

EAR, NOSE AND THROAT

The Ear

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- Ear examination**
- Ear pain history**
- Ear discharge history**
- Vertigo history**
- Tinnitus history**
- Hearing loss history**

Ear examination:

In this part of ENT examination we will know:

- 1- Clinical examination of the ear.
- 2- Testing the hearing.

Part 1: Clinical examination of the ear

The steps in brief: 1- **WIPE**. 2- **Inspect**. 3- **Palpate**. 4- **Otoscope**.

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| 1- WIPE |
| 2- Inspect |
| A. The Auricle & and external meatus |
| 1- Inspect each auricle and surrounding tissues for deformities, lumps or skin lesions. |
| 2- Notice the shape and size |
| 3- Look for asymmetry of the 2 ears - Helix, antihelix and tragus. |
| 4- Discoloration |
| 5- Deformities (cauliflower, bat ear) |
| 6- Inflammation& discharge (Comment on discharge color and amount and coming from which ear) Note: If ear pain, discharge or inflammation is present, 1- move the auricle up and down and press the tragus. Movement of these structures is (<u>painful in acute otitis externa, but not in otitis media.</u>) 2- Press firmly just behind the ear (<u>Tenderness behind the ear may be present in Otitis Media</u>) |
| B. Pre and post-auricular areas |
| 1- Scars from any previous surgery |
| 2- Look for hematomas |
| 3- Look for obvious masses or lymph node enlargements |
| 3- Palpate |
| 1- Palpate the pinna (1- Looking for swelling or nodules. 2- Check for tenderness) |
| 2- Palpate around the ear (1-Lymph nodes (Pre-auricular/retro-auricular/ suboccipital/superior jugular) 2- Parotid gland.) |
| 4- Otoscope |
| A. Technique |
| 1- choose the ear speculum that the canal can accommodate and fit it on the otoscope |
| 2- Tilt patient head slightly to the opposite side |
| 3- Hold the auricle gently and pull it upwards and slightly from the head. This helps to straighten the auditory canal. |
| 4- Hold the otoscope handle between your thumb and fingers like a pen(for right ear, hold it in right hand and for left ear hold it in left hand) |
| 5- Brace your hand against patients face. Your hand and instrument thus follows unexpected movements by the patients. |
| 6- Insert the speculum gently into the auditory canal, directing it somewhat down and forward. |

| | |
|---|---|
| | |
| B. Inspect the auditory canal | |
| 1- Look for signs of infection, wax build up, foreign body or discharge | |
| 2- Look for signs of healing infection (granulation and blood vessels) | |
| 3- Ask the patient if it's painful. | |
| C. Inspect the tympanic membrane | |
| 1- Identify: the pars tensa with its cone of light, the handle and short process of malleus, and the anterior and posterior folds of the pars flaccida and position of the malleus handle | |
| 2- Gently move the speculum so that you can see as much of the tympanic membrane as possible | |
| 3- Look for any pathology of tympanic membrane (e.g. perforation, chalky patches and atrophy) | |
| 4- Test the mobility of the tympanic membrane using a pneumatic otoscope (if available) | |
| Normal: • Auditory canal: Some hair, often with yellow to brown cerumen. | Normal: • Ear drum: ◦ Pinkish gray (pearly grey) in color, translucent and in neutral position. ◦ Malleus lies in oblique position behind the upper part of drum. ◦ Mobile with air inflation. |
| NB: Swab and culture any discharge | |

Part 2: Testing the hearing

Tuning fork test:

- 1- To differentiate between conductive and sensorineural hearing loss.
- 2- 512Hz tuning fork is usually used.

• **Rinne Test**

✓ (As what was written in the guideline)

Place the base of a vibrating tuning fork on the mastoid bone. When patient can no longer hear the sound, quickly place the fork close to the ear canal and ask patient if he still can hear the sound.

Interpretation:

Normally: Air conduction (AC) > bone conduction (BC).
In conductive hearing loss BC > AC

✓ (As what the doctors do during the clinic)

Put the vibrating tuning fork in front of the ear (not touching it), then on the mastoid process. Ask the patient when they can hear it loudest.

