

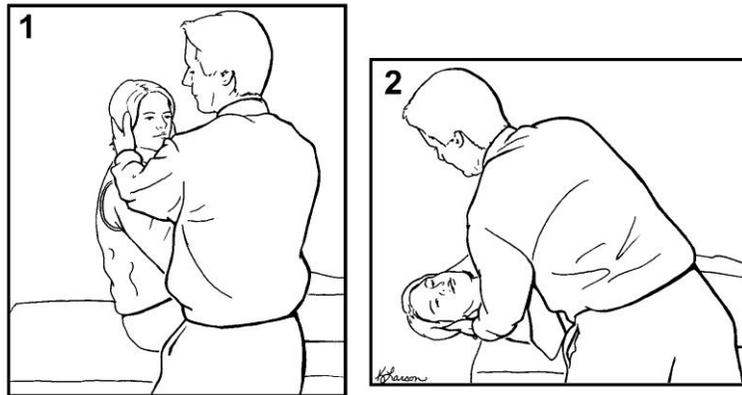
# EXAMINATION, NYSTAGMUS AND TREATMENT MANEUVERS FOR BPPV

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## Examination

- Neurological examination is important to clarifying the differential diagnosis
- Dix Hallpike should be included in those with report of positional vertigo and should be considered even in those with a vague or poor history of dizziness (1) since some have BPPV but do not relay a history of it.
- Examination maneuvers for positional vertigo
  - Dix Hallpike maneuver

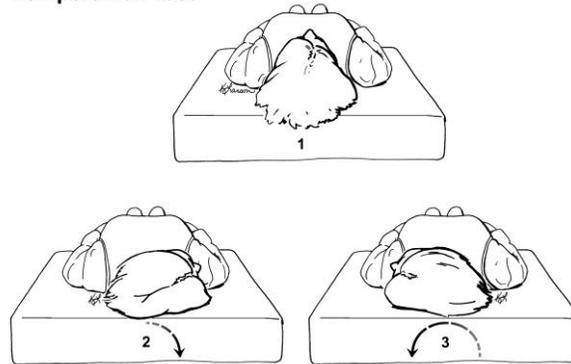
### Dix Hallpike



- What to look for with Dix Hallpike
  - Latency before the onset of nystagmus (2-10 seconds)
  - Nystagmus: a burst or paroxysm of upbeating and counter clockwise (from observers perspective) nystagmus for right posterior canal BPPV; with Dix Hallpike to the left, the nystagmus is clockwise torsional and upbeating.
  - Reaction from the patient that they are having vertigo
  - Duration of 5-30 seconds or so
  - Nystagmus with Dix Hallpike means the right posterior canal is affected. If one also sees nystagmus with Dix Hallpike to the left, then the left side is affected.
  - Nystagmus that is horizontal or downbeating suggests either another canal is affected or there could be a different, possibly CNS cause rather than the posterior canal form of BPPV.
  - Video examples

- Supine Roll test (Lempert roll test, Pagnini-McClure test)

#### Lempert Roll Test



- What to look for with Supine roll test
  - Latency may be fairly brief with hcBPPV
  - Nystagmus: a burst horizontal direction changing positional nystagmus
  - What does that mean? Direction-changing nystagmus is a form of positional nystagmus that changes direction with changes in head position
    - *Geotropic* = nystagmus with fast phase beating toward the ground. That is, when supine and the head is turned to the right nystagmus beats toward the right (toward the ground) and when head is turned to the left, the nystagmus changes to become left beating (also toward the ground).
    - *Apogeotropic* = nystagmus with fast phase beating away from the ground. That is, when supine and the head is turned to the right nystagmus beat toward the patient's left (away from the ground) and when head is turned to the left, the nystagmus changes to beat to the patient's right (also away from the ground).
  - Reaction from the patient that they are having vertigo
  - Duration of 5-30 seconds or so
- Treatment maneuvers for hcBPPV are predicated on knowing the affected side. How does one tell the affected side?
  - Geotropic the side affected is the side with the most intense nystagmus on the supine roll test
  - If BPPV started as posterior canal BPPV and converted (so-called canal switch) it is the same side
  - Apogeotropic: the side with the less intense nystagmus is the affected side
  - Sit-to-supine maneuver – take the patient rapidly from seated to straight supine, then nystagmus is away from the affected side in geotropic and toward the affected side in apogeotropic
  - Bow and lean test (see appendix)(2)
  - Sometimes you will not know
- Video examples

What to do if the history suggests BPPV but there are no symptoms and no nystagmus?

