

# Tips and Tricks to Evaluating Dizziness & Vertigo

Danielle Hart, MD

# Objectives

- To develop a solid approach to the dizzy patient
- To identify emergent causes of vertigo
- To recognize and avoid the pitfalls of dizziness evaluation
- To understand and perform the particle repositioning maneuvers

CC: “I feel dizzy”

What do you feel is the most important historical point to delineate?

Dizziness

```
graph TD; Dizziness[Dizziness] --- Presyncope[Presyncope]; Dizziness --- Vertigo[Vertigo]; Dizziness --- Dysequilibrium[Dysequilibrium]; Dizziness --- Other[Other];
```

Presyncope

Vertigo

Dysequilibrium

Other

# Discuss with your Neighbors...

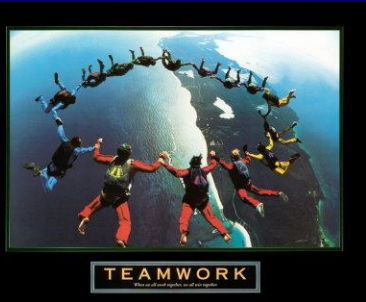
Patient #1: Donald Jackson, 52 y/o

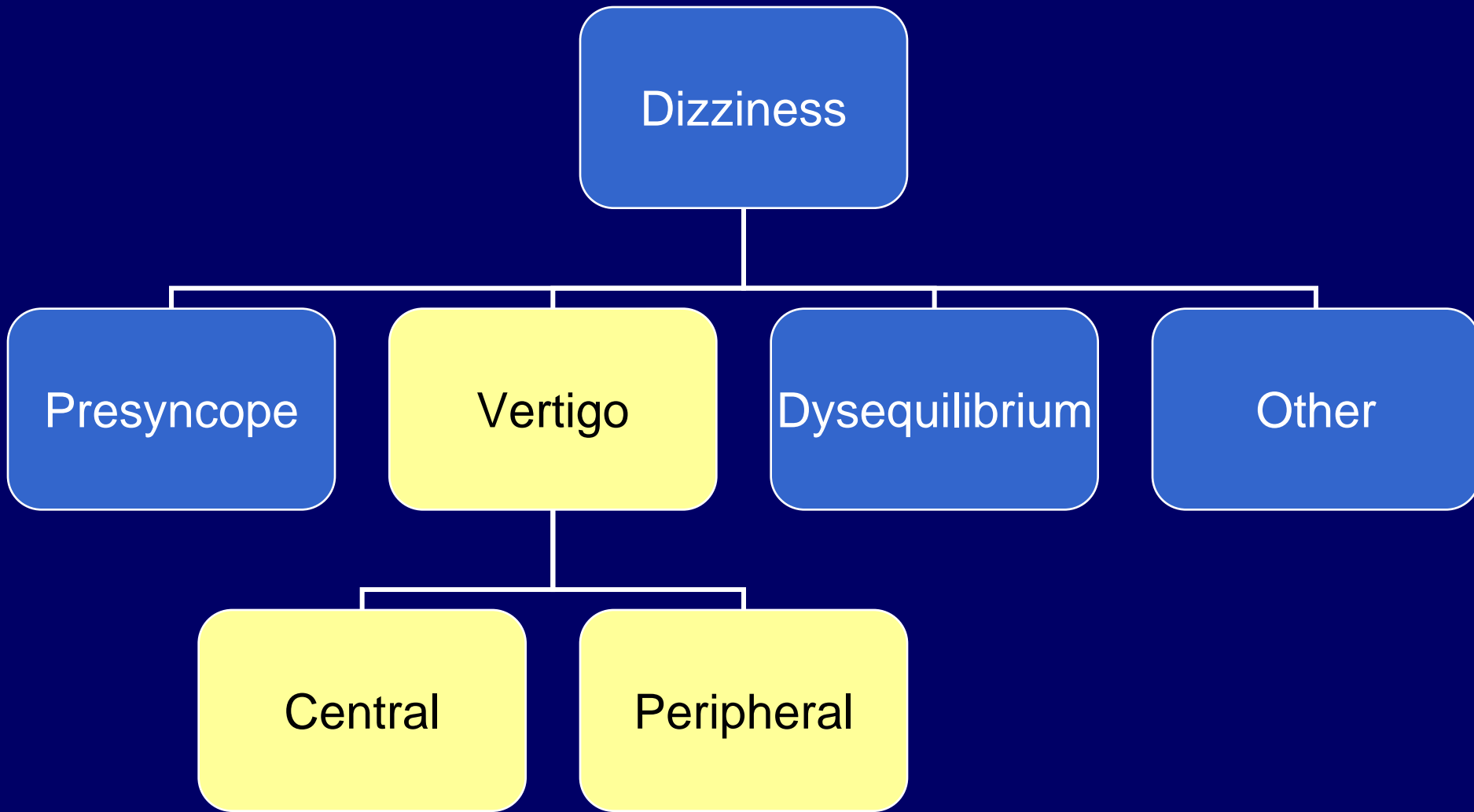
CC: “I feel dizzy”

HPI: “Things are spinning”

You have 1 minute

Task: What are 3 of the most important historical questions that you ask to guide your evaluation? Why?





**Characteristic****Peripheral****Central**

Onset	Sudden	Gradual
Intensity	Severe	Mild - Moderate
Duration	Usually seconds / mins	Days to Months
Onset/Pattern	Sudden / Intermittent	Gradual / Constant
Nausea / Diaphoresis	Frequent	Less often
Head position	Worsened by position	Less change
Nystagmus	Horizontal, Rotatory	Any type, Vertical
Neuro finding	None	Usually present
Auditory $\Delta$	Possible, tinnitus	None*

# What Maintains Normal Equilibrium?

- Vision
- Proprioception
- Vestibular system
- CN VIII (acoustic)
- Vestibular nuclei (brainstem)
- Cerebellum

# Important Exam Aspects

- Eyes – Nystagmus, PEERL, EOMI, etc
- Ears – OM, FOB, TM perforation, etc
- Vision & Hearing (+/-Weber & Rinne tests)
- Proprioception
- Complete neuro exam
  - Cerebellar testing & CN exam
  - INCLUDE GAIT TESTING

# Myth or Fact?

All vertigo is made worse by head movement.

# Myth or Fact?

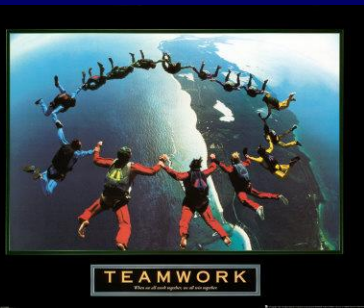
All vertigo is made worse by head movement



**FACT**

# Pt #1, Donald Jackson, 52 y/o

- Central Vertigo
- What is the differential diagnosis?



# DDx: Central Vertigo, BAD Stuff

- Vertebral artery dissection
- Vertebrobasilar insufficiency
- Cerebellar hemorrhage
- Cerebellar / brainstem infarct or neoplasm
- 4<sup>th</sup> ventricle / CN 8 neoplasm
- Chiari malformation
- CNS infection
- Hypoglycemia
- Temporal lobe seizure, Non-convulsive status

# DDx: Central Vertigo, OK stuff

- Migraine
- Hypertension
- Multiple Sclerosis
- EtOH Intoxication
- Medications
- Post concussive syndrome
- Cervical spine muscle / ligamentous injury

# Myth or Fact?

To make the diagnosis of migrainous vertigo, the patient must have a headache.

# Myth or Fact?

To make the diagnosis of migrainous vertigo, the patient must have a headache.



MYTH

# Myth or Fact?

If a patient has neck pain and vertigo following trauma, it is likely due to strain of the proprioceptors in the cervical spine musculature.

# Myth or Fact?

If a patient has neck pain and vertigo following trauma, it is likely due to strain of the proprioceptors in the cervical spine musculature.



MYTH

# Myth or Fact?

If a cerebellar or brainstem infarct / hemorrhage is the culprit, the patient will have other complaints or other neurologic findings on exam.

# Myth or Fact?

If cerebellar or brainstem infarct / hemorrhage is the culprit, the patient will have other complaints or other neurologic findings on exam.



MYTH

# Myth or Fact?

In dizzy patients with head or neck pain & normal ear exam, one must strongly consider vascular dissection or aneurysm unless the dx of migraine is clear.

# Myth or Fact?

In dizzy patients with head or neck pain & normal ear exam, one must strongly consider vascular dissection or aneurysm unless the dx of migraine is clear.



FACT

# WorkUp: Central Vertigo

- Glucose
- Laboratory studies ?
  - EtOH? CBC? BMP? TSH? Med levels?
- Imaging
  - HCT / CTA
  - MRI / MRA
  - Angiography

# Treatment: Central Vertigo

**TREAT THE UNDERLYING CAUSE**

# Next Case...

Patient #2: Sheila Day, 52 y/o

CC: “I feel dizzy”

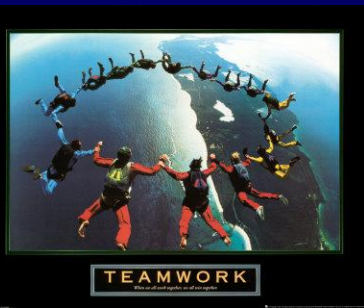
HPI: “Things are spinning”

**Characteristic****Peripheral****Central**

Onset	Sudden	Gradual
Intensity	Severe	Mild - Moderate
Duration	Usually seconds / mins	Weeks / Months
Onset/Pattern	Sudden / Intermittent	Gradual / Constant
Nausea / Diaphoresis	Frequent	Less often
Head position	Worsened by position	Less change
Nystagmus	Horizontal, Rotatory	Any type, Vertical
Neuro finding	None	Usually present
Auditory $\Delta$	Possible, tinnitus	None *

# Pt #2, Sheila Day, 52 y/o

- Peripheral Vertigo
- What is your differential diagnosis?



# Differential Dx: Peripheral Vertigo

- BPPV
- Labyrinth ischemia / infarct
- Perilymphatic fistula
- Semicirc canal dehiscence
- Motion sickness
- Meniere's disease
- Labrynthitis
- Vestibular neuronitis
- Vestibular ganglionitis
- Cholesteatoma
- OM, Serous otitis
- Malignant OE
- TM rupture, FOB
- Labyrinth concussion
- Cerumen impaction
- Hypoglycemia
- Oto-syphillis
- Ototoxicity

# Myth or Fact?

Vertigo from a perilymphatic fistula or semicircular canal dehiscence syndrome can be provoked by valsalva, loud sounds, or insufflation.

