433 Teams

ENT

Deafness

Color index:

432 Team – **Important** – **433 Notes (group A)** **433 Notes (group F)** – **Not important**

Hearing loss:

How common is hearing loss?

- Overall about 1 in 10
- 1 in 3 adults 65 - 75
- 1 in 2 older than 75
- 1-2% school age children
- 4% children under 5

Signs of Hearing Loss:

- Talking louder than necessary
- Turning up volume on the TV or radio
- Complaints that other people “mumble”
- Confusion of similar sounding words نخلة/نحلة
- Inappropriate responses in conversation
- Ringing or buzzing in the ears
- Lip Reading
  - Watching a speaker’s face intently
  - Difficulty “hearing” someone behind
  - Having difficulty on the telephone

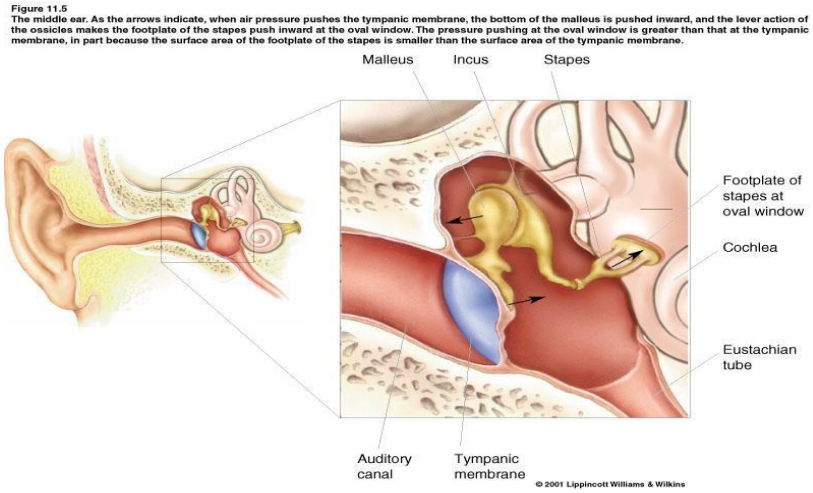
Effects of sensory loss:

- Don’t enjoy conversations – too much work
- People think you are an idiot
- Scared to try new contacts
- Scared to take new jobs
- Limits your world
- limit activities
- Isolation
- Depression
- Anxiety
- Insecurity
- strain relationships
- Increases psychosocial difficulties

Deafness & Recruitment:

Recruitment:

Out of proportion of loudness. (Meaning the patient can't hear, but when he hear, he hear everything louder than it's normal range) The cochlea normally acts as a filter; it decreases loud voices and amplifies the low sounds, here the cochlea is not functioning well.



When the external and the middle ear are affected= conductive hearing loss.
Inner ear (cochlea) and the nerve= sensory hearing loss.
Cochlea's job is tuning of the sound.

Conductive Defects:

Any disease process which interferes with the conduction of sound to reach cochlea causes conductive hearing loss. The lesion may lie in the external ear and tympanic membrane, middle ear or ossicles up to stapediovestibular joint.

- Wax, foreign bodies, furuncle, tumors (Any form of obstruction can cause CHL)
- Otitis externa
- Ear drum Scarring; perforation
- Otitis media
  - Acute suppurative (ASOM)
  - Otitis media with effusion (OME)
  - Chronic otitis media (CSOM)
- Otosclerosis
- Ossicular chain disruption
  - Fixation of ossicles
  - Eustachian tube blockage
  - Meatal atresia
  - Congenital cholesteatoma
  - Osteoma, squamous cell carcinoma

1.Wax:

Is the commonest cause of conductive hearing loss (CHL).

2.Microtia:

Deformity of the ear auricle.

3. Atresia:

No ear canal.

