

# Dizziness and Vertigo

Summary from Rosen's By Lindsay Schroeder

## Epidemiology

- 7.5 million people in ambulatory settings annually, 2.5% of ED visits

## Pathophysiology

- collaboration of functions of visual, proprioceptive (muscles and joints), and vestibular (otic labyrinths)
- vestibular apparatus- 3 semicircular canals (movement and angular momentum) plus the utricle (position relative to gravity) and saccule in the inner ear/ petrous temporal bone
  - impulses go via the vestibular part of CN VIII → enter the brain stem just below the pons/anterior to the cerebellum → 4 vestibular nuclei in the brainstem then cerebellum → medial longitudinal fasciculus (MLF) and vestibulospinal tract → motor neurons in the extremities
- vertigo- inner ear disease causing asymmetric signals from the bilateral semicircular canals
- nystagmus- unbalanced vestibular signals result in asymmetrical stimulation of the medial and lateral rectus, if vestibular most often unidirectional and horizontal (cerebral or brain stem lesion if vertical)
  - slow- towards the side of the stimulus
  - fast- cortical correction to midline, this direction is used for naming
- vestibular nuclei connected to the autonomic system explaining the associated perspiration, nausea, vomiting

## Differential Diagnosis

- peripheral vs central vs systemic causes (see box and tables 19-1 and 19-3 for examples and characteristics) but generally central causes are less common but more serious than peripheral
  - most common peripheral causes of true vertigo: BPPV, vestibular neuritis, labyrinthitis, and Ménière's disease
  - acute suppurative labyrinthitis is the only peripheral cause that needs urgent intervention, rest are benign
  - don't forget that posterior circulation stroke/bleed can cause vertigo
  - vestibulotoxicity - aminoglycosides, anticonvulsants, alcohols, quinine, quinidine, and minocycline
- sometimes dizziness is a metaphor for malaise (ddx: anemia, infection, depression)

## Signs and Symptoms

- vertigo- patient spinning vs room spinning
- near syncope- feeling faint or lightheaded
- disequilibrium- unsteady gait
- nonspecific dizziness- related to anxiety
- hypotension, carotid bruit, asymmetric pulse/BP in upper extremities, serous otitis media, pupillary abnormalities, papilledema, CN VI palsy, internuclear ophthalmoplegia, nystagmus
- table 19-2 details distinguishing features of nystagmus to differentiate between central and peripheral lesions

## Work-up

- complete neuro exam
- Dix-Hallpike testing- dx posterior canal BPPV
- roll test- dx horizontal canal BPPV
- head thrust/impulse test- dx vestibular neuritis and labyrinthitis
- fingerstick glucose if history of DM
- CBC, BMP, EKG if concern is near syncope rather than vertigo
- if stroke risk factors or nystagmus suggestive of central lesion- head CT(A) or MRI(A)

## Empiric Management

- if positive Dix-Hallpike, treat with Epley maneuver (figure 19-4)
- if positive roll test, treat with bbq roll maneuver (page 168)
- stop offending medications
- start new med if cause warrants (meclizine, antiemetics, migraine tx, steroids, antibiotic...)

## Disposition

- discharge if: symptoms resolve with peripheral cause
- admit if: cannot walk, intractable symptoms, concern for cerebellar hemorrhage or infarction, vertebrobasilar insufficiency, acute bacterial labyrinthitis
- primary care follow up, consider ENT or neurology follow up if suspected acoustic neuroma or perilymphatic fistula