



Assessing the Deaf & the Dizzy

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Overview

- Severe & profoundly deaf children & adults
- Neonatal screening
- Paediatric testing
- Adult cochlear implant candidates
- Sudden sensorineural hearing loss
- Dizziness
 - “Types of dizziness”
 - “Best guesses”
 - BPPV



PAEDIATRIC SENSORINEURAL HEARING LOSS

Paediatric Sensorineural Hearing Loss



- Congenital SNHL: 1.3-2.3 /1000 children
 - 50%: Genetic
 - 25%: Environmental
 - 25%: Sporadic
- In 2005 58% of deaf children born in NZ had no risk factors for SNHL
 - Majority non-syndromic autosomal recessive genetic

Acquired Paediatric Sensorineural Hearing Loss



- Maternal infection
 - T Toxoplasmosis
 - O Other (Hep B, Syphilis, VZV, HIV, Parvovirus B19)
 - R Rubella
 - C Cytomegalovirus
 - H Herpes Simplex
- Neonatal ICU child
 - Prematurity <32 weeks
 - Hypoxia
 - Low birth weight
 - Jaundice
 - Neonatal meningitis

Diagnosing Paediatric Sensorineural Hearing Loss



- Objective
 - Auditory Brainstem Response (ABR)
 - Able to do from birth, asleep child under GA
 - Gold standard
 - Time consuming, skill required for interpretation
- Subjective
 - Distraction testing
 - Conditioned Orientation Response (COR) testing
- Screening
 - Automated ABR
 - Otoacoustic emissions

Managing Paediatric Sensorineural Hearing Loss



- Attempt aetiology diagnosis
- Ophthalmology + Paediatric + Genetic review
- Family support
 - Advisor on Deaf Children
- Collaboration between
 - Parents, Advisor, Paediatrician, Audiologist, GP & Ophthalmologist
- Hearing Aids +/- Cochlear Implantation

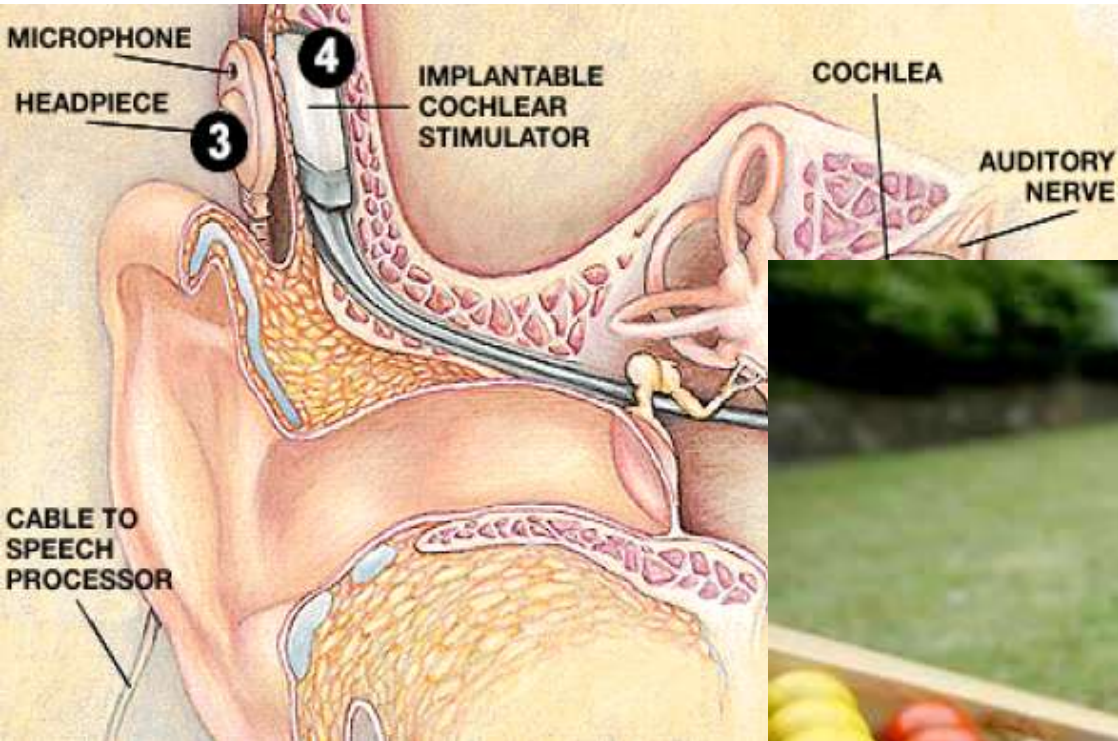
Managing Paediatric Sensorineural Hearing Loss