# Myth or Fact?

Vertigo from a perilymphatic fistula or semicircular canal dehiscence syndrome can be provoked by valsalva, loud sounds, or insufflation.



**FACT**

# Myth or Fact?

Vertigo associated with fever and otitis media can be treated as an outpatient with oral antibiotics and close follow up.

# Myth or Fact?

Vertigo associated with fever and otitis media can be treated as an outpatient with oral antibiotics and close follow up.



MYTH

# Myth or Fact?

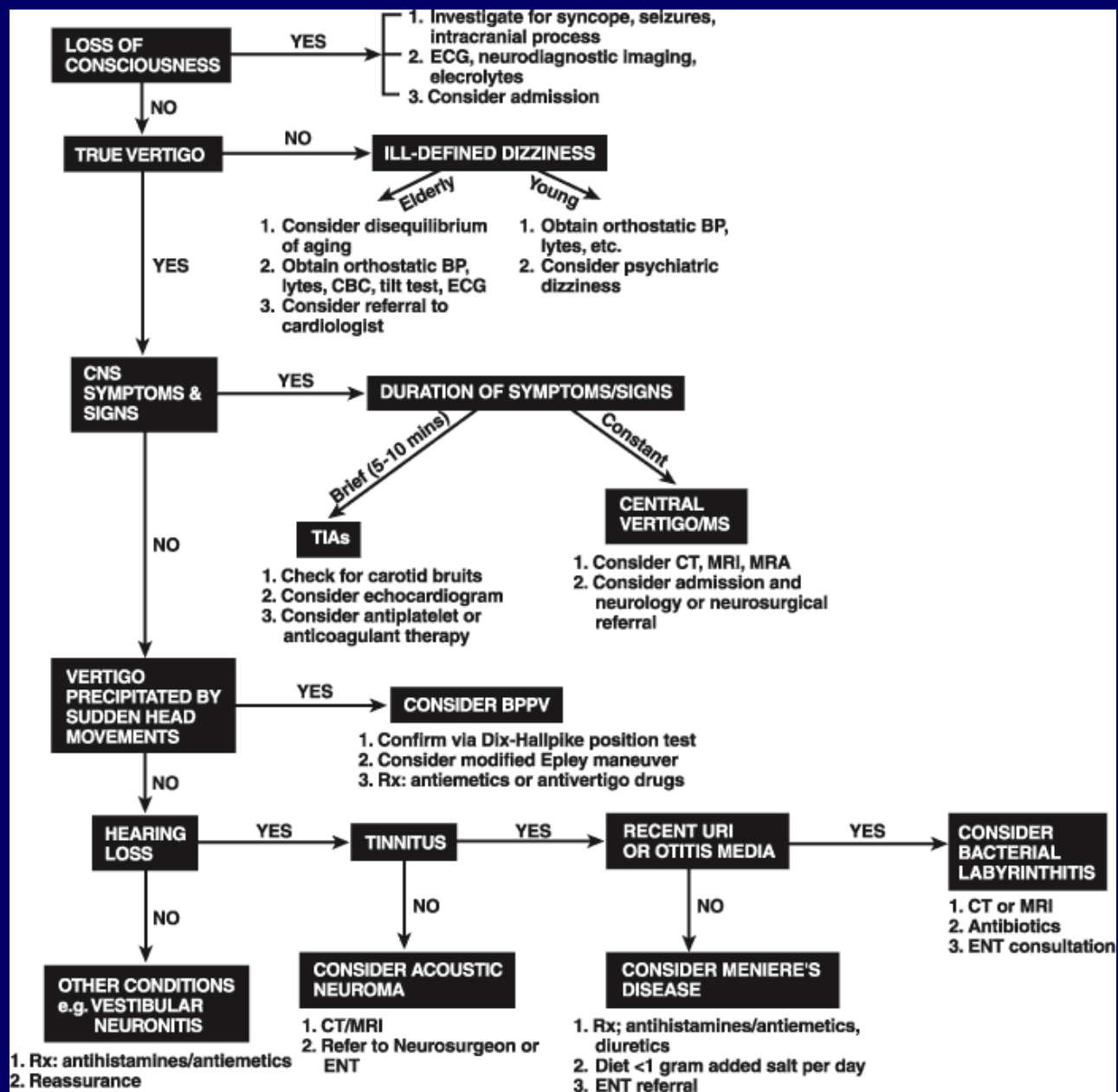
If there is vertigo associated with a Bell's palsy, you must investigate for an intracranial cause.

# Myth or Fact?

If there is vertigo associated with a Bell's palsy, you must investigate for an intracranial cause.



MYTH



Source: Tintinalli JE, Kelen GD, Stapczynski JS: *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*, 6th Edition: <http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

# WorkUp: Peripheral Vertigo

- Dix Hallpike
- Head Impulse Test
- Test of Skew
- Glucose
  
- CBC? Electrolytes? TSH? RPR?
- Medication levels?

# Newman-Toker's Rule (HINTS)

<u>Test</u>	<u>Peripheral Vertigo</u>	<u>Central Vertigo</u>
Head Impulse Test	Positive	Negative
Nystagmus	Unidirectional	Bidirectional
Test of Skew	Negative	Positive

# Pharmacologic Treatment: Peripheral Vertigo

- Anti-histamines
- Anti-cholinergics
- Phenothiazines
- Benzodiazepines
  
- Stop ototoxic medications
- Avoid stimulants
- Calcium Antagonists?
- Steroids ?

# Myth or Fact?

Antihistamines are probably more effective for vertigo and less sedating than benzodiazepines.

# Myth or Fact?

Antihistamines are probably more effective for vertigo and less sedating than benzodiazepines.



FACT

# Myth or Fact?

Routine use of vestibular suppressants is discouraged as primary therapy for BPPV.

# Myth or Fact?

Routine use of vestibular suppressants is discouraged as primary therapy for BPPV.



FACT

# BPPV Treatment: Repositioning Maneuvers

- Epley Maneuver
- Semont Manuever
- Log Roll Manuever (barbeque maneuver)
- Brandt-Daroff Exercises
- (Cawthorne's Exercises)

# Disposition: Peripheral Vertigo

- Admit acute suppurative labyrinthitis
- Admit those who can't walk
  
- All others: Follow up with ENT (or PCP)

# Myth or Fact?

85 y/o M has brief episodes of vertigo lasting minutes at a time with spontaneous resolution; this is BPPV. The patient can be d/c'd with symptomatic control and ENT follow up.

# Myth or Fact?

85 y/o M has brief episodes of vertigo lasting minutes at a time with spontaneous resolution; this is BPPV. The patient can be d/c'd with symptomatic control and ENT follow up.



MYTH

# Myth or Fact?

A few beats of horizontal nystagmus on lateral gaze can be normal (physiologic).

# Myth or Fact?

A few beats of horizontal nystagmus on lateral gaze can be normal (physiologic).



FACT

# Myth or Fact?

If a patient has BPPV, they should have a positive Dix Hallpike test and positional nystagmus.

# Myth or Fact?

If a patient has BPPV, they should have a positive Dix Hallpike test and positional nystagmus.



MYTH

# Myth or Fact?

If a patient is symptomatic with the dix hallpike but doesn't have nystagmus, it's worth trying repositioning maneuvers.

# Myth or Fact?

If a patient is symptomatic with the dix hallpike but doesn't have nystagmus, it's worth trying repositioning maneuvers.



FACT

# Myth or Fact?

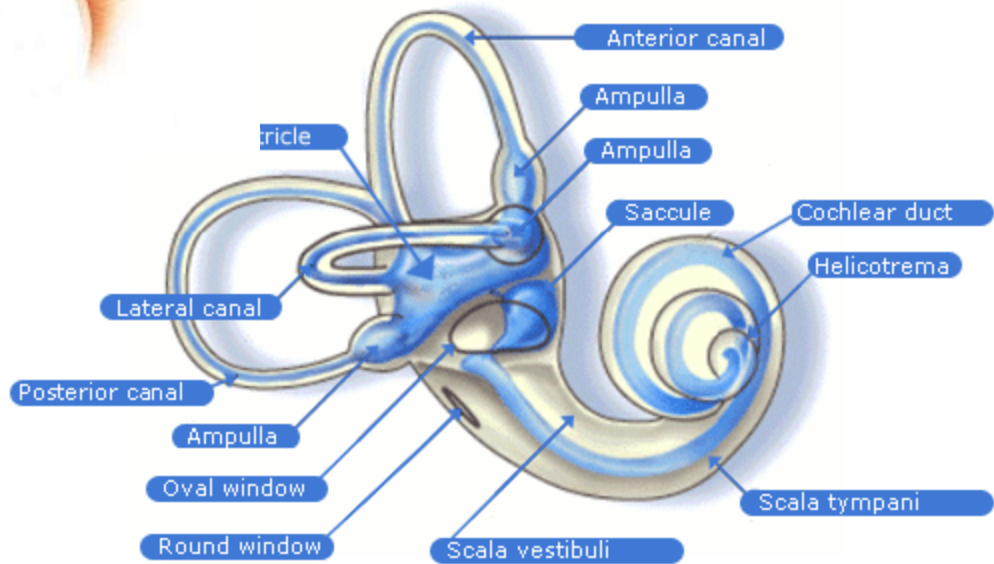
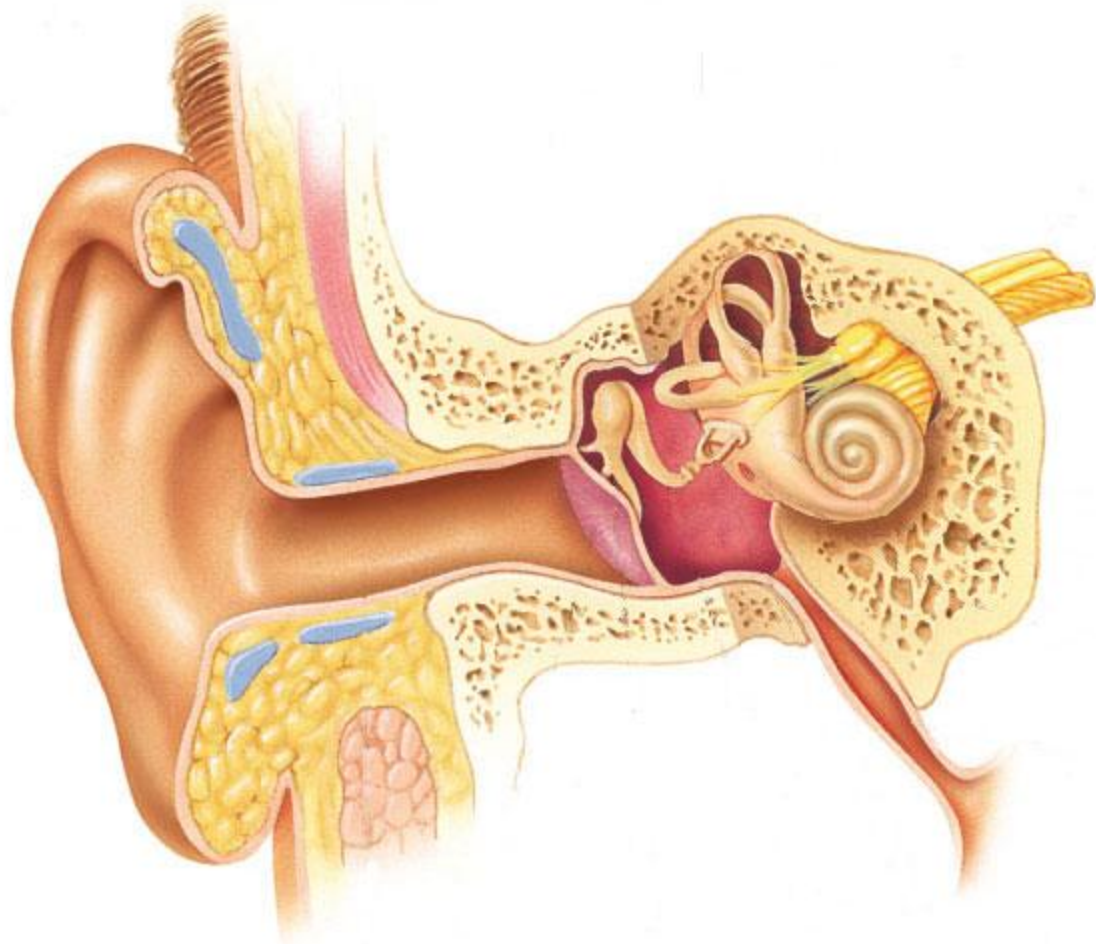
Regarding repositioning maneuvers, it doesn't matter which semicircular canal the otolith is in, the maneuvers are the same.

