Dizziness and Vertigo

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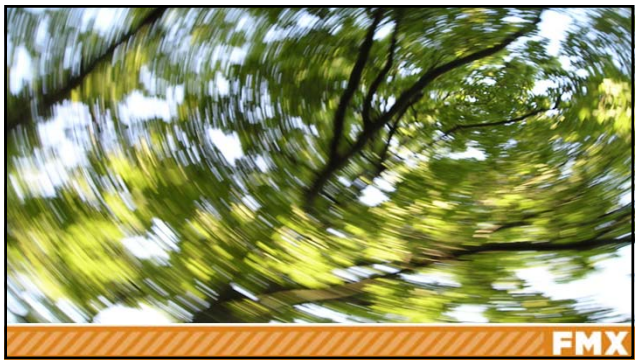
Dr. Lee is a graduate of the University of South Florida (USF) in Tampa, receiving both her medical degree and master of public health degree from USF. She completed her residency at the University of Florida in Gainesville. While a resident, Dr. Lee served as chief resident and received the Society of Teaching Scholars Resident Teacher Award. After working in private practice in Alabama, she joined the faculty of the Florida Hospital Family Medicine Residency Program in 2010. In 2015, her family relocated to Austin where she joined the faculty of the University of Texas at Austin Family Medicine Residency. In 2014 and 2015, she was awarded the Excellence in Faculty Teaching Award at the Florida Hospital Family Medicine Residency Program.

Learning Objectives

1. Narrow the differential diagnosis of dizziness with physical examination tests and appropriate history taking, including a medication review and anxiety disorder evaluation.
2. Treat vertigo using the Epley maneuver and vestibular rehabilitation for identified vestibular disorders.
3. Use evidence-based guidelines to select appropriate treatment of dizziness as appropriate per the etiology.
4. Develop collaborative care plans, including patient education, to help patients minimize reoccurrences of dizziness.

Audience Engagement System

Step 1 Step 2 Step 3



Dizziness: Objectives

- Learn to apply categorical approach to dizziness using the following system: **Vertigo, Presyncope, Dysequilibrium, Non-Specific, Emergent/Trauma**
- Differentiate Central from Peripheral Vertigo
- Become confident with the diagnostic and treatment maneuvers for BPPV
- Recognize emergent causes of dizziness and treat appropriately

Dizziness Pre-Test

1) What percent of patients with dizziness alone are presenting with a stroke?
2) Tinnitus, Aural Fullness, Mastoid pain, and vertigo are characteristic of which condition?
3) History will reveal the diagnosis in what percent of patients with the CC of dizziness?
4) According to recent literature the MOST common cause of episodic vertigo is which condition?
5) Hearing loss and tinnitus are characteristic of which general category of vertigo: Central or Peripheral?
6) Which Test is considered the GOLD standard for diagnosis of Posterior Semi-Circular Canal BPPV ?
7) Which treatment has Strength of Recommendation A (SOR A) for BPPV?

Dizziness

- "The problem of Dizziness in one of the most exasperating…physicians all know that sinking feeling elicited by the patient who sits down and, when you ask, "What can I do for you?" says, "I'm dizzy."

-Martin Samuels MD, American Academy of Neurology

Dizziness:

What is your main concern when you see a patient complaining of dizziness?

1) I'm afraid I won't understand their concern
2) It will take too much time
3) I never learned those "manuevers"
4) I might miss something bad

Dizziness: The Truth

How common are strokes that present only with "dizziness" and NO OTHER neurologic symptoms?

A) 0.7%
B) <0.1%
C) 17%
D) 7.1%

Stroke. 2006 October:37(10): 2484-2487

Dizziness: Barriers

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Dizziness

- Vertigo – Central or Peripheral
- Presyncope
- Dysequilibrium
- Non-Specific/Psyhiatric
- Emergent Urgent

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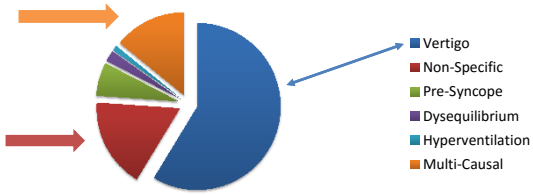
Dizziness: 100 Patients



Ann Intern Med. 1992;117:898-904.

