

# ***Diagnosis and Treatment of Dizziness in the Primary Care Setting***

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### **Educational Objectives**

By completing this educational activity, the participant should be better able to:

1. Discuss the etiology and pathogenesis of dizziness.
2. Appropriately diagnose a patient who presents with dizziness.
3. Describe various management plans and treatments for dizziness based on differential diagnosis.

### **Speaker Disclosure**

Dr. Fowler has disclosed that he is a consultant for AstraZeneca.



# DIZZINESS AND VERTIGO

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## Disclosure

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## Disclaimer

- ▣ Dizziness is difficult to diagnose, symptoms are often vague and the differential is broad (no single diagnosis accounts >10% of cases)
- ▣ Hence, this talk is difficult to give! (and difficult to follow!)
- ▣ I'm not an otolaryngologist or neurologist...

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## Disclaimer

- ▣ However...
- ▣ It is estimated that primary care clinicians care for >50% of patients that present with dizziness

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## Audience Polling Question 1

Dizziness is the chief presenting symptom for patients 25 years and older in what percent of Primary Care visits?

1. 3%
2. 9%
3. 15%
4. 20%

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## Audience Polling Question 2

Dizziness is the chief presenting symptom in what percent of Emergency Department (ED) visits?

1. 3%
2. 12%
3. 25%
4. 33%

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### Audience Polling Question 3

Dizziness and Vertigo are one and the same.

1. True
2. False

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### Statistics

- ▣ 3% of Primary Care visits for patients 25 and older
- ▣ 3% of all ED visits
- ▣ Again, primary care cares for >50% of patients that present with dizziness
- ▣ A final diagnosis is not obtained in about 20% of cases.

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### Traditional Dizziness Subcategories

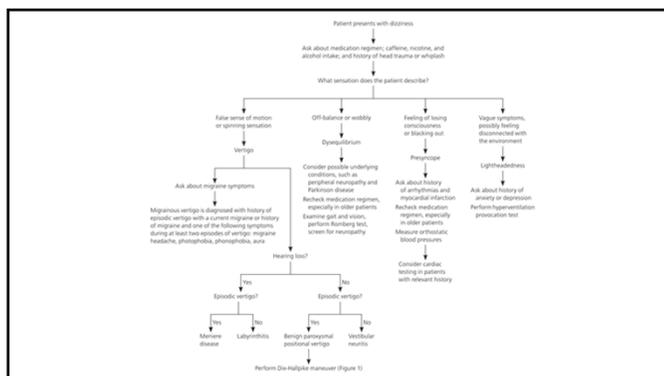
- ▣ Vertigo
- ▣ Disequilibrium
- ▣ Presyncope
- ▣ Lightheadedness

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### Dizziness

- ▣ Vertigo
  - False sense of motion, possibly spinning sensation
  - 45-55% of patients with dizziness
- ▣ Disequilibrium
  - Off-balance or wobbly
  - Up to 16% of patients with dizziness
- ▣ Presyncope
  - Feeling of losing consciousness or blacking out
  - Up to 14% of patients with dizziness
- ▣ Lightheadedness
  - Vague symptoms, possibly feeling disconnected with the environment; about 10% of patients with dizziness

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### Problems with Traditional Dizziness Subcategories

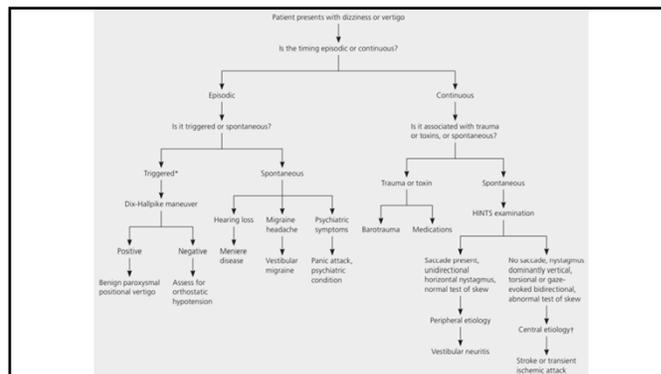
- ▣ Patients may have difficulty describing
- ▣ Patients may give conflicting accounts at different times
- ▣ Symptom quality does not reliably predict cause

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## Problems with Traditional Dizziness Subcategories

- ☐ Rarely are the terms Presyncope or Lightheadedness (vague) used any more
- ☐ Timing and triggers

