



433 Teams  
**ENT**

7

# Deafness

Color index:

432 Team – **Important** – 433 Notes – Not important

[ent433team@gmail.com](mailto:ent433team@gmail.com)



## 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 *نحلة/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

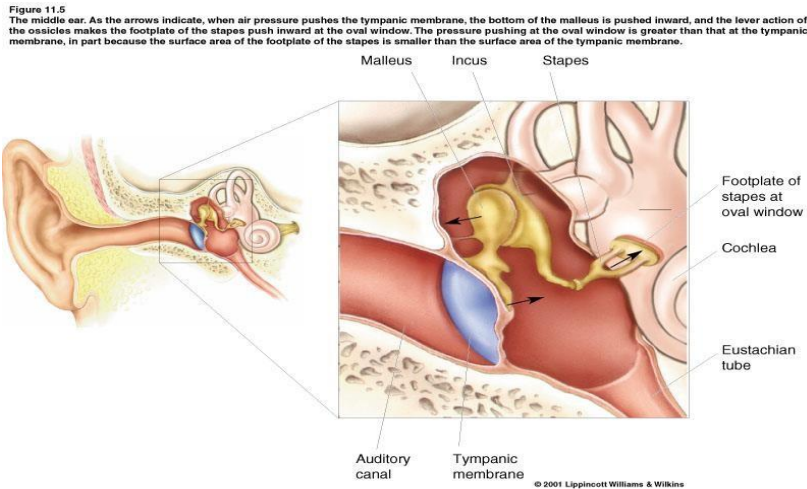
### Effects of sensory loss:

- 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.



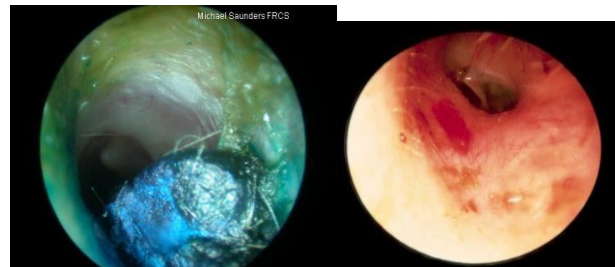
When the external and the middle ear are affected= conductive hearing loss.

Inner ear (cochlea) and the nerve= sensory hearing loss.

Cochlea's job is tuning of the sound.

## Conductive Defects:

- Wax & foreign bodies
- Otitis externa
- Ear drum Scarring; perforation
- Otitis media
  - Acute suppurative (ASOM)
  - Otitis media with effusion (OME)
  - Chronic otitis media (CSOM)
- Otosclerosis
- Ossicular chain disruption



## 1. Wax:

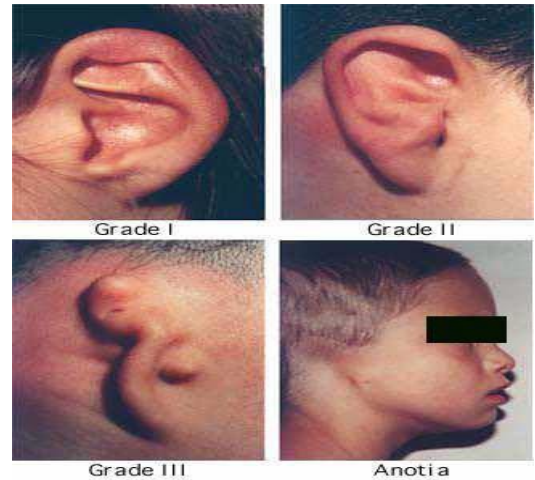
Is the commonest cause of conductive hearing loss (CHL).

## 2. Microtia:

Deformity of the ear auricle.

## 3. Atresia:

No ear canal.