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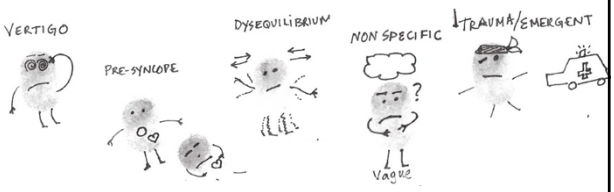
Dizziness: Objective #1 - Framework



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Dizziness: Case #1

- 39 yo male, 4 days ago he was at work and was struck with a sensation of movement. It was very disorienting and it required him to leave work, lasting several hours. Just before the episode he felt like a pressure was building up in his ear. He reports that he has never had vertigo before.
- Past medical history of notable for musculoskeletal low back pain. Family and social history are unremarkable.
- Meds: occasional ibuprofen
- ROS: 1 year ago he saw ENT who told him he had hearing loss. Recently he has been experiencing tinnitus in both ears. He seems highly sensitive to loud noises lately.

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Dizziness: Case #1
AES #1

What is the most likely cause of the patient's symptoms?

1) BPPV
2) Meniere's Disease
3) Migraine
4) TIA

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Dizziness Case #1

History alone reveals the diagnosis in what fraction of patients?

1) 1/2
2) 2/3
3) 3/4
4) 1/3

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Dizziness: Case #1 Explanation

- History alone reveals the diagnosis in roughly **3/4** of patients

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Dizziness Case #1 Explanation

Meniere's Disease – although we have yet to perform a physical exam the patient has several features in his history that make Meniere's disease likely:

- Vertigo lasting several hours
- Tinnitus
- Aural Fullness
- No Consistent Provoking Factor
- Sensitivity to Loud Noise

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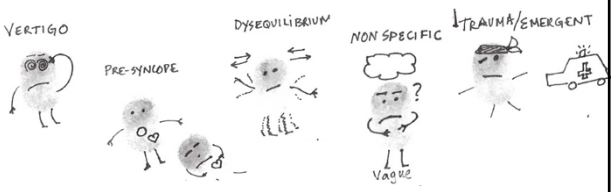
Dizziness: Framework



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Anatomy Review

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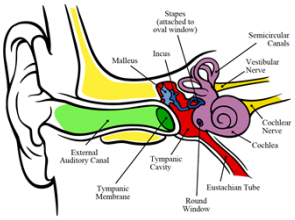

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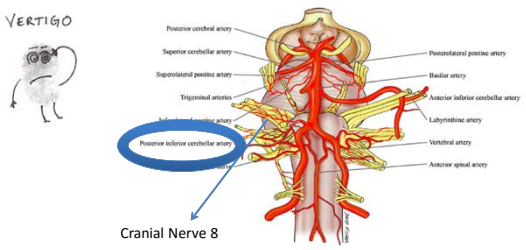

Fig. 1. Frontal view of brain stem showing the vertebral and basilar arteries and arterial supply of the lower cranial nerves after Leblanc (Leblanc, 2000). [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

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Dizziness: Vertigo Differential

Central

Peripheral

Other

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Dizziness: Vertigo Differential

Central
Cerebellopontine Angle Tumor (Includes Acoustic Neuroma)
Cerebrovascular Disease, incl TIA
Migraine
Multiple Sclerosis

Peripheral
Acute Labyrinthitis
Acute Vestibular Neuronitis
Benign Positional Paroxysmal Vertigo
Cholesteatoma
Herpes Zoster Oticus
Meniere's Disease
Otosclerosis
Perilympatic Fistula

Other
Cervical Vertigo
Drug Induced
Psychological

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Dizziness: Vertigo EBM Pearl

- Vestibular migraine (VM) is the most common cause of episodic vertigo in adults as well as in children.
- Although VM accounts for 7 % of patients seen in dizziness clinics and 9 % of patients seen in headache clinics it is still underdiagnosed.