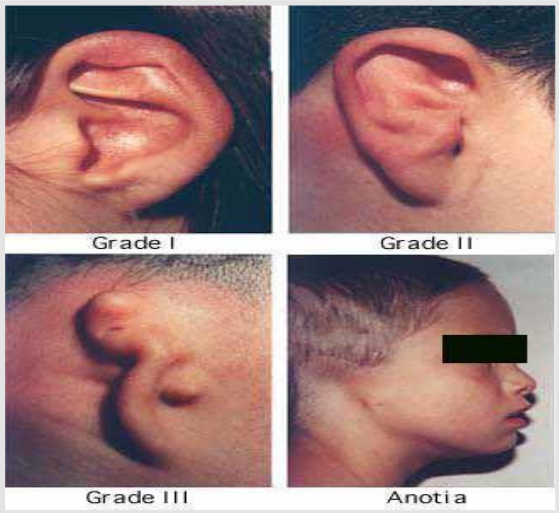


Table 5.1 Congenital causes of conductive hearing loss

- Meatal atresia
- Fixation of stapes footplate
- Fixation of malleus head
- Ossicular discontinuity
- Congenital cholesteatoma

Table 5.2 Acquired causes of conductive hearing loss

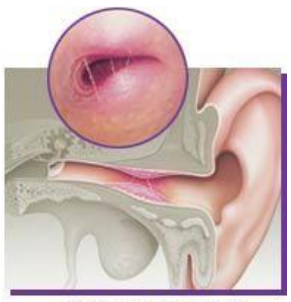
External ear	Any obstruction in the ear canal, e.g. wax, foreign body, furuncle, acute inflammatory swelling, benign or malignant tumour or atresia of canal.
Middle ear	(a) Perforation of tympanic membrane, traumatic or infective (b) Fluid in the middle ear, e.g. acute otitis media, serous otitis media or haemotympanum (c) Mass in middle ear, e.g. benign or malignant tumour (d) Disruption of ossicles, e.g. trauma to ossicular chain, chronic suppurative otitis media, cholesteatoma (e) Fixation of ossicles, e.g. otosclerosis, tympanosclerosis, adhesive otitis media (f) Eustachian tube blockage, e.g. retracted tympanic membrane, serous otitis media

4. AOE: (acute otitis externa):

It's a common condition involving inflammation of the ear canal.

The acute form is caused primarily by bacterial infection, with Pseudomonas aeruginosa and Staphylococcus aureus the most common pathogens.

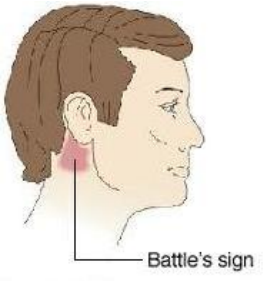
(Source: http://www.aafp.org/afp/2012/1201/p1055.html)


Swimmer's Ear (AOE)

Raccoon eyes sign:

(Skull base fracture blood goes to the external auditory canal> tympanic membrane perforation> blood in the middle ear)

Battle's sign :



5. Perforated drum:

Fresh blood indicates a recent injury (acute injury).

* Drum Retraction (Adhesive OM):

It's also called Atresia, Atelectasis ear.

The tympanic membrane gets sucked in because of eustachian tube dysfunction and negative pressure, which will suck the ear-drum inside. We treat it by ventilation tube, which prevents the ear from getting sucked inside by preventing the negative pressure. So perforation and retraction both of them are causes conductive hearing loss.

Treatment of adhesive OM is attachment of tube.

6. Tympanosclerosis:

Calcification of an old inflamed tissue. (usually it's asymptomatic, but when it's symptomatic it causes CHL) (ask about previous infection in the ear while taking the history because it comes from recurrent infections)

It's a condition characterized by the presence of masses of hard, dense connective tissue around the auditory ossicles in the middle ear, also know as myringosclerosis.

Treatment of CHL:

-Removal of canal obstruction

-Removal of fluid

-Removal of mass from the middle ear (Tympanotomy)

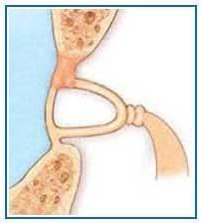
-Stapedectomy (Treatment of fixation of ossicles)

-Tympanoplasty (in case of perforated tympanic membrane)

-Hearing aid

7. Otosclerosis:

Fixation of the stapes by new bone formation.



A disease of the bony otic capsule characterized by abnormal replacement of mature bone of the otic capsule by woven bone of greater thickness.

