

THE EAR EXAMINATION

Anatomy and Physiology of the Ear

• External ear

- Auricle or pinna (canal have hairs cerumen) 2.5

• Middle ear: tympanic membrane , Ossicles, tympanic cavity

- Malleus (hammer)
- Incus (anvil)
- Stapes (stirrup)
- Eustachian tube

(continues)

Anatomy and Physiology of the Ear

• Inner ear

- Labyrinth (hearing & equilibrium):-

1. Vestibule: (hearing & balance)

2. Semicircular canals : 3 (balance & equilibrium for the body)

3. Cochlea: 3 (2 compartments - perilymph & third endolymph) as sound waves travel through the ear

VIII-CN: acoustic N

Health history

- Patient profile
- Age : Hearing lose related to age (presbycusis), sensorineural degeneration ,otosclerosis (elderly).
- Sex : female ,calcification of the ossicles .
- Chief compliant :
- **Change in or lose of hearing**
- Location :unilateral or bilateral.
- Quality ;low sounds , high sounds
- Quantity ;partial or complete
- Associated manifestations i.e. tinnitus
- Aggravating factors i.e. loud sound
- Alleviating factors * Timing
- **Otorrhea :drainage of liquid from ear**
- Location, Quality, Quantity , Associated manifestations (fever, headache), Aggravating factors (position), Alleviating factors (position), Timing (post trauma)

Chief Complaint

- **Otalgia:** discomfort in the ear
 - **Location:** unilateral ,bilateral
 - **Quality:** aching ,dull, sharp
 - **Associated manifestations:** drainage ,tinnitus, dysphagia, sore throat ,vertigo, diminished hearing
 - **Aggravating factors:** tooth infection, upper RI, perforated TM, object ear, change in ear pressure
 - **Alleviating factors:** analgesics, up right or supine position
 - **Setting:** outdoors, high altitudes, noisy environment
 - **Timing:** continuous ,intermittent ,after swimming, head trauma, loud noises , after pressure change, flying
- **Tinnitus:** Ringing in the ear
 - **Location:** unilateral ,bilateral
 - **Quality:** pulsatile ,buzzing, high-pitched ringing
 - **Associated manifestations** :pressure in ear ,hearing loss, upper RI ,allergies
 - **Aggravating factors:** medication ,fluid in ear ,perforation TM ,position ,↑ cerumen
 - **Alleviating factors:** discontinuing medication ,position change
 - **Setting:** work
 - **Timing:** continuous ,intermittent ,long-standing, recent, drug therapy, exposure to loud noises

Past Health History

- **Medical History**
 - Acute otitis media , acute otitis externa, serous otitis ,hearing difficulties
 - Chronic diseases, such as diabetes mellitus, renal disease, hypertension, immunosuppression
 - **Surgical History:** Tympanostomy tubes, Neurosurgery
 - **Allergies:** Severity of signs and symptoms
 - **Seasonal or environmental**
 - **Medications:** Antibiotics, antihistamines, decongestants, مزيلات الاحتقان, steroids, chemotherapy, immunosuppressive drugs
- (continues)

Past Health History

- Accidents/injuries
 - Foreign bodies
 - Trauma to the ear
 - Sports injuries
 - Special needs
 - Use of assistive devices (hearing aids)
 - Childhood illnesses
 - Ear infections
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Family Health History

- Hearing loss otosclerosis

Social History

- Alcohol use
- Tobacco use
- Drug use:
- Work/home environment
- Hobbies/leisure activities
- Stress

