

Hearing loss

Overview

Rory Attwood
MBChB,FRCS

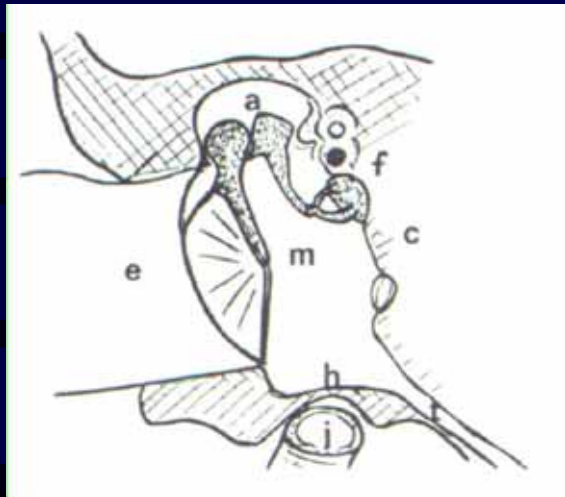
Division of Otorhinolaryngology
Faculty of Health Sciences
Tygerberg Campus, University of Stellenbosch

Not “deafness”

- **Deaf** is a total lack of hearing
- Deafness has connotations of discrimination
- Word “deaf” frightens people

Hearing loss (HL) - classification

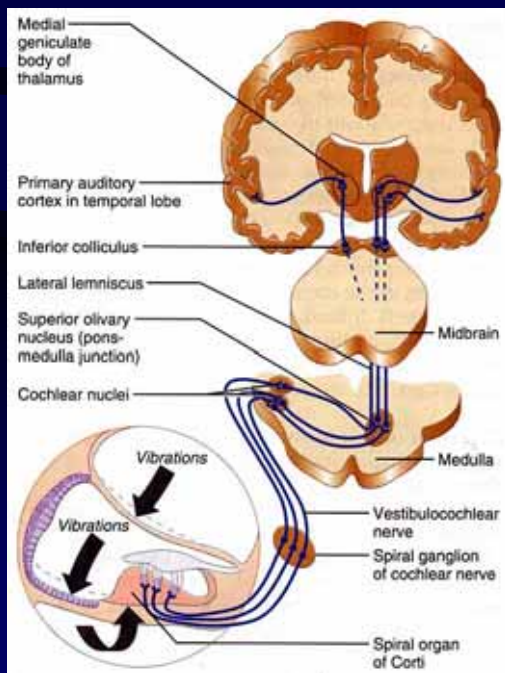
- Conductive - any interruption of passage of acoustic energy between pinna and oval window (CHL)



- Sensorineural

Hearing loss (HL) - classification

- Conductive
- Sensorineural - any damage to the organ of Corti or VIII nerve pathway or auditory cortex (SNHL)



Hearing loss (HL) - classification

- Can be “mixed”

conductive & sensorineural

Testing

- Multitude of testing possibilities
 - clinical (in room with patient)
 - audiological (by audiologist or audiometrician)

Testing

- Clinical
 - tuning forks

simple, quick and
accurate means of differentiating
between CHL & SNHL and
between true HL and malingering

Tuning forks

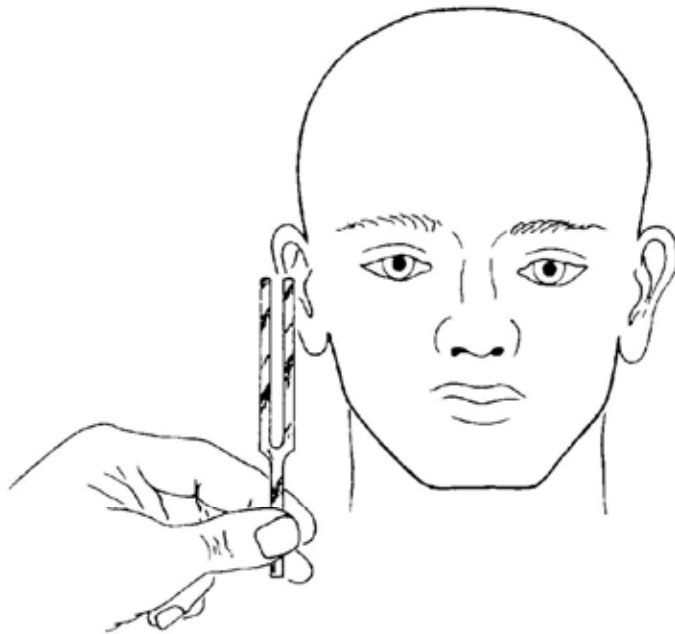
- T fork large so that rate of decay is not rapid
- 512 Hz (or 256 Hz)
- Broad base - applied to bone