Interpretation:

Normal result: the sound is heard best at the ear canal AC>BC (+ve rinne test)

Abnormal results: • In conductive deafness, the sound is heard best at the mastoid process BC>AC (-ve rinne test)

• In sensorineural deafness, the sound is heard best in front of the ear AC>BC

• **Weber Test**

- 1- Place the base of a vibrating tuning fork on the mid forehead.
- 2- Ask the patient where he hears the sound

Interpretation:

- Normally sound is heard in the center or equally in both ears.
- In conductive deafness, it will be heard in deaf ear.
- In sensorineural deafness, it will be heard in normal ear.

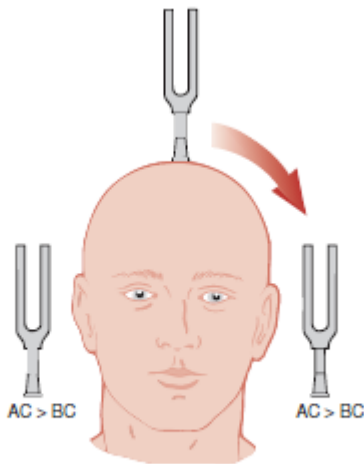


Figure 3.4 Sensorineural deafness in the right ear. The Rinne test is positive on both sides and the Weber test is referred to the left ear.

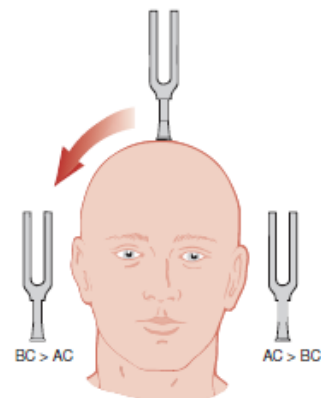


Figure 3.5 Conductive deafness in the right ear. The Rinne test is negative on the right, positive on the left, and the Weber test is referred to the right ear.

REMEMBER for complete examination you need to do ENT examination +head and neck examination+ cranial nerve examination including facial nerve

Post- Exam: ✓Thank the patient. ✓Ask if he/she has any questions. ✓Cover the Patient ✓Wash hands. ✓Summarize findings

History of Earache “Otalgia”

Otalgia is defined as ear pain. Two separate and distinct types of otalgia exist. Pain that originates within the ear is **primary otalgia**; pain that originates outside the ear is **referred** or **secondary otalgia**.

- **Causes of Primary otalgia:**

- 1) **Auricle:**

- **Hematoma**
- **Cellulitis**
- **Herpes zoster oticus:** reactivation of the varicella virus after primary infection. Burning pain, hyperesthesia, and pruritus. Vesicular lesions may be seen on the pinna or in the ear canal
- **Environmental injuries to the ear:** frostbite or sunburn can also cause redness, swelling, and pain of the auricle. Typically, there will be a history of environmental exposure to suggest the diagnosis.

- 2) **Auditory canal:**

- **Otitis externa:** typically caused by *Pseudomonas aeruginosa*, *Staphylococcus aureus*. Otitis externa usually results from the introduction of water into the ear canal as a result of swimming. The cardinal symptom of acute otitis externa is pain and tenderness localized to the auditory meatus. There may also be pain with jaw movement, a feeling of fullness in the ear, itching of the ear canal, or discharge from the canal. Fever is rare.
- **Malignant otitis externa:** occurs when infection spreads from the ear canal to the surrounding bones of the skull base. Usually in immunocompromised and diabetic patients.
- **Furuncle:** infection of hair follicle.
- **Foreign body or cerumen (wax) impaction.**
- **Tumors.**
- **Trauma.**

- 3) **Middle and inner ear:**

- **Acute otitis media and its complications.**
- **Otitis media with effusion.**
- **Cholesteatom.**
- **Trauma:** tympanic membrane perforation, trauma to ossicles or inner ear, basilar skull fracture.
- **Hemotympanium:** blood in tympanic cavity.

- **Causes of secondary otalgia:**

Referred pain can result from disorders in areas innervated by cranial nerves responsible for sensation in the external and middle ear (5th, 9th, and 10th). Specific areas include the nose, paranasal sinuses, nasopharynx, teeth, gingiva, temporomandibular joint (TMJ), mandible, parotid glands, tongue, palatine tonsils, pharynx, larynx, trachea, and esophagus.

Personal data:

- Name
- Age

- Occupation

Chief complaint:

- What brought you here today?
- When did you first notice the problem?
- Route: ER/elective
- Time of admission

History of presenting illness:

- **Site:** unilateral or bilateral, point at the pain site.
- **Onset:** gradual or sudden.
- **Character:** describe the character of pain (is it burning, sapping, pinching)
- **Course:** continuous or intermittent:

If intermittent, it is important to determine whether it is random or occurs mainly with swallowing or jaw movement.