## 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.

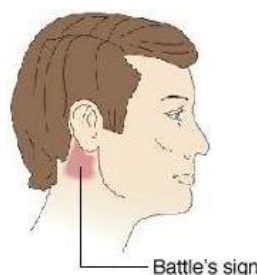


(Source: <http://www.aafp.org/afp/2012/1201/p1055.html> )

## **Raccoon eyes sign:**

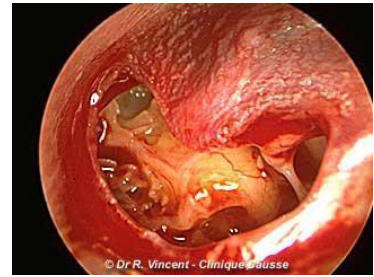
(Skull base fracture blood goes to the external auditory canal > tympanic membrane perforation > blood in the middle ear)

## **battle's sign :**



## Perforated drum:

Fresh blood indicates a recent injury (acute injury).



## 5. 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 eardrum 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

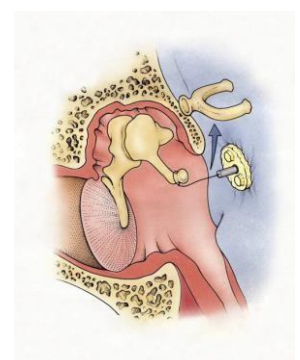
Treatment of adhesive OM is attachment of **tube**.



## 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. (source: [medical dictionary](#))



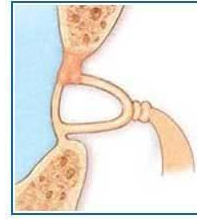
## 7. Otosclerosis:

Fixation of the stapes by new bone formation.

- 10% otosclerotic lesions (10% symptomatic)
- Females: Male 2: 1
- Middle-age
- 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):

- Congenital
- Trauma
- Infection
- Noise
- Ototoxic
- Presbycusis
- Acoustic neuroma

### 1. Congenital hearing loss:

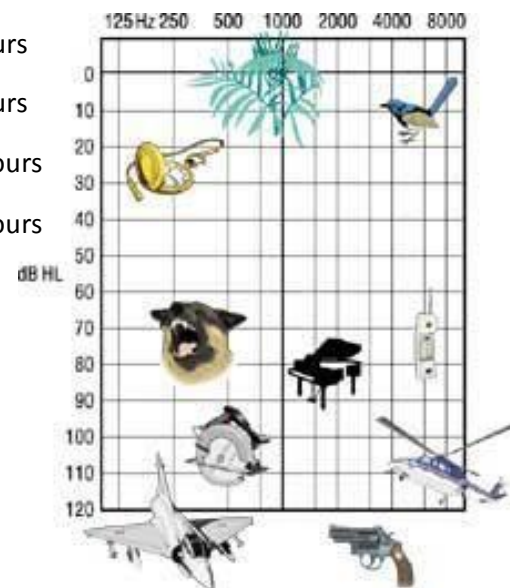
- Deafness affects 0.2%
- SNHL attributed to
  - 50% genetic factors
  - 20-25% environmental
  - 25-30% sporadic
- Genetic (due to consanguinity marriages)
  - 75% AR (autosomal recessive)
  - 20% to AD (autosomal dominant)
  - 5 % X-linked

### 2. Noise induced SNHL:

- Boilermaker's deafness
- One of the most common occupationally induced disabilities
- 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)
- Diuretics
- Antineoplastics
- Antinflammatories
- Antimalarial agents
- Ototoxic agents
- Others

#### **Higher risk:**

1. Renal failure (Elevated peak and trough levels)
2. Liver failure
3. Immunocompromise
4. Collagen-vascular disorders
5. Advanced age (> 65 years)
6. Prior ototoxicity
7. Concurrent use of known ototoxic agents
8. Preexisting HL or Vestibular
9. Bacteremia (fever)
10. Treatment course longer than 14 days
11. + ve FHx of AG ototoxicity

### **4. Presbycusis:**

Aging process of human beings, it's associated with grey hair, cataract and SNHL.

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.

### **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 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):**

Implant in the brains



## 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. Labrinthitis
- D. Wax

**Answers:**

C, A, C

# Done By:

Othman Abid
Majed Altulyan

