

## Ear Assessment & Diagnostic Procedures

- Subjective Data
  - Past Health History-especially childhood illness, recent injuries, ear complaints
  - Surgery or head trauma? Recent or as a child?
  - Medications-ototoxic meds? Aspirin can cause tinnitus.
  - Allergies-seasonal allergies?
  - Family History-genetics can play a role
  - Noise exposure-loud work environment? Hobbies? Concerts? Earbuds?
- Objective Data
  - Does the patient hear well during history intake? DO you have to constantly repeat yourself? Issues in both ears or just one ear? Any factors that relieve or exacerbate?
- Visual Inspection
  - External Ear-any redness, discharge, swelling, lesions, abnormal appearance?
  - Palpate-any nodules? Any irregular feeling skin in or around ear lobe? Behind ear?
- Otoscopic Examination
  - lighted instrument used to look in ear canal
  - Position:
  - Evaluate: tympanic membrane for color, contour, intactness, cone of light
- Hearing Tests
  - Gross Hearing Tests: Whisper test
- Tuning Fork Tests: Weber and Rinne Test

o Rinne Test:

- o Vibrating fork is placed first on patient's mastoid process. When the patient indicates they no longer hear the sound the tuning fork is moved directly next to the ear in the air.

- o Air conduction should always be more efficient than bone conduction

Positive Rinne Test- Air conduction is greater than bone conduction (Normal)

Negative Rinne Test- Bone conduction is greater than air conduction (Abnormal)

o Weber Test

- o Stem of an activated tuning fork is placed on the middle of forehead or skull bone. Normal hearing indicates sound heard in both ears-no lateralization of sound. Both ears hear sound equally. (Normal)

- Conductive hearing loss-sound will lateralize to poor ear. So, if someone has a lot of fluid in their Left ear and the test is done, the sound will lateralize to the left ear which is the "poor ear" in this case. The sound heard via the affected ear has less environmental noise reaching the cochlea via air conduction (for example, the environmental noise is masked) as compared to the unaffected ear which receives sounds from both bone conduction and air conduction. Therefore, the affected ear is more sensitive to bone-conducted sound.

- Sensorineural hearing loss-sound lateralizes to good ear. So, if that same person had a bad Left ear due to some issue from birth the sound would lateralize to the good ear because there is a problem in the bad Left ear that doesn't allow the transmission of sound normally.

- o Audiometry: diagnostic instrument for evaluating hearing. Different tones and levels are used to evaluate hearing.
- Types of Equilibrium- we maintain equilibrium because it is controlled by the vestibule in the ear and our semi-circular canals.
  - o Manifestations of Equilibrium Problems
    - o Nystagmus-abnormal eye movements. May look like twitching to observer.
    - o Vertigo-sense that the person/objects around the person are moving or spinning
  - o Tests for vestibular function and equilibrium
    - o Electronystagmography-tests for vestibular function
    - o Rotary Chair Test or Sinusoidal Harmonic Acceleration- tests for Meniere's
    - o Platform Posturography-tests postural control capabilities
    - o Nursing Care- light meals before tests, could be dizzy, nauseated. Safety, Fall Risk.
- Hearing Loss causes include: aging, injury, disease, heredity, medications, noise exposure, and prenatal damage
- Types of Hearing Loss
  - Conductive: problem with conduction of air sound waves.
  - Sensorineural: damage to the inner ear structures
  - Mixed: Both sensorineural and conductive hearing loss have occurred.
  - Functional-hearing loss manifested as a result of emotional disturbance
- Gerontologic Considerations: Presbycusis- hearing loss due to aging. Eardrum gets thicker causing it to be harder to conduct sound waves to the inner ear. Hair and cerumen build up. Ossicles calcify and harden. Tiny hair cells can be damaged. Tinnitus-ringing in the ears that may be accompanied by age related hearing loss can occur

- Nursing Considerations for hearing loss: Speak normal, but maybe more slowly. Use a deep voice, but a lower pitch in a quiet environment.

#### 4). General Ear Care Guidelines

Environmental Noise- wear ear protection!

Disease Prevention-maintain immunizations. Rubella can cause hearing loss

Ototoxic Drugs-can result in damage to acoustic nerve

Prevention of Trauma-avoid sharp/foreign objects in the ear

General Ear Care- only clean ears with a washcloth and pinky finger and be gentle

- Instilling Eardrops: Check that drops are room temp
  - Position- pt lies on side, Nurse to straighten Ear canal. Up and back for adult, down and back for child.
  - Keep dropper tip clean and don't contaminate by touching skin. Keep patient on their side for 5-10 minutes.
- Ear Irrigation- to remove wax, clean ear canal, remove foreign body by flushing out.
  - Contraindicated if patient has a living insect in ear or a water-soluble item such as rice, or organic material that would swell with instillation of h2O

Ear Wicks- can be used to help deliver medication past a swollen middle ear canal. Small cotton wick. Apply med to wick once in the ear.
- Ear Care Specialists
  - Otolologist-doctor that specializes in diagnosis and treatment of ear surgery, performs surgery
  - Otolaryngologist-doctor that specializes in problems related to ENT, does surgery
  - Audiologist-not a doctor but specializes in non-medical evaluation and rehab of hearing disorders