- **Radiation.**
- **Severity:**
 - 1) From a scale of 0-10, how severe is your pain?
 - 2) Does it wake you up from sleep?
 - 3) Did it affect your work or social life?
- **Relieving & aggravating factors.**
- **Progression:** same, progressing, improving?
- **Frequency:** is this your first episode or did it happen before?
- **Diagnosis and medication:** have been seen by a doctor? What have you been diagnosed with? Are you taking any medications for this problem?

Associated symptoms:

Symptoms arising from the ear itself:

- Discharge, blood, increased wax production
- Itching
- Ringing (tinnitus)
- Hearing loss
- Vertigo
- Nystagmus

Symptoms arising from the nose and sinuses:

- Sneezing
- Itching
- Runny, congested nose
- Discharge or bleeding from the nose (epistaxis)
- Difficulty breathing or blocked nose
- Headache and heaviness

Symptoms arising from the mouth and throat:

- Sore throat
- Odynophagia (pain on swallowing)
- Dysphagia (difficulty in swallowing)
- Hoarseness and changes in the voice
- Halitosis (bad breath)
- Mouth breathing, snoring during sleep or sleep disturbances
- Trismus "lock-jaw" (spasm of jaw muscles)

Respiratory symptoms:

- Cough
- Shortness of breath
- Chest pain
- **Constitutional symptoms:** fever, nausea, vomiting, change in weight or appetite.

Risk factors:

- Did you have any recent ear infections and were there any complications? (ex: perforated tympanic membrane, middle ear effusion)
- Recent upper respiratory tract infections: rhinitis/sinusitis.
- Attempts at cleaning the ears with cotton swabs or sharp objects.
- Recent trauma to the head, neck, or ears.
- Barotrauma: recent air travel or undersea diving are potential causes for hemotympanum in the absence of external trauma.
- Dental status: recent dental procedures enquire about dental hygiene and presence of dental abscesses.
- Problems in the neck and temporomandibular joint.
- Recent travel or contact with sick people.
- Chronic illnesses: Diabetes, Hypertension, asthma, immunocompromised state.
- Ear surgeries

Past medical history:

- Chronic illnesses
- Cervicofacial pain syndromes (eg, myalgias, neuralgias, arthritis)
- Have you been diagnosed with any tumors in the head or neck?

Past surgical:

- Previous hospital admissions.
- Previous surgical procedures.
- Blood transfusions.

Family history:

- Family members with similar complaints.
- Chronic diseases.

Social History:

- Smoking.
- Alcohol consumption.
- Occupation (it could be due to ototoxicity from chemicals, noise pollution)

Summary:

- Personal data.
- Chief complaint.
- Important +ves and -ves.

Ear discharge (otorrhea) history:

Ear discharge (otorrhea) is drainage exiting the ear. It may be serous, serosanguinous, or purulent.

Etiology

Causes may originate from the ear canal, the middle ear, or the cranial vault. The most common causes are

1-Acute otitis media with perforation

Severe pain of the ear usually occurs due to swelling and pressure caused by the purulent discharge. The pain usually precedes the discharge and may be accompanied by other symptoms like a sore throat, red eyes (conjunctivitis), fever, diminished hearing and at times, jaw pain.

- Children with acute otitis media also present with restlessness, irritability, loss of appetite and may be seen constantly interfering with the ear. Recurrent bouts of acute otitis media should be investigated and appropriate long term treatment and preventative measures should be implemented.

Treatment:

- Antibiotics may be necessary for bacterial infections, which is the most common cause of infection in acute otitis media.
- Anti-inflammatory drugs will reduce any pain and swelling and corticosteroids may be necessary in severe cases of swelling which is not resolving with anti-inflammatory drugs

2-Chronic otitis media

Chronic otitis media with perforation may result in a persistent ear discharge and some of the other symptoms of an acute otitis media may not be present. Usually the discharge is yellow to brown and has a foul odor and can affect hearing and balance or may be reported as dizziness. Chronic otitis media is also called 'glue ear' due to the thick, sticky discharge.

Treatment

- Antibiotics may be necessary for long standing bacterial infections.
- Corticosteroids may be necessary to reduce swelling and secretions.
- Grommets may be inserted and this may also be necessary in children experiencing recurrent bouts of acute otitis media.

3) Chronic otitis media with Cholesteatoma

A cholesteatoma is when a keratin mass occurs in the middle ear. It can block the eustachian tube, damage surrounding tissues and increase the risk of chronic otitis media. Retraction (not perforation) of the ear drum allows the discharge to empty through the ear canal. A chronic, offensive smelling ear discharge that is scanty may be a sign of a cholesteatoma. Initially it may be painless pain can set it as the condition progresses.

Treatment

- Surgery is usually necessary.

The most common causes of ear discharge is due to an infection of the outer or middle ear although otorrhea is also present in severe head trauma.

4) Severe Head Injury

Head trauma, especially in cases of hard falls, severe assault or motor vehicle accidents, may result in otorrhea. This may be seen as a clear fluid usually due to a CSF leak, or blood stained fluid or in severe cases, profuse bleeding.

Treatment

- Severe head trauma requires immediate medical treatment and should be treated as a medical emergency especially if there is a concurrent discharge of blood or fluid from the nose (nosebleed).
- A CT scan is necessary and the attending physician will decide on the appropriate treatment based on the findings.

5) Otitis Externa

Otitis externa is an inflammation of the external ear (pinna) and ear canal caused by infection or an allergic response. The most common symptoms include pain, itchy and swollen ear canal. Otitis externa due to infections is also known as swimmer's ear and is common during the summer 'swimming' season.

Treatment

- Antibiotics is required for bacterial infections. A viral or fungal infection causing otitis is less common but appropriate treatment should be implemented if necessary.
- Antihistamines are usually required in otitis externa due to allergies.
- Corticosteroids ear drops may be used to reduce swelling and itching of the ear canal in severe cases, provided that the ear drum is not perforated.

Types of discharge

Can often be identified by the color, viscosity (fluid 'thickness') and odor.

- Purulent otorrhea: acute and chronic suppurative otitis media, malignant otitis, Swimmer's ear.
- Non-purulent otorrhea: Swimmer's ear, foreign body, CNS fluid leakage, invasive otitis externa.
- Bloody otorrhea: trauma to external canal or middle ear, barotrauma, foreign body.

History:

- Duration of the discharge. (Chronic or acute)
- How did u notice it?
- Is it progressing with time?
- Is it continuous or intermittent?
- Is it profuse or scanty?
- Is it purulent or watery?
- Ask about the smell (foul smelling)
- Ask about the color
- Ask if the symptoms are recurrent
- Ask important associated symptoms can be associated with ear discharge including: **fever**, pain, vertigo, and tinnitus, ear pain (otalgia), Swollen ear, Itchy ear or itching ear canal and hearing Loss
- Ask about activities that can affect the canal or tympanic membrane (eg, swimming or diving, air travel, insertion of objects, including cotton swabs, use of ear drops).
- Ask about upper respiratory symptoms
- Ask about head trauma sufficient to cause a CSF leak

- **Review of systems (facial nerve, nose and throat)** systemic symptoms suggesting granulomatosis with polyangiitis (eg, nasal discharge, cough, joint pains).

- **Past medical history** should note any previous known ear disorders, , and diabetes or immunodeficiency

- **Past surgical history** ear surgery (particularly tympanostomy tube placement)

- **Drug** intake and associated treatment with chemotherapy or radiation therapy

Testing:

Culture of ear drainage

If CSF leakage is in question, discharge can be tested for glucose or β_2 -transferrin; these substances are present in CSF but not in other types of discharge.

-Foul smelling discharge from the ear is usually a sign of infection or cholesteatoma. Refer to Smelly Ear.

-Yellow or brown fluid is also a sign of infection and in persistent infections (chronic), the discharge may be stained with blood and is usually thick and sticky.

- In acute infections, the ear secretion may appear white.

-Bloody discharge, especially of 'fresh' blood, indicates a rupture of microvessels of the middle or inner ear or more serious causes of bleeding within the cranial cavity.

-Clear discharge, sometimes referred to as watery ear discharge, may be an indication of tissue swelling or more seriously, cerebrospinal fluid which is the fluid that surrounds the brain in the cranial cavity.

