototoxicity
- Syphilis
- Meningitis
- Vestibular Migraine

Table 1. Differential Diagnosis of Acute Vertigo.

Cause	Onset and Course	Nystagmus	Auditory Symptoms	Other Features
BPPV*	Recurrent, transient, positional; usually provoked by turning over or getting in and out of bed	Positional, with mixed vertical torsional nystagmus in BPPV involving posterior canal and horizontal nystagmus in BPPV involving horizontal canal	None	Recent inciting event possible (e.g., recumbent position at dentist's office or hair salon, prolonged bed rest, head trauma); history of similar episodes
Stroke	Spontaneous, usually sustained; may be worsened by positional change	Spontaneous, with beating in various or changing directions	Occasional	Neurologic symptoms or signs may include headache and vertical misalignment of eyes; results of head-impulse test typically normal†
Vestibular neuritis	Spontaneous, sustained; may be worsened by positional change	Spontaneous, predominantly horizontal	None	May be preceded by viral illness; results of head-impulse test abnormal†
Vestibular migraine	Recurrent, spontaneous; duration for minutes to hours; may be positional	Rare, but when present usually positional	Occasional	Migrainous headaches, motion sickness, family history
Meniere's disease	Recurrent, spontaneous; typical duration for hours	Spontaneous, horizontal	Fluctuating hearing loss, tinnitus	Ear pain, sensation of fullness in ear

* BPPV denotes benign paroxysmal positional vertigo.
† In the head-impulse test, the result is considered abnormal when a corrective movement (saccade) is required to maintain straight-ahead fixation after the head has been rotated to the side.[11]

Session Evaluation

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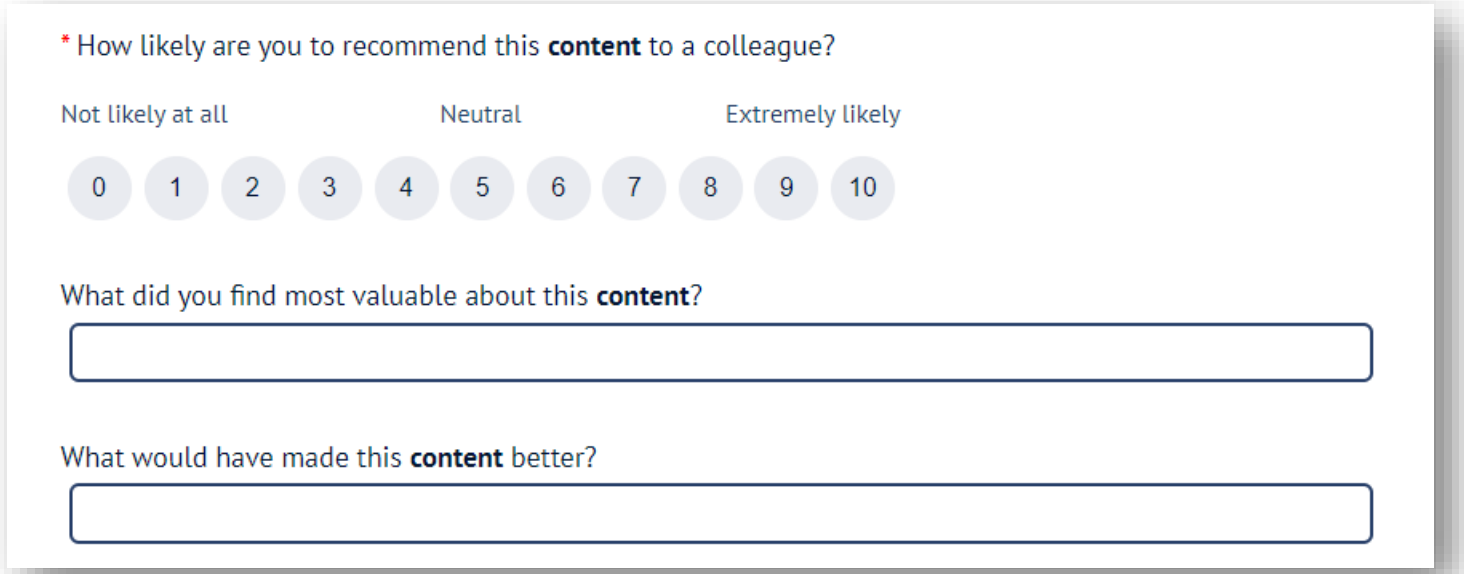
- Your feedback is valuable, take a moment to complete the survey for this session.
- To claim CME, you must complete a separate survey available after the convention.



Veronique Au, MD, MMM
Vituity National Physician Director
for Outpatient Medicine
Veronique.Au@vituity.com