# Vertigo and Dizziness

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# Vertigo and Dizziness

- Prevalence
  - 1 in 5 adults report dizziness in last month
  - Increases in elderly
  - Worsened by decreased visual acuity, proprioception and vestibular input
- Dizziness
  - Non-specific term
  - Different meanings to different people
    - Could mean
      - Vertigo - Syncope - Presyncope
      - Weak - Giddiness - Anxiety
      - Anemia - Depression - Unsteady

# Vertigo and Dizziness

- Vertigo
  - Perception of movement
  - Peripheral or Central
- Syncope
  - Transient loss of consciousness with loss of postural tone

# Vertigo and Dizziness

- Presyncope
  - Lightheadedness-an impending loss of consciousness
- Psychiatric dizziness
  - Dizziness not related to vestibular dysfunction
- Disequilibrium
  - Feeling of unsteadiness, imbalance or sensation of "floating" while walking

# Pathophysiology

- Normally there is balanced input from both vestibular systems
- Vertigo develops from asymmetrical vestibular activity
- Abnormal bilateral vestibular activation results in truncal ataxia

# Vertigo and Dizziness

- Nystagmus
  - Rhythmic slow and fast eye movement
    - Direction named by fast component
    - Slow component due to vestibular or brainstem activity
    - Slow component usually ipsilateral to diseased structure
    - Fast component due to cortical correction
- Physiologic Vertigo
  - "motion sickness"
  - A mismatch between visual, proprioceptive and vestibular inputs
  - Not a diseased cochleovestibular system or CNS

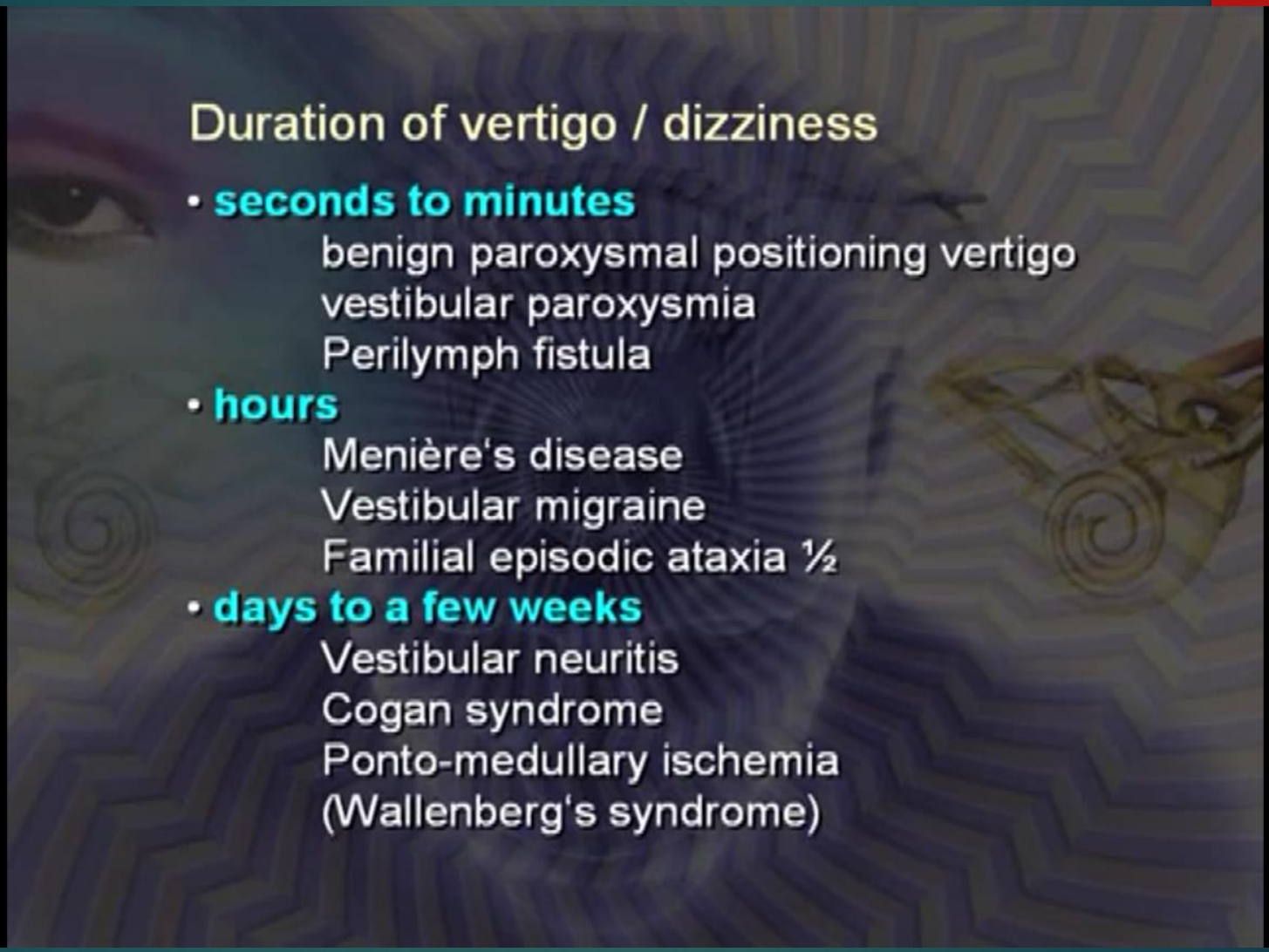
Table 1.1. Relative frequency of different vertigo syndromes diagnosed in a dedicated neurological dizziness unit (n = 4,790 patients in 1989–2003)