DDx

Acute discharge*

| | | |
|---|--|---|
| Acute otitis media with perforated TM | Severe pain, with relief on appearance of purulent discharge | Clinical evaluation |
| Chronic otitis media | Otorrhea in patients with chronic perforation, sometimes with cholesteatoma Can also manifest as chronic discharge | Clinical evaluation Sometimes high-resolution temporal bone CT |
| CSF leak caused by head trauma | Significant, clinically obvious head injury or recent surgery Fluid ranges from crystal clear to pure blood | Head CT, including skull base |
| Otitis externa (infectious or allergic) | <i>Infectious</i> : Often after swimming, local trauma; marked pain, worse with ear traction Often a history of chronic ear dermatitis with itching and skin changes <i>Allergic</i> : Often after use of ear drops; more itching, erythema, less pain than with infectious Typically involvement of earlobe, where drops trickled out of ear canal <i>Both</i> : Canal very edematous, inflamed, with debris; normal TM | Clinical evaluation |
| Post-tympanostomy tube | After tympanostomy tube placement May occur with water exposure | Clinical evaluation |

Chronic discharge

| | | |
|--|--|--|
| Cancer of ear canal | Discharge often bloody, mild pain Sometimes visible lesion in canal Easy to confuse with otitis externa early on | Biopsy CT MRI in some cases |
| Cholesteatoma | History of TM perforation Flaky debris in ear canal, pocket in TM filled with caseous debris Sometimes polypoid mass or granulation tissue over the cholesteatoma | CT Culture (No use for MRI unless intracranial extension is suspected) |
| Chronic purulent otitis media | Long history of ear infections or other ear disorders Less pain than with external otitis Canal macerated, granulation tissue TM immobile, distorted, usually visible perforation | Clinical evaluation Usually culture |
| Foreign body | Usually in children Drainage foul-smelling, purulent Foreign body often visible on examination unless marked edema or drainage | Clinical evaluation |
| Mastoiditis | Often fever, history of untreated or unresolved otitis media Redness, tenderness over mastoid | Clinical evaluation Culture Usually CT |
| Necrotizing otitis externa | Usually history of immune deficiency or diabetes Chronic severe pain Periauricular swelling and tenderness, granulation tissue in ear canal Sometimes facial nerve paralysis | CT or MRI Culture |
| Granulomatosis with polyangiitis (formerly Wegener granulomatosis) | Often with respiratory tract symptoms, chronic rhinorrhea, arthralgias, and oral ulcers | Urinalysis Chest x-ray Antineutrophilic cytoplasmic antibody testing Biopsy |
| <p>* < 6 wk. TM = tympanic membrane.</p> | | |

Vertigo history:

“Doctor I feel dizzy”

Dizziness is a word that is often used to describe two different feelings. It is important to know exactly what you mean when you say "I feel dizzy," because it can help you and your doctor narrow down the list of possible problems.

Lightheadedness is a feeling that you are about to faint or "pass out". Although you may feel dizzy, you **do not feel as though you or your surroundings are moving**. Lightheadedness often goes away or improves when you lie down. If lightheadedness gets worse, it can lead to a feeling of almost fainting or a fainting spell (syncope). You may sometimes feel nauseated or vomit when you are lightheaded.

Vertigo is a feeling that you (subjective vertigo) or your surroundings (objective vertigo) are moving when there is no actual movement. You may feel as though you are off balance, spinning, whirling, falling, or tilting. When you have severe vertigo, you may feel very nauseated or vomit. You may have trouble walking or standing, and you may lose your balance and fall.

Vertigo has relatively few causes unlike lightheadedness or dizziness:

- 1) Central (brain causes)
- 2) Peripheral (inner ear causes)

Peripheral causes:

1) Benign paroxysmal positional vertigo (BPPV)

is the most common form of vertigo (in >40 years old)

Characterized by:

- Repeated attacks of vertigo usually of short duration less than a minute.
- It may be initiated by sudden head movements or moving the head in a certain direction, such as rolling over in bed.
- Not associated with any hearing impairment

This type of vertigo is rarely serious and can be treated.

