BPPV

- Vertigo - sensation of swaying, tilting, spinning or feeling unbalanced
- Vertigo can be benign or sinister
- Displacement of calcium carbonate crystals in the semicircular canals
- The crystals settle in the endolymph
- No stimulus causing hair cells to fire
- displaced crystals shift with the fluid

Stimulus is unbalanced with respect to opposite ear

- This causes symptoms of dizziness/spinning/swaying

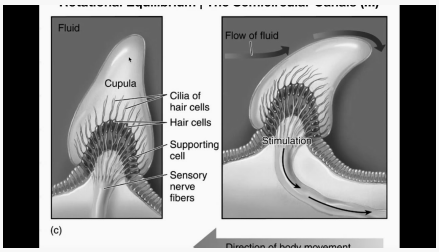
Demographics

- Can occur at any age, but common at the 4th and 5th decade
- Incidence increases over time because of the degenerative changes in the otolithic membrane (elderly can have falls)
- Slightly more common in females
- Affects right labryrinth more commonly

Risk Factors

- Sedentary lifestyle
- Nutritional deficiencies
- Hyperinsulinemia
- Hyperglycemia

Ear Anatomy



- Filled with endolymph , endolymph bends cilia , movement of these cilia sends signals to brain
- Transmits to eyes and cervical proprioceptors
- Superior semicircular canal detects nodding movement
- Horizontal semicircular - right and left head rotation
- Posterior semicircular - Movement in coronal plane(lat flexion of head)

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Causes

- Usually idiopathic (calcium carbonate particles dislodge and migrate into semicircular canals)
- Cranial Trauma
- Prior otological surgery
- Infection
- Vestibular neuritis
- Middle ear disease
- Menieres
- Ovarian hormonal dysfunction
- Ototoxicity
- Endolymphatic hydrops
- Syphilis
- Psychological disorders
- Vestibular system degeneration
- Metabolic disorders
- CV disease
- Vertobrobasilar insufficiency
- Vertebral artery stenosis and tortuosity

Presentation

- Sudden episodes of rotatory vertigo
- Usually lasts 10-20 seconds after head position change
- Usually occurs during moving from upright to lying down. rolling from side to side in bed, bending forward, moving head to look up and downor side to side
- Usually occurs with increased anxiety, impaired postural control, reduced quality of life
- Rule out more sinister causes of vertigo/dizziness
- Pinpoint site of involved canal (multiple can be involved and it can occur bilaterally)
- Most cases affect posterior semicircular canal
- +ve Dixhallpike (for posterior reproduction of dizziness, nausea, and or upbeating rotary nystagmus (pupils move counterclockwise in right labryrinth lesions and clockwise in left) - Downward facing ear one being tested
- +ve supine roll test (for horizontal canal)
- Anterior canal is rare due to it's upright orientation (debris likely to fall out)

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Imaging

- **MRI and CT/Not BPPV if:**
Negative Dix-hallpike or supine roll
Abnormal cranial exam findings
Nystagmus (Vertical, torsional, direction-changing, non-fatigable - central cause)
Continuous symptoms
Head trauma
Vertigo occurs without changing head positions
Loss of conciousness
Frequent unexplained falls
Recent viral infection
Hearing loss
Tinnitus
Ear fullness
Earache
Ptosis
Facial/extremity paraesthesia
Visual disturbances
Difficulty swalling/speaking
Ataxia
medications (anti-hypertensive/anti-depressants)

- This is to rule out other pathologies

DDx

- Cervicogenic vertigo (similar to BPPV, patient complains of floating/lightheadness/unsteadiness, presents with loss of Cx ROM, Cx restrictions and tenderness +ve neck torsion test - stimulates cx proprioceptors)
- Concussion (Trauma)
- Intracranial Bleed (UMNL)
- CNS ischemia/stroke/VBAI (Gait, Ataxia, Rhomberg, coordinationother symptoms, Cranial nerves, blood pressure)
- Neoplasm (Lymphnodes, systemic signs)
- Infection (Temperature, Otoscopic exam, Lymph nodes)
- Intracranial swelling
- Migraine
- Carotid sinus syndrome (Auscultation of carotid)
- Intoxication
- Menieres
- Perilymphatic fistula
- Vestibular system degeneration
- CV disease (Heart and Respiratory exam)
- Drug toxicity
- Cerebellopontine angle neoplasm
- Brainstem encephalitis

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Management

- Canalith repositioning and home exercises for appropriate semicircular canal
- If posterior, Epley maneuver or Foster Half somersault
- If horizonal canal, Lempert 360 roll maneuver (BBQ roll)
- If anterior, Epley/reverse epley
- Inform patients that they might feel dizzy, attempt to keep their eyes open as much as possible (look at my nose)
- Inform patients to sleep with the affected side up and reaccurance rates (10 and 80% - delay between symptom and management leads to higher occurance rates) and safety
- If CNS/balance disorders - additional home support to reduce risk of falling
- Home exercises: Brandt-Daroff exercises, Foster half somersault, Eye tracking
- **Contraindications:** Acute Cx F#/instability, recent cx spine surgery, perilymph fistula, Detached retina, Unstable carotid artery disease/stenosis, Vertebrobasilar insuffciency, Stroke/TIA, Unstable Heart disease, Severe neck disease (Cervical spondylosis +myelopathy, Advanced RA
- Cx SMT
- Antihistamines (Meclizine) suppress labryrinth excitability and vestibular-end organ receptors
- Anti-emetics (ondansetron, metoclopramide, promethazine/prochlorperazine)

Prognosis

- Most pts find relief within 4-6 weeks
- Recurrence rates 5-25%
- Risk of recurrence: Females, older patients, psychiatric

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