| Diagnosis | Frequency % |
|---|---|
| Benign paroxysmal positioning vertigo | 18.3 |
| Phobic postural vertigo (PPV) | 15.9 |
| Central vestibular vertigo | 13.5 |
| Vestibular migraine | 9.6 |
| Vestibular neuritis | 7.9 |
| Menière's disease | 7.8 |
| Bilateral vestibulopathy | 3.6 |
| Psychogenic vertigo (without PPV) | 3.6 |
| Vestibular paroxysmia | 2.9 |
| Perilymph fistula | 0.4 |
| Various other disorders | 12.3 |
| Unknown aetiology | 4.2 |

# Vertigo-Characteristics

| | Peripheral | Central |
|---|---|---|
| Onset | Sudden | Usually slow |
| Severity of Vertigo | Intense | Usually mild |
| Pattern | Paroxysmal | Constant |
| Exac. by movement | Yes | Variable |
| Autonomic | Frequent | Variable |
| Laterality | Unilateral | Uni or bilat |
| Nystagmus | Horizontorotary | Any |
| Fatigable/Fixation | Yes | No |
| Auditory symptoms | Yes | No |
| TM | May be abnormal | Normal |
| CNS symptoms | Absent | Present |

# Duration of vertigo



# Vertigo-Physical Exam

- Cerumen/FB in EAC
- Otitis media
- Pneumatic otoscopy
- Tympanosclerosis or TM perforation
- Nystagmus
- Fundoscopic exam
- Pupillary abnormalities
- Extraocular muscles
- Cranial nerves
- Auscultate for carotid bruits
- Orthostatic vital signs
- BP and pulse in both arms
- Gross hearing
- Weber-Rinne test
- External auditory canal vesicles
- Gait and Cerebellar function

# Investigations

- CT-if cerebellar mass, hemorrhage or infarction suspected
- Glucose and ECG in the "dizzy" patient
- Cold caloric testing
- Angiography for suspected VBI
- MRI
- Electronystagmography and audiology

# Peripheral Vertigo- Differential

- Labyrinthine Disorders
  - Most common cause of true vertigo
  - six entities
    - Benign paroxysmal positional vertigo (BPPV)
    - Vestibular paroxysm
    - Labyrinthitis
    - Ménière disease
    - Vestibular neuronitis
    - Acoustic Neuroma

# *Benign Paroxysmal Positional Vertigo*

- Extremely common
- Otolithic calcium carbonate crystals become loose, and fall into the posterior semicircular canal
- No hearing loss or tinnitus
- Short-lived episodes brought on by rapid changes in head position
- Usually a single position that elicits vertigo
- Less pronounced with repeated stimuli
- Typically can be reproduced at bedside with positioning maneuvers