- Okay to make presumptive diagnosis of BPPV
- Revisit the history
- Repeat Dix Hallpike again

What to do if the history suggests BPPV and the patient reports dizziness but there is no nystagmus?

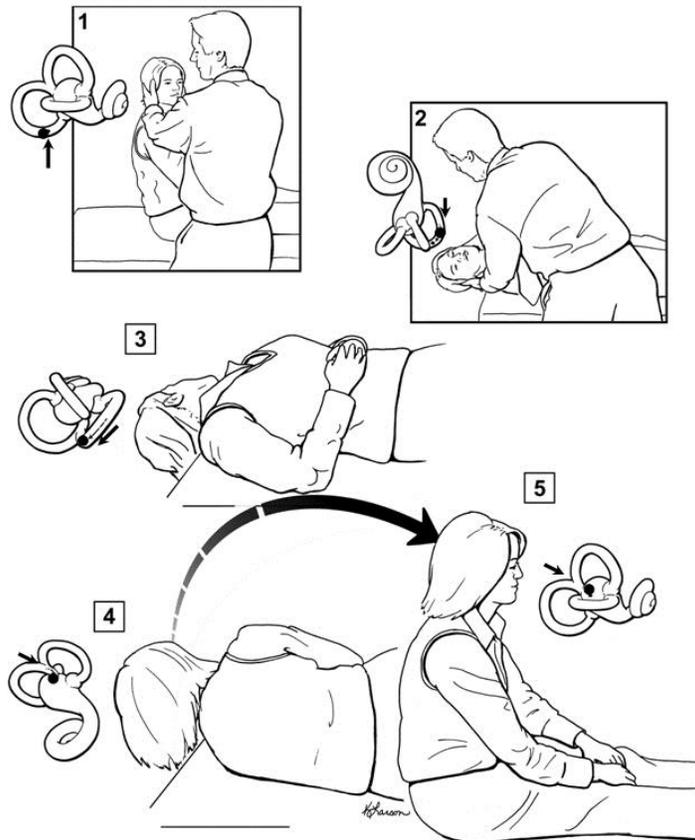
- It might be BPPV and the patient is very sensitive and/or anxious
- Uncompensated vestibulopathy or motion sensitivity will cause symptoms but not the characteristic nystagmus. Determine if virtually any kind of rapid head movements causes dizziness.
- It does not hurt to treat with a maneuver if you think it might be BPPV but no nystagmus but the diagnosis is not as assured.

What if there is nystagmus but it is not either the type described for posterior or horizontal canal BPPV?

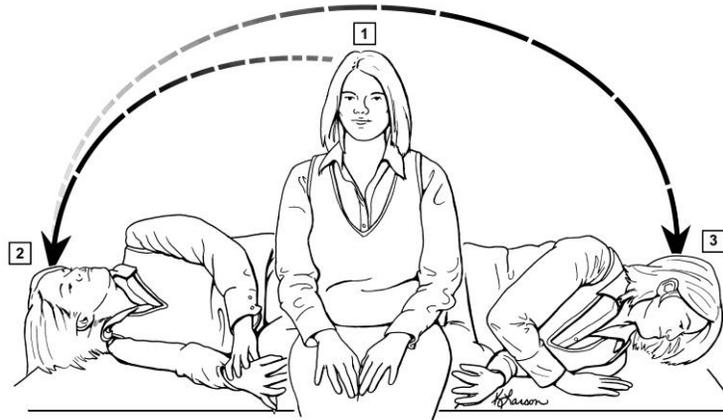
- Make note of the response to the maneuver
- Examine for spontaneous or gaze-evoked nystagmus when patient is sitting
- Examine for any other brainstem or cerebellar findings
- If history seems strong for BPPV, may try to treat but if it does not resolve, brain MRI may be indicated.