Health Maintenance Activities

- Sleep
 - Diet
 - Use of safety devices
 - Healthy checkups
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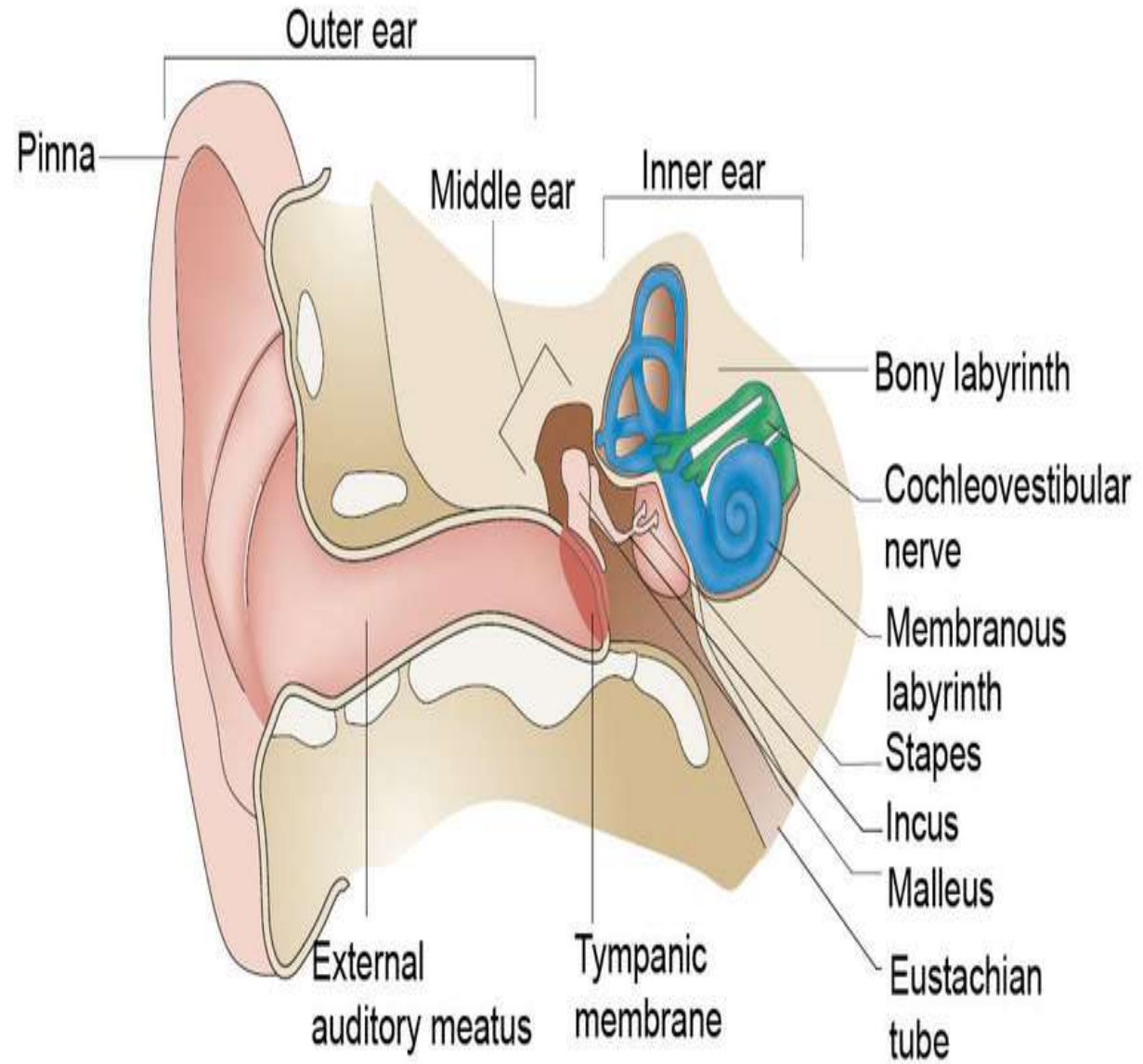
General Approach to Assessment

- Greet the patient تحية
- Explain assessment techniques
- Quiet, well-lit environment
- Sitting position
- Compare right to left
- Systematic approach

Ear assessment (practical)



Health history



Equipment

- Otoscope
- Tuning fork



Physical assessment of the ear

1-Auditory screening(CN VIII)

•1-Voice –whisper Test

Normal finding: able to repeat words whispered at a distance of 2 feet

•2-Tuning Fork Test:

Weber Test

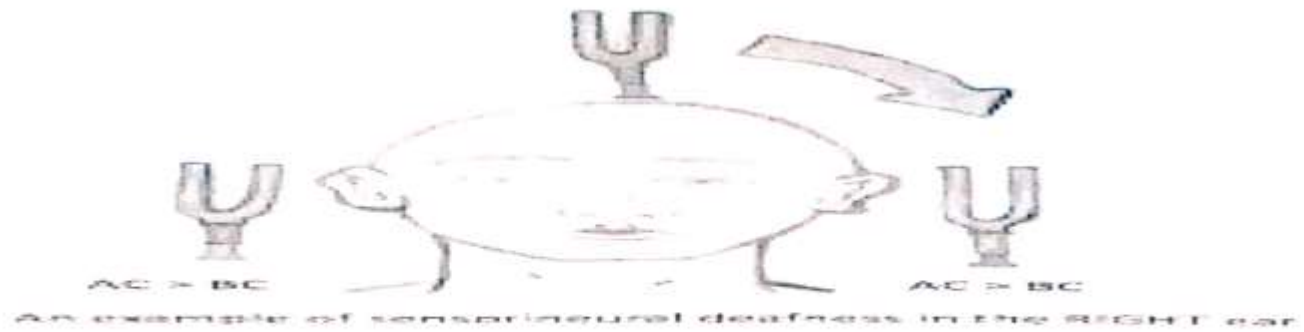
Normal finding: able to hear sound equally in both ears

Rinne Test

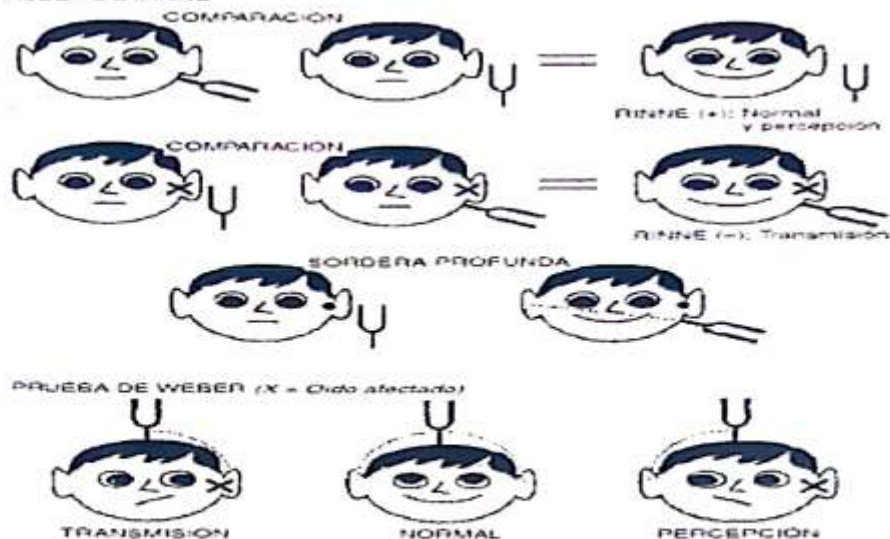
Normal finding: air conduction > bone conduction

Rinne Test

- *Rinne positive* ($AC > BC$): this is the response in normal ears and in people with a sensorineural hearing loss in the test ear.
- *Rinne negative* ($BC > AC$): this is the response in people with a conductive hearing loss in the test ear.



PRUEBA DE RINNE



Assessment of the Ear

• Abnormal findings

- Small- or large-size ears
- Pale, red, cyanotic
- Purulent drainage
- Clear or bloody drainage
- Pain or tenderness on palpation
- Tumor
- Hematoma behind ear over mastoid

(continues)

2-Inspection and palpation of external ear

Inspection

- Inspect the ear and note their position, color, size shape
- Note any deformities, nodules, inflammation, or lesion
- Note color, consistency, amount cerumen

Palpation

Palpate the auricle and mastoid

3-Otoscopic assessment

- Inspect both ears
- Normal findings
 - No redness, swelling, tenderness, lesions, drainage, foreign bodies
 - Tympanic membrane is pearly gray with well-defined landmarks
 - Light reflex present at 5 o'clock in right ear and 7 o'clock in left ear
 - Tympanic membrane moves when the patient blows against resistance

