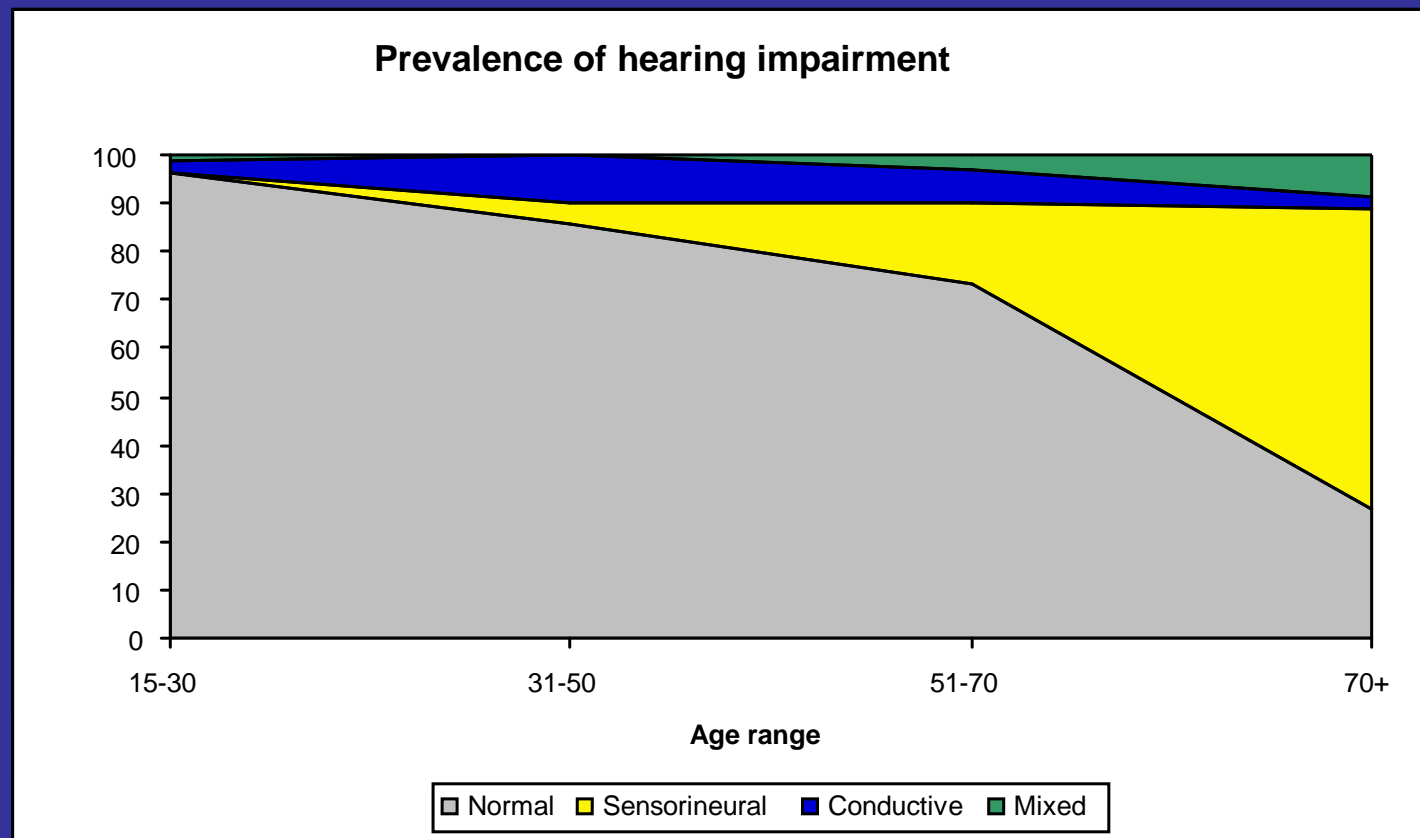


ASSESSMENT OF HEARING

Malcolm Giles, FRACS
Dept of Otolaryngology
Waikato Base Hospital
Hamilton

ASSESSMENT OF HEARING

WHY?



ASSESSMENT OF HEARING

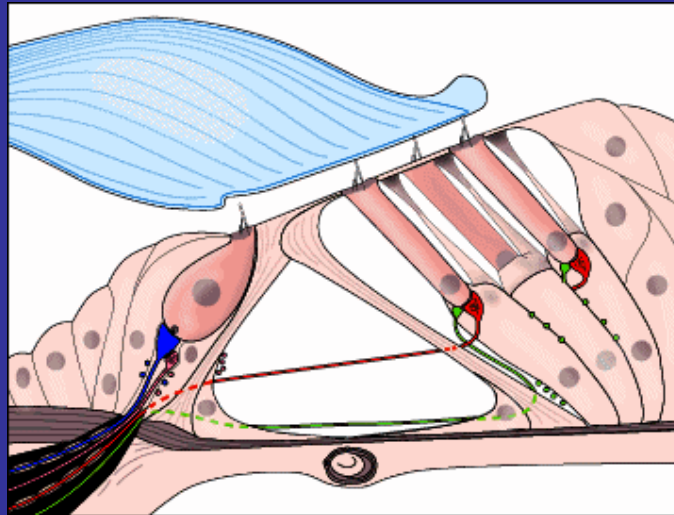
1. How hearing works
2. Types of hearing impairment
3. Measuring patient hearing
4. Advice to nonOtolaryngologists

How hearing works: External and middle ear



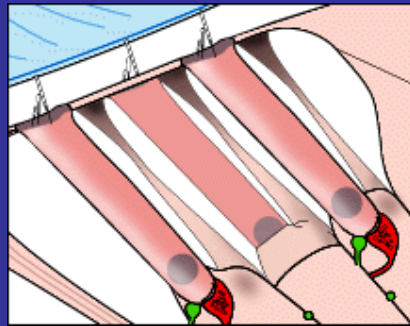
<http://www.iurc.montp.inserm.fr/cric/audition/english/ear/fear.htm>

How hearing works: Inner ear 1



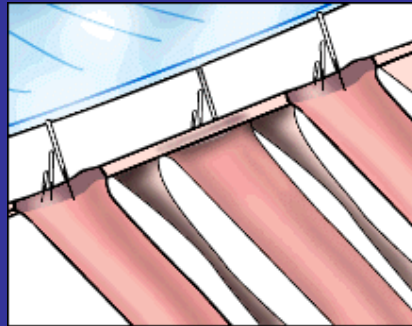
<http://www.iurc.montp.inserm.fr/cric/audition/english/ear/fear.htm>

How hearing works: Inner ear 2



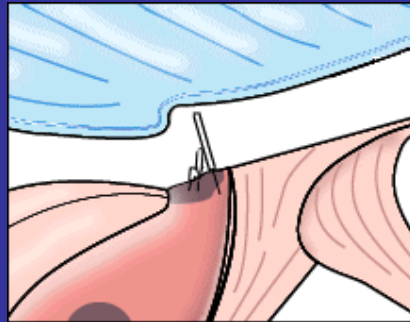
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How hearing works: Inner ear 3



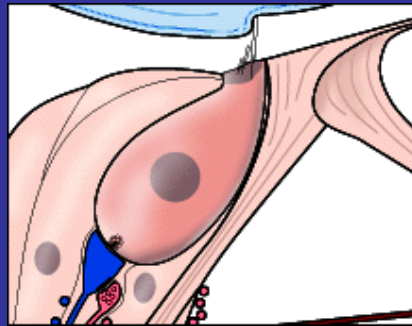
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How hearing works: Inner ear 4



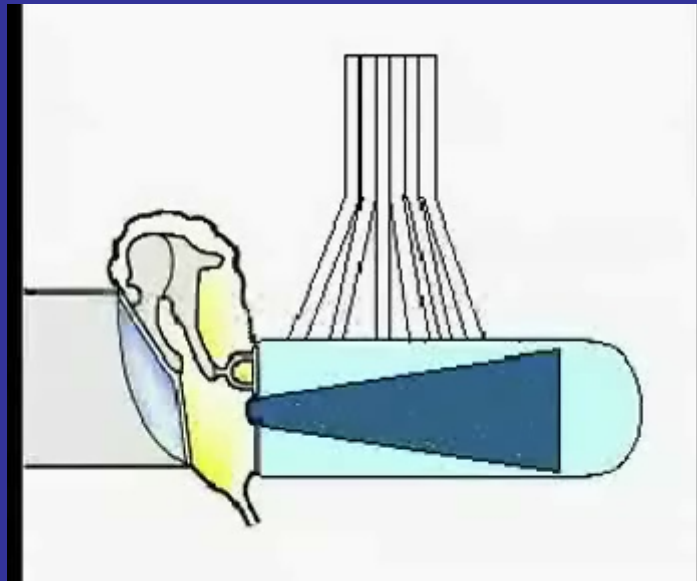
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How hearing works: Inner ear