J Neurol. 2016; 263: 82–89

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Dizziness: Vertigo EBM Pearl

- International Headache Society (IHS) Classification – **Basilar Type Migraine**:
  - IHS (2012) diagnostic criteria combine the typical signs and symptoms of migraine with the vestibular symptoms → lasting 5 min to 72 h

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Dizziness: Vertigo EBM Pearl

IHS Diagnostic criteria Basilar Type Migraine: Aura

A. Aura consisting of at least **two of the following fully reversible symptoms**, but no motor weakness:

- dysarthria
- vertigo
- tinnitus
- hypacusia
- diplopia
- visual symptoms simultaneously in both temporal and nasal fields of both eyes
- ataxia
- decreased level of consciousness
- simultaneously bilateral paresthesias

-at least one aura symptom develops gradually over ≥5 minutes and/or different aura symptoms occur in succession over ≥5 minutes
-each aura symptom lasts ≥5 and ≤60 minutes

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Dizziness: Vertigo Differential

Central Peripheral

?

WHICH ONE

Dizziness: Vertigo AES #2

Which of the following are characteristic of Peripheral causes of Vertigo?

- 1) Purely Vertical, horizontal, or torsional nystagmus
- 2) Hearing loss and tinnitus are common
- 3) Severe Imbalance, may be unable to stand or Walk
- 4) All of the above

Dizziness: Vertigo Differential

Central ? Peripheral

WHICH ONE

↓

History and Physical

Vertigo: History and Physical

Vertigo: History	Central	Peripheral
Nystagmus		
Neurologic Exam/Gait		
Hearing Loss		

Vertigo: History and Physical

Vertigo: Physical Exam	Central	Peripheral
Nystagmus	*Purely one direction *Not inhibited by fixation on object	*Combined Horizontal and Torsional *Inhibited by fixation on object
Neurologic Exam/Gait	*Can be Severe Gait Disturbance (Difficulty Standing OR Sitting) *Other Neuro exam findings	*Mild to Moderate, usually able to walk, on occasion can be severe
Hearing Loss, Tinnitus	*Rare	*Common

Dizziness: Vertigo Review

Which of the following are characteristic of Peripheral causes of Vertigo?

1) Purely Vertical, horizontal, or torsional nystagmus

2) Hearing loss and tinnitus are common

3) Severe Imbalance, may be unable to stand or Walk

4) All of the above

Vertigo: RED FLAGS

1. Nystagmus that is NOT inhibited by visual fixation
2. Nystagmus that is ONE direction
3. Head Trauma
4. Change in level of consciousness
5. Fever
6. Other Neurologic Signs are present

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Vertigo

Central or Peripheral

H+P, PE

Red Flags?

ER/MRI

Central

Dix-Hallpike/ Supine Roll

\+

BPPV

\-

Other Peripheral Causes

Acute Labyrinthitis
Acute Vestibular Neuronitis
Cholesteatoma
Herpes Zoster Oticus
Meniere's Disease
Otosclerosis
Perilympatic Fistula
Vestibular Schwannoma

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Dizziness: Vertigo Differential

Central
Cerebellopontine Angle Tumor (Includes Acoustic Neuroma)
Cerebrovascular Disease, incl TIA
Migraine
Multiple Sclerosis

Peripheral
Acute Labyrinthitis
Acute Vestibular Neuronitis
Benign Positional Paroxysmal Vertigo
Cholesteatoma
Herpes Zoster Oticus
Meniere's Disease
Otosclerosis
Perilympatic Fistula

Other
Cervical Vertigo
Drug Induced
Psychological

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Vertigo: Dix-Hallpike

- Posterior Semi-Circular Canal BPPV should be diagnosed when vertigo associated with nystagmus is provoked by the Dix-Hallpike Maneuver

BPPV Clinical Practice Guideline – American Academy of Otolaryngology

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Vertigo: Dix-Hallpike Evidence

- The Dix-Hallpike test is generally considered the **gold standard test** for the diagnosis of posterior canal
- The **sensitivity** of the Dix-Hallpike test has been estimated at **48 to 88%** -

Otolaryngol Clin North Am. 2012 Oct; 45(5): 925-940

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Vertigo: Dix-Hallpike

https://www.youtube.com/watch?v=8RYB2QlO1N4

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Vertigo: BPPV Treatment AES #3

Which has Strength of Recommendation A (based on multiple, good quality RCTs) for the treatment of BPPV of posterior canal?