# Vestibular paroxysmia

- Due to neurovascular cross- compression
- Short attacks of rotational vertigo
- Treated by 200-600 mg/ day carbmazepine

# Labyrinthitis

- Associated hearing loss and tinnitus
- Involves the cochlear and vestibular systems
- Abrupt onset
- Usually continuous

- Oto-Toxic drugs
  - Due to toxic effects of medications
  - Still relatively common
  - Mild tinnitus and high frequency hearing loss
  - Vertigo in acute phase
  - Ataxia in the chronic phase
  - Common etiologies

    -Aminoglycosides
    -Erythromycin
    -Phenytoin
    -Quinidine
    -Alcohol
    -Vancomycin
    -Barbiturates
    -Furosemide
    -Salicylates

# Labyrinthitis

- Chronic
  - Localized inflammatory process of the inner ear due to fistula formation from middle to inner ear
  - Most occur in horizontal semicircular canal
  - Etiology is due to destruction by a cholesteatoma

# Vestibular Neuronitis

- Suspected viral etiology
- Sudden onset vertigo that increases in intensity over several hours and gradually subsides over several days
- Mild vertigo may last for several weeks
- May have auditory symptoms
- Highest incidence in 3rd and 5th decades

# Ménière Disease

- First described in 1861
- Triad of vertigo, tinnitus and hearing loss
- Due to cochlea-hydrops
  - Unknown etiology
  - Possibly autoimmune
- Abrupt, episodic, recurrent episodes with severe rotational vertigo
- Usually last for several hours

# Acoustic Neuroma

- Peripheral vertigo that ultimately develops central manifestations
- Tumor of the Schwann cells around the 8th CN
- Vertigo with hearing loss and tinnitus
- Earliest sign is decreased corneal reflex
- Later truncal ataxia
- Most occur in women during 3rd and 6th decades

# Central Vertigo-Differential

- Central Vertigo
  - Vertebrobasilar Insufficiency
    - Atheromatous plaque
    - Subclavian Steal Syndrome
    - Drop Attack
  - Cerebellar Hemorrhage
  - Multiple Sclerosis
  - Head Trauma
  - Neck Injury
  - Temporal lobe seizure
  - Vertebral basilar migraine
  - Metabolic abnormalities
    - Hypoglycemia
    - Hypothyroidism

# Head and Neck Trauma

- Due to damage to the inner ear and central vestibular nuclei, most often labyrinthine concussion
- Temporal skull fracture may damage the labyrinth or eighth cranial nerve
- Vertigo may occur 7-10 days after whiplash

# Vertebral Basilar Migraine

- Syndrome of vertigo, dysarthria, ataxia, visual changes, paresthesias followed by headache
- Distinguishing features of basilar artery migraine
  - -Symptoms precede headache
  - -History of previous attacks
  - -Family history of migraine
  - -No residual neurologic signs
- Symptoms coincide with angiographic evidence of intracranial vasoconstriction

# Metabolic Abnormalities

- Hypoglycemia
  - Suspected in any patient with diabetes with associated headache, tachycardia or anxiety
- Hypothyroidism
  - Clinical picture of vertigo, unsteadiness, falling, truncal ataxia and generalized clumsiness

