

# Assessment of the Ears

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## Learning Objectives

- Identify the structures and functions of the Ear
- Discuss how the nurse focus and prioritize subjective /objective data collection
- - pt safety issues
- Identify normal and abnormal findings
- Identify teaching opportunities for health promotion and risk reduction r/t the ear system
- Demonstrate application of the knowledge: Think like Nurse & Act like Nurse: Pulling it ALL together: Reflection and critical thinking

## Ear Anatomy

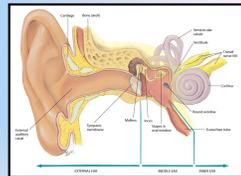
- Sensory organ of the body
- Used for hearing and maintaining equilibrium
- Composed of 3 sections
- External ear
- Middle ear
- Internal ear

## Videos

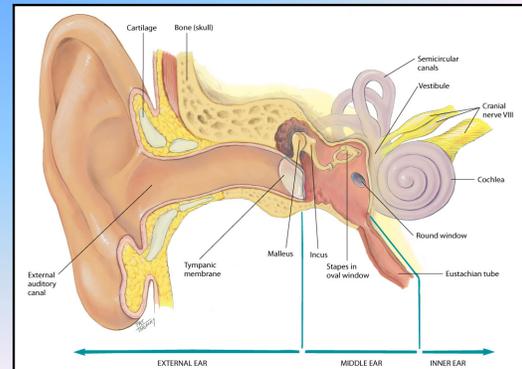
- Hearing and the Cochlear:  
<http://www.nlm.nih.gov/medlineplus/ency/anatomyvideos/000063.htm>  
<http://www.nlm.nih.gov/medlineplus/ency/article/000129.htm>

## Structure and Function

- External ear
  - External auditory canal
  - Tympanic membrane
- Middle ear
  - Malleus, incus, and stapes
  - Eustachian tube
- Inner ear
  - Vestibule and semicircular canals
  - Cochlea

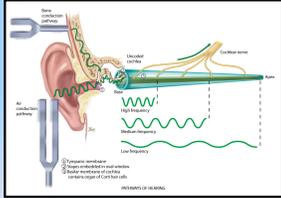


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## Structure and Function (cont.)

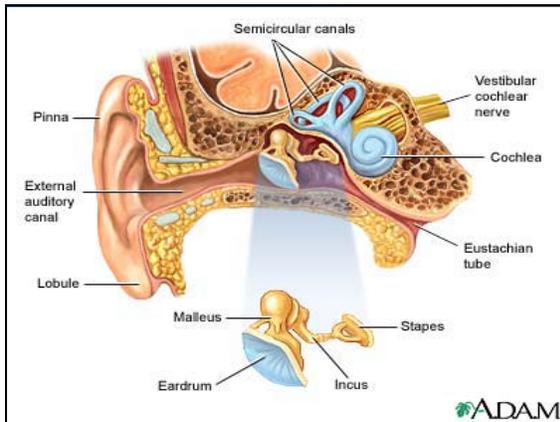
- Hearing
  - Levels of auditory system
    - Peripheral
    - Brainstem
    - Cerebral cortex
  - Pathways of hearing
    - Air conduction
    - Bone conduction



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## Auricle

- 
- Helix
  - Triangular fossa
  - Anthelix
  - Concha
  - External auditory meatus
  - Tragus
  - Antitragus
  - Lobule



## Middle Ear Anatomy

- 
- Malleus
  - Ear canal
  - Tympanic membrane
  - Mastoid bone
  - Oval window under footplate of stapes
  - Round window
  - Incus
  - Stapes
  - Tensor tympani muscle
  - Eustachian tube

## Inner Ear Anatomy

- 
- Semicircular canals
  - Vestibule
  - Vestibular nerve CN VIII
  - Cochlear nerve CN VIII
  - Cochlea
  - Oval window under footplate of stapes
  - Round window

## Structure and Function (cont.)

- Hearing loss
  - Conductive
  - Sensorineural (perceptive)
- Equilibrium
  - Vertigo



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## Structure and Function (cont.)

- Developmental Care
  - Infants and children
  - The adult
  - The aging adult
- Cross-cultural Care
  - Otitis media
  - Cerumen
  - Hearing loss

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## Assessment of the Ears

- **Subjective Data-**
- Hx. Earaches
- Infections
- Discharge (otorrhea)
- Hearing loss
- Environmental noise
- Tinnitus
- Vertigo

## Assessment of the Ear

- **Objective data:**
- Inspect and palpate external ear:
- Note color, lesions, tenderness, discharge
- If S/S of ear infection, inspect unaffected ear first to avoid transferring infected material.