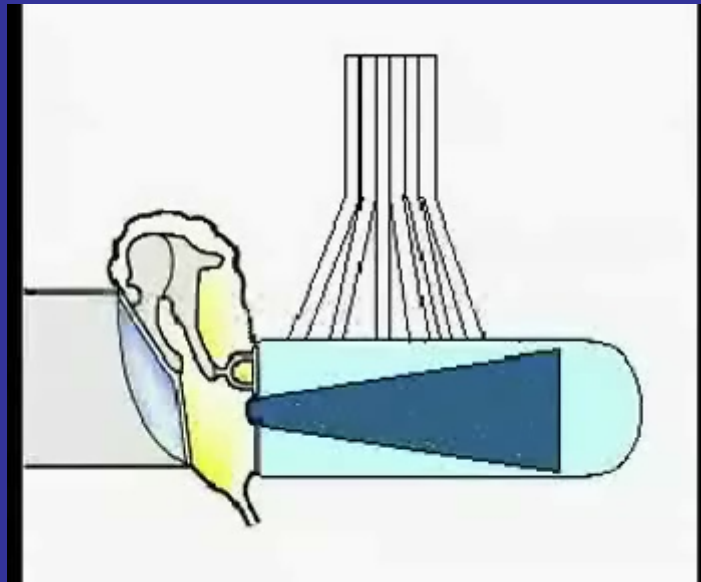


<http://www.iurc.montp.inserm.fr/cric/audition/english/ear/fear.htm>

How hearing works: Clinical Model

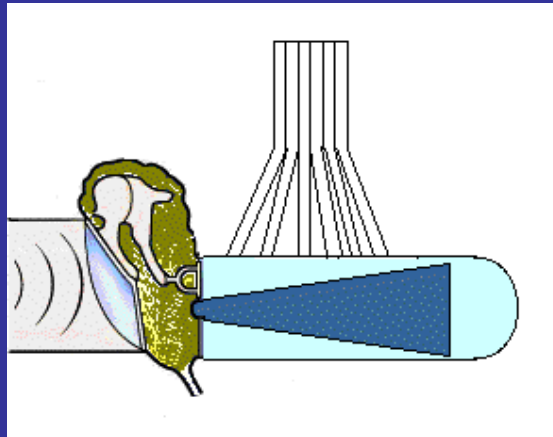


How hearing works: Conductive Hearing Loss



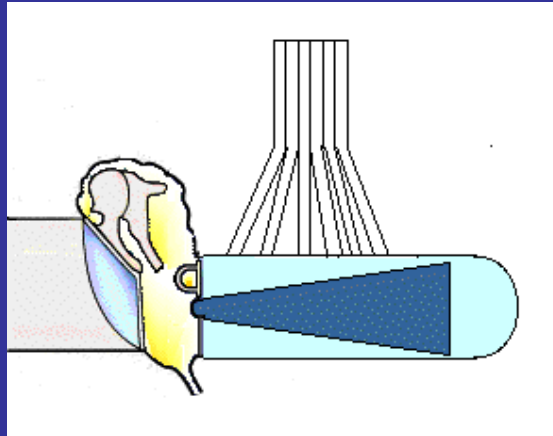
Normal

How hearing works: Conductive Hearing Loss



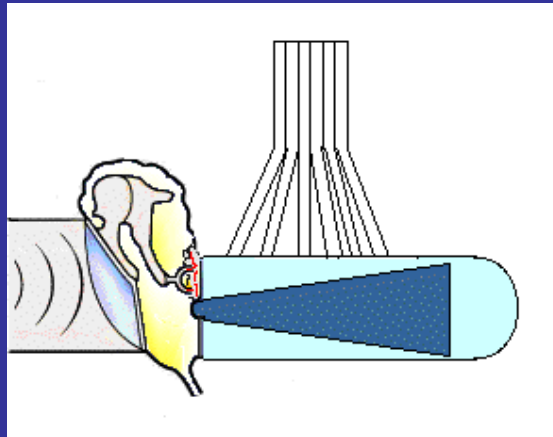
Middle ear fluid