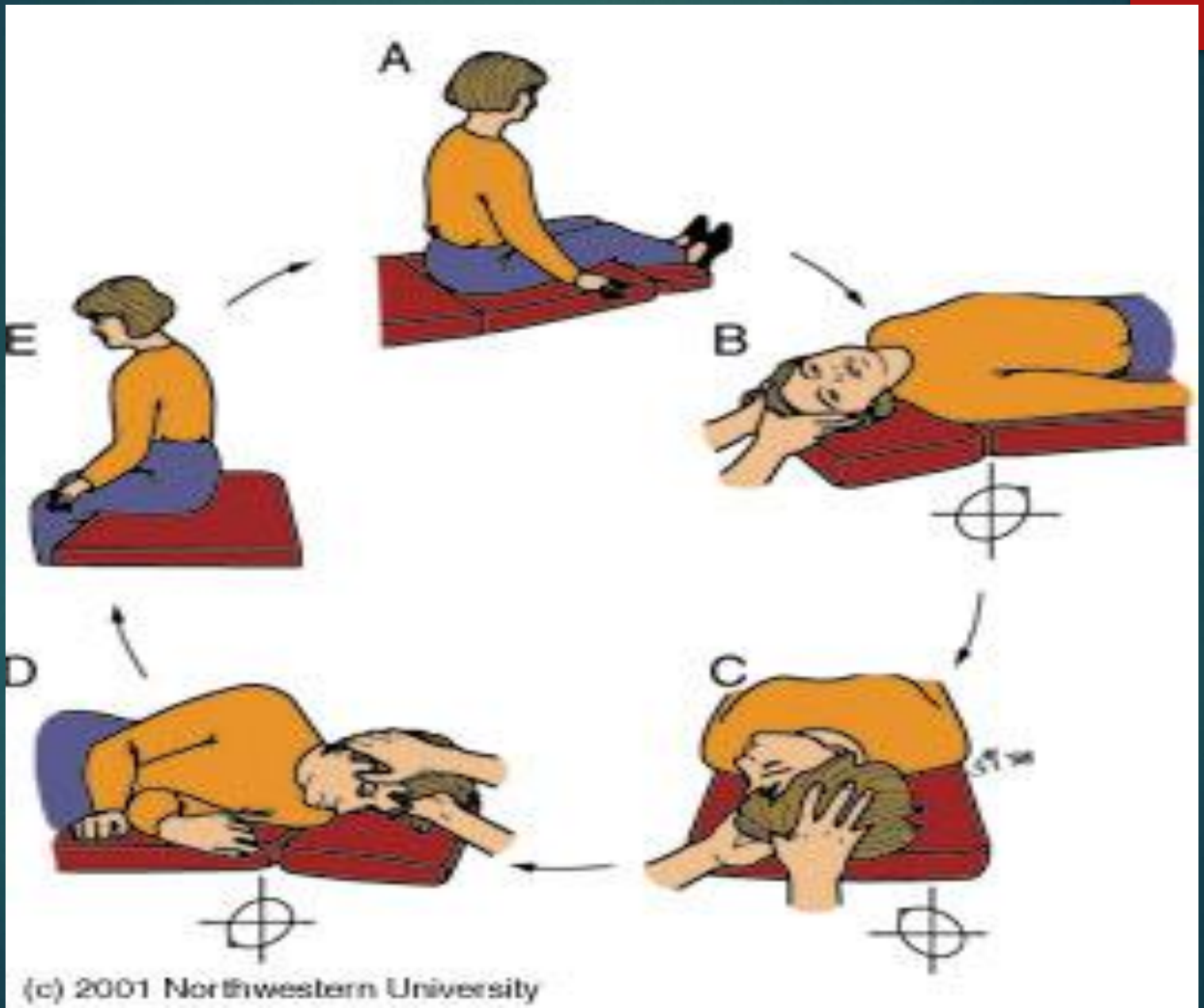
# Management

- Based on differentiating central from peripheral causes
- VBI should be considered in any elderly patient with new-onset vertigo without an obvious etiology
- Neurological or ENT consult for central vertigo
- Suppurative labrynthitis-admit and IV antibiotics
- Toxic labrynthitis-stop offending agent if possible

# Management

- Severe Ménière disease may require chemical ablation with gentamicin
- Attempt Epley maneuver for BPPV
- Mainstay of peripheral vertigo management are antihistamines that possess anticholinergic properties
  - -Meclizine
  - -Promethazine
  - -Scopolamine
  - -Diphenhydramine
  - -Droperidol

# Epley Maneuver



# Summary

- Ensure you understand what the patient means by “dizzy”
- Try to differentiate central from peripheral
  - Often there is significant overlap
- Not every patient needs a head CT
- Central causes are usually insidious and more severe while peripheral causes are mostly abrupt and benign
- Most can be discharged with antihistamines