- Early identification is key – Diagnose <1 month
 - Newborn screening & Parental concern
- Window for speech & language development
 - 12 – 18 months: Single words
 - 3 years: Speaking in sentences
- Hearing Aids by 3 months
- Cochlear Implantation before 1 year if Hearing Aids not effective



Cochlear Implantation





Paediatric SNHL Key Points

- Urgency
- Always act on parental concern
 - Refer for ABR
- Screening = just that
- “Glue ear” is not the only cause of hearing loss
- All kids ex-NICU are at greater risk of SNHL



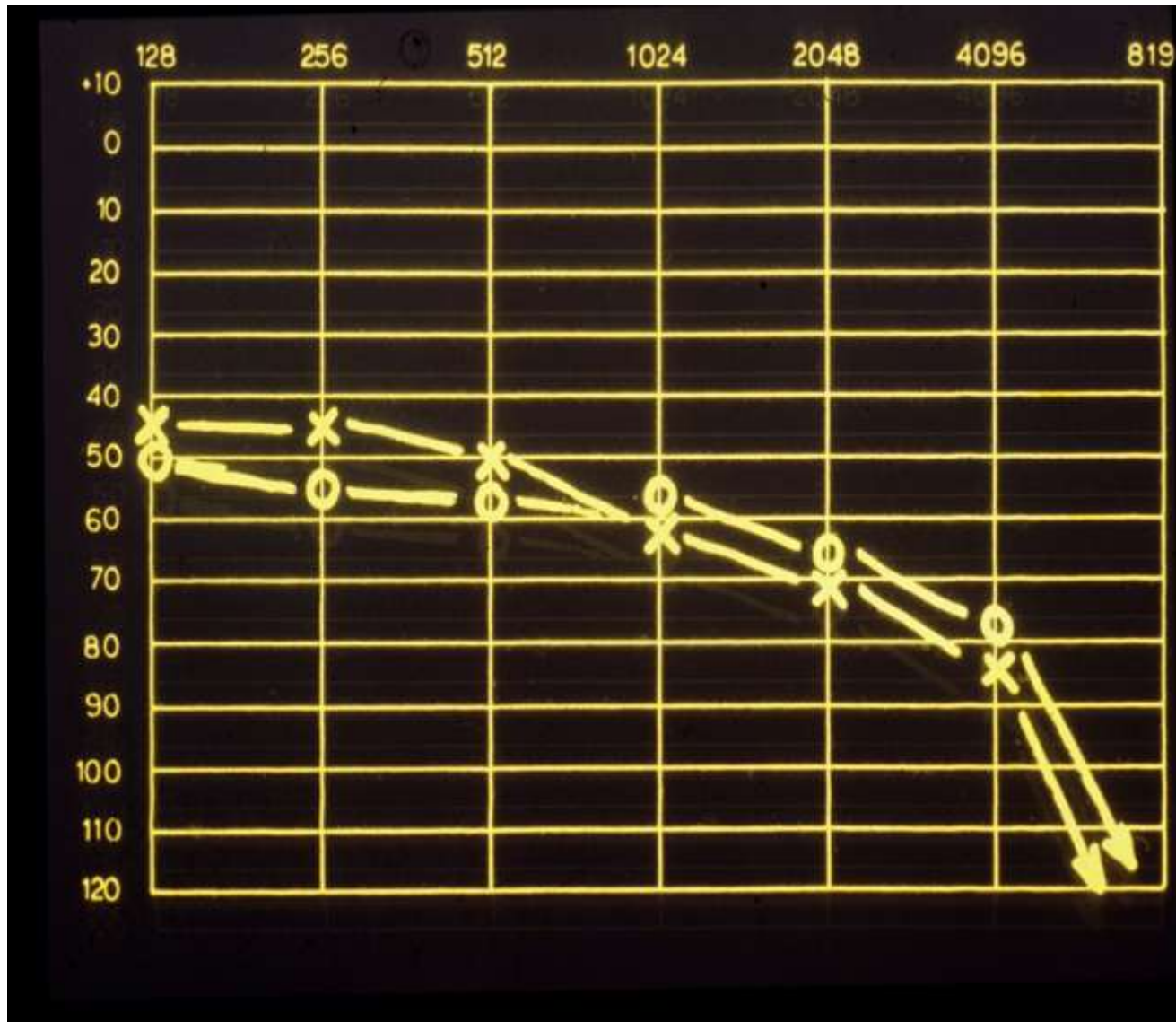
ADULT SENSORINEURAL HEARING LOSS

Adult Sensorineural Hearing Loss



- Post-lingual population
- Most common cause = PRESBYACUSIS
 - “Old age hearing loss”
 - Symmetrical, down sloping, high-frequency SNHL