How hearing works: Conductive Hearing Loss



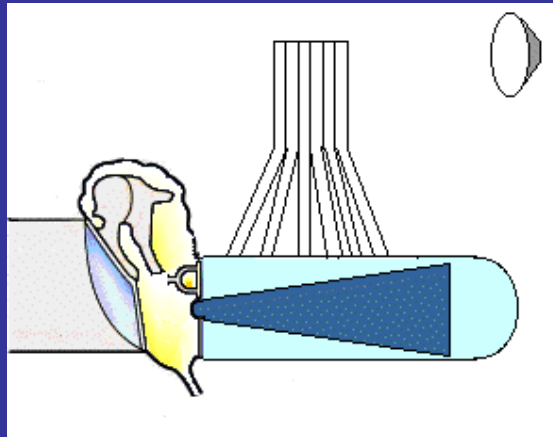
Ossicular Discontinuity

How hearing works: Conductive Hearing Loss



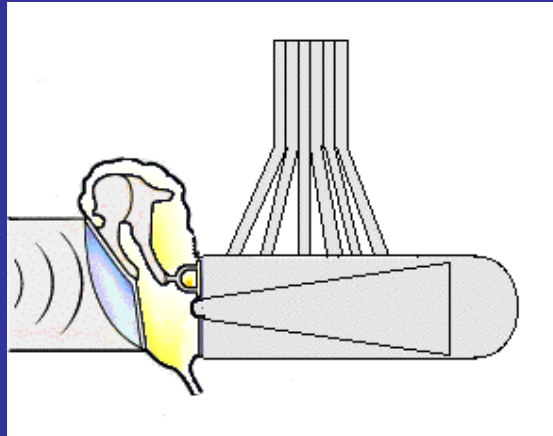
Otosclerosis

How hearing works: Conductive Hearing Loss



Measuring inner ear function

How hearing works: Sensorineural Hearing Loss

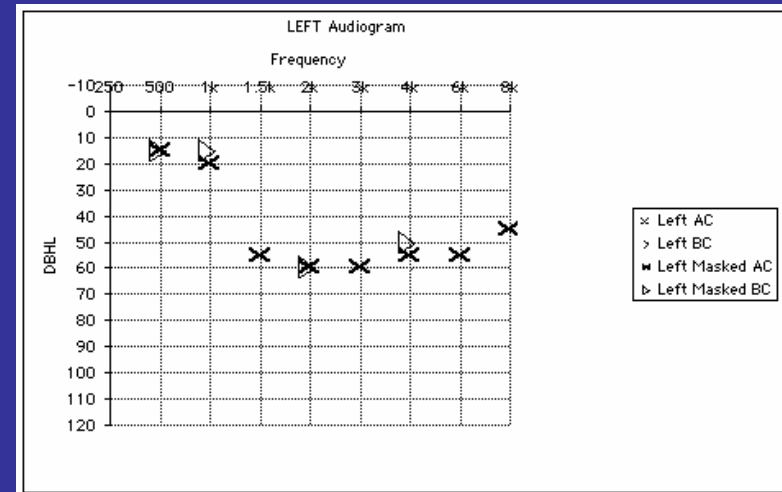
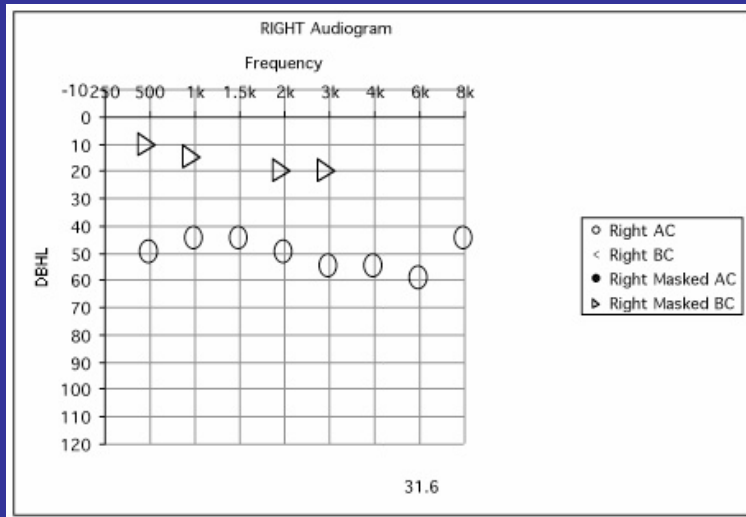