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## TiTrATE

- ☐ TiTrATE-Timing, Triggers and a Targeted Examination

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## Head Trauma or Whiplash

- ☐ Following head trauma or whiplash, incidence of dizziness as high as 78 to 80%

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## Medications Causing Dizziness

Alcohol  
 Cardiac medications/ antihypertensives  
 Alpha blockers (e.g., doxazosin)  
 Angiotensin-converting enzyme inhibitors  
 Beta blockers  
 Clonidine  
 Dipyridamole  
 Diuretics (e.g., furosemide)  
 Hydralazine  
 Nitrates (e.g., nitroglycerin paste, sublingual nitroglycerin)  
 Sodium-glucose cotransporter-2 inhibitors  
 Phosphodiesterase inhibitors type 5  
 Central nervous system medications  
 Antipsychotics (e.g., chlorpromazine, clozapine, thioridazine)  
 Opioids  
 Parkinsonian drugs (e.g., bromocriptine, levodopa/carbidopa)  
 Skeletal muscle relaxants (e.g., baclofen, cyclobenzaprine, methocarbamol, tizanidine)  
 Tricyclic antidepressants (e.g., amitriptyline, doxepin, trazodone)  
 Urologic medications  
 Phosphodiesterase type 5 inhibitors (e.g., sildenafil)  
 Urinary anticholinergics (e.g., oxybutynin)

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## Dizziness

- ☐ Level of Evidence:
  - ☐ A = consistent, good-quality patient-oriented evidence
  - ☐ B = inconsistent or limited-quality patient-oriented evidence
  - ☐ C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series
- ☐ For information about the SORT evidence rating system, go to <http://www.aafp.org/afpsort.xml>

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## Dizziness

- ▣ Most patients do not require imaging (MRI) (Level of Evidence C when no other neurologic abnormalities) unless:
  - Suspected posterior fossa tumor or stroke
  - New onset vertigo associated with dysarthria or numbness
  - Age > 65 with CV risk factors (esp. if presyncope)
  - CT only if post concussion or suspected normal pressure hydrocephalus (NPH= dementia, incontinence, gait abnormality)

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## Audience Polling Question 4

What is most common cause of Dizziness?

1. Meniere's disease
2. BPPV
3. Medications
4. Vestibular neuronitis
5. Schwannoma

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## Audience Polling Question 5

Trick question! Single most common cause of Dizziness is orthostatic changes due to Medications. However, a, b and d combined are overall most common cause Dizziness

1. Meniere's disease
2. BPPV
3. Medications
4. Vestibular neuronitis
5. Schwannoma

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## Question 5

- ▣ Medications implicated in 23% of cases of dizziness in older adults in a primary care setting (Maarsingh OR, et al)

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## Dizziness Subcategories

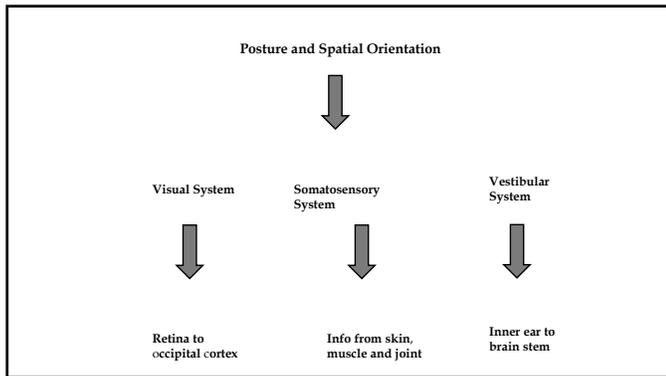
- ▣ Vertigo
- ▣ Disequilibrium
- ▣ Presyncope
- ▣ Lightheadedness

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## Disequilibrium

- ▣ TIA
- ▣ Stroke
- ▣ Vision abnormalities
- ▣ Parkinson's disease
- ▣ Peripheral neuropathy
- ▣ Musculoskeletal abnormalities
- ▣ Medications (e.g., benzodiazepines; tricyclics, etc.)