Presbycusis

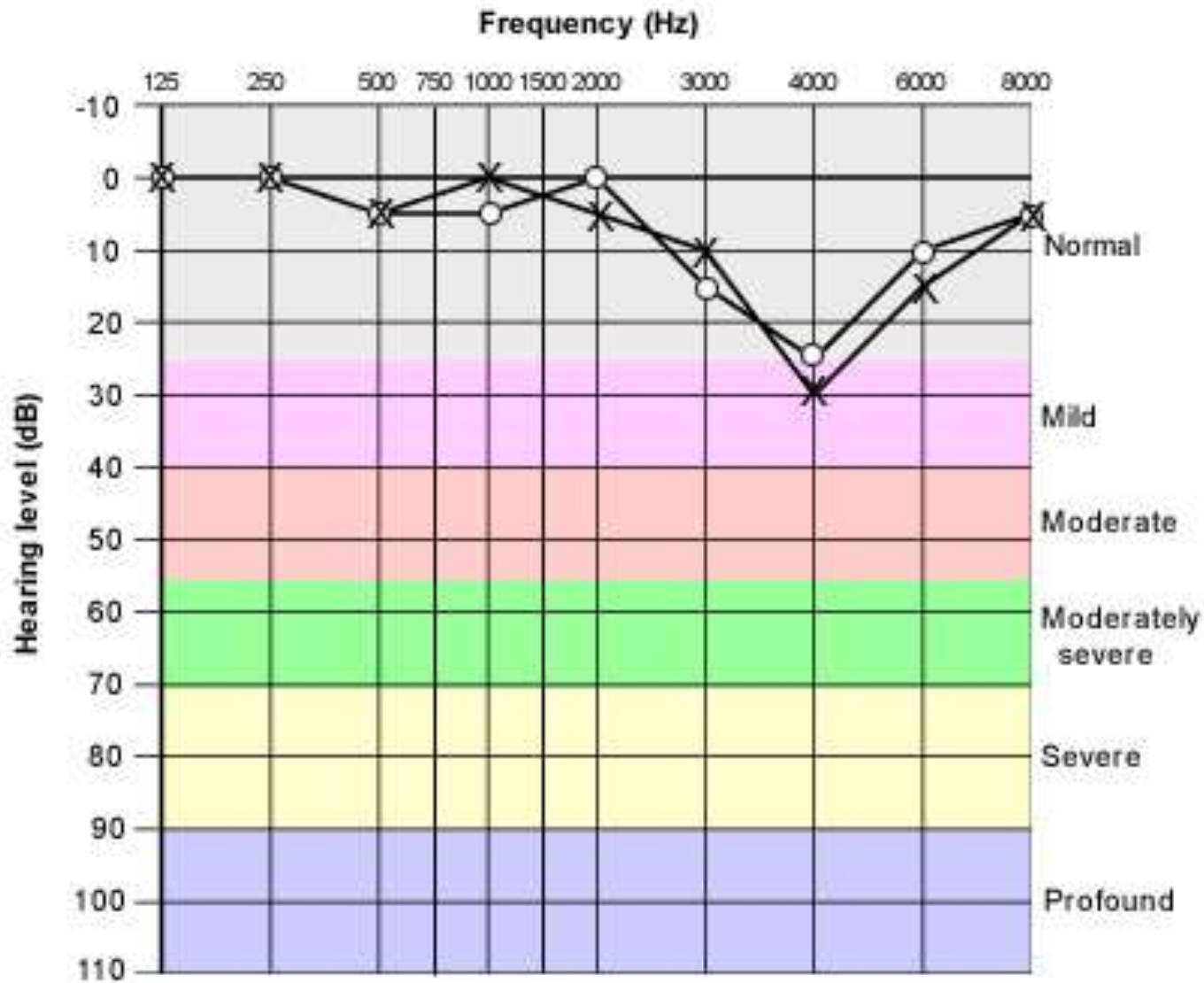


Noise-Induced Hearing Loss



- Exposure to high intensity continuous noise with bursts of energy
- Noise dose = Intensity x Time
 - Increase of 3dB doubles sound intensity
- Occupational exposure → ACC implications
- Hearing aids useful but expensive

Noise-Induced Hearing Loss



Sudden Sensorineural Hearing Loss



- Idiopathic
 - ?Viral
 - ?Vascular
 - ?Membrane break
- Evidence base for treatment not strong **but requires early referral – within days**
- Steroids
 - Systemic
 - Topical to middle ear space
- Can be a presentation of acoustic neuroma

Unilateral Sensorineural Hearing Loss



- Vestibular schwannoma (Acoustic neuroma)
 - Benign peripheral nerve sheath tumour
 - Slow growing
 - MRI diagnosis in persistent idiopathic asymmetric SNHL

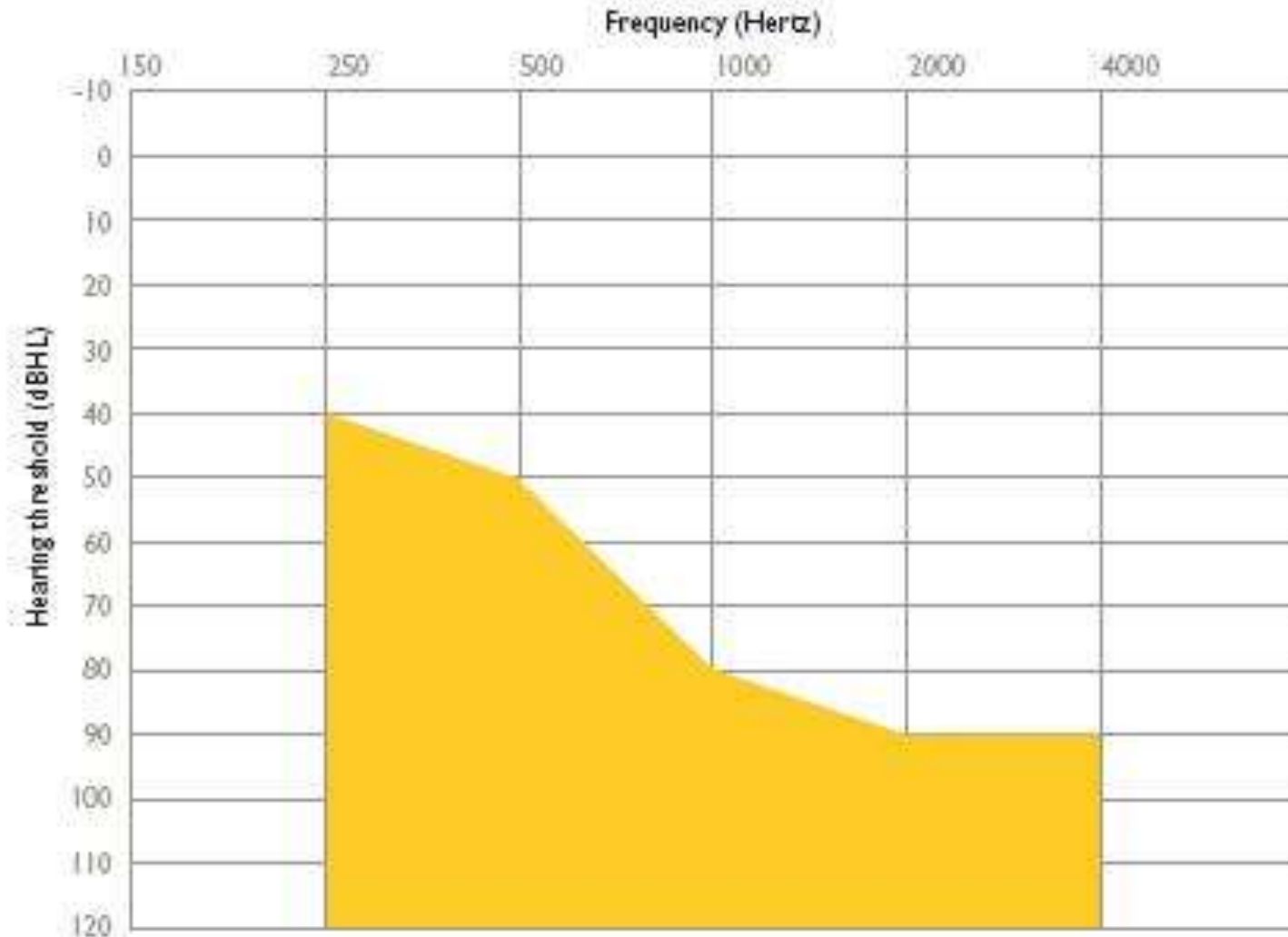
- Active intervention in selected patients
 - Surgery / Radiotherapy
 - ?Die with vs die of
 - Symptoms