How hearing works: Central Auditory Factors

- Central auditory pathway can compensate for peripheral hearing loss



Measuring Hearing



The pure tone audiogram: a graph of the softest sound heard versus frequency

Pure Tone Threshold

- Hand held audiometer
- Screening audiometry
- Full audiometry

- Casual audiometrist
- Trained audiometrist
- Audiologist



Accuracy
Information

Pure Tone Threshold

- Cheap
- Hand held audiometer
- Specificity (80%)
sensitivity (60%) in
children with OME
- Vaughan-Jones &
Mill, Laryngoscope
1992 600-2



Pure Tone Threshold

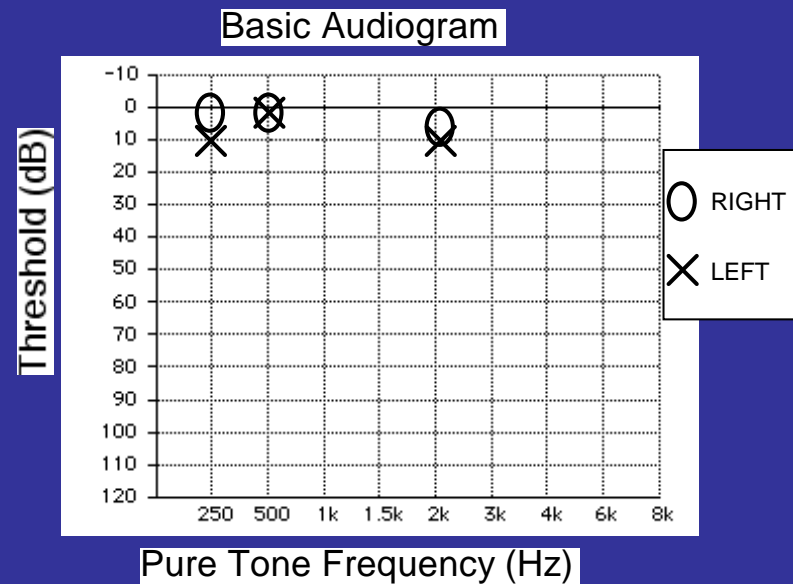
- Cost to patient
- Screening audiometer
- Sensitivity and specificity variable
- Influenced by testing environment



Measuring Hearing

Pure Tone Threshold

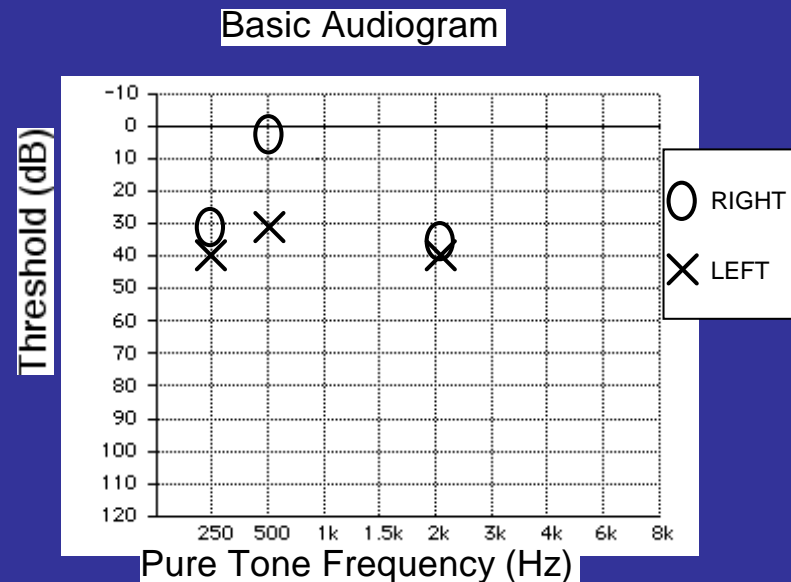
- Hand held audiometer
- Screening audiometry