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### Disequilibrium

- ❑ If TIA or stroke is cause, almost always have other neurologic findings
- ❑ Of those presenting with dizziness to ED, only 3.2% are due to TIA or stroke
- ❑ Of those patients presenting with isolated dizziness to ED, only 0.7% were due to TIA or stroke

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### Pre-Syncope

- ❑ Mostly Cardiovascular
  - Arrhythmias
  - Orthostatic hypotension
  - Myocardial ischemia
  - Carotid artery stenosis

Valsalva Maneuver will often reproduce symptoms

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### Pre-Syncope

- ❑ Older the patient with first presentation of syncope (esp. > 65), the more likely it is Cardiovascular in origin
  - Younger the patient, more likely Vasovagal origin
  - If prior episode, the longer in years since prior episode, the more likely it is Vasovagal origin

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- ❑ However, in patients with supraventricular tachycardia (SVT), 75% experience dizziness versus 30% with syncope

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### Lightheadedness

- ❑ Psychiatric causes are most common
- ❑ Substance abuse
- ❑ Alcohol abuse
- ❑ Hyperventilation syndrome

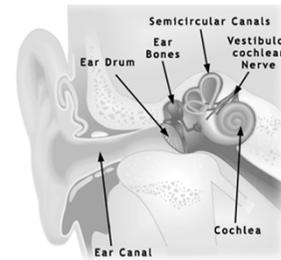
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## Vertigo

- Benign paroxysmal positional vertigo (BPPV) (episodic)
- Vestibular neuritis (persistent, hearing loss)
- Labyrinthitis (persistent)
- Meniere's (episodic, hearing loss)

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## Vestibular System



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## Vertigo

- 35% of adults > 40 have vestibular dysfunction

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## Pathologic Vertigo

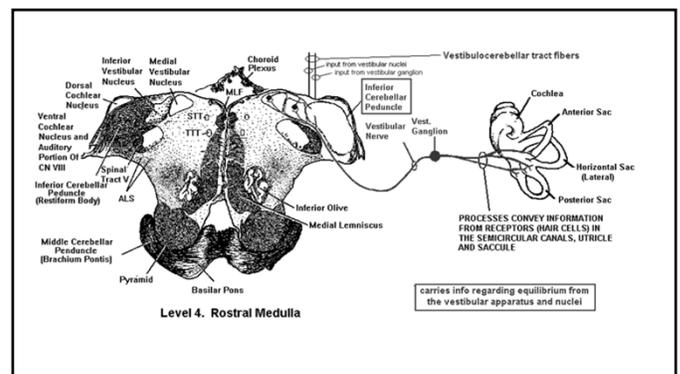
- ▣ Result of lesions to
  - Visual system
  - Somato-sensory system
  - Vestibular system

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## Pathologic Vertigo

- ▣ Especially if associated with unilateral hearing loss!

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## Visual Vertigo

- Incorrect spectacles
- Sudden extra-ocular muscle paresis with diplopia

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## Somato-Sensory Vertigo

Rare in isolation

Causes: Peripheral neuropathy  
Myelopathy

Leading to reduction in sensory input  
needed for central compensatory response

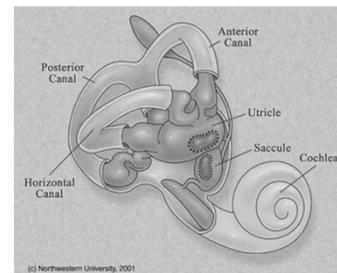
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## Vestibular Vertigo

- Most common cause of vertigo
  - Central
  - Vertigo of vestibular nerve origin
  - Labyrinthine dysfunction

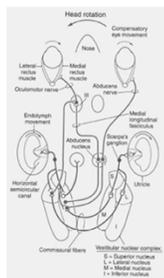
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## Inner Ear



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## Vestibulo-Ocular Reflex



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## Vestibular Vertigo

- Central
  - Atypical Migraine
  - TIAs
  - Cerebrovascular disease
  - Multiple Sclerosis
  - Tumors and malformations of the posterior fossa
  - Bleeds secondary to falls

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## Vestibular Nerve

- ❑ Involve the nerve in the petrous bone
- ❑ At the cerebellopontine angle
- ❑ Less severe
- ❑ Adjacent auditory nerve involved and hence accompanied by hearing loss and tinnitus
- ❑ Most common cause is a schwannoma (acoustic neuroma) or meningioma

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## Labyrinthine Dysfunction

- ❑ Benign Paroxysmal Positional Vertigo (BPPV)
- ❑ Vestibular Neuronitis (prolonged 1 to 7 days)
- ❑ Labyrinthitis
- ❑ Meniere's Disease
- ❑ Auto-immune Inner-ear disease

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## Approach to a Patient with Dizziness