A) Epley maneuver
B) Antivert (meclizine)
C) Scopolamine patch
D) Diphenhydramine

Amer Fam Physician. 2015 Aug 1;92(3): 184-185

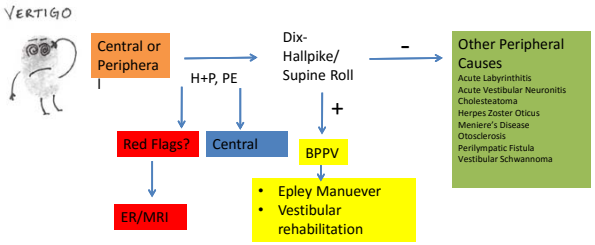
Vertigo: BPPV Treatment

- Patients with posterior canal BPPV should be treated with **particle repositioning maneuver (Epley)**
- Initial therapy may include **vestibular rehabilitation** or **observation** and assurance. Reasses patients in one month.
- **BPPV** should **NOT** be routinely treated with vestibular suppressant medications such as antihistamines (meclizine) or benzodiazepines.

Vertigo: Epley Video

https://www.youtube.com/watch?v=jBzlD5nVQjk

Vertigo



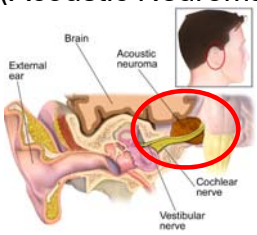
Pearls for Peripheral Vertigo

Etiology	Hearing Loss	Pearls
Vestibular Neuritis	No	-May last 7 days or more (3-6 weeks) -Associations: recent viral illness -Can Mimic Central Pathology, image if red flags -**Treatment:** Antihistamines or Anti-emetics in first 24-48 hours, (Corticosteroid Taper - Controversial), Vestibular Rehabilitation
Labyrinthitis	Yes	-Acute onset -Associations: recent viral illness, trauma, otitis media -Mimics Meniere's -**Treatment:**

Vertigo: Pearls for Peripheral Vertigo

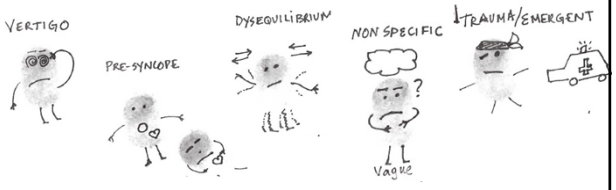
Etiology	Hearing Loss	Pearls
Vestibular Schwannoma (Acoustic Neuroma)	Yes Audiogram: Retrocochlear hearing loss	-If suspected obtain CT with special view of internal auditory meatus -**Treatment**: Surgery
Perilymphatic Fistula	Yes, Audiogram: Intermittent conductive and sensory neural Hearing loss	-Sneezing or moving affected ear downward can provoke vertigo -Use same technique to check TM mobility, in case of fistula increased pressure → vertigo and/or nystagmus -**Treatment:** Microsurgery

Vertigo: Vestibular Schwannoma (Acoustic Neuroma)



Dizziness

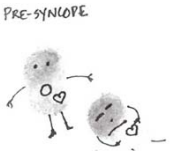
Dizziness: Objective #1 - Framework



Dizziness: Case #2

- 62 yo female for the last month notes “dizziness upon standing”. She has lost 10 pounds due to lack of appetite. Notes profound fatigue and exercise intolerance.
- **Past Medical**: Chronic Idiopathic Neuropathy, Depression
- **Medications**: Morphine Sulfate ER 15 mg BID, SSRI
- **ROS**: No SOB, No CP, No fever, no obvious source of infection.
- **Vitals: 97/58** (previous blood pressure one month ago 128/78)

Dizziness: Case #2



Morning Serum Cortisol **Low**
ACTH stimulation test → appropriate adrenal response

Case #2 = Presyncope due to hypotension due to Secondary Adrenal Insufficieny due to morphine.

Presyncope: Evaluation

- Orthostatic hypotension
  From SUPINE to STANDING (after waiting 2-5 minutes)
  - 20 drop in systolic OR
  - 10 drop in diastolic OR
  - Symptoms: weakness, blacking out, visual blurring
- Postural Orthostatic Tachycardia Syndrome:
  - 30 Beats per minute INCREASE in pulse from supine to standing

Dizziness: Case #3

- 39 yo female, reason for visit “is trouble walking” for one week, and feels “off balance”. She is previously healthy. She has spins and needles sensation down her back and right leg feels numb.
- **Past Medical:** None
- **Medications:** None
- **ROS**: no vertigo, no hearing loss, no nausea
- **Exam:** Spastic Ataxic Gait, holding on to her husband to walk. Positive Rhomberg.