- If frequency too low – felt more than heard
- If frequency too high – dissipates too fast

Rinne

- Tests air conduction – much more efficient than BC
- + Rinne
- - Rinne
- false - Rinne

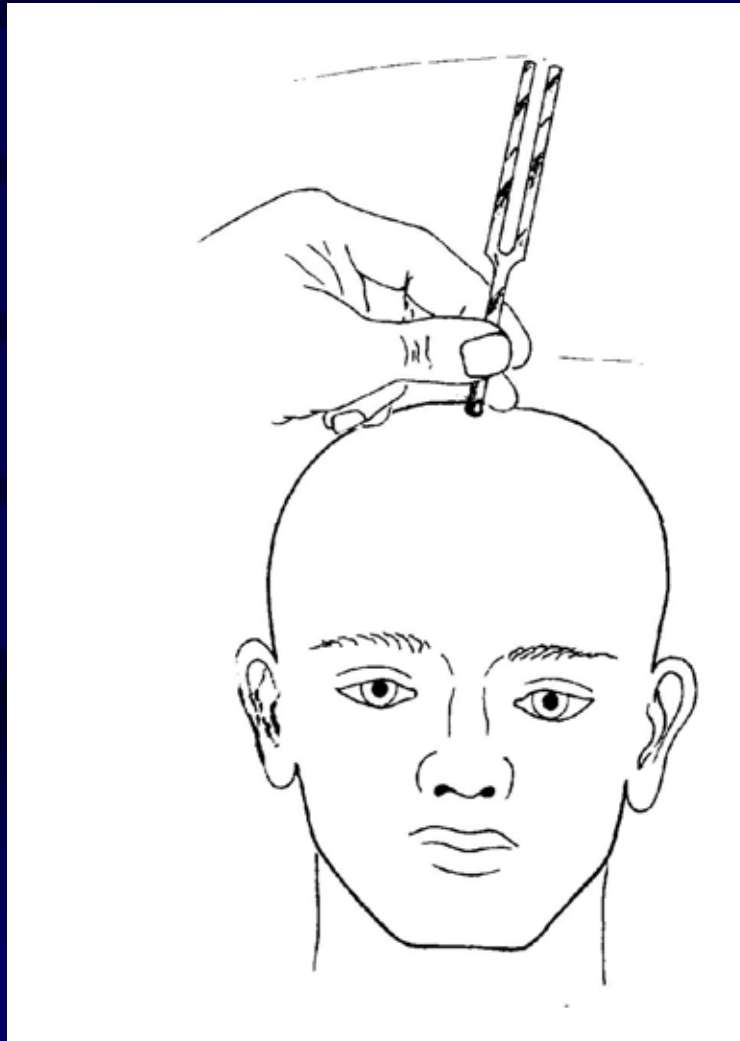
Tuning fork - Rinne



Weber

- Assymetrical conductive loss
- Very sensitive in compliant patient
- If CHL unilateral as little as 5 dB detected