## Inspect/Palpate EAR

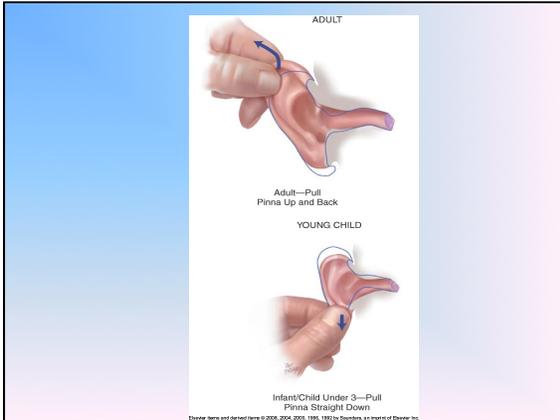


## Otitis externa



## Keloid scar





### Otoscopic Examination

- Insert otoscope and examine ear canal noting: redness, swelling, lesions, discharge or foreign bodies
- Inspection of Tympanic Membrane normally TM - Pearly gray, shiny, translucent
- Flat, slightly pulled in at center
- Skin intact, no redness/ discharge
- Canal- clear, no obstructions



### Objective Data—Physical Exam (cont.)

Otoscopic examination

- Position of head and ear
- Method of holding and inserting otoscope
- External canal
  - Color
  - Swelling
  - Lesions
  - Discharge
- Tympanic membrane
  - Color and characteristics
  - Position
  - Integrity of membrane



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### Objective Data—Physical Exam (cont.)

Test hearing acuity

- Conversational speech
- Whispered voice test
- Tuning fork tests
  - Weber test
  - Rinne test



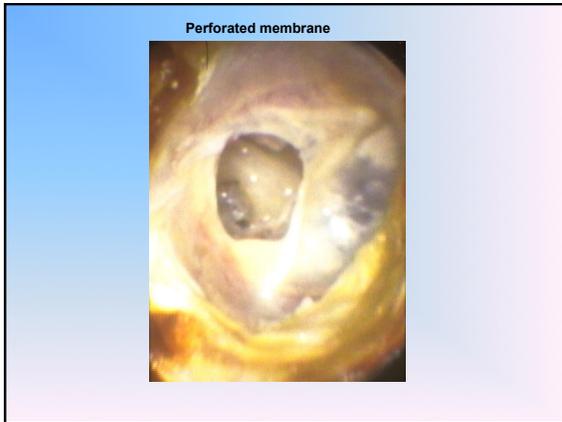
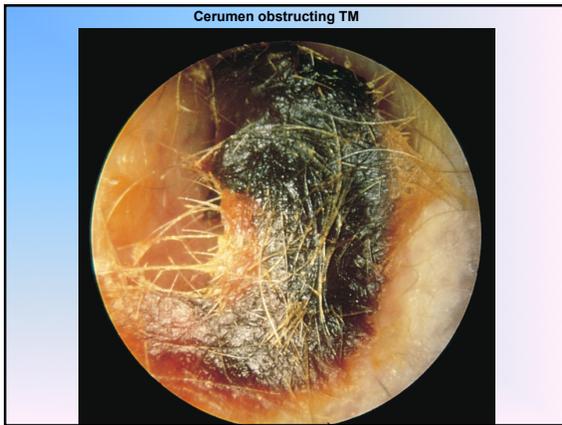
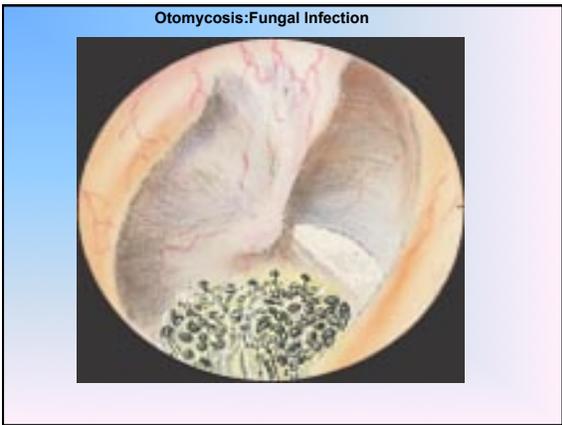
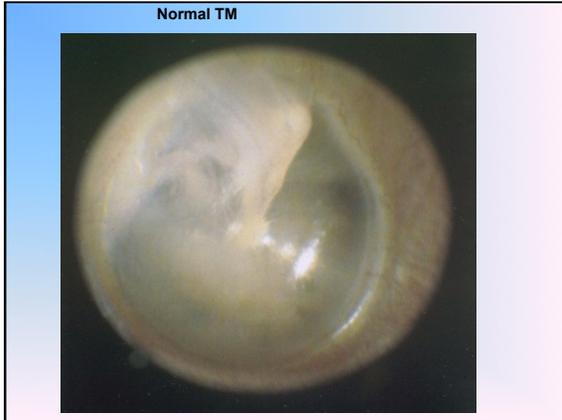
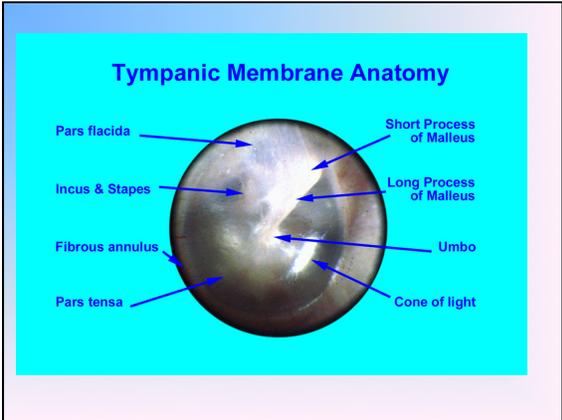
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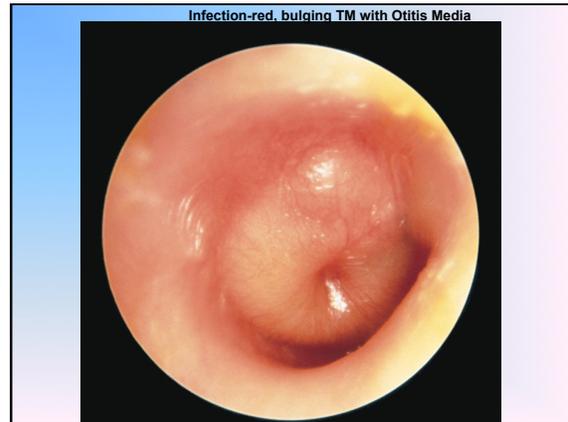
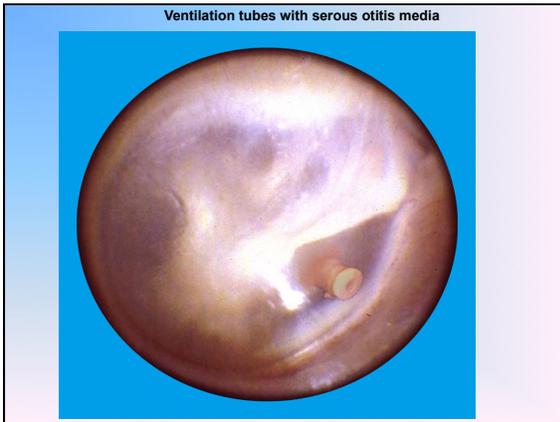
### Objective Data—Physical Exam (cont.)

