Ear Assessment

An ear assessment includes observing the external ear, an otoscope examination and hearing acuity tests. First, the external ear is a bilateral inspection looking at position, size, symmetry and presence of lesions, drainage, nodules or redness. The external ear canal is inspected for patency prior to performing an otoscope examination, as occluding cerumen or significant inflammation can provide challenges. After inspecting the opening of the ear canal, the otoscope exam begins by inserting an appropriately sized speculum comfortably into a seated patient. The examiner must use two hands to both gently manipulate the pinna to open the S-shaped ear canal and hold the otoscope without forceful or traumatic entry into the canal. Once positioned, the examiner can look into the otoscope and observe the canal and tympanic membrane, known as the eardrum. The tympanic membrane provides valuable information about the health of the middle ear, as the examiner can see structures through the translucent surface and see a cone of light reflex shining off the surface in a healthy and intact eardrum. Hearing acuity tests are performed by the examiner, and these include the whisper test, Weber's test and the Rinne test.



PLAY PICMONIC

EXTERNAL EAR

Inspect Position and Symmetry
Position and Symmetry of Ear
Assess the size, shape and condition of the external ear. Variance in bilaterally symmetric size and shape may not be clinically significant, but the presence of swelling or thickening could indicate underlying or repeated trauma (e.g. "cauliflower ear").

Inspect for Lesions, Drainage, Nodules or Redness
Leeches, Drainage, Knobs and Redness
Assess the skin condition for consistency with the patient's facial skin color. Concerning lesions, such as evolving moles or nevi, could be malignant skin cancer. Drainage from the external ear canal may be a ruptured tympanic membrane or basilar skull fracture. After inspecting, palpate the external ear for tenderness or additional nodules.

Inspect Opening of Ear Canal
Opening of Ear Canal
Prior to performing an otoscopic exam, assess the patency and condition of the external auditory meatus ("ear canal"). Unexpected swelling, redness, or drainage are clinically significant and warrant further assessment. Cerumen may be present at the opening, and the color of cerumen ranges from grey-yellow to light brown and black. Also, it can be moist and waxy to dry and hardened.

OTOSCOPIC EXAMINATION

Insert Speculum
Inserting Speculum
Choose a speculum size fitting comfortably in the patient's external auditory meatus, but not too small to limit visualization of the tympanic membrane ("ear drum") and canal. When inserting the speculum, asking the patient to tilt their head slightly away from you and toward the opposite shoulder straightens the obliquely sloping ear drum. Hold the otoscope comfortably in your hand of preference. Using the other hand and with an adult or older child as a patient, gently grasp and firmly pull the patient's pinna up and back to further straighten the S-shaped canal. In children younger than 3 years, pull the pinna down to straighten the canal.

Position Scope
Positioning Scope in Ear
Once the canal is straight, move the otoscope toward the ear and use the dorsum of your hand and fingers to gently make contact with the patient's face prior to inserting the speculum. This assists in preventing unintended trauma or forceful insertion. Once the speculum is fully inserted, bring your eye up to the otoscope and assess the position and view of the canal and eardrum. If unable to visualize the eardrum, reposition the patient and/or speculum and reassess.

View Structures
Ear Structures
Structures of the external ear include the canal, the tympanic membrane ("eardrum"), and distal bones seen through a translucent eardrum (AKA "landmarks;" e.g. sections of the malleus: the umbo, manubrium, short process). The canal is expectedly free from swelling or erythema, foreign bodies, lesions or discharge. The eardrum appears shiny, with present landmarks, and pearly-grey in color. Scarring appears white and dense, commonly found in

Sign up for FREE at picmonic.com

repeated trauma or infection in older children or adults. A bulging, erythemic, non-intact or absent landmarks could indicate current or prior inflammation or infection to the middle ear, or otitis media.

Light Reflect

Light Reflect in Ear

A cone of light is present on a healthy tympanic membrane. This light is a reflection off the otoscope's light and is often found in the anteroinferior quadrant of the membrane. Absence of the light reflex can indicate an unhealthy eardrum or middle ear.

HEARING ACUITY TESTS

Whisper Test

Whisper

A whisper voice test is performed 2 feet behind the patient, and starts as the patient occludes one ear to grossly test the hearing of the other ear. Occlusion is best performed by pressing on the tragus with one finger into the auditory meatus (e.g. ear canal). The examiner leans in on the unoccluded ear and whispers three individual random letters and numbers (e.g. "3, Y, 8"). The patient is asked to repeat the series of numbers/letters. If incorrect, attempt the whisper test again with another random sampling of numbers/letters. A passing score is 4/6 with two series of numbers/letters per ear. Repeat this process with the other ear.

Weber's Test

Web giving Weber's Test

Weber's test is used to lateralize or distinguish conductive and sensorineural hearing loss following direct visualization and needed clearing of the external ear canal (e.g. removal of cerumen impaction). It is less accurate than the Rinne test, and is performed by applying a primed tuning fork to the frontal occiput of the patient's head. If conductive hearing loss is present in one ear, the sound will lateralize to the "poorer" ear. If sensorineural hearing loss is present in one ear, the sound lateralizes to the "better" ear. Any suspicious, occult findings need to be confirmed with an audiometry test.

Rinne Test

Rhinoceros giving Rinne's Test

Rinne Test is used to detect hearing loss, and compares the patient's ability to hear via air conduction (AC) through the external ear canal versus bone conduction (BC), or the vibration of sound through the cranial bones. It is performed one ear at a time, starting with application of a primed tuning fork to the mastoid process posterior to the ear. The patient "hears" vibration via BC, and reports when the vibration is no longer heard. Immediately following this report, the examiner moves the tuning fork inches away from the auditory meatus to measure the patient's ability to hear via AC. The patient expectedly reports hearing the sound via AC, and this is a "normal" finding of AC greater than BC, or AC>BC. If conductive hearing loss is present, the patient hears via BC as long as AC, or BC=AC. Sensorineural hearing loss is reported in a patient who cannot hear via BC or AC. Any suspicious, occult findings need to be confirmed with an audiometry test.

Sign up for FREE at picmonic.com