Is the Patient a CI Candidate?



- Oral vs signing
- Profound loss in high frequencies
- Not coping without lip reading, off telephone
- Age not necessarily contraindication

Unaided Pure Tone Thresholds Suggesting CI Candidacy



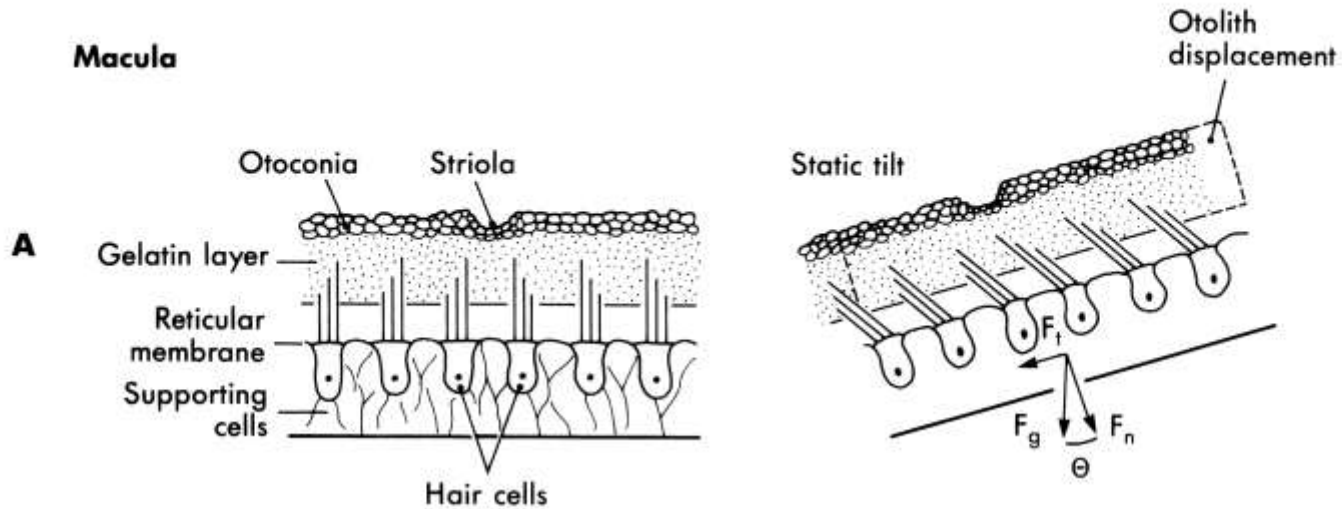


“DIZZINESS”