Vestibular apparatus

- Romberg test
- Developmental Care
  - Infants and young children

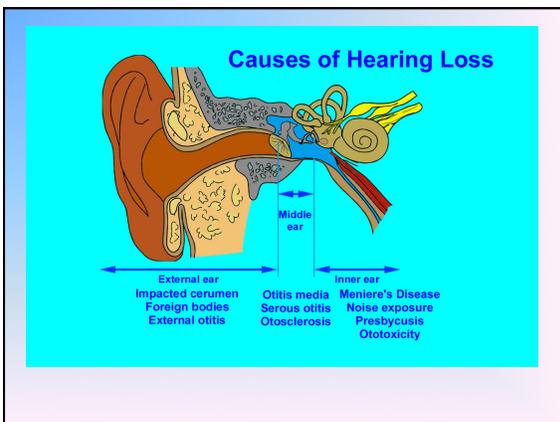
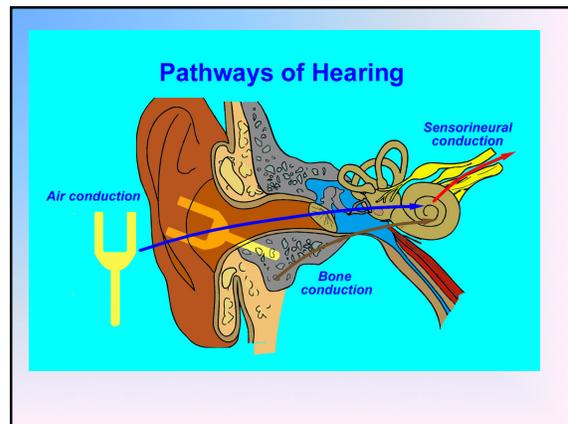
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## Hearing Loss

- **Conductive**
- Mechanical dysfunction of external /middle ear
- Examples include: impacted cerumen, foreign body, pus or perforated TM, otosclerosis
- **Sensorineural**
- Pathology of inner ear, CNVIII, temporal lobe of brain
- Example: presbycus- gradual nerve degeneration

