Definition

- **Benign** - not life-threatening
- **Paroxysmal** - a sudden onset
- **Positional** - response provoked by change in head position
- **Vertigo** - sensation of movement, usually described as spinning or turning
- **BPPV** is the most common form of vertigo & inner ear vestibular disorders
Typical Presentation

- Transient episodes of vertigo (<1 minute)
- Initiated by position change
- Characterized by periods of exacerbation and remission
- Usually unilateral
- Symptoms include dizziness, imbalance, difficulty concentrating & nausea
What Triggers BPPV?

- Lying down or getting up
  - getting in and out of bed
- Rolling over in bed
- Bending over
  - picking something up
- Looking up
  - Shaving
  - Washing hair in shower
- Going to dentist or beauty salon
How does BPPV cause Vertigo

- Semicircular Canals (SCC)
  - Filled with endolymph
  - Detect rotational movement
  - Endolymph exerts pressure on Cupula (sensory receptor at SCC base) & sends impulses to brain
  - Otolith in the semicircular canals shift causing the cupula to send false positional signals to the brain
Etiology

- Idiopathic (unknown causes)
  - Natural age-related degeneration of otolithic membrane
- Head injuries (concussions, whiplash)
- Other possible causes
  - Ear viruses, migraine, ear surgery
Incidence

Accounts for 20% of dizziness cases presenting to ENT office

Frequently seen in elderly

• 50% of all dizziness in elderly is due to BPPV
Aging & Vestibular Dysfunction – why should we care?

- Increased falls risk in elderly
  - Major public health concern – leading cause of injury-related death & nonfatal injury in U.S.
  - At risk for fractures (hip)
  - Complications after hip fractures – blood clots, infection, pneumonia
  - Loss of independence (65-80% never regain preinjury level of independence)
  - 3 year mortality rate = ~ 50%
Types of BPPV

Cupulolithiasis--otoconia in the utricle break loose and adhere to the cupula of the posterior semicircular canal

Canalithiasis--otoconia are free floating in the posterior semicircular canal
  - The most common form
  - Accounts for 81-90% of all cases
Evaluation

- Dix Hallpike (may use Frenzel Goggles)
  - Patient sitting upright
  - Turn head 45° to right
  - Eyes remain open
  - Assist patient into supine, head hanging position; maintain 45° head turn to right
  - Patient focuses on target; observe eyes for nystagmus
  - Maintain head hanging position for 30-40 seconds; if response occurs, wait for nystagmus to fatigue
  - Patient centers head and returns to upright, seated position
  - When seated, patient focuses on target; if response was demonstrated, may see nystagmus reversal
  - Repeat with head hanging left
Frenzel Goggles

Used to detect nystagmus during Dix-Hallpike evaluation
Diagnosis is based on a positive Dix-Hallpike

BPPV Nystagmus Classifications

- Counterclockwise – lateral canal BPPV
- Clockwise – lateral canal BPPV
- Down beating – superior canal BPPV
- Up beating – posterior canal BPPV
Typical Characteristics of Nystagmus

- Latency - 10-40 seconds
- Paroxysmal
- Rotary nystagmus
- Duration < 1 minute
- Fatigues with repetition
- Nystagmus may reverse in upright position
Nystagmus video

http://www.youtube.com/watch?v=ZWnuAbBdKD0&feature=endscreen&NR=1
Interventions

- Wait/see – symptoms may subside within 2 months
- Medication (little benefit)
- Habituation exercises (Brandt-Daroff)
- Surgery
- Canalith Repositioning Procedures (CRP)
  - Epley and Semont maneuvers
  - Move otoconia from posterior canal into utricle (90% success rate)
CRP/Epley is only done when a positive Dix-Hallpike is observed

- Should only be performed after a negative Cerebral Artery Screen
- Should only be performed by trained clinicians
- Not many therapists trained to treat BPPV: Certified Vestibular Rehab. Specialist

http://www.youtube.com/watch?v=7ZgUx9G0uE&feature=related
Canalith Repositioning Procedure (CRP)

1. Supporting patient’s neck, quickly assist patient into supine, head hanging position; maintain 45° head position
   - Otoconia move toward center of PSSC
2. Without lifting the patient’s head, help patient turn head to the opposite Hallpike position
   - Otoconia reach common crus
3. Rotate head and body until patient is lying on side and nose is pointing to floor
   - Otoconia pass through common crus
4. Maintaining head position from #3, assist patient to a seated position
   - Otoconia enter utricle
5. Ask patient to center head and to tilt head down 20°
   - Otoconia move into utricle
6. Repeat positions 1-5 until there is no nystagmus in any position
Canalith Repositioning Procedure/Epley
Patient instructions following CRP/Epley

- Sleep semi-recumbent for one night
- Avoid provoking head positions for one week
  - Avoid moving head up and down
  - Move head and body as a unit
  - Can wear soft cervical collar as reminder for head movement
- Do not sleep on the side that was just treated
Bilateral BPPV

• Much less common
• If you see it, usually will see with head trauma
• Must treat one side at a time so you don’t “undo” the side you just treated
• Harder to clear—generally will have multiple visits
Lateral Canal BPPV

- Otoconia migrate to the lateral canal
- Less common than posterior canal BPPV
- Can happen after CRP/Epley if head is lifted between first and second positions
Lateral Canal BPPV

- Roll test
  - Body supine
  - Head inclined 30º
  - Turn head to either side
Lateral Canal BPPV

- Patients usually describe a strong and prolonged vertigo
  - Often report dizziness when turning over in bed but not in other positions
- Can last up to or longer than a minute
- See a horizontal nystagmus, not rotary
- Nystagmus is typically present in both head positions but one is usually significantly worse
- Nystagmus can be geotropic (towards ground) or ageotropic (towards sky)
- Most commonly canalithiasis with geotropic nystagmus that is greater on the affected side
Maneuver for Lateral Canal BPPV
Summary

• Most common disorder of the inner ear’s vestibular system
• Etiology is idiopathic or head trauma
• More common in elderly – can have dramatic effect on quality of life
• Diagnosis is based on positive Dix-Hallpike
• CRP/Epley highly successful
References:

References cont.: