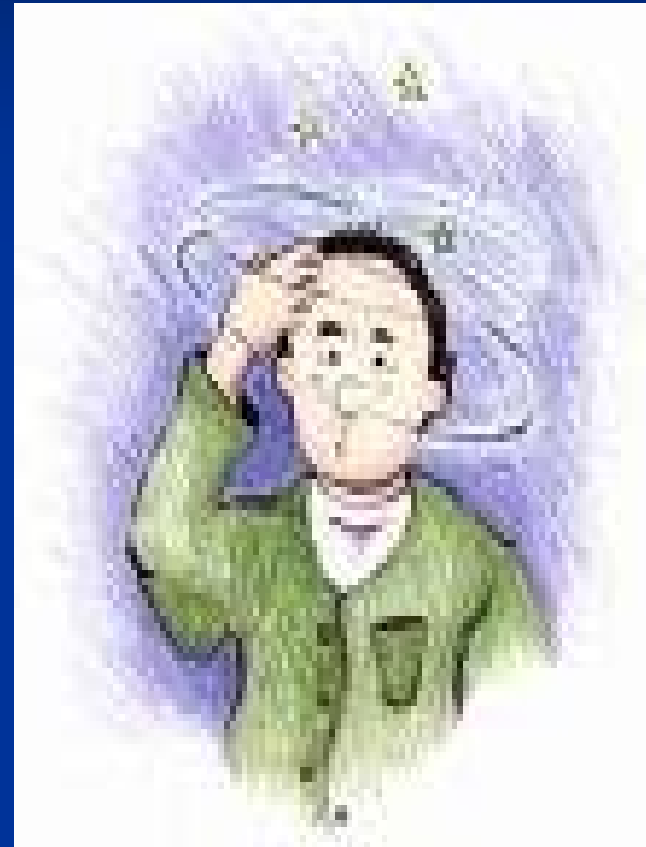


Evaluation of Vertigo

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Vertigo

- The hallucination of movement
- Typically described as a spinning and circling sensation
- This generally reflects an abnormality of peripheral and or central vestibular pathways.



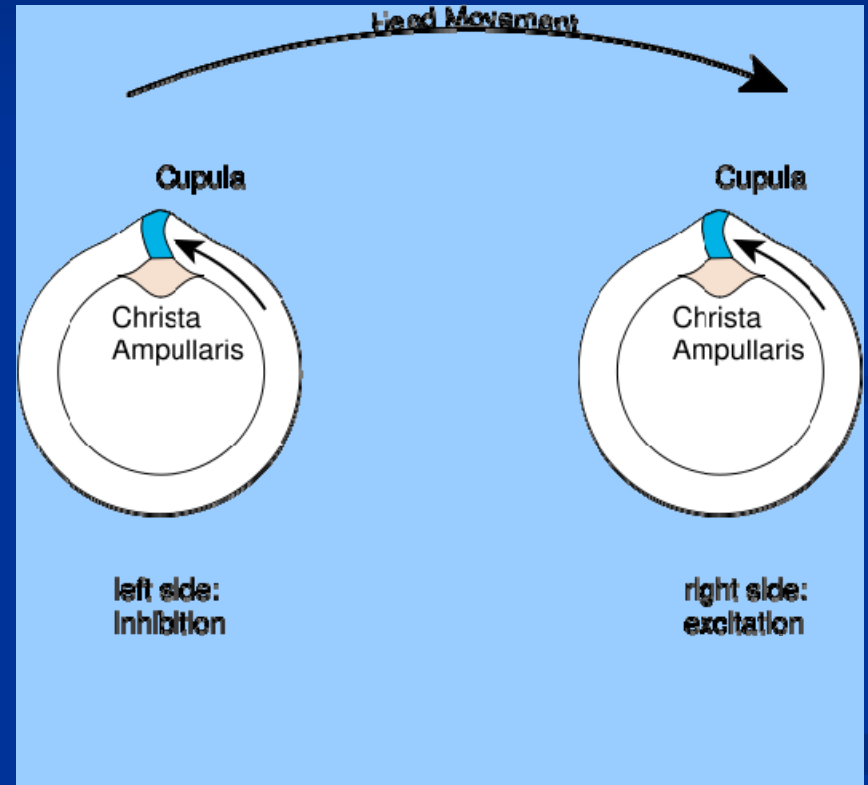
Dizziness

- An altered sense of well being
 - Light headedness, giddiness, floating, weakness, difficulty concentrating