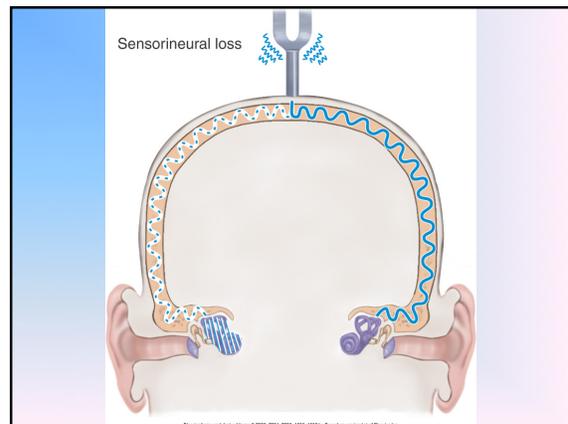
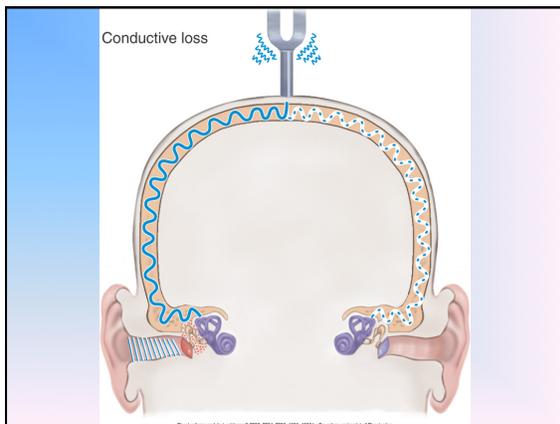


## Hearing Acuity

- Without Audiometry, other tests are crude measures.
- **Whisper test:**
- Test one ear at a time
- Press on tragus
- Whisper words from 1-2 ft. away
- Person should be able to repeat back the words

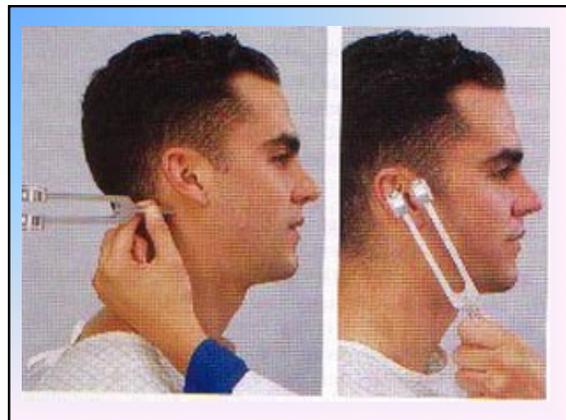
## Weber Test

- Weber test- valuable when person reports hearing better with one ear.
- Strike tuning fork and place on midline of skull
- Tone should be equally loud bilaterally
- Person should hear the tone by bone conduction (BC)



## Rinne Test

- Strike and place tuning fork on mastoid process. (Sound heard via bone conduction = BC)
- Instruct person to signal when sound stops.
- Quickly reposition fork in front of ear close to ear canal (sound heard via air conduction=AC)
- Instruct person to signal when sound stops.
- Normally sound is heard twice as long by AC as by BC.
- Recorded as AC > BC



## Sample Charting

- **Subjective**

- States hearing is good. No earaches, infections, discharge, hearing loss, tinnitus or vertigo

## Sample Charting

- **Objective**

- Pinna- skin intact with no masses, lesions, tenderness, or discharge.
- Otoscope- external canals are clear with no redness, swelling, lesions, foreign body, or discharge. Both tympanic membranes are pearly gray, with light reflex and landmarks intact, no perforations.
- Hearing- whispered words heard bilaterally, Weber test: tone heard midline without lateralization. Rinne test: AC > BC and = bilaterally.

## Sample Nursing Diagnoses

**Wellness Diagnoses**

1. Readiness for enhanced communication r/t use of hearing aid AEB...

**Risk Diagnoses**

1. Risk for injury r/t hearing impairment  
2. Risk for loneliness r/t hearing loss

**Actual Diagnoses**

1. Disturbed Sensory Perception: Auditory r/t conductive or sensorineural hearing loss AEB...  
2. Acute pain r/t infection of external or middle ear AEB...  
3. Impaired social interaction r/t inability to interact effectively with others secondary to hearing loss AEB.....  
4. Disturbed body image r/t concern over appearance and need to wear hearing aid AEB....

Which of the following factors may contribute to sensorineural hearing loss?

- A. Impacted cerumen
- B. Otosclerosis
- C. Drugs affecting the cochlea
- D. Vertigo

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Which of the following would *not* contribute to the development of otitis media?

- A. Prematurity
- B. Positioning during bottle feeding
- C. Ethnicity
- D. Tinnitus

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## Summary

- **Assessment of the ear includes:**
  - Inspection & palpation of external ear
  - Otoscopic exam including ear canal and tympanic membrane
  - Testing hearing acuity
  - Sample documentation