Measuring Hearing

Pure Tone Threshold

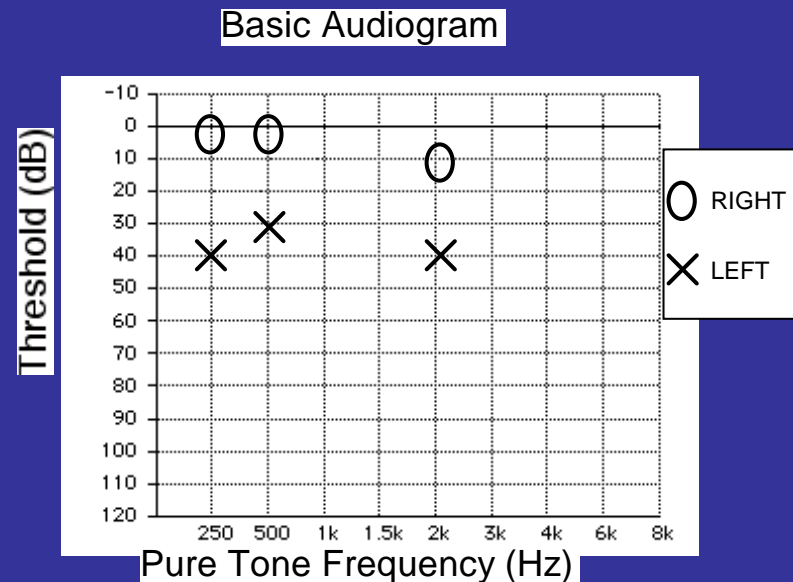
- Hand held audiometer
- Screening audiometry



Measuring Hearing

Pure Tone Threshold

- Hand held audiometer
- Screening audiometry



Measuring Hearing



Calibrated Audiometer

Measuring Hearing



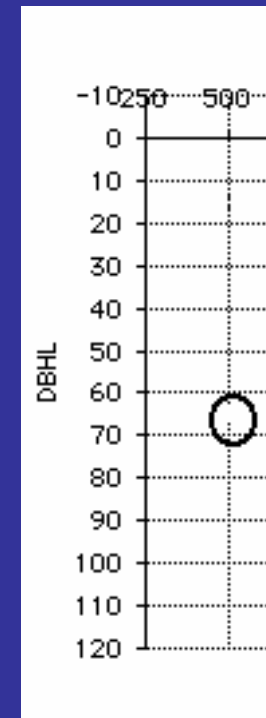
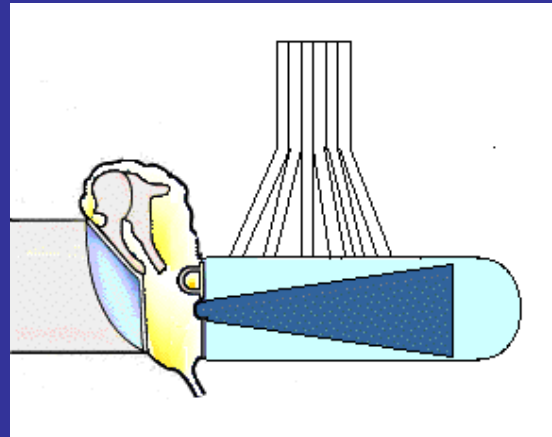
Sound Proof Booth

Measuring Hearing



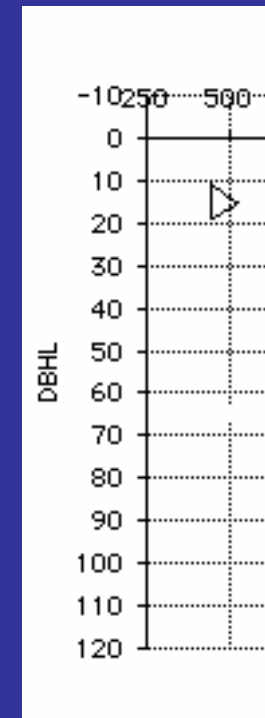
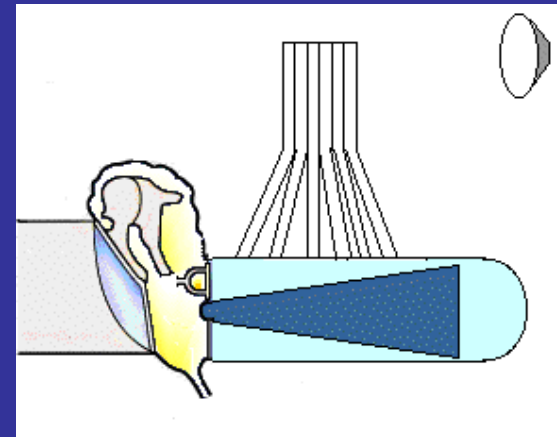
Determine Threshold