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## Physical Examination

- ❑ Vital Signs with orthostatic measurements
- ❑ Complete physical exam with attention to the Ears, Cardiovascular and Neurologic systems
- ❑ Hearing Test (rub fingers together!)
- ❑ Neck for flexibility and range of motion
- ❑ Gait

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## Laboratory Testing

- ❑ No lab testing (level of Evidence C if no other neurologic abnormalities present)
- ❑ ENT battery of tests when I was resident (ESR, ANA, RF, RPR, AIC)
- ❑ In my practice experience, most common lab abnormalities with presyncope are the CBC or TSH

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## Vestibular Exam

Focus on two reflexes  
 Vestibulo-ocular reflex (VOR)  
 Vestibulo-spinal reflex (VSR)

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## Nystagmus

- ▣ Central
  - Purely horizontal or vertical gaze not suppressed by visual fixation
- ▣ Peripheral
  - Rotatory and most evident by removing with visual fixation
  - Frenzel goggles or infrared nystagmography is used to eliminate visual fixation

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## Audience Polling Question 6

Clinical recommendation to perform the Dix-Hallpike Maneuver to diagnose BPPV is

1. Level of Evidence A
2. Level of Evidence B
3. Level of Evidence C

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## Dix-Hallpike Test

- ▣ 50-88% sensitivity for BPPV

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## Dix-Hallpike Test (Level of Evidence C)

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## Vestibular Tests

- ▣ ENG (Electronystagmography)
  - Saccadic Test evaluates voluntary fast-eye movements
  - Gaze Test evaluates gaze-evoked nystagmus related to cerebellar disease
  - Pursuit-eye Movements Test - tracking of moving objects and detects brainstem and cerebellar lesions

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**Optokinetic Nystagmus Test** - Evaluates moving images on the retina  
Detects lesions oculomotor nuclei in the deep parietal lobe and also internuclear ophthalmoplegia

**Head Shake Nystagmus Test**  
Detects unilateral vestibular hypofunction

**Bithermal Caloric Test**  
Standard for evaluating unilateral vestibular deficit

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- ▣ **Rotating Chair Test**
  - Evaluates integrity of the vestibulo-ocular reflex.
  - Determines the degree of central vestibular compensation and the residual vestibular function.
- ▣ **CDP Test (Computer aided dynamic posturography)**
  - Evaluates both sensory and motor components of balance.
  - Clinically very useful for vestibular rehabilitation.

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- How Useful are these Vestibular Tests?**
- ▣ Raw data tracings should be viewed and evaluated carefully to avoid over interpretation due to noise
  - ▣ Oculomotor findings are usually over interpreted leading to unnecessary investigations
  - ▣ Does not detect torsional eye movements seen in BPPV
  - ▣ Not cost-effective
  - ▣ Most of the abnormalities can be gleaned from a carefully conducted office exam

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**Treatment**

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- Treatment**
- ▣ Disequilibrium, Presyncope and Lightheadedness can be improved or alleviated by treating the underlying cause

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- Treatment**
- ▣ Orthostatic Hypotension
    - Review medication list
    - Hydration
    - Midodrine
    - Fludrocortisone (adrenal insufficiency)
  - ▣ Hyperventilation Syndrome
    - Breathing exercises
    - Anti-anxiety medications

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- Treatment - Vertigo**
- ▣ Migraine
    - Triptans

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## Treatment - Vertigo

### Vestibular neuritis

Brief course antiemetics (metoclopramide, prochlorperazine), antihistamines (meclizine, promethazine, dimenhydrinate) or benzodiazepines

Corticosteroids may be used in severe cases

Early vestibular rehabilitation

### Auto-immune mediated inner ear disease

Oral and intra-tympanic corticosteroids

Occasionally methotrexate used in severe cases

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### ▣ BPPV

#### ▪ Canalith Repositioning

▫ Epley Maneuver - Evidence rating is A

▫ Meclizine for vertigo

▫ Vestibular rehabilitation

### ▣ Meniere Disease

▫ Salt restriction to 1-2 gm a day (Evidence rating C)

▫ Diuretics maybe used in some cases (Evidence rating C)

▫ Intratympanic steroids in severe cases

▫ Endolymphatic sac surgery in resistant cases

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## Audience Polling Question 7

Epley maneuver and Vestibular Rehabilitation are effective treatments for BPPV.

1. True
2. False

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## Epley's Maneuver (Canalith Repositioning) (Level of Evidence B)

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## References

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