- 10% otosclerotic lesions (10% symptomatic)
- Middle-age
- Females: Male 2: 1
- Worse during pregnancy (due to hormonal changes)
- Treatment: Stapedectomy

(it's an excessive growth in the bones of the middle ear, which interferes with the transmission of sound, source medical dictionary)

Stapedectomy: is a surgical procedure in which the inner most bone (stapes) of the middle ear is replaced with a small plastic tube of stainless-steel wire to improve the movement of sound to the inner ear.

Sensory neural hearing loss (SNHL):

Sensorineural hearing loss (SNHL) results from lesions of the cochlea, VIIIth nerve or central auditory pathways. It may be present at birth (congenital) or start later in life (acquired).

- Congenital (Inner ear abnormalities)
- Trauma
- Infection (Labrynthitis, meningitis)
- Noise
- Ototoxic (Aminoglycosides)
- Presbycusis
- Acoustic neuroma
- Systemic disorders (DM, hypothyroidism, kidney disease and multiple sclerosis)
- Vestibular schwannoma
- Autoimmune
- Meniere's disease

Diagnosis:

1.History

2.Severity of deafness (mild, moderate, moderately severe, severe, profound or total). This can be found out on audiometry.

3.Site of lesion

4.Laboratory tests (X-rays or CT scan of temporal bone for evidence of bone destruction (congenital cholesteatoma, glomus tumour, middle ear malignancy or acoustic neuroma), blood counts (leukaemia), blood sugar (diabetes), serology for syphilis, thyroid functions (hypothyroidism), kidney function tests).

1. Congenital hearing loss:

- Most common congenital disease
- Deafness affects 0.2%
- SNHL attributed to

– 50% genetic factors

– 20-25% environmental

– 25-30% sporadic

- Genetic (due to consanguinity marriages)

– 75% AR (autosomal recessive)

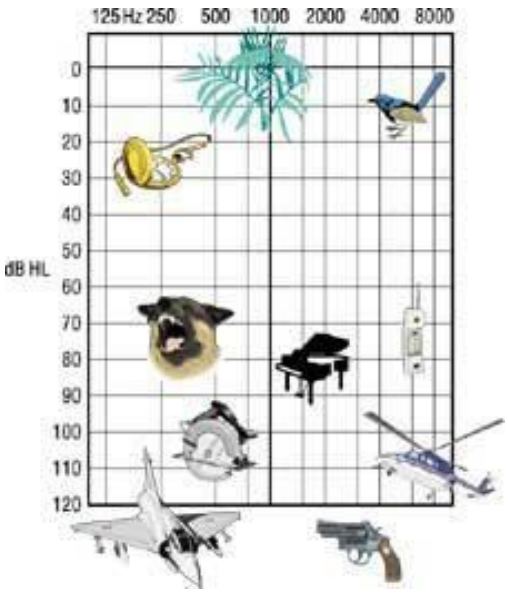
– 20% to AD (autosomal dominant)

– 5 % X-linked

- Over 400 syndromes

- Can lead to delayed speech and language development

2. Noise induced SNHL:



- Boilermaker's deafness
- One of the most common occupationally induced disabilities
- Follows chronic exposure to less intense sounds than seen in acoustic trauma and is mainly a hazard of noisy occupations.
- Causes damage to hair cells, starting in the basal turn of cochlea. Outer hair cells are affected before the inner hair cells.
- **Tinnitus** (only sign)

–Commonly accompanied NISNHL

-Warning sign

(One gunshot could cause SNHL, and in KSA fireworks)

* 90 db for 8 hours
* 95 db for 4 hours
* 100 db for 2 hours
* 105 db for 1 hours

3. Ototoxicity:

- Antibiotics (aminoglycosides)

Patients particularly at risk are those:

.Concomitantly receiving other ototoxic drugs,

.Who have already received aminoglycoside antibiotics,

.Who are receiving high doses of ototoxic drugs with high serum level of drug,

.Who have genetic susceptibility to aminoglycosides.