# Myth or Fact?

Regarding repositioning maneuvers, it doesn't matter which semicircular canal the otolith is in, the maneuvers are the same.



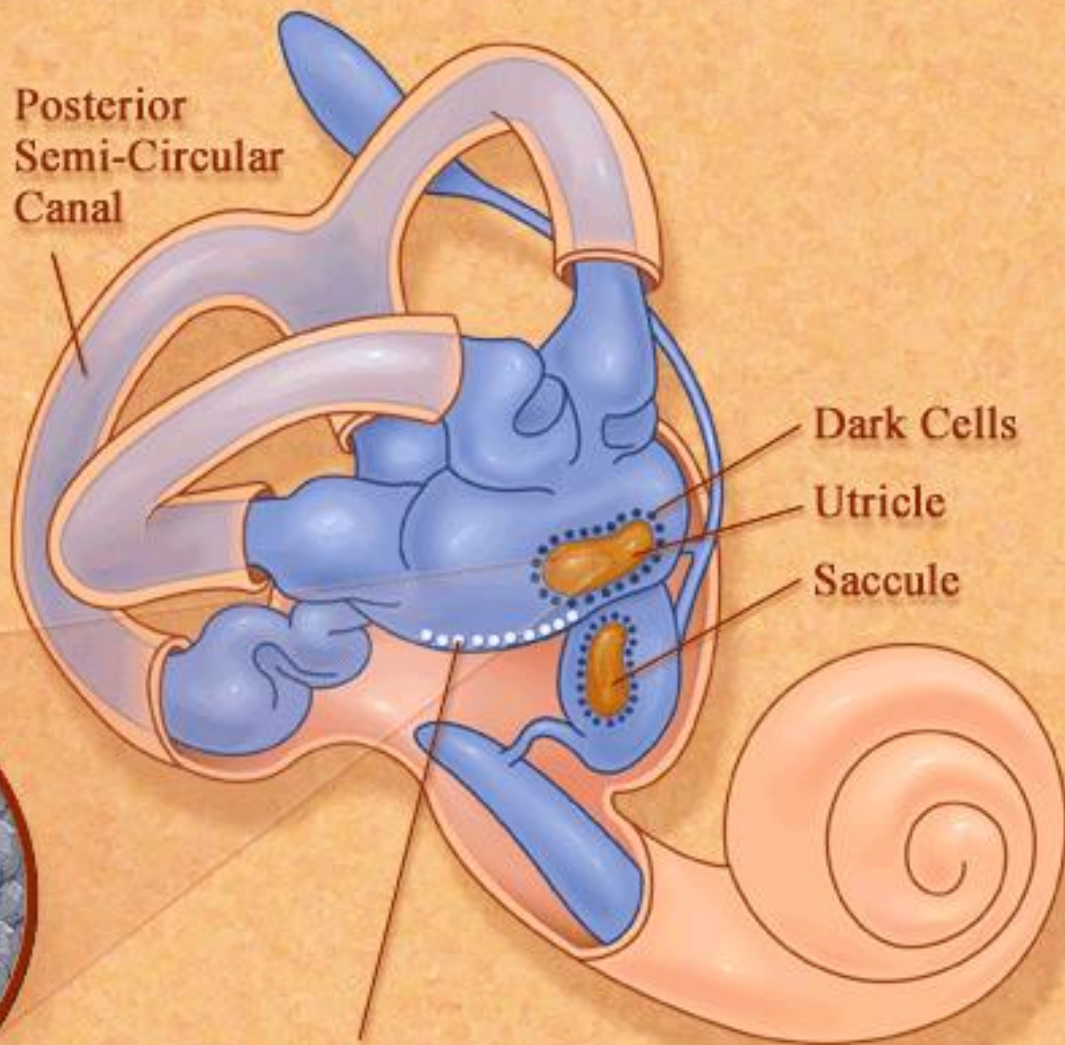
MYTH





Posterior  
Semi-Circular  
Canal

Otoconia



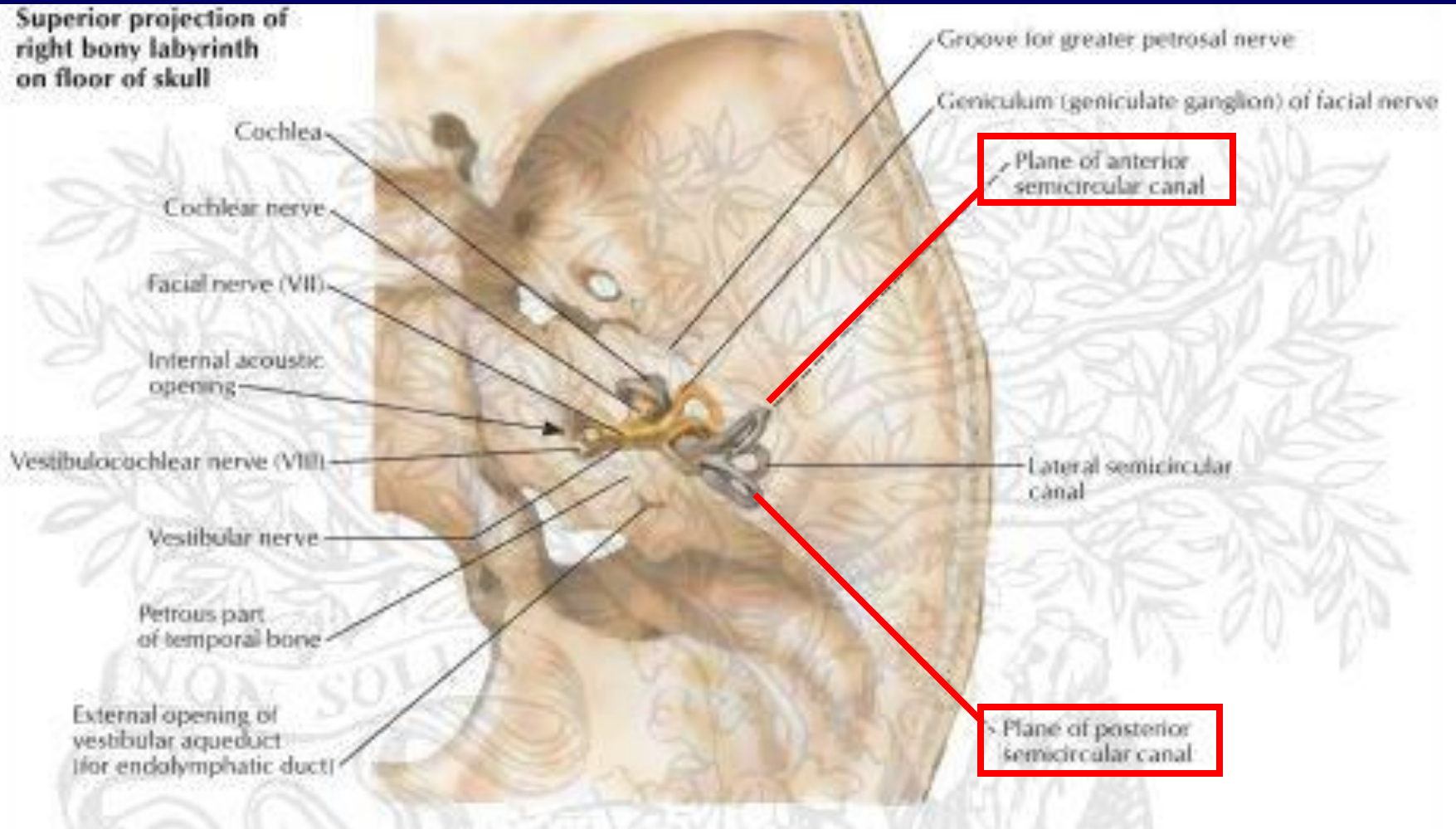
Dark Cells

Utricle

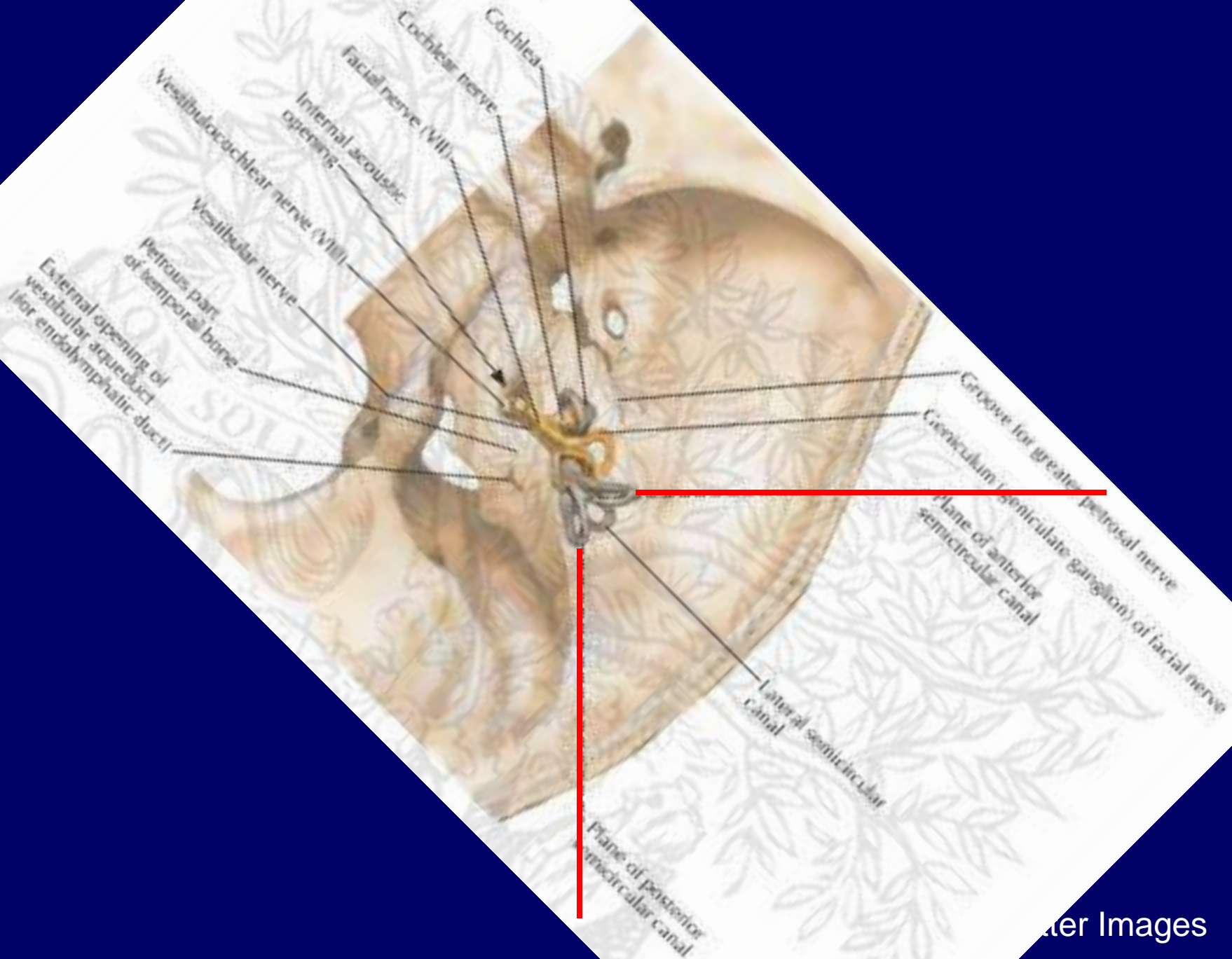
Saccule

Displaced  
Otoconia

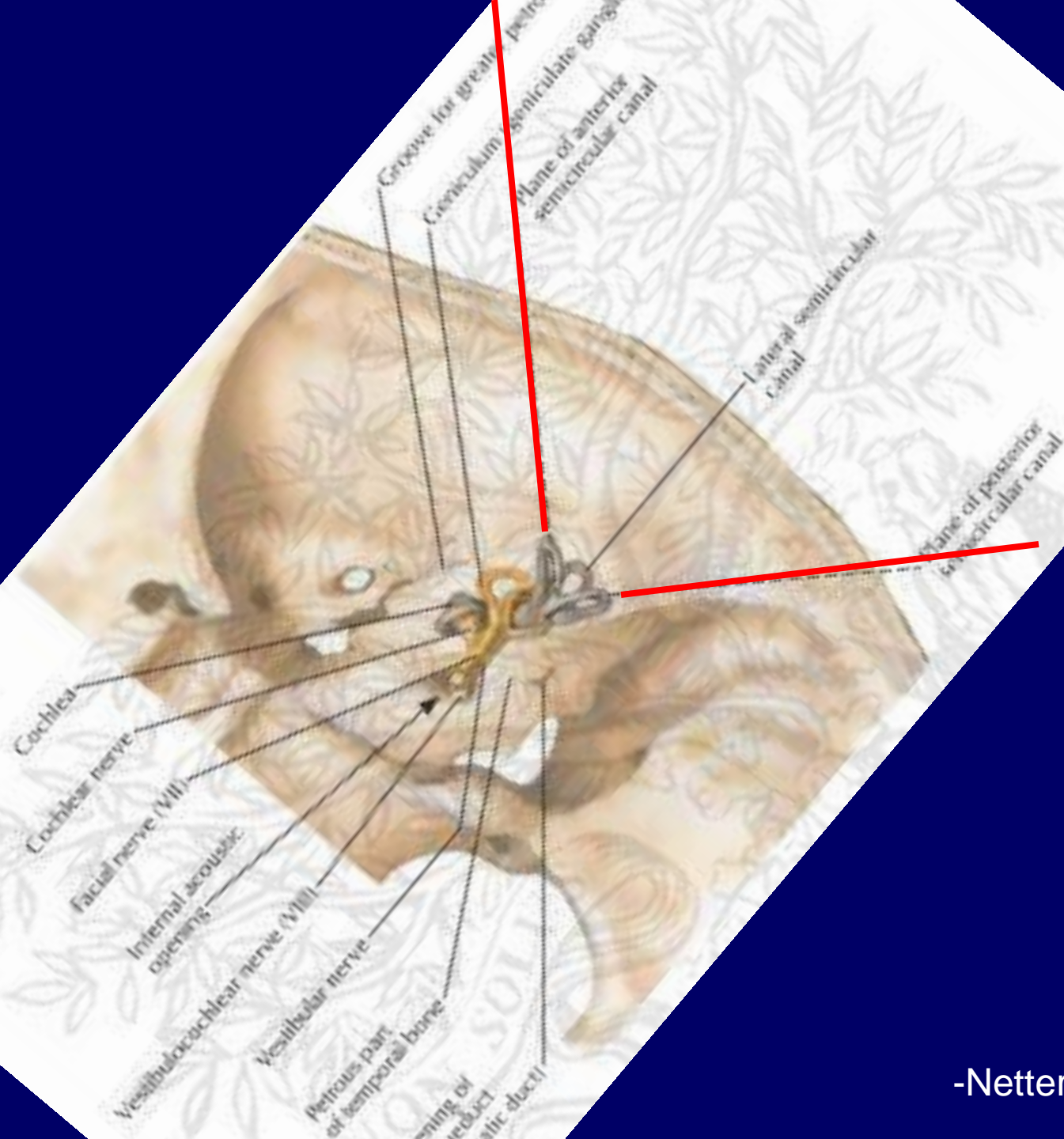
**Superior projection of  
right bony labyrinth  
on floor of skull**







Superior projection of right bony labyrinth on floor of skull



# Nystagmus

- Why?
- Fast vs slow phase
- How to document it
- Horizontal vs. Rotatory vs. Vertical

**Nystagmus**  
**Characteristics**

**Peripheral**  
**Vertigo**

**Central**  
**Vertigo**

Type	Horizontal, Rotatory	Any, Vertical
Direction	Unidirectional	Changes direction
Positioning	-----	-----
Latency	2-20 seconds	Short / None
Duration	Transient (< 1 min)	Sustained
Intensity	Mild to Severe	Mild
Fatigability	Fatigues with repetition	Nonfatigable
Visual fixation	Suppressed	Not suppressed *



# Myth or Fact?

If the history is BPPV, but the epley maneuver doesn't work, clinicians should do the supine roll test.

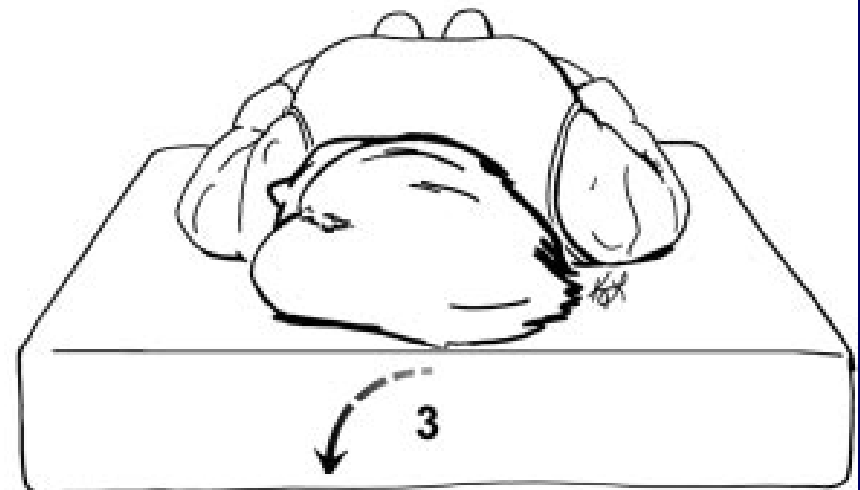
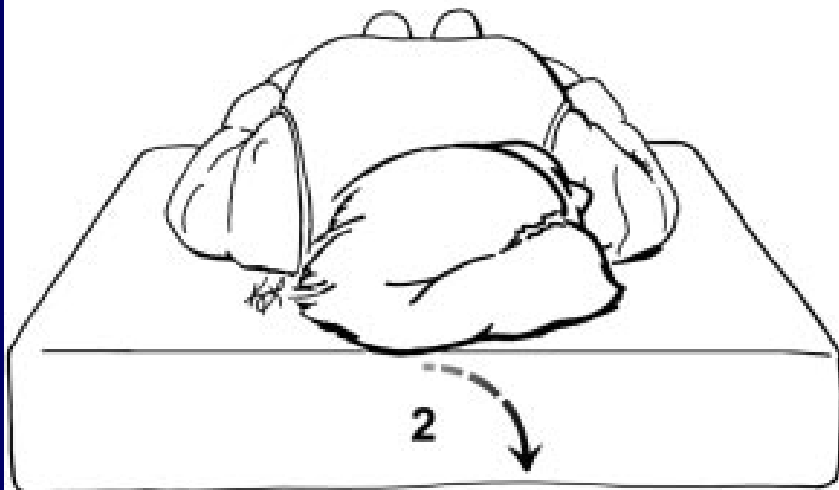
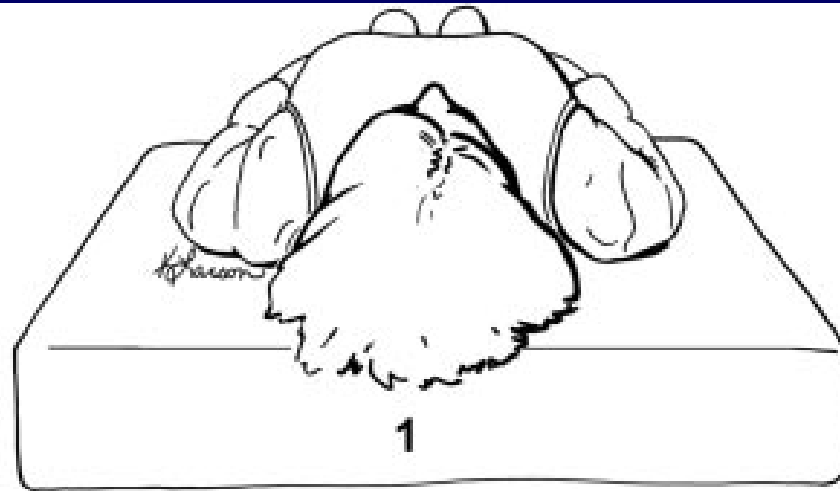
# Myth or Fact?

If the history is BPPV, but the epley maneuver doesn't work, clinicians should do the supine roll test.

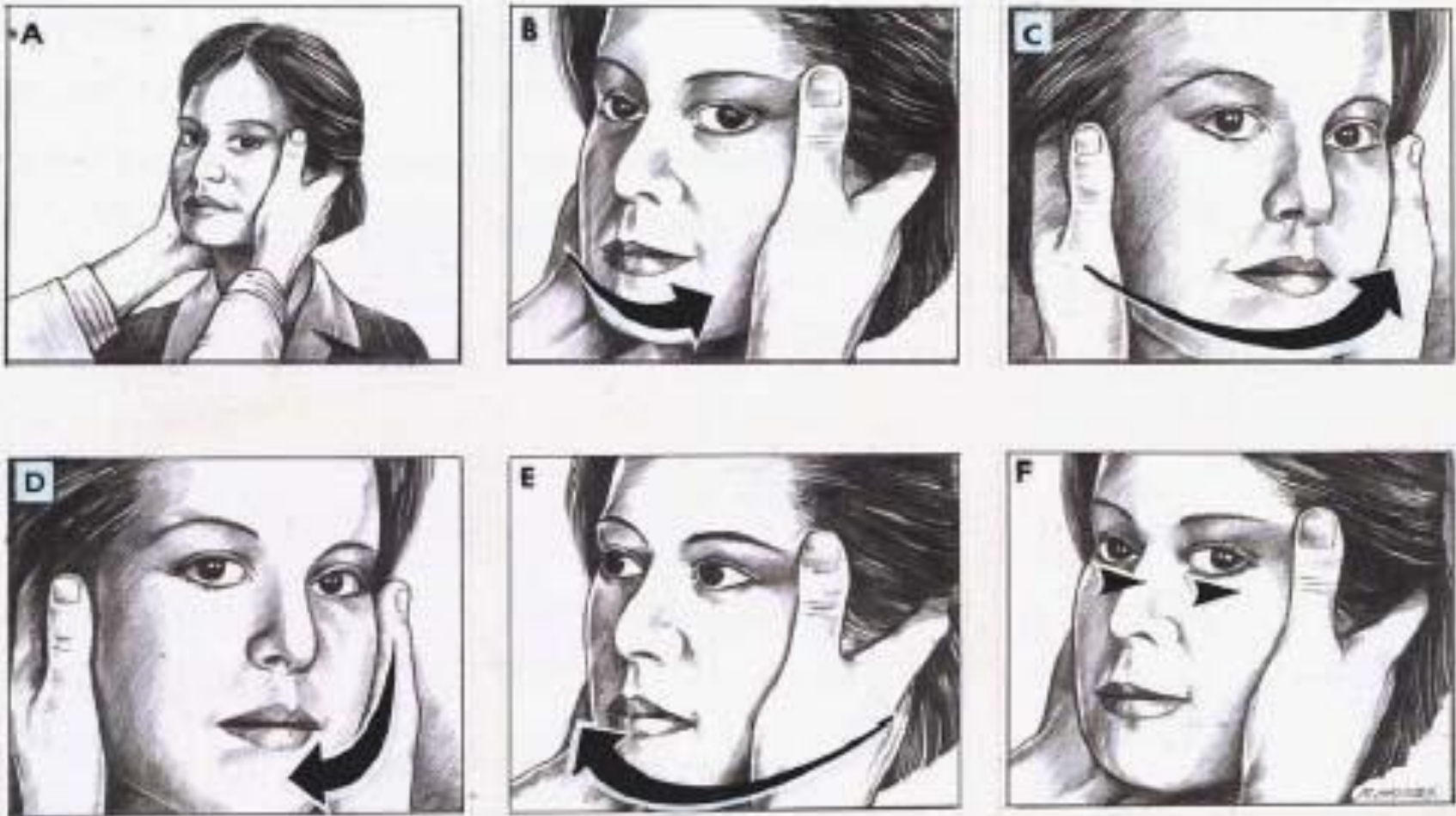


FACT

# Supine Roll Test



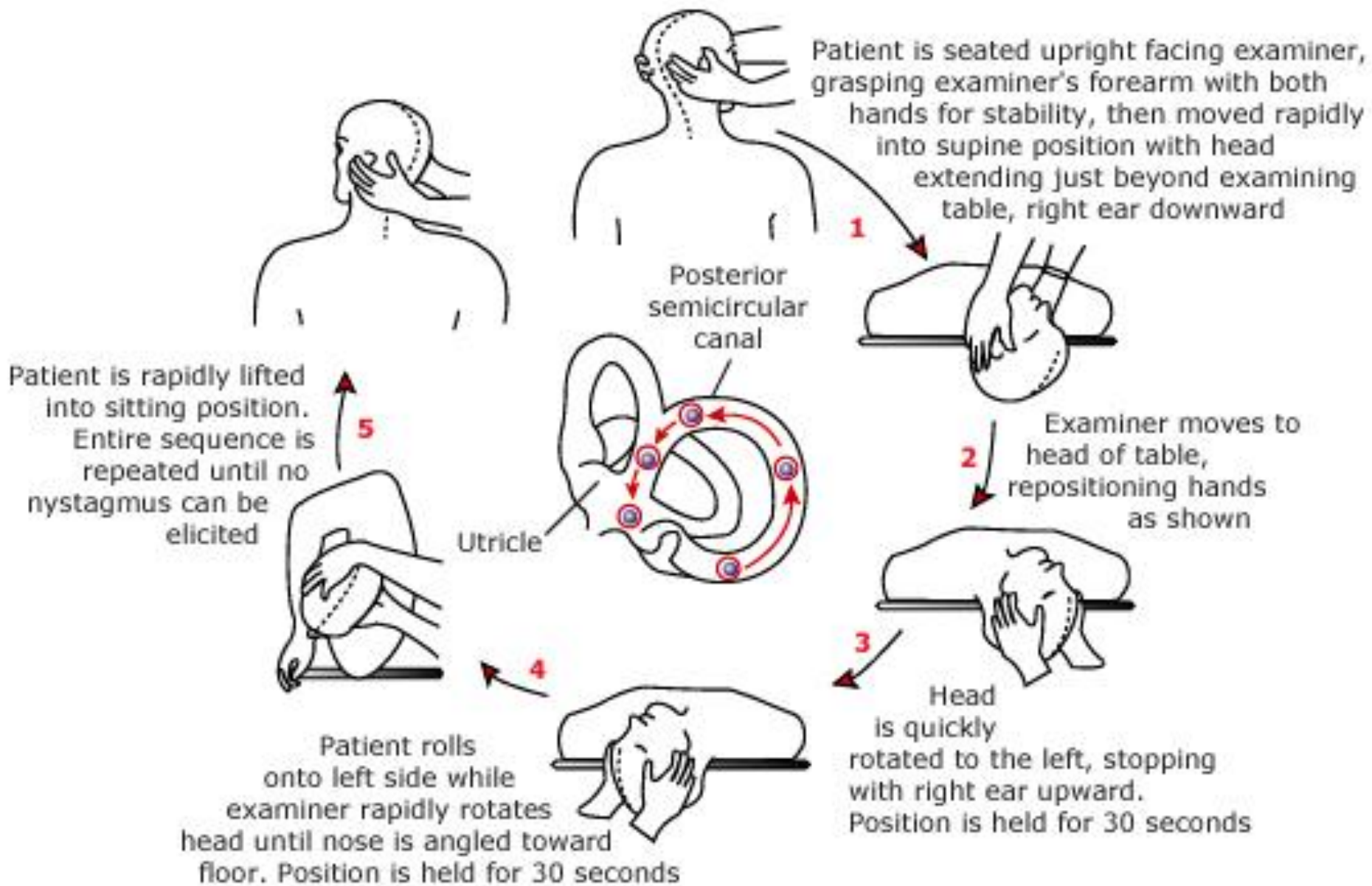
# Head Impulse Test

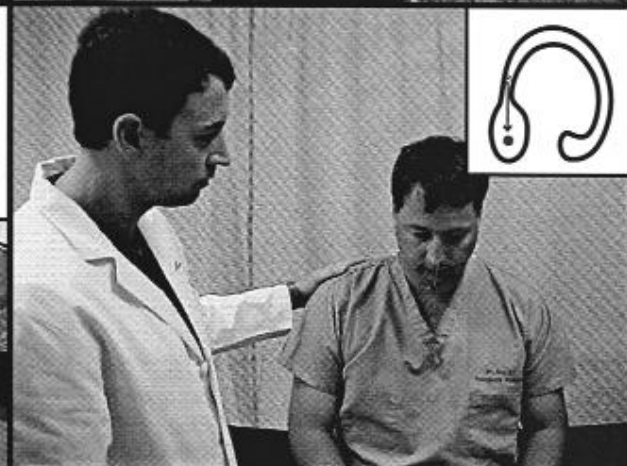
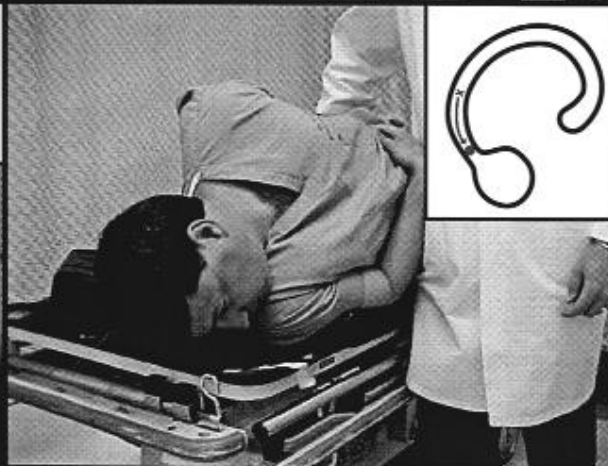
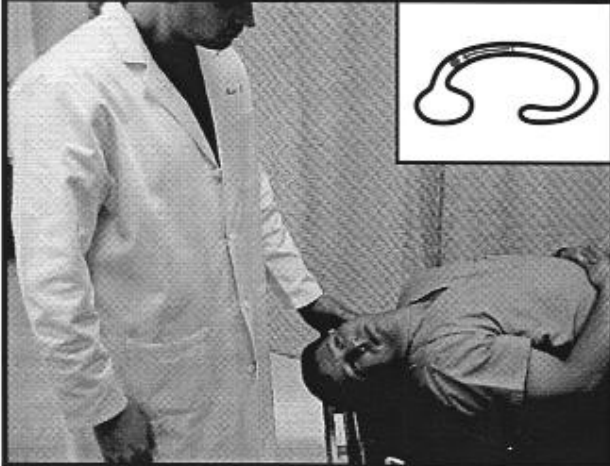
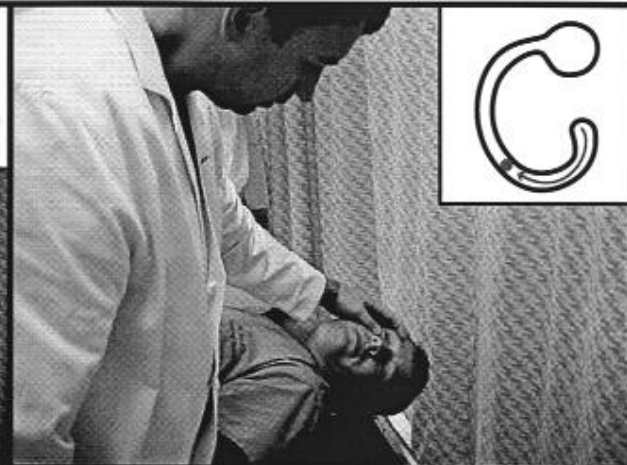
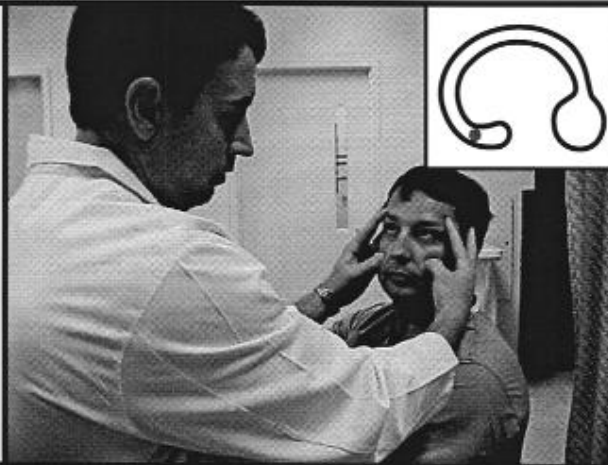
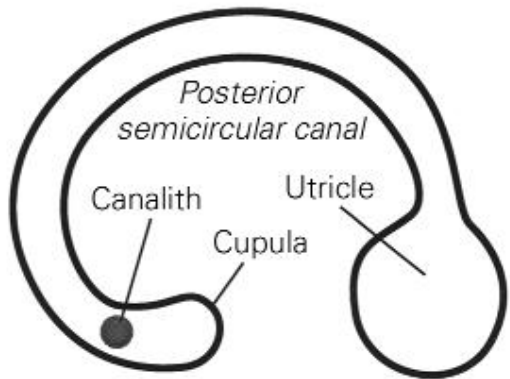


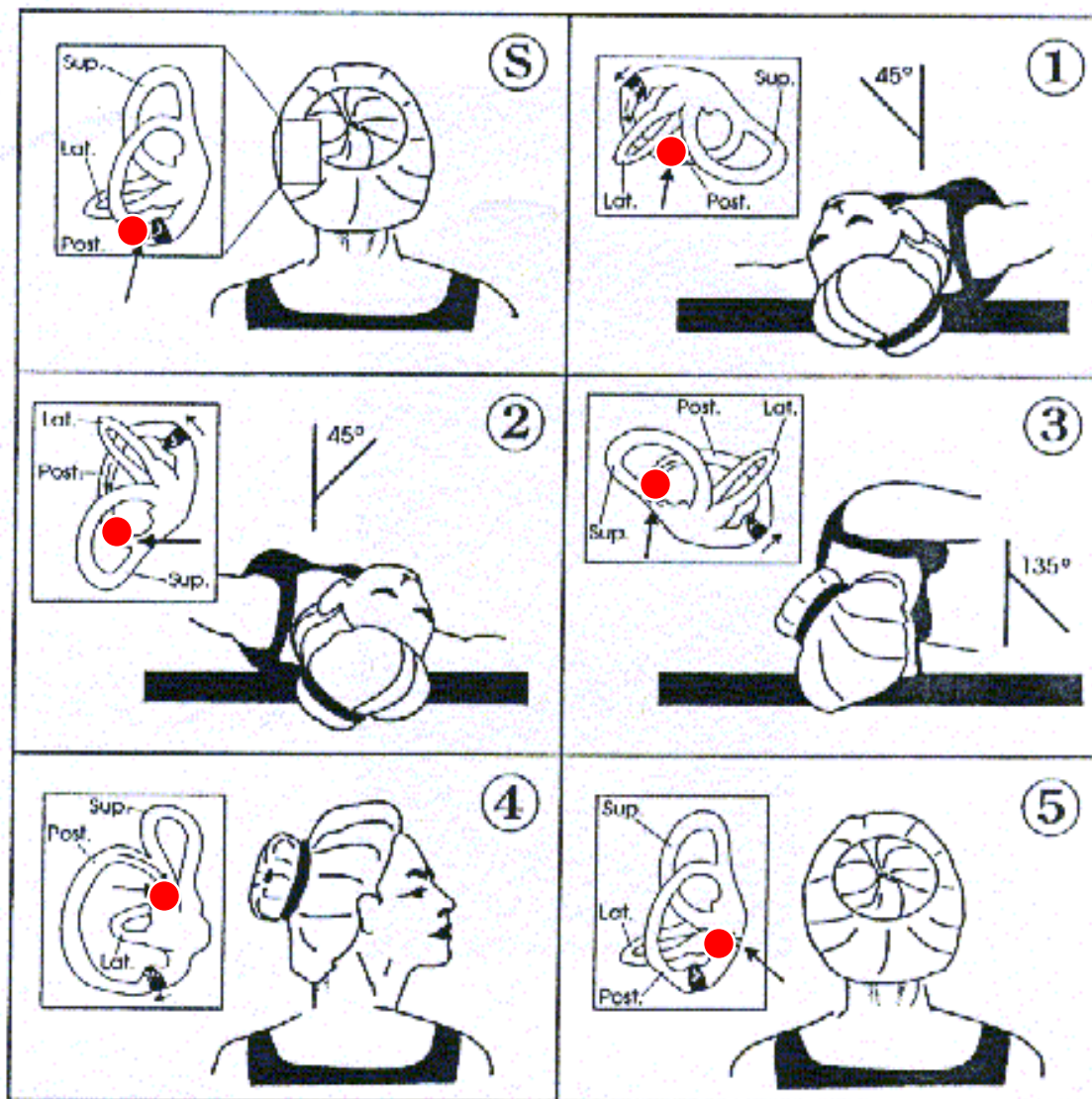
**Figure 3.** The head impulse test. The examiner turns the patient's head as rapidly as possible

# Repositioning Maneuvers

- Epley Maneuver
- Semont Manuever
- Log-Roll maneuver (barbeque maneuver)
- Brandt-Daroff Exercises
- (Cawthorne's Exercises)







**Figure 3.** Positioning sequence for left posterior semicircular canal, as viewed by operator (behind patient). *Box.* Exposed view of labyrinth, showing migration of particles (*large arrow*).

**S.** Start—patient seated (oscillator applied). **1.** Place head over end of table, 45 degrees to left. **2.** Keeping head tilted downward, rotate to 45 degrees right. **3.** Rotate head and body until facing downward 135 degrees from supine. **4.** Keeping head turned right, bring patient to sitting position. **5.** Turn head forward, chin down 20 degrees. Pause at each position until induced nystagmus approaches termination, or for T (latency + duration) seconds if no nystagmus. Keep repeating entire series (1–5) until no nystagmus in any position.

# Myth or Fact?

You can make a patient worse by doing the Epley maneuver.

# Myth or Fact?

You can make a patient worse by doing the Epley maneuver.



FACT

# Myth or Fact?

Patients have to stay upright for 48 hours after their repositioning maneuver.

# Myth or Fact?

Patients have to stay upright for 48 hours after their repositioning maneuver.



MYTH

# Myth or Fact?

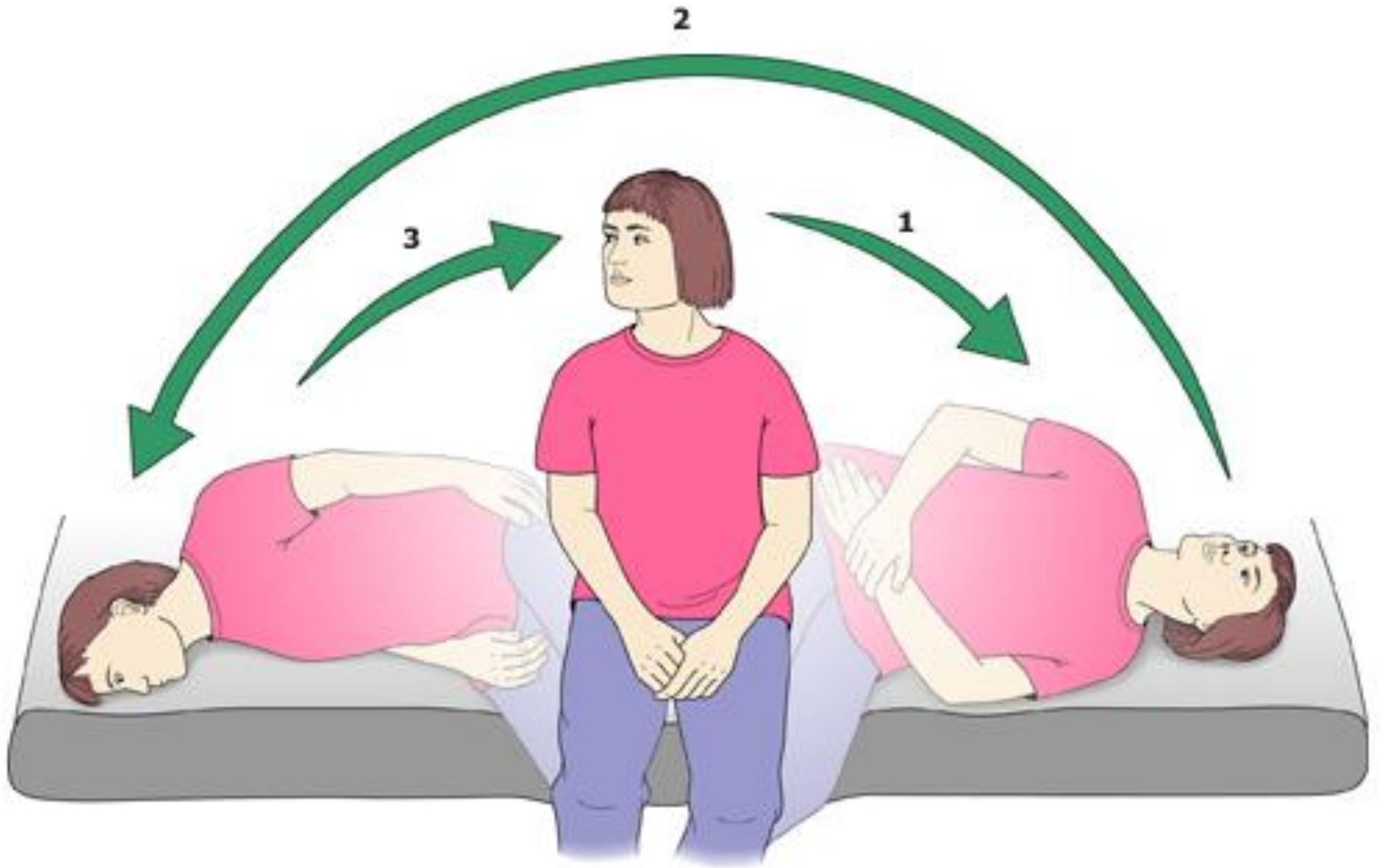
The Epley maneuver is better than the Semont maneuver.

# Myth or Fact?

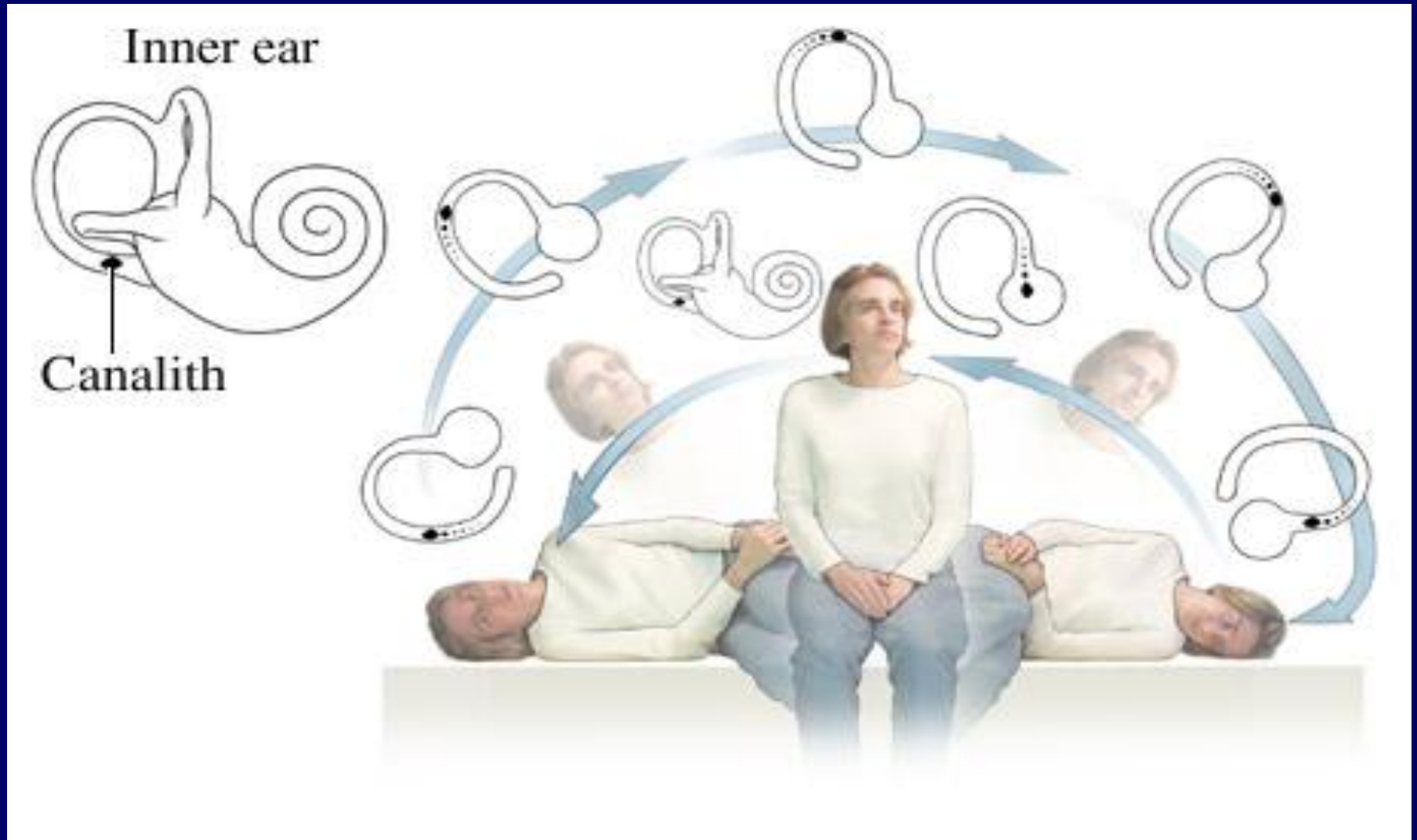
The Epley maneuver is better than the Semont maneuver.



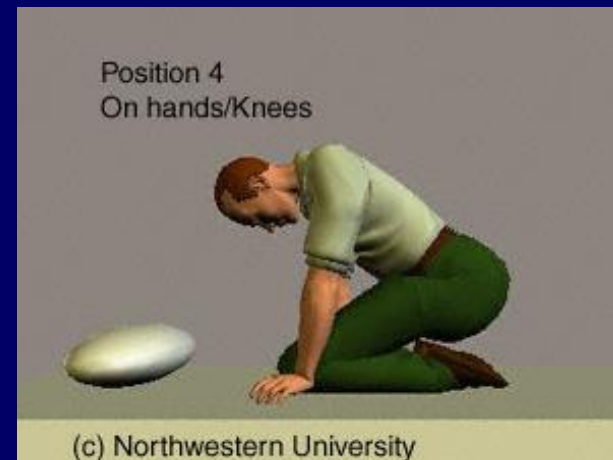
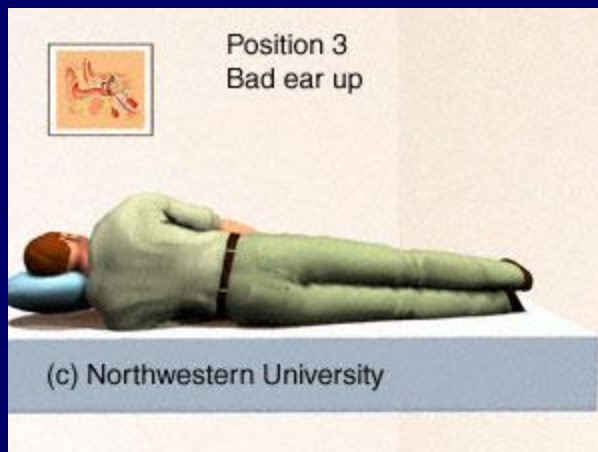
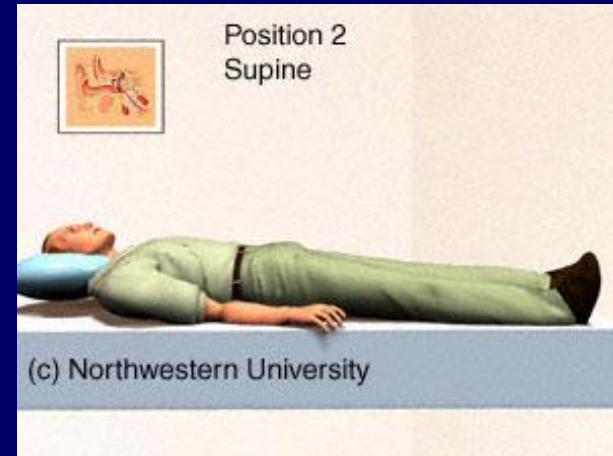
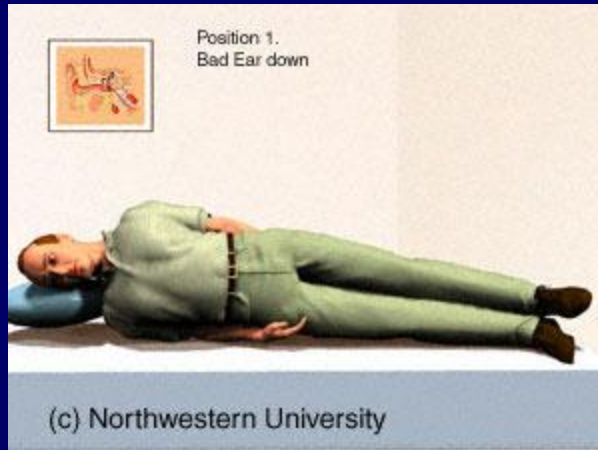
UNKNOWN