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Inspect using Otoscope

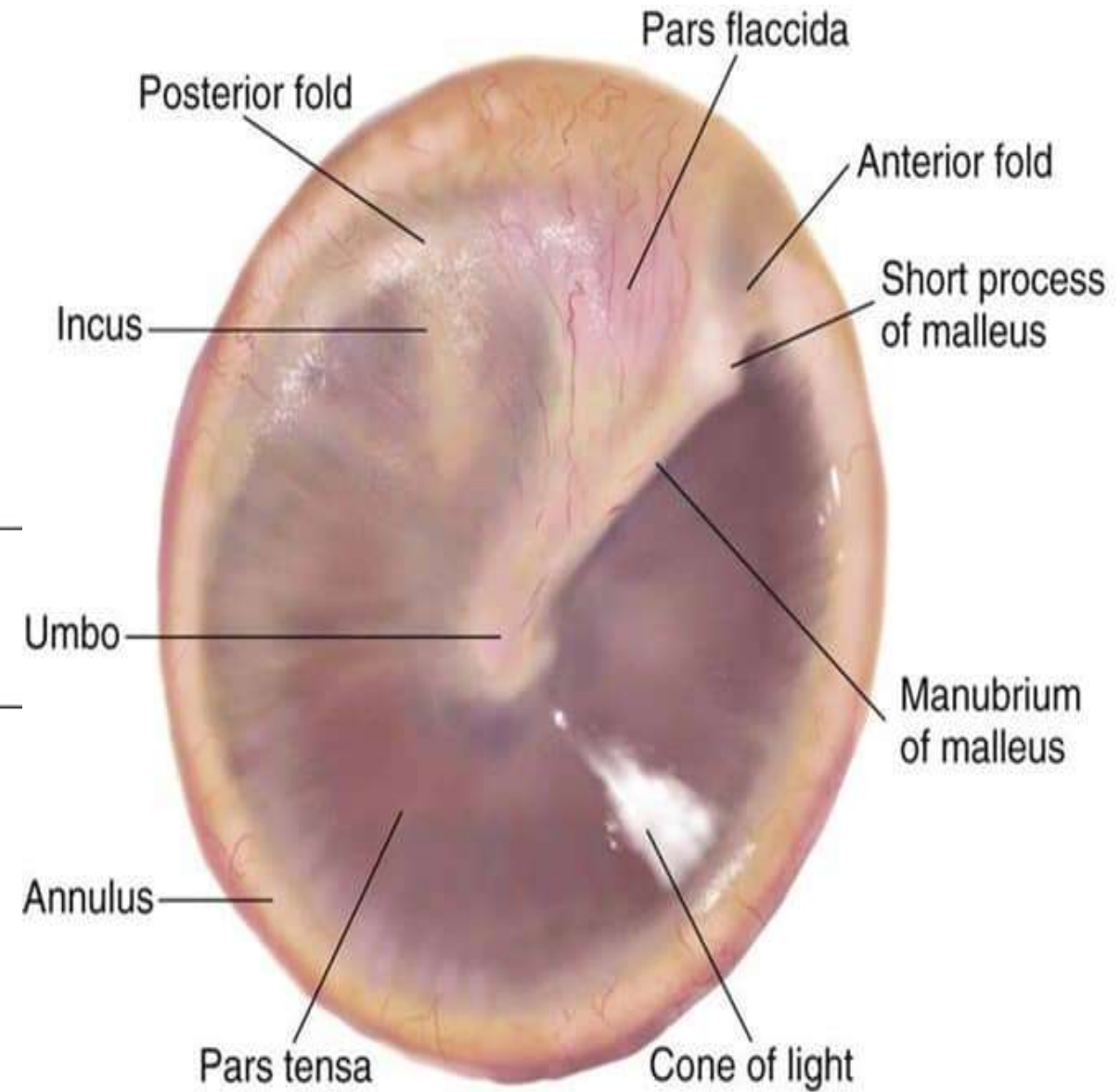
- **External canal**

- Color
- Swelling
- Lesions
- Discharge ; color and odor.
Clean or change speculum
before examining other ear.

Otoscopic Assessment

- **Abnormal findings**

- Redness, swelling, narrowing, pain
- Drainage
- Hard, dry, very dark yellow cerumen
- Reddened tympanic membrane
- Severe pain
- Chalk patches on tympanic membrane



TYMPANIC MEMBRANE