Tuning fork - Weber

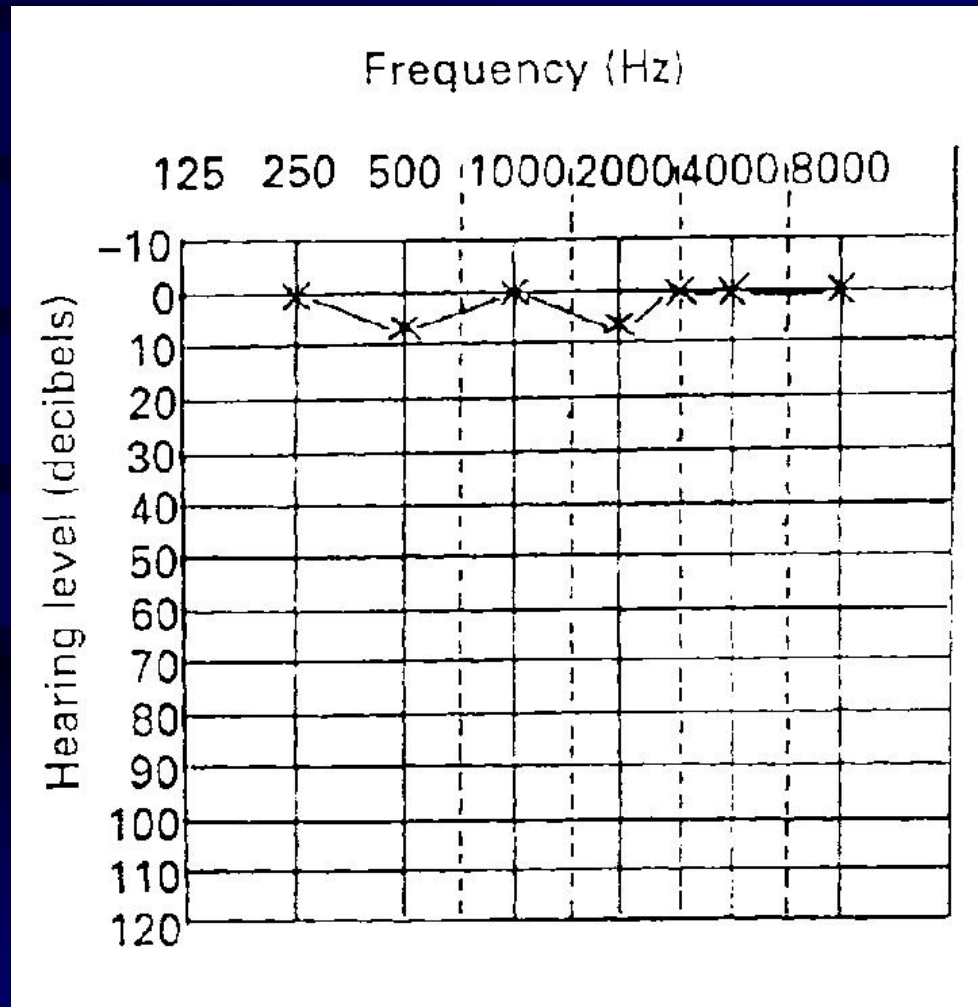


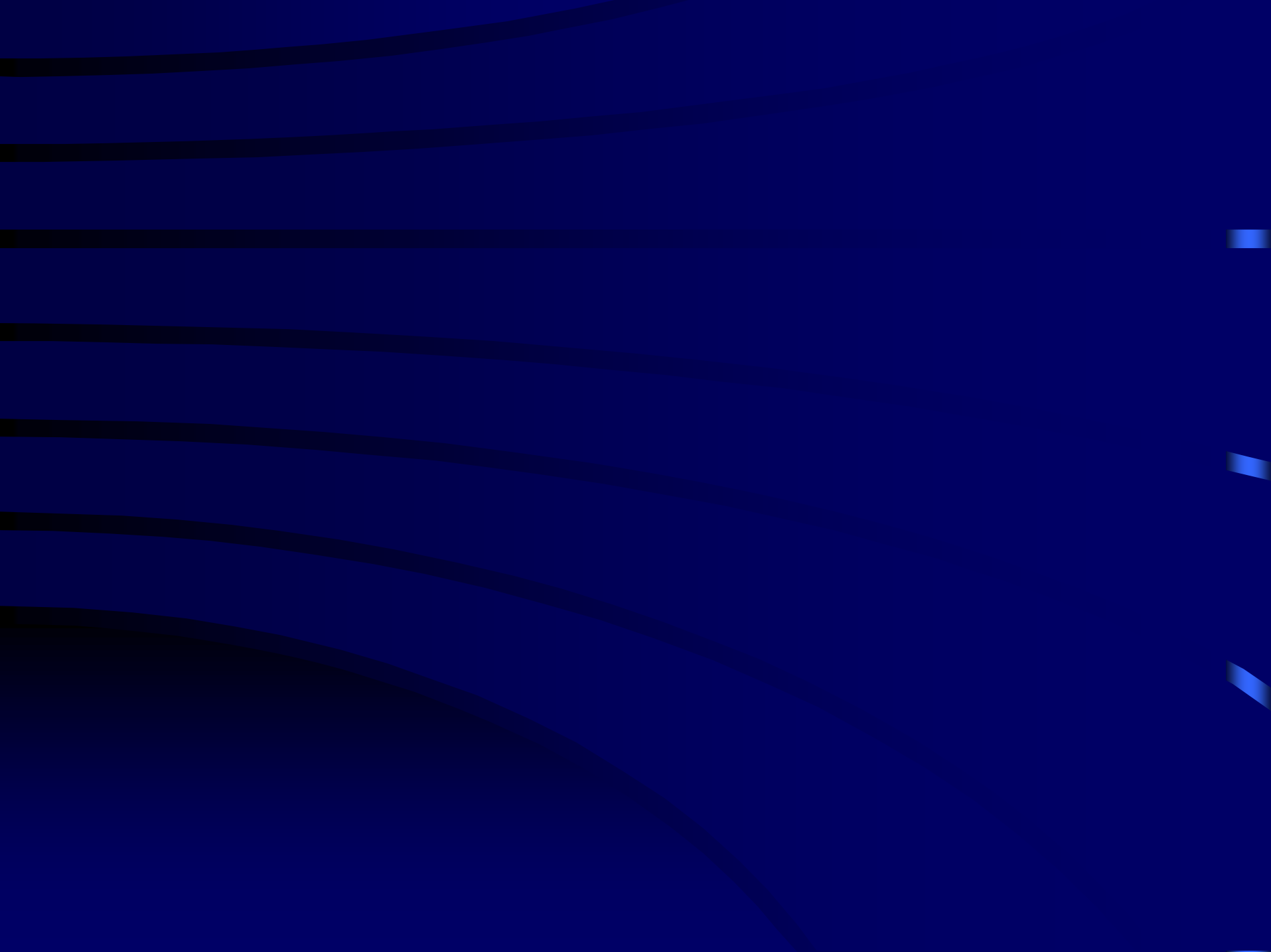
Testing

- Clinical
 - free-field speech testing

Simple, rapid, accurate to within 3 dB of true threshold of speech reception threshold