Measuring Hearing



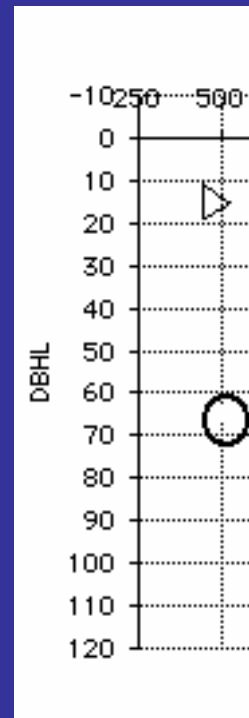
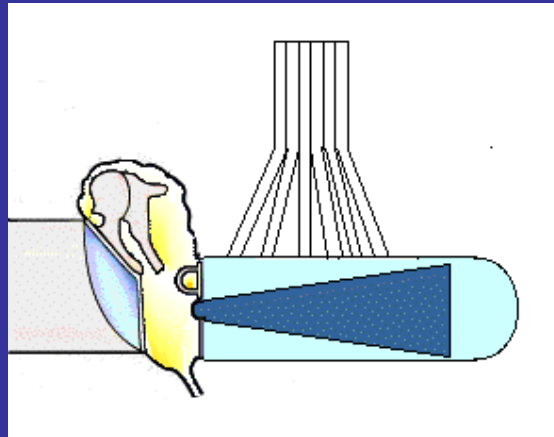
Determine Threshold:
Air Conduction

Measuring Hearing



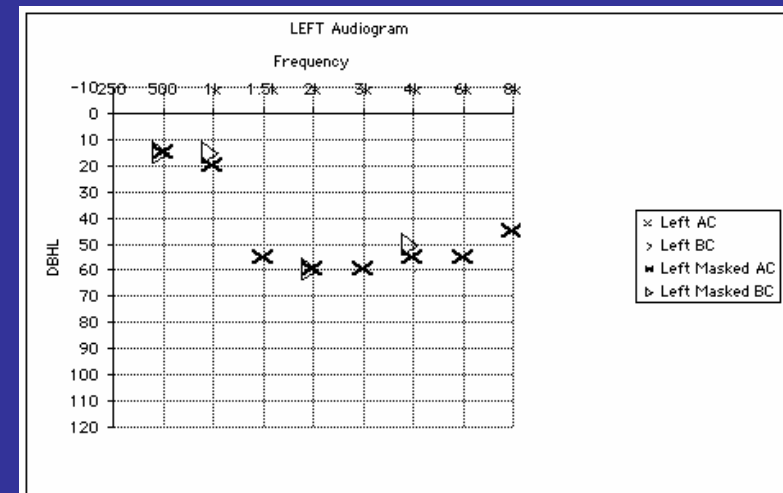
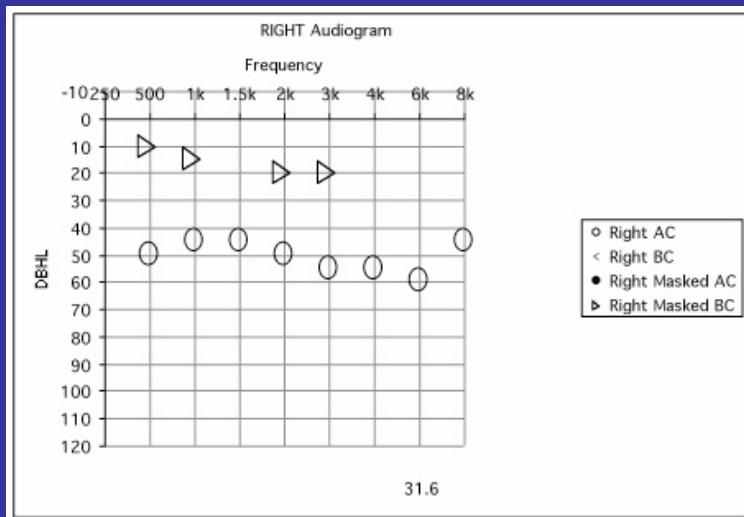
Determine Threshold:
Bone Conduction