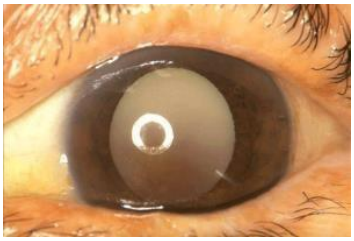
- Diuretics (Furosemide) They are known to cause oedema and cystic changes in the stria vascularis of the cochlear duct.
- Antineoplastics
- Antinflammatories
- Antimalarial agents (chloroquine, quinine)
- Ototopic agents

- Others

Higher risk:

1. Renal failure (Elevated peak and trough levels)
2. Liver failure
3. Immunocompromised patients
4. Collagen-vascular disorders
5. Advanced age (> 65 years)
6. Prior ototoxicity
7. Concurrent use of known oto-toxic agents
8. Preexisting HL or Vestibular
9. Bacteremia (fever)
10. Treatment course longer than **14** days
11. Positive family history of AG ototoxicity

4. Presbycusis:



It's associated with grey hair, cataract and SNHL.

Sensorineural hearing loss associated with physiological aging process in the ear is called presbycusis. It usually manifests at the age of 65 years but may do so early if there is hereditary predisposition, chronic noise exposure or generalized vascular disease.

Treatment: Hearing aid

Presbycusis = Deafness + Tinnitus + Recruitment

Overview of Hearing Loss:

- #1 Handicapping disorder
- 60% of Americans > 65 HL
- 90% of > 75 Y have HL
- HL + degenerative processes of aging.
- ½ Vestibular symptoms

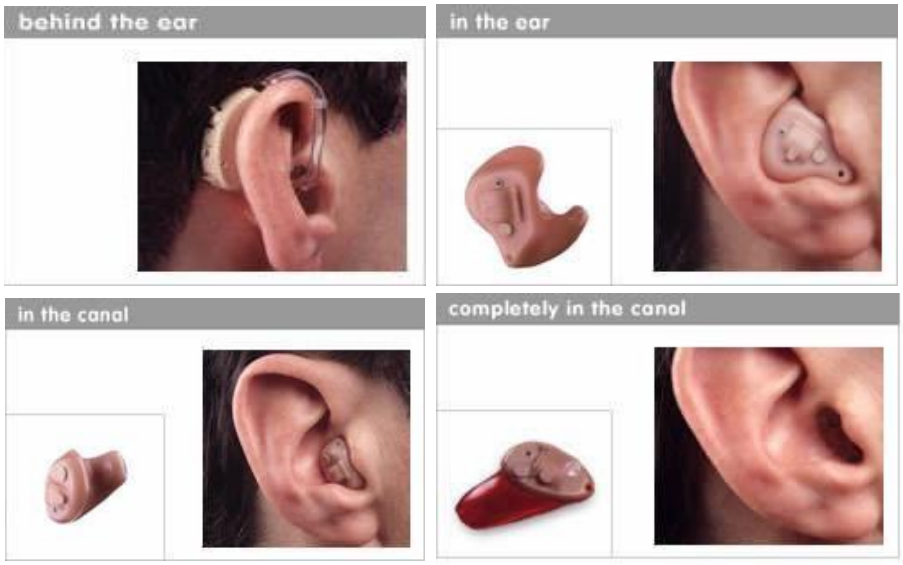
Problems With Diagnosis:

- Shame or embarrassment.
- HA social stigma
- Embarrassment prevents 15 million elderly people from getting help.

Conductive Hearing loss	Sensorineural Hearing loss
-Negative Rinne test (BC>AC)	-A positive Rinne test (AC > BC)
-Weber lateralized to the poorer ear	-Weber lateralized to better ear
-Normal absolute bone conduction	-Bone conduction reduced
-Low frequencies affected more	-More often involving high frequencies
-Audiometry shows bone conduction better than air conduction with air-bone gap. Greater the air-bone gap, more is the conductive loss	-No gap between air and bone conduction curve on audiometry
-Loss is not more than 60 dB.	-Loss may exceed 60 dB.
-Speech discrimination is good	-Speech discrimination is poor.
	-There is difficulty in hearing in the presence of noise.

Hearing Aids

History: 1550 by Girolamo Cardano when he saw that sound could be transmitted through the teeth.



