Examination of the ears and functional testing of hearing

To begin:

WIPE

- Wash hands
- Introduce self
- Identify patient
- Permission – gain consent for the exam
- Position – seated
- Pain – ask if the patient is in pain
- Privacy – ensure curtains/doors are closed
- Exposure – ears accessible – if someone wears a head covering you should ask if they are happy to be examined, and ask the patient to expose the ear as comfortable.

General inspection and active observation

Around the bed

What to examine	Assessing for
General appearance	See if the patient is alert, orientated, in pain, generally appearing well or unwell
Hearing aids	Note if the patient is wearing any hearing aids. Ask the patient to remove them for the examination. Make sure you explain the examination before doing so.
Walking aids	Indicates general mobility level. Vestibulocochlear nerve pathology can cause both a hearing and balance issue

Inspection

Where	Example of why
Pinnae	Asymmetry Deformity Erythema - otitis externa Scars – previous surgery Skin changes – skin cancers
Mastoid	Erythema and swelling – mastoiditis Scars – previous surgery Bruising
Pre-auricular region	Lymphadenopathy Preauricular sinus
Conchal bowl	Discharge

Palpation

Where	Example of why
Tragus	Tenderness – otitis externa
Pre auricular lymph nodes & Post auricular lymph nodes	Lymphadenopathy
Mastoid	Bogginess, swelling, tenderness

Otoscopy

Tips:

- Put the otoscopy head on the battery handle, if applicable, and turn on.
- Place speculum (disposable cap) on the otoscope. Use the largest size appropriate for the patient's ear canal (usually 4mm).
- Examine the "normal" ear first.
- Hold the otoscope in the right hand for the right ear and left hand for the left ear.
- Hold it in a tripod grip, and use your hand to stabilise on the patient's cheek.

Where	**Examine**	**Example of why**
External ear canal Pull pinna gently – back and up for adults to straighten the external auditory canal. For children pull horizontally backwards.	External auditory meatus External auditory canal (enter under direct visualisation i.e don't have your eye up to the auroscope at the time)	Wax Discharge/debris Erythema Foreign bodies Skin changes (lesions, dryness etc) Narrowing of the canals Bony exostosis
Visualising the tympanic membrane	Inspect all 4 quadrants of the TM • Colour • Shape • Light reflex- anterior inferior quadrant • Normal anatomical features (pars tensa, pars flaccida, light reflex, handle and lateral process of the malleus).	Erythema – inflammation Bulging TM – increased middle ear pressure Retracted TM – reduced middle ear pressure Absent/distorted light reflex – otitis media Perforations – infection, trauma, cholesteatoma (superior part) Scarring – tympanosclerosis Air/fluid levels behind the TM

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Clinical test of hearing

What	Examine	Example of why
Gross hearing assessment	Say a set of 3 numbers into the ear and ask the patient to repeat them. Create some noise to mask the opposite ear e.g. make a rustling sound next to the ear canal. Repeat, using the following steps, until the patient can repeat the numbers correctly: whisper at arm's length; whisper closer (~6 inches from the ear); speak at normal voice at arm's length; speak closer. If patient still can't hear, can continue with a louder voice.	If a patient can hear quietest whisper (approx. 25dB) they have normal hearing. Hearing loss may range from quiet speech (40dB) to a raised voice (80dB)

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Rinne and Weber's test

What	Examine	Example of why
Rinne's test	Place a vibrating 512Hz tuning fork on the mastoid process When the patient can't hear it anymore, take it off the bone and hold it just outside the same ear. Ask the patient if they can hear it again. OR Modified Rinne's: Place a vibrating 512Hz tuning fork on the mastoid process. Move it outside the ear. Ask the patient to state which is louder.	Normal & sensorineural hearing loss - air conduction > bone conduction Conductive hearing loss - bone conduction > air conduction
Weber's test	Place a vibrating 512Hz tuning fork on the forehead at midline or on the bridge of the nose.	Normal – heard equally both sides Conductive deafness – louder in affected ear Sensorineural deafness – louder in the normal ear

	Hearing loss	Rinne's	Weber's
Interpretation	None	Air > bone	Midline
	Conductive	Bone > air	Affected ear
	Sensorineural	Air > bone	Normal ear