Measuring Hearing



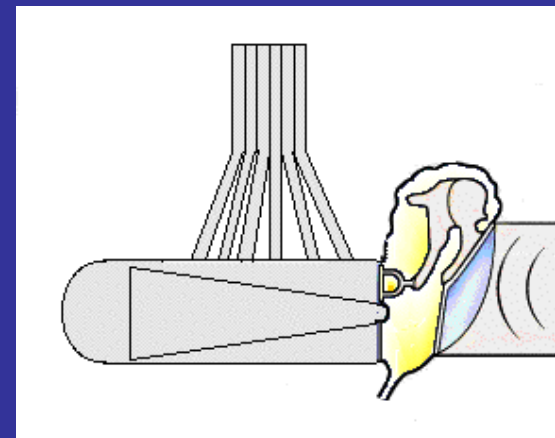
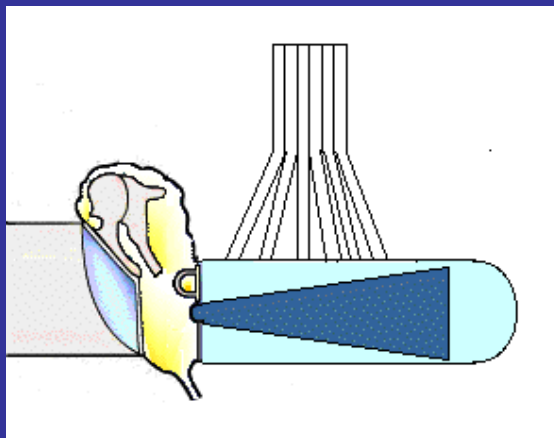
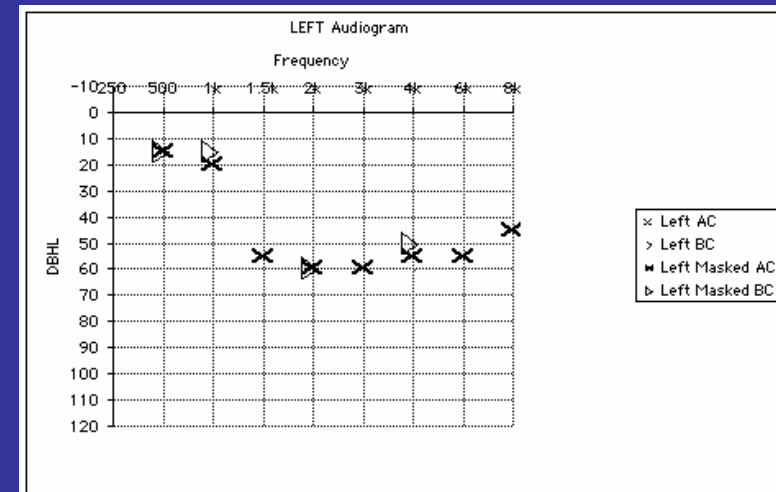
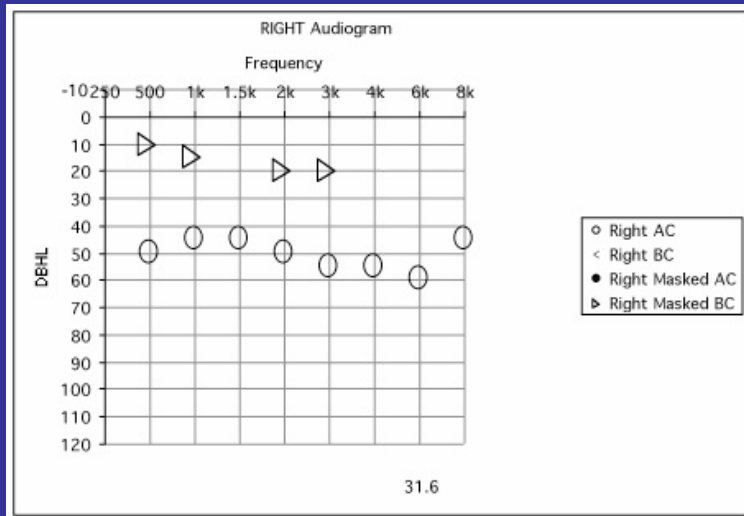
The 'air bone gap'

Measuring Hearing



The completed audiogram

Measuring Hearing



Advice to nonotologists

- As the chest Xray is to the lungs, the audiogram is to the ear
- If your adult patient presents with
 - Hearing loss
 - Tinnitus
 - Vertigo
 - Blocked sensation
- Get an audiogram from an Audiologist
- Read the report!

ASSESSMENT OF HEARING

WHY?