Cochlear implant:

Putting tiny electrode in the cochlea.

In congenital HL the cochlear implant is ineffective after 5 years, due to the disappearance of auditory segment from the brain. But in people who used to hear and then lost their hearing there is no time limit for the usage of cochlear implant.

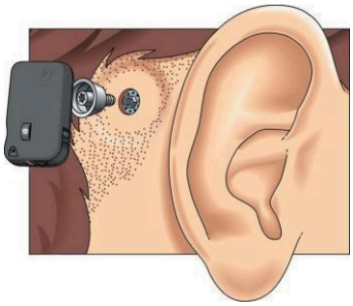
It's a device consisting of a microphone, signal processor, external transmitter, and implanted receiver; the receiver is surgically implanted under the skin near the mastoid process above and behind the ear.(source: medical dictionary)

So in the exam if they gave you a cochlear implant picture you should know it, it looks like a regular hearing aid but with a magnet from outside.

Classical indication of cochlear implant:

Bilateral sensory-neural hearing loss not benefiting from hearing aids and less than 5 years of age if congenital hearing loss.

Bone Anchored Hearing Aids (B.A.H.A):



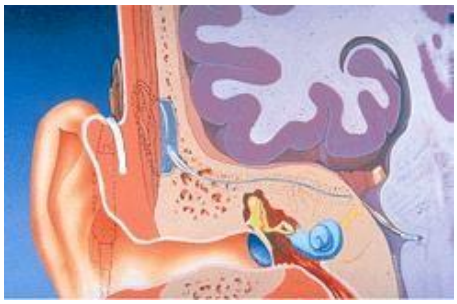
Titanium implants, used in conductive hearing loss (CHL) (they use titanium because it doesn't react with the body)

BAHA stimulates the cochlea by transmitting the sound waves through the bones in our skull, or bone conduction, thereby bypassing the outer and the middle ear.

(source: http://www.earassociates.com/services-bone-anchored-hearing- aids-san-jose-ca.html)

Auditory brainstem implant (A.B.I):

It's Implanted in the brain



MCQs:

Q1: Patients with sensorineural hearing loss will have:

A. Normal air conduction and abnormal air conduction.

B. Normal bone conduction and abnormal air conduction.

C.Both air and bone conductions are abnormal.

D. Air bone gap.

E. Non of the above.

Q2: Presbycusis is:

A. SNHL.

B. Mixed hearing loss.

C. Conductive hearing loss.

Q3: All cause conductive hearing loss except:

A. Tympanosclerosis

B. COM

C. Labyrinthitis

D. Wax

Q4: A 1-year-old girl presents with a history of hearing loss since birth.She has a positive family of profound hearing loss; three older sisters go to a school of deaf-mutes. Her examination was unremarkable. Her ABR exhibits no waves and the CT scan was normal. She has used a hearing aid for 6 months without improvement. What's most appropriate intervention?

A. Cochlear implant

B. 4-year trial of hearing aid until the age of 5

C. BAHA

D. Nothing to be done, as the case of her older sisters

Q5:A 60 year old African housewife complains of right-sided hearing loss associated with tinnitus and no vertigo. Her ear exam is normal and an audiogram reveals right conductive hearing loss.

Otosclerosis is more common in which of the following?

A.Overweight individuals

B.Women

C.The elderly

D.Africans

Q6:A 22-year-old male presents with bilateral hearing loss and discharge. He had cholesteatoma in both ears and had undergone mastoidectomy surgeries. He is currently using a hearing aid in both ears with minimum benefit and the hearing aids aggravate his ears discharge. His ear examination reveals bilateral mastoid cavities with was and crusts. An audiogram reveals bilateral conductive hearing loss.

The best treatment for the patient would be which of the following?

A.Using small hearing aids that fit in the mastoid cavities

B.BAHA

C.Cochlear implant on one side

D.Cochlear implant on both sides

Q7:Otosclerosis hearing loss in pregnancy can do which of the following?

A.Improve

B.Get worse

C.Fluctuate

D.Disappear

Answers:

C, A, C, A, B, B, B

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