## Treatment Maneuver for Posterior Canal BPPV

### 1. Canalith repositioning procedure (so-called Epley maneuver)



### 2. Semont liberatory maneuver

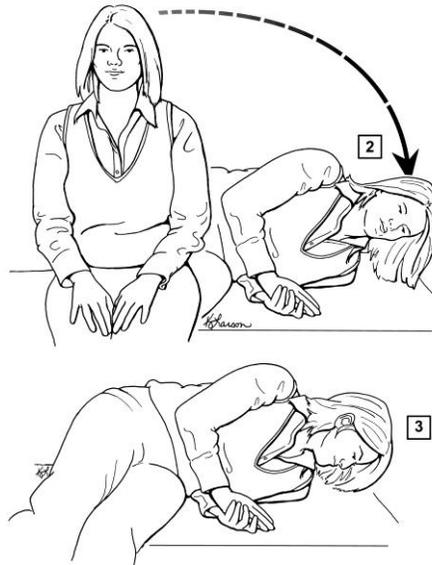


Both the Canalith repositioning procedure and Semont maneuver use the influence of gravity to eliminate the calcium carbonate material from the lumen of the posterior canal back to the main vestibule (utricle). Both treatments are highly effective and is considered standard of care (3-5).

### Treatment Maneuver for Horizontal Canal BPPV

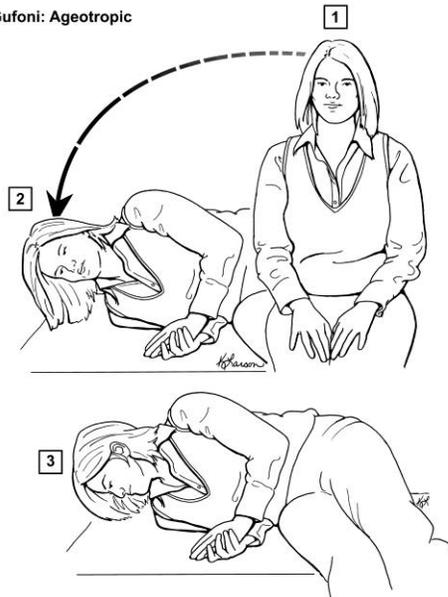
- Epley or Semont maneuvers for posterior canal BPPV are unlikely to be effective (5).
- There are many reported maneuvers but are the ones that seem best (6):
  - Gufoni for geotropic (right ear affected) (7, 8):

Gufoni: Geotropic 1



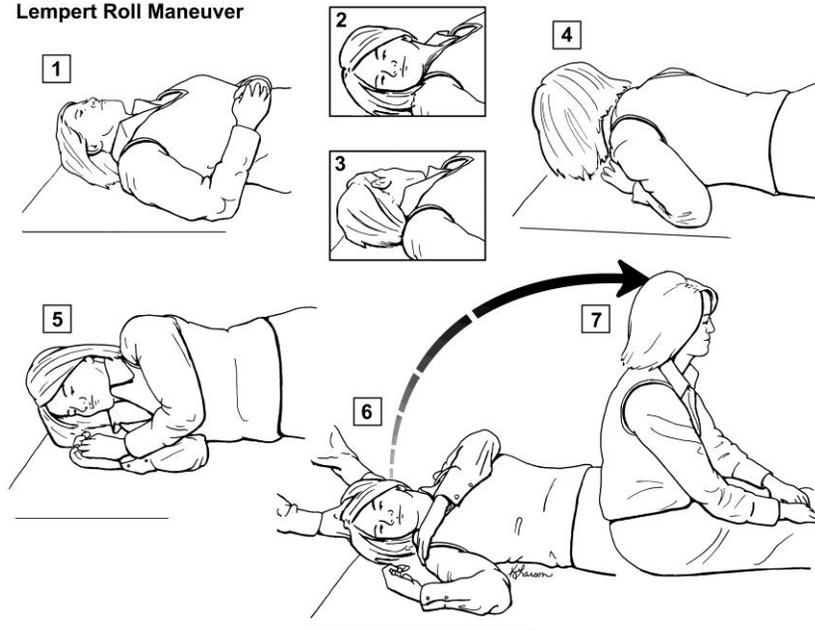
- Gufoni for apogeotropic (right ear affected) (7, 9):