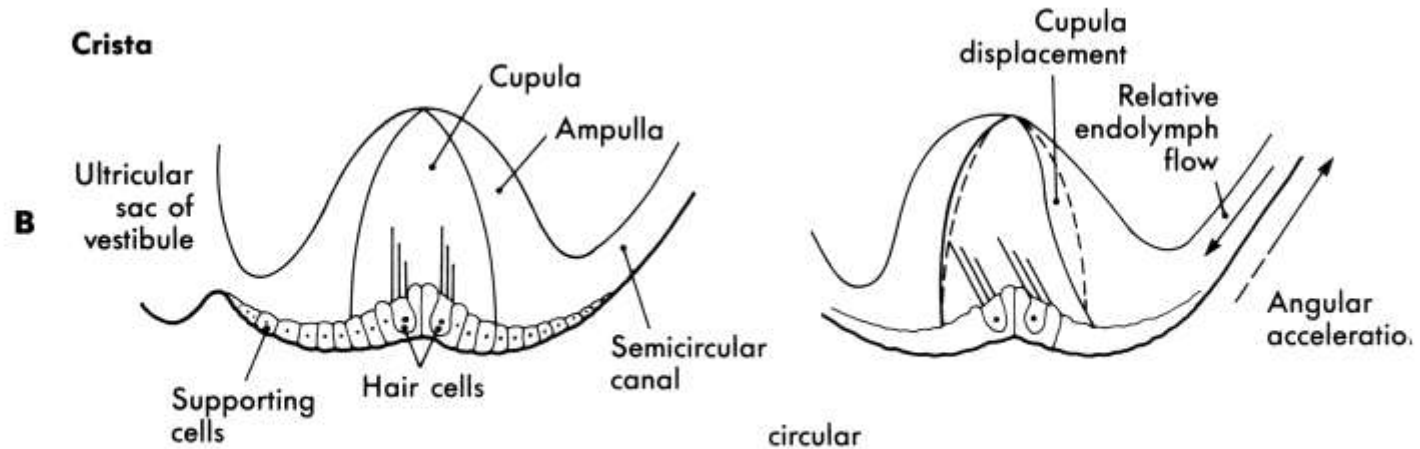
Vestibular Organs



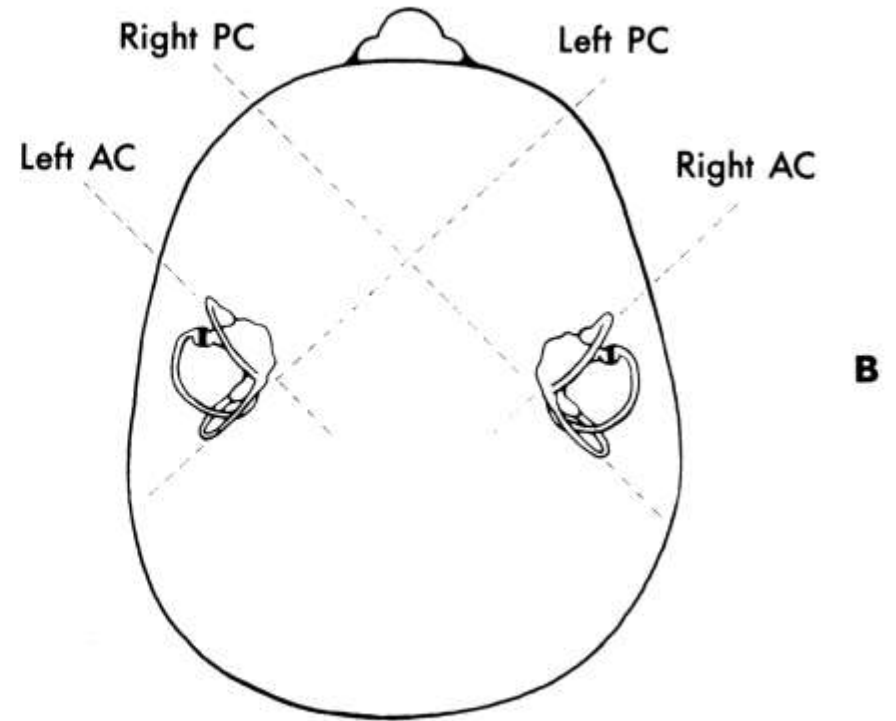
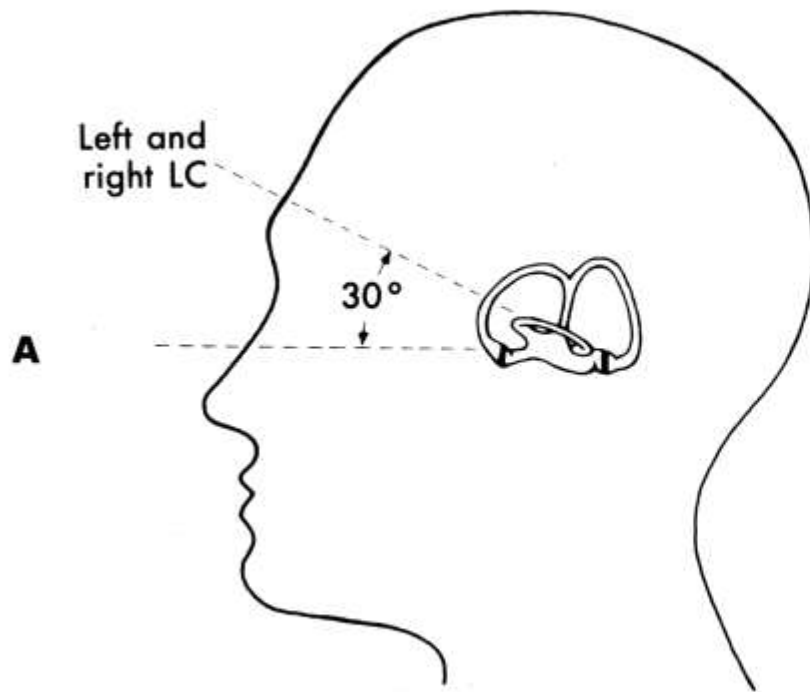
Macula