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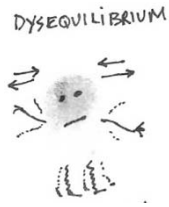
Dizziness: Case #3



-Abnormal Neurologic Exam
-Acute onset
-Asymmetric, diffuse deficits

↓

Urgent Imaging

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MRI: Demyelinating process localized to Cervical and Thoracic Spine. No lesions on brain MRI.

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Multiple Sclerosis

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Dizziness: Case #4

- 32 yo male, reports 3 months of dizziness. He feels weak, and will occasionally have palpitations. Over the last year the patient has become a new father and has lost his job. He denies depression or anxiety. But reports feeling “stressed”.
- **Past Medical, Meds:** None
- **ROS:** no nausea, no hearing loss, no headaches
- **Physical:** Vitals and exam normal.

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Dizziness: Case #4

1) 28% of patients with dizziness reported symptoms of at least ONE anxiety disorder
2) 25% of patients with dizziness met criteria for panic disorder

J Psychosom Res. 2009;66(5): 417-424
J Nerv Ment Dis. 2001;189(5):321-327

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Dizziness: Case #5

25 yo, 3 days ago an airplane overhead door opened and luggage fell on her head. She immediately felt head pain and nausea. She experienced vomiting. She presents today with dizziness, a sensation of lightheadedness and pre-syncope, worse with exertion.

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Dizziness: Case #5

Concussion, now post-concussive syndrome.

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Dizziness Case #6

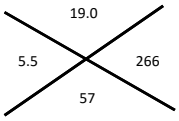
60 yo male, presents with severe dizziness. He is “uncomfortable” standing or sitting due to feeling like the room is moving. The sensation has been constant for hours and came on abruptly. He has no hearing loss or tinnitus. He is also having slurring of words and problems with coordination.

Dizzines Case #6

- **PMHX:** None
- **Social** History: 40 pack year smoker
- **PE:** vitals are normal
  - Can’t leave hospital bed, fear of falling over.
  - Neuro exam: visual exam is notable for double vision, also slurring of speech

Dizziness Case #6

- Labs:



Abnormal Neurologic Exam

Dx: Polycythemia (brainstem stroke → vertigo and neuro signs/symptoms)

Practice Recommendations

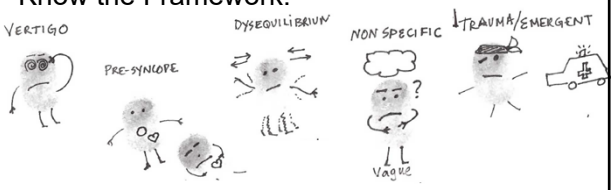
1) Treatment with the Epley Maneuver resolves BPPV better than sham or control treatments (SOR A)
2) Selective serotonin reuptake inhibitors can relieve vertigo in patients with anxiety disorders. Because of side effects, slow titration is recommended. (SOR B)
3) Vestibular suppressant medication is recommended for symptom relief in patients with acute vestibular neuronitis.(SOR C)

Dizziness: Post Test

1) What percent of patients with dizziness alone are presenting with a stroke? 0.7%
2) Tinnitus, Aural Fullness, Mastoid pain, and vertigo are characteristic of which condition? Meniere’s
3) History will reveal the diagnosis in what percent of patients with the CC of dizziness? 75% (3/4)
4) According to recent literature the MOST common cause of episodic vertigo is which condition? Basilar Migraine
5) Hearing loss and tinnitus are characteristic of which general category of vertigo: Central or Peripheral? Peripheral
6) Which Test is considered the GOLD standard for diagnosis of Posterior Semi-Circular Canal BPPV ? Dix-Hallpike
7) Which treatment has Strength of Recommendation A for BPPV of Posterior Canal? Epley

Take Home Points

Know the Framework:



Graphic courtesy of David Koo, MD

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Questions

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Billing & Coding

When services performed in conjunction with:

Office Visit 992xx *

*Time-based selection documentation criteria:

- Face-to-face time
- greater than 50% spent counseling/coordinating care

Additional tests to confirm or monitor:

95992 Canalith repositioning procedure (eg, Epley manueuver)

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Interested in More CME on this topic?

aafp.org/fmx-neurologic

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