Physiology

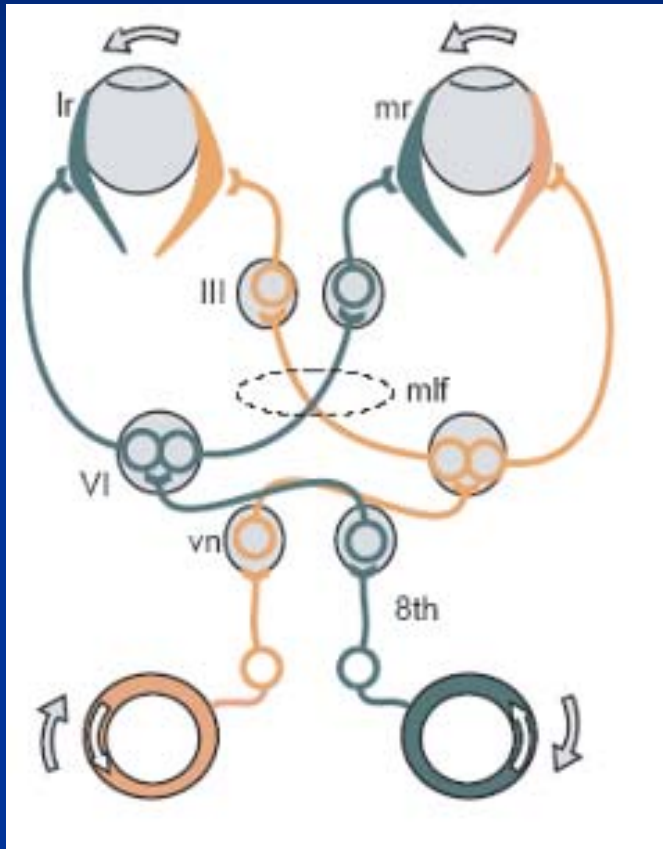
- Vestibular information provided through linear (Otolithic) and angular (semicircular) acceleration receptors of the inner ear.
- Impulses from the inner ear synapse with central vestibular nuclei of the brainstem and form specific second-order vestibulospinal tract (VST) and Vestibulocerebellar (VCT) tracts and the VOR Vestibulo-ocular-reflex.



VOR

- The vestibular system, allows crisp clear vision by compensating for head movements almost immediately.
- To achieve this , signals from the semicircular canals are sent in a fairly direct route to the extra ocular muscles via a three neuron arc.
- Via these direct connections, eye movements will lag head movements by less than 10ms in a healthy individual.

Vestibulo-ocular reflex (VOR)



- Three Neuron Arc.
- During a head movement to the right, 8th cranial nerve from the vestibular nerve system to the vestibular nuclei Vn in the brainstem to the V1 abducens nucleus. The mlf projects then to the III oculomotor nucleus. The left lateral rectus lr, and right medial rectus mr, contract turning the eyes to the left.

Classification of Dizziness

- Psychogenic
- Nonvestibular organic
- Vestibular causes

History

- 90% of vertigo diagnosed by history alone.
- Physical exam
- Diagnostic testing
- Imaging
 - Useful adjuncts at times to the history

History

- Attacks of true vertigo from the peripheral vestibular system tend to be described crisply with a clear
 - onset,
 - Duration
 - Associated symptoms
 - Aggravating, alleviating factors

History

- Associated symptoms suggestive of inner ear disease
 - Hearing loss
 - Tinnitus
 - Aural pressure or fullness

History

- Central nervous system disorders causing vertigo: look for associated focal deficit
 - Dysphagia
 - Diplopia
 - Paresies, paresthesia
 - Incontinence
 - Loss of Consciousness (rule out cardiac arrhythmia)
effects of medications

History

- Psychogenic dizziness
 - Long meandering history
 - Difficult to decipher
 - Associated depression or anxiety

Physical Exam

- Otoscopy
- Cranial nerve assessment
- Oculomotor testing
- Cerebellar tests
- Special tests: look for Tullio phenomenon, or Hennebert sign
- Presence of nystagmus

Testing

- Complete Audiogram
- ENG: Electronystagmography
- ABR
- Imaging: MRI, CT
- ECOG

Five common causes of peripheral vestibular dysfunction

- Menieres disease
- Benign positional vertigo
- Vestibular neuronitis
- Recurrent vestibulopathy
- Acoustic neuroma



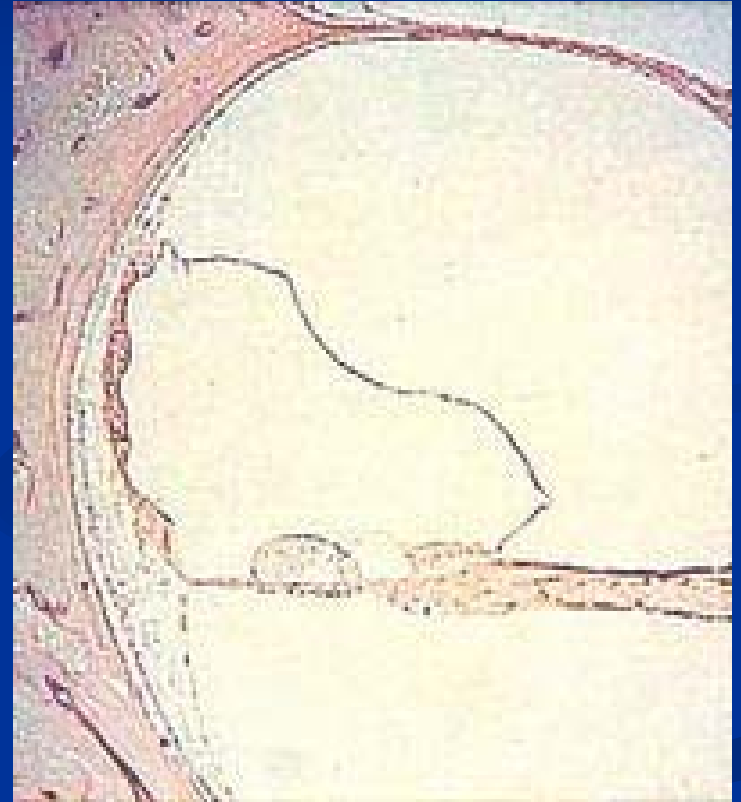
Meniere's Disease



- Vertigo lasts minutes to hours
- Associated tinnitus and/or aural fullness at the time, or preceding the vertigo
- Fluctuating low frequency sensorineural hearing loss

Menieres Disease

- Treatment: Diet
- Medication Serc, HCTZ, Supportive, medical ablation of vestibular labrynth.
- Surgical: Singular Neurectomy, labrinthectomy
- remember; 50% of patients will develop bilateral disease
- 80% of pateints will get better with medical therapy.

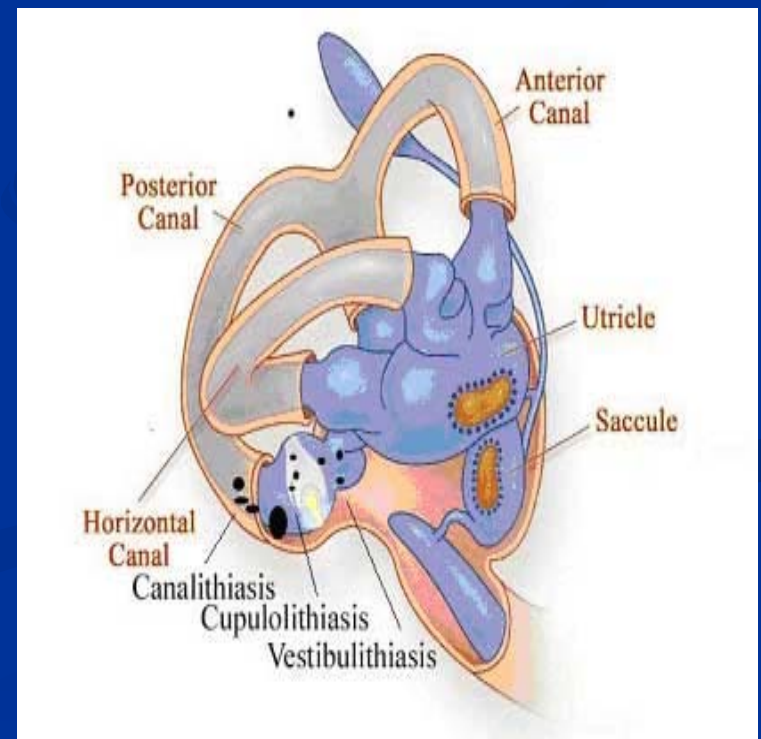


Recurrent Vestibulopathy

- Vertigo lasts minutes to hours.
- No associated otologic symptoms
- No hearing loss

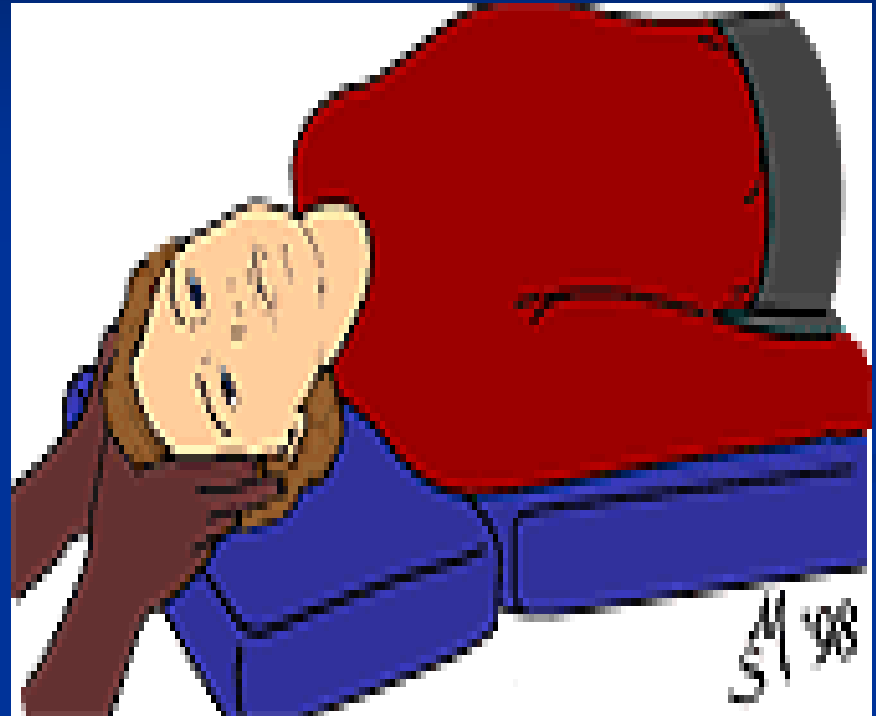
Benign positional vertigo

- Vertigo lasting several seconds
- No associated otologic symptoms
- Positional
- Paroxysmal.
- Fatigueable
- Treatment: repositioning maneuver, Brandt exercises, posterior semicircular canal occlusion.



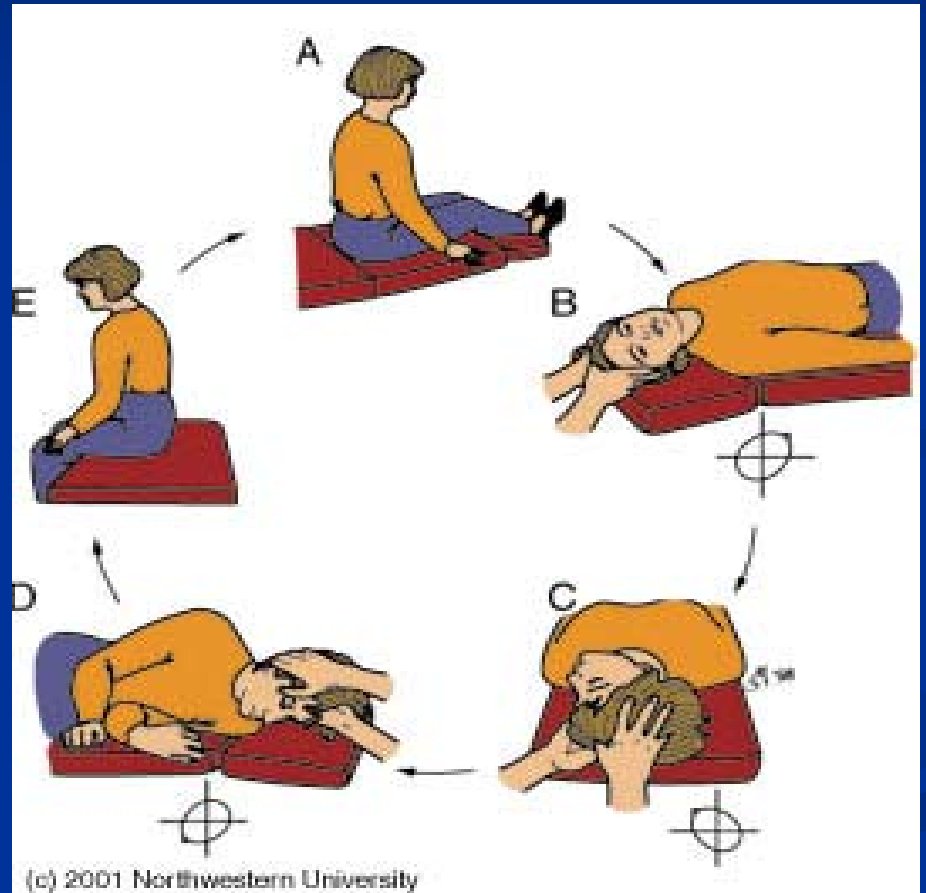
BPPV Diagnosis

- Hallpike Maneuver
- Lay the patient with head 45 degrees from the earth vertical plane, and 30 degrees to the affected side.
- There will be a geotropic nystagmus seen lasting for 5-30 seconds



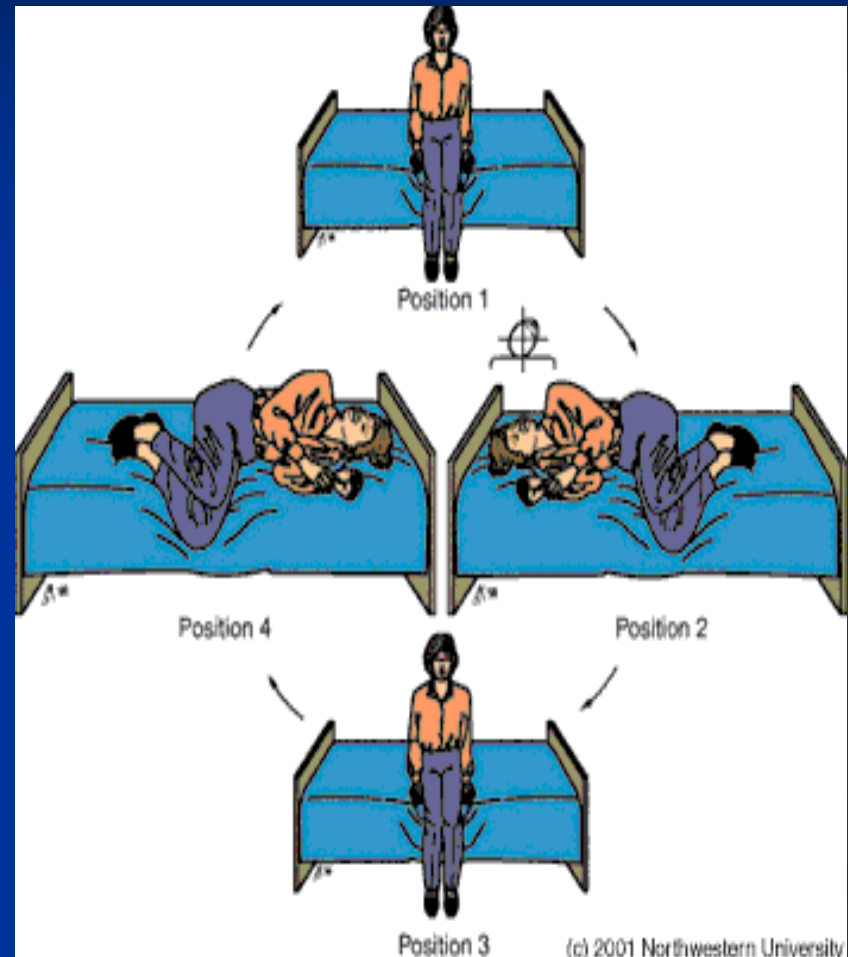
BPPV Treatment

- Particle Repositioning maneuver



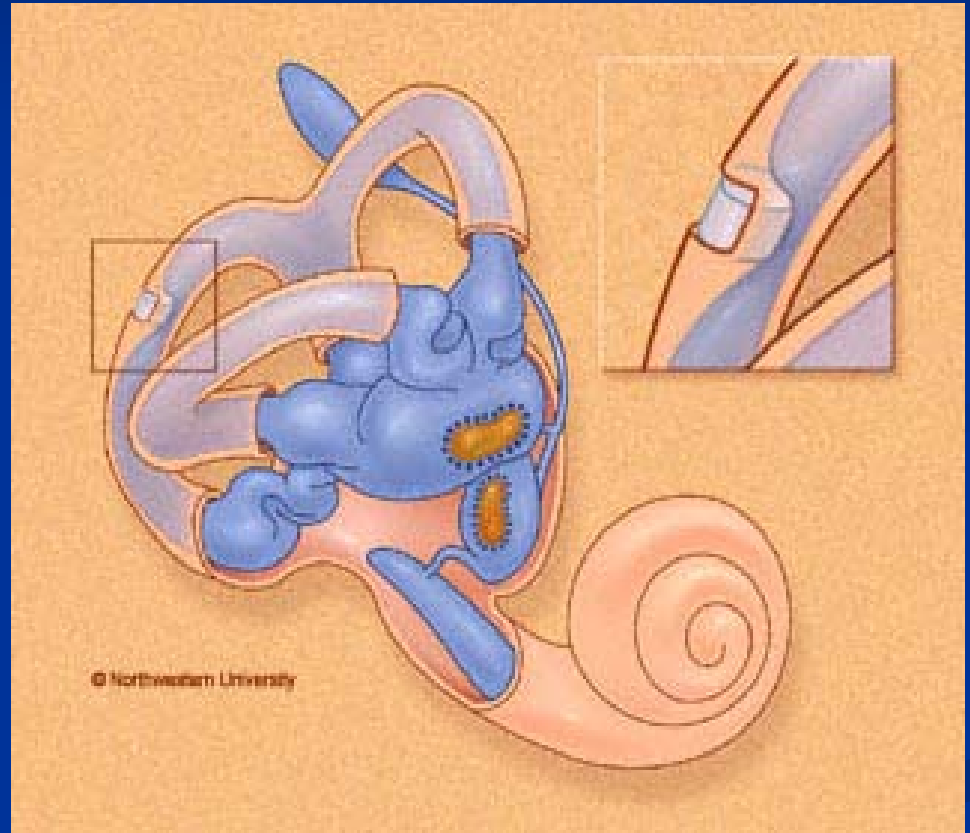
BPPV Treatment

- Brandt Exercises.
- Do up to three times per day, each taking up to five minutes.
- For recurrent disease.
- Patients who can't tolerate the repositioning maneuver
- Up to ten percent will recur in a year.



BPPV Treatment

- Posterior Canal Occlusion



Vestibular Neuronitis

- Vertigo is intermittent lasting for days , and rarely weeks
- Imbalance can take up to 6 months to resolve. Will occasionally be permanent.
- Generally no associated otologic symptoms.
- Treatment: supportive.

Acoustic Neuroma

- Patient complains of imbalance
- No rotational illusion
- Associated hearing loss, and tinnitus, are progressive
- treatment: observation, surgical excision, Gamma Knife.



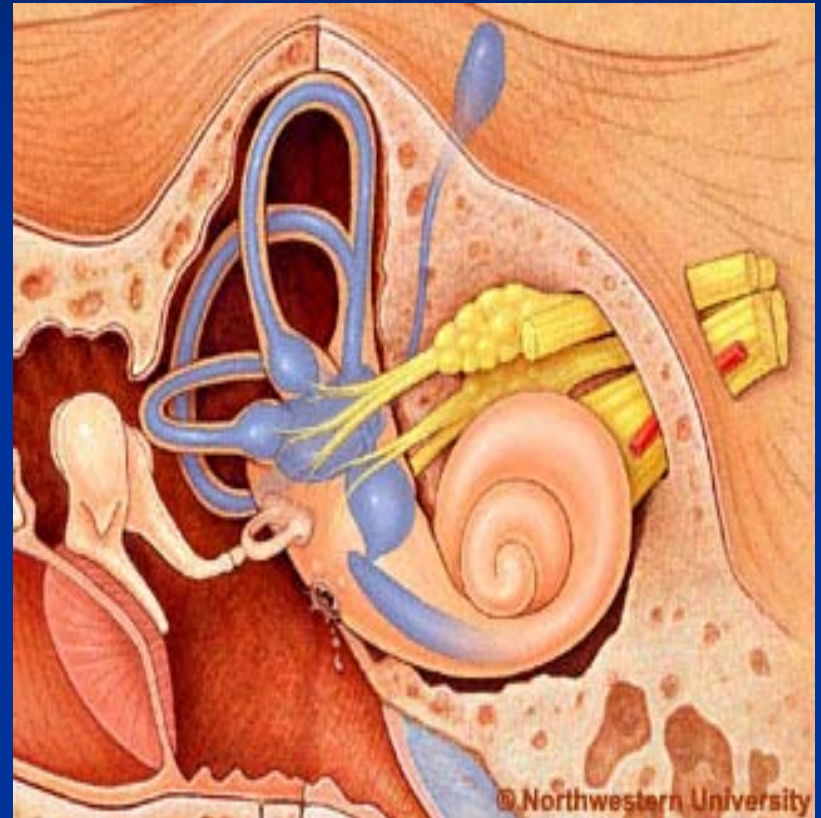
Traumatic Vertigo

- Diffuse Axonal injury
- Perilymphatic fistula
- Concussive labyrinthitis
- Cervical Vertigo
- Secondary benign positional vertigo is common.
- Psychogenic dizziness
- Temporal bone fracture



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Psychogenic vs Organic vestibular Dizziness

Feature	Organic Vestibular	Anxiety
Duration	Seconds, minutes or hours	Variable , from a flash to days or months
Frequency	Except for BPPV, rarely more than once a day	Constant or several times per day
Head movement	Intensifies symptoms	Symptoms usually not affected to any degree
Ataxia during spell	Usually prominent	Insignificant
Effect of hyperventilation	Not like the attack	Often reproduces symptoms of the attack.

When to Refer?

- The problem seems to be peripheral in nature, and requires further testing, or treatment
- To confirm a diagnosis.
- Patient request
- Asymmetric hearing loss
- Persistent unilateral tinnitus