# Semont Maneuver



# Lempert Roll Maneuver



# Myth or Fact?

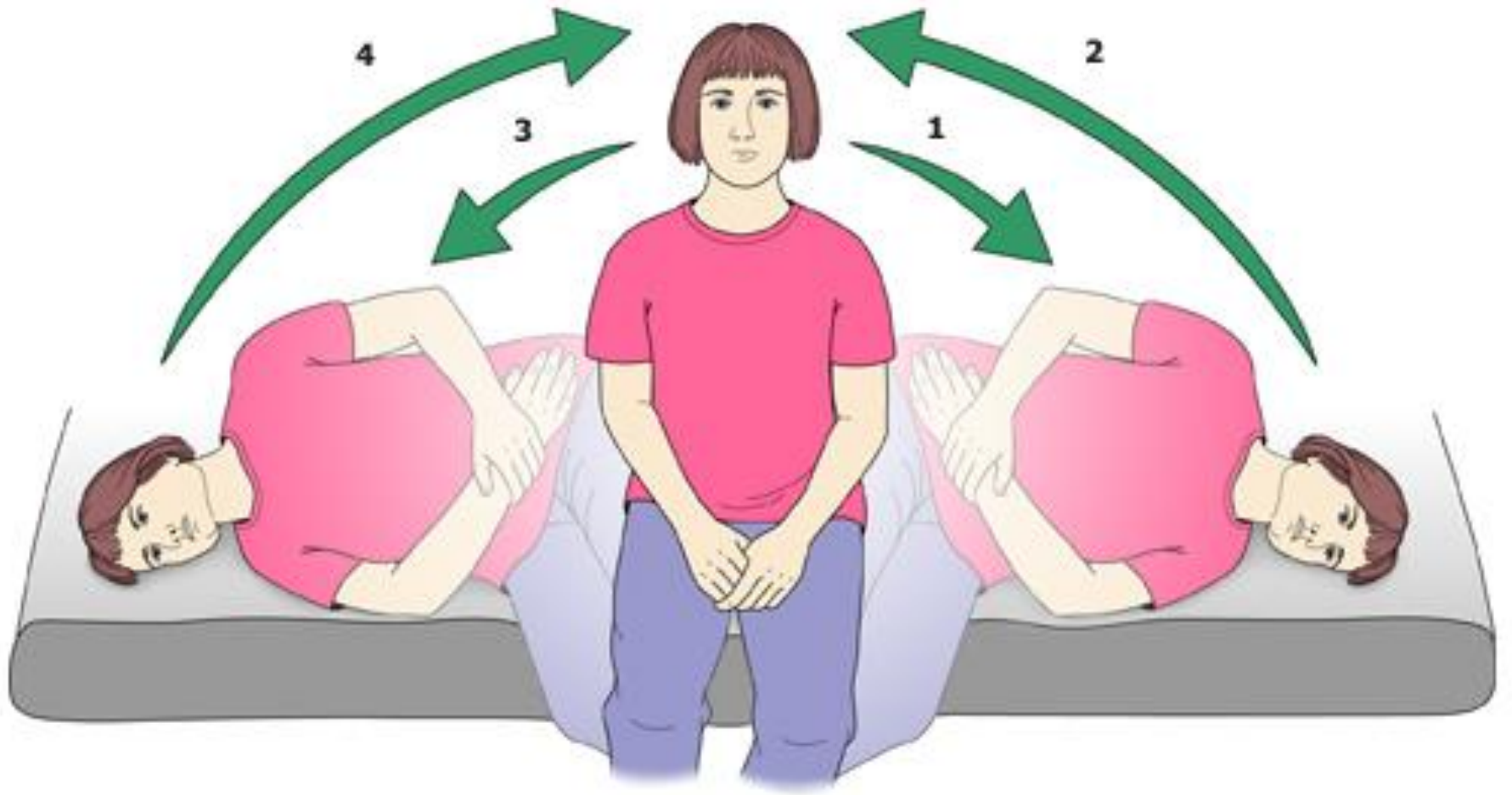
Patients can continue to do CRPs at home effectively.

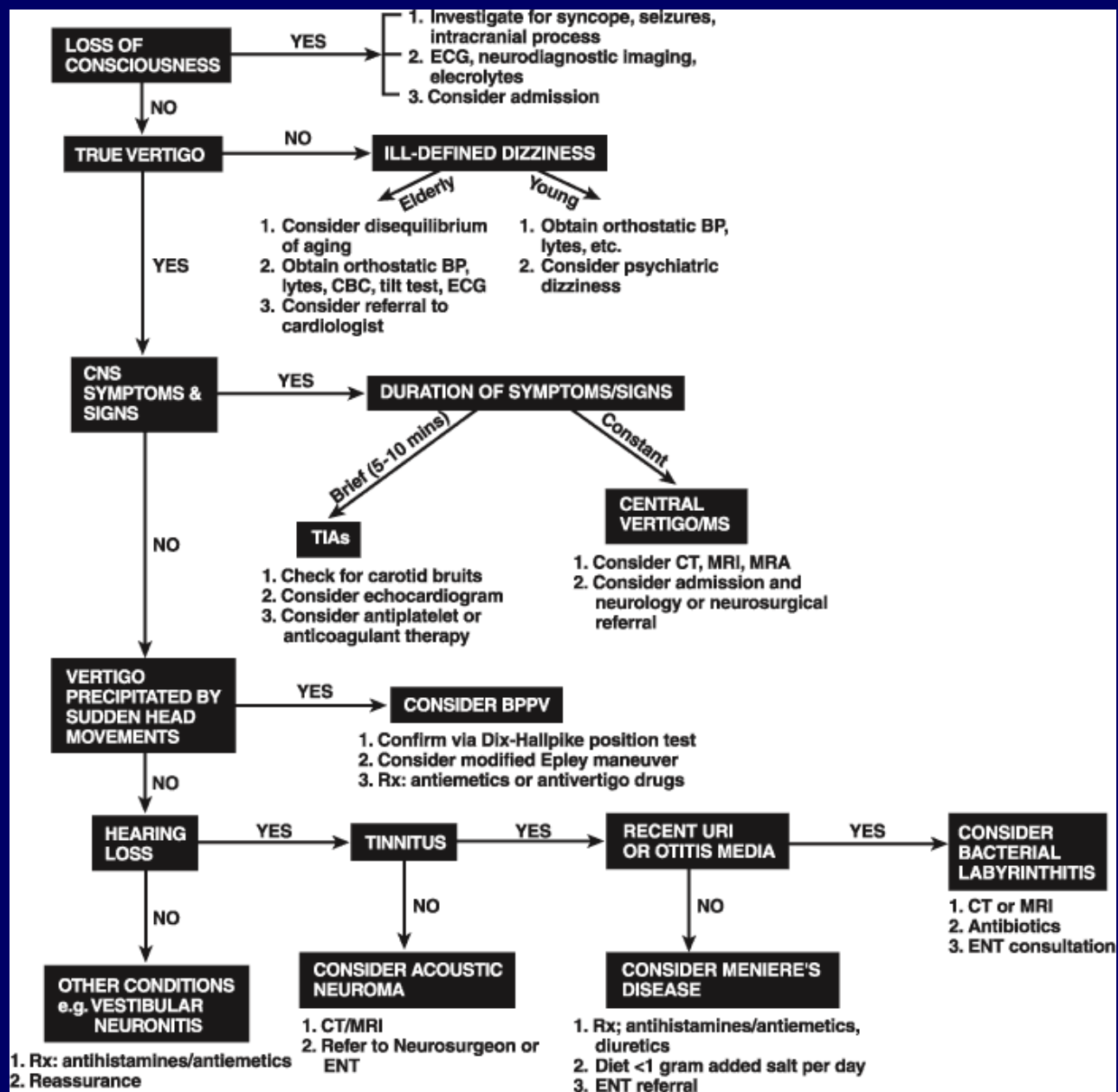
# Myth or Fact?

Patients can continue to do CRPs at home effectively.



FACT





Source: Tintinalli JE, Kelen GD, Stapczynski JS: *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*, 6th Edition: <http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

# Patient #3a

A 62 y/o pt presents with acute onset of vertigo associated with N/V x 4 hours. No other neurologic complaints or findings on exam except mild gait imbalance. No hearing changes or tinnitus.

# Patient #3b

A 62 y/o pt presents with acute onset of vertigo associated with N/V x 4 hours. No other neurologic complaints or findings on exam except mild gait imbalance. No hearing changes or tinnitus.

This patient also has a headache.

# Patient #4

58 y/o F with acute onset of vertigo 2 hours ago, also with hearing loss and tinnitus.

# Patient #5a

56 y/o F with dizziness which started when rolling over in bed. Her symptoms are only with turning her head, but not when looking up or down, or getting out of or into bed. Duration = 30 seconds.

# Patient #5b

56 y/o F with dizziness which started when rolling over in bed. Her symptoms are only with turning her head, but not when looking up or down, or getting out of or into bed. Duration = 30 seconds.

What if these symptoms were only with turning the head one direction?

# Patient #5c

56 y/o F with dizziness which started when rolling over in bed. Her symptoms lasted 5 minutes, and spontaneously resolved. This occurred one other time today, and did not seem associated with head position.

# Conclusions

- Characteristics of dizziness are equally as important as subjective description
- Central vs Peripheral vertigo
  - General rules
  - Cerebellar infarct / hemorrhage vs VN
  - Labrythine infarct vs Meniere's
- Admit bacterial labrynthitis
- Use CRPs instead of meds for BPPV