Normal audiogram



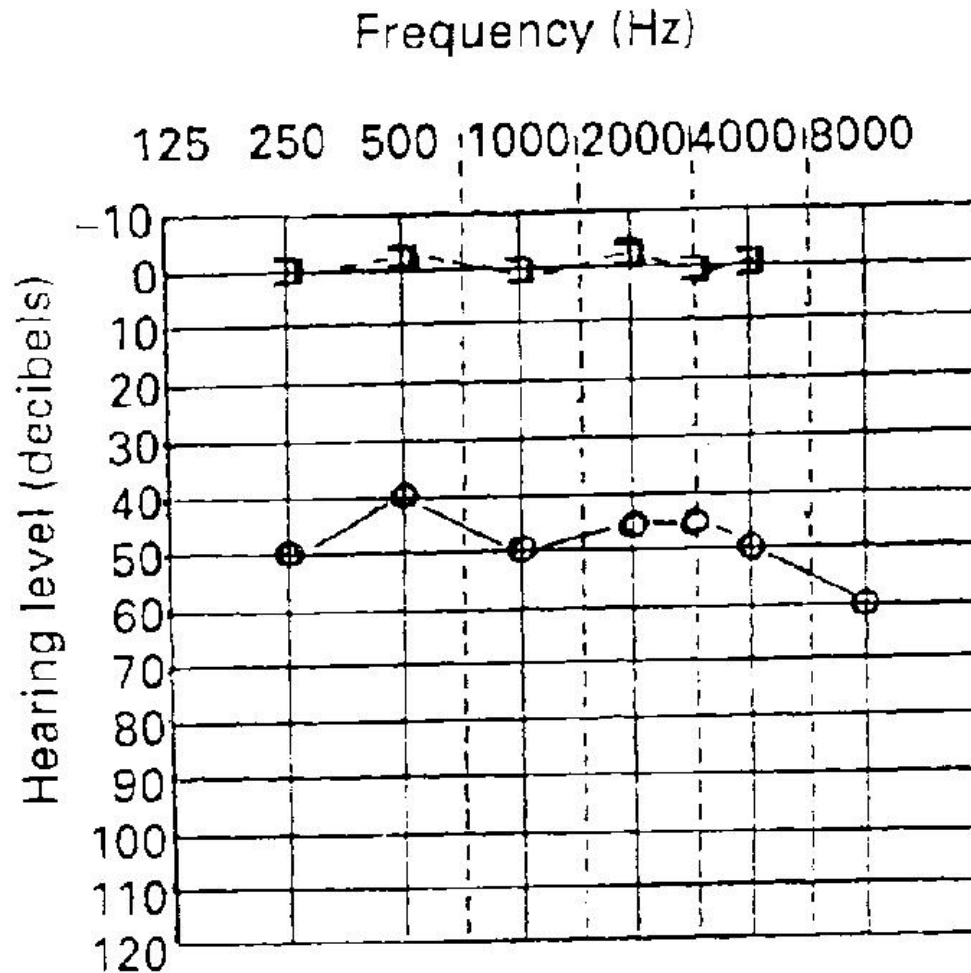


Conductive HL

- Congenital – many syndromes affecting the development of ext. ear from 1st branchial cleft and 1st & 2nd branchial arches

(eg Treacher-Collins, Pierre-Robin, Crouzon's, Apert's)

Conductive loss



Congenital CHL classification

- Hereditary
 - EA or ME
 - present at birth (syndromes)
 - appearing in childhood
(osteogenesis imperfecta)
- Predisposing disorders
 - cystic fibrosis, cleft palate,
Down syndrome
- Miscellaneous
 - congenital cholesteatoma
 - fibrous dysplasia

Congenital CHL

- Minor aplasia - EAC narrow
 - pinna normal or minor deformity
 - ossicular fixation

Congenital CHL

- Major aplasia - microtia
 - EAC atresia
 - ossicular fixation

Congenital CHL

- Major aplasia / atresia - EAC atretic
 - tympanic cavity small
 - cochlear abnormal

Congenital CHL - management

- Congenital loss may be suspected at birth (eg family history or syndromal)
- Refer to Paediatric ENT or Audiologist for:
 - investigation
 - appropriate surgery
 - appropriate rehabilitation

Conductive HL

- Acquired
 - OME/ effusions
 - foreign body / wax
 - perforation
 - ossicular damage
 - otitis externa / furuncle
 - fracture
 - EAC neoplasm- benign
 - malignant
 - atresia and stenosis

Acquired CHL - management

- From history and examination,
diagnose and treat appropriately

Sensorineural HL

- Congenital – many syndromes involve the VIII nerve to varying degrees

(eg Pendred's, Usher's Waardenbur's)

Congenital SNHL classification

- Hereditary - HL present at birth - HL alone
 - syndrome + HL
- HL appears in childhood
 - HL alone
 - syndrome + HL
- Secondary to intrauterine event
 - Infections (rubella, CMV, syphilis)
 - Ototoxic drugs (aminoglycosides, diuretics, cytotoxics, salicylates, quinine, anticonvulsants)

Congenital SNHL classification

- Secondary to intrauterine event
 - Metabolic disorders (diabetes mellitus)
 - Perinatal disorders (hypoxia, hyperbilirubinaemia, premature delivery, low birth weight)

Congenital SHL

- Variable - uni- or bilateral
 - mild
 - moderate
 - severe
 - profound

Congenital SHL - management

- Prevent
- Depends on cause
- Depends on extent
- Depends whether uni- or bilateral

Congenital SHL - management

- Hearing amplification - if appropriate
- Alternative means of communication
 - lip reading
 - sign language
- Cochlear implant - if appropriate

Congenital SHL - management

- Family support and advice

Sensorineural HL

- Acquired
 - trauma - sharp / blunt
 - acoustic – blast / noise
 - barotrauma – window rupture
 - surgery
 - infective labyrinthitis
 - syphilis
 - Meniere's
 - presbycusis
 - ototoxicity
 - CVA

Acquired SHL - management

- Prevent
- Depends on cause
- Depends on extent
- Depends whether uni- or bilateral

Acquired SHL - management

- Hearing amplification - if appropriate
- Alternative means of communication
 - lip reading
 - sign language
- Cochlear implant - if appropriate

Acquired SHL - management

- Family support and advice