Crista



Semicircular Canals





Definition

Vertigo

- an illusion of **movement**

Unsteadiness/Imbalance

- a feeling that one might fall

Pre-syncope

- a feeling that one may lose consciousness

Dizziness is not a medical term



The History

Critical in diagnosis

- (1) What form of “dizziness”?
- (2) How long is each episode of vertigo?
 - seconds
 - minutes to hours
 - days



Duration of Vertigo

Seconds	Minutes to hours	Days
BPPV Uncompensated Vestibular hypofunction	Endolymphatic hydrops - idiopathic = Ménière's - secondary –syphilis, Cogan, delayed - “vestibular Ménière's” “recurrent vestibulopathy”	Vestibular neuronitis

Neuro-otologic Examination



- otoscopy
- tuning forks , whisper
- eye movements
- cranial nerves especially 3-12
- cerebellar tests
- Romberg/Tandem
- Unterberger Stepping Test
- Head-thrust test
- Head-shaking nystagmus
- Hallpike test

Benign Paroxysmal Positional Vertigo



- Most common of all peripheral vestibular disorders
- Brief (30 seconds) severe vertigo induced by specific head movements
- Usually self-limiting
- No associated hearing loss, tinnitus



BPPV

- Usually idiopathic
- Important cause of post-traumatic dizziness
- May occur after vestibular neuronitis, stapedectomy Ménière's Disease, chronic middle ear disease, perilymph fistula

Pathophysiology



- Particles ? Calcium carbonate settle in the (usually posterior) semicircular canal
- Canalithiasis vs Cupulolithiasis
free floating vs fixed to cupula
- Head movement in the plane of the canal produces the symptoms either by making the cupula gravity sensitive or by inducing an endolymph current

BPPV - Management



- Often self limiting
- Reassurance and explanation
- Particle - repositioning manoeuvres
- Rarely - surgery

The Hallpike Manoeuvre



Features of posterior canal BPPV

- (1) Latent period - a few seconds, up to 20-30
- (2) Nystagmus - fast phase towards floor, associated with vertigo, briefly crescendo, plateau then subside
- (3) Fatigueable



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Modified Epley Particle Repositioning Manoeuvre



- Slow
- Maximal neck extension
- Don't move until vertigo & nystagmus stops
- Only one side at a time