Gufoni: Ageotropic



- Roll maneuver (aka, Lempert roll maneuver, Barbecue roll), (Right ear affected, geotropic type):

Lempert Roll Maneuver



## **Anterior Canal BPPV**

- Usually transitory down-beating positional nystagmus (10)
- Most commonly encountered treated posterior canal BPPV
- Persistent forms are rare
- Of all positional vertigo types, this is the one most likely to be misdiagnosed as peripheral when it is in fact central. One study reported 75% of positional downbeat nystagmus due to CNS causes (11).
- Determining side affected can be difficult unless it started out as posterior canal BPPV
- Nystagmus is downbeat but torsional element is small and not so helpful in lateralizing
- May treat with posterior canal canalith repositioning on both sides if in doubt.

## **Multiple Canal BPPV**

- When more than one canal is affected at the same time (10)
- May require more follow-up visits and treatments, especially if trauma induced (12)

## **Other Positional Dizziness**

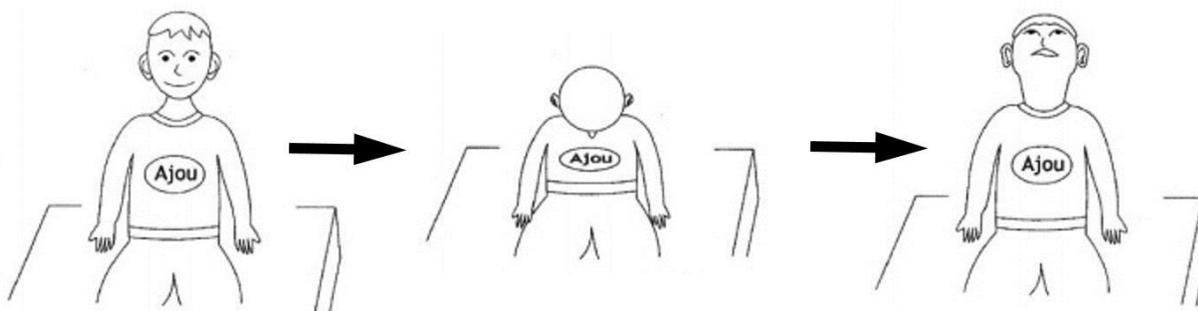
- **Vestibular Causes, some central causes to think about:**
  - Atlanto-axial subluxation
  - Cerebellar degeneration
  - Structural lesions: foramen magnum, cerebellum, medulla, cerebellar peduncles, dorsal pons, 4<sup>th</sup> ventricle
  - Vertebrobasilar insufficiency: vertebral narrowing or dissection
  - Migraine positional vertigo (13, 14)
- **Non-vestibular Causes of Positional Dizziness**
  - Postural hypotension
  - POTS
  - Ventricular plug

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## APPENDIX

Bow and Lean test to help determine the affected side in the horizontal canal form of BPPV:



For geotropic hcBPPV, the direction of nystagmus in the bow (neck flexed while seated) position is in the direction of the affected ear and opposition the direction of the nystagmus in the lean position (neck extended back while seated) (From Choung YH, Shin YR, Kahng H, et al. "Bow and lean test" to determine the affected ear of horizontal canal benign paroxysmal positional vertigo. *Laryngoscope* 2006;116(10):1776-81.)