- Etiology: Due to canalithiasis (migration of free floating otoliths within the endolymph of the semicircular canal) or cupulolithiasis (otolith attached to the cupula of the semicircular canal) can affect each of the 3 semicircular canals, although the posterior canal is affected in >90%

Diagnosis:

- History
- Dix-Halpike maneuver: 5 Signs of BPPV Seen with DixHallpike Maneuver
 - 1-Geotropic rotatory nystagmus (nystagmus MUST be present for a positive test)
 - 2- Fatigues with repeated maneuver and fixation
 - 3-Reversal of nystagmus upon sitting up
 - 4- Latency of ~20 s
 - 5- Crescendo/decrecendo vertigo lasting 20 s

Treatment:

- Anti-emetics for nausea/vomiting
- Particle repositioning maneuvers:
 - 1)Epley maneuver: (Performed by MD)
 - 2)Brandt-Daroff exercises: (performed by patient)
- Surgery for refractory cases

2)labyrinthitis or vestibular neuritis (inflammation inside the inner ear) which is characterized by

Acute phase: severe vertigo with nausea, vomiting, and imbalance lasting 1 to 5 d, Irritative nystagmus (fast phase towards the offending ear) Patient tends to veer towards affected side.

Convalescent phase: imbalance and motion sickness lasting days to weeks ,Spontaneous nystagmus away from affected side, gradual vestibular adaptation requires weeks to months

- Mostly preceded by Viral infection of vestibular organ (Measels, mumps, herpes zoster) Or URTI.
- Affect all ages but rare in children.
- Affected patient presents acutely with spontaneous nystagmus, vertigo and nausea & vomiting and imbalance WITHOUT hearing loss that resolves over days leaving the residual imbalance that last days to weeks.
- It takes 3 weeks to recover from vestibular neuritis

Treatment:

Patient requires only symptomatic treatment

- Acute phase: bed rest, vestibular sedatives (Gravol®), and diazepam.
- Convalescent phase: progressive ambulation especially in the elderly, vestibular exercise: (involve eye and head movements, sitting, standing, and walking)

3) Meniere's disease

- Pathophysiology: 1-Unknown etiology 2-↑ production of fluid within inner compartment or inadequate absorption of endolymph leads to endolymphatic hydrops.
- **4 main symptoms:**

Vertigo (minutes to hours)

Hearing loss (Low frequency fluctuating SNHL) “remains”

Tinnitus

Fullness of the ear “pressure”

- -In 10 - 20% of cases the disease later involves the opposite ear
- Triggers: High salt intake, caffeine, stress, nicotine and alcohol.

Diagnosis

- History
- PTA
- Must monitor the other ear as bilaterally occur in 35% of cases.
- **Diagnostic Criteria for Meniere's Disease** (must have all three):

-Two spontaneous episodes of rotational vertigo ≥20 minutes

-Audiometric confirmation of SNHL (often low frequency)

-Tinnitus and/or aural fullness

Treatment

- Low-salt diet
- Medical therapy
- Meniett device's
- Chemical perfusion
- Acute management: bed rest, antiemetics, antivertiginous drugs [e.g. betahistine]
- Long term management : low salt diet, diuretics, betahistine prophylactic.
- Surgical: selective vestibular neurectomy or Transtympanic labyrinthectomy

Central causes:

1) Acoustic neuroma

is an uncommon cause of vertigo. It's benign tumor arise from vestibular division of VIII

Pathogenesis:

- Starts in the internal auditory canal and expands into cerebellopontine angle (CPA), compressing cerebellum and brainstem.
- When associated with type 2 neurofibromatosis (NF2): bilateral acoustic neuromas, café au-lait skin lesions, and multiple intracranial lesions

Clinical presentation:

- Unilateral tinnitus
- Sensorineural hearing loss
- Dizziness But true vertigo is rare as tumor growth slowly thus compensation occurs.
- Facial nerve palsy and trigeminal (V1) sensory deficit (corneal reflex) are late complication.

DDx:

Acoustic neuroma mimics Meniere's disease in presentation and imaging is the only way to differentiate between them.

Diagnosis:

- History
- PTA (Unilateral SNHL)
- Radiology (CT, MRI) **MRI with Gadolinium contrast is the gold standard.**

Treatment:

- Expectant management if tumor is very small, or in elderly.
- Definitive management is surgical excision

2) Cerebrovascular accidents:

- elderly patient with chronic disease like (DM, HTN) with sudden attack of vertigo + neurological symptoms.
- Complications from diabetes can cause arteriosclerosis (hardening of the arteries) which can lead to lowered blood flow to the brain, causing vertigo symptoms.

3) Multiple sclerosis

Vertigo is one of the symptoms of MS. The onset is usually abrupt, and examination of the eyes may reveal the inability of the eyes to move past the midline toward the nose.

4) Migraine

a severe form of headache, may also cause vertigo. The vertigo is usually followed by a headache, although not always.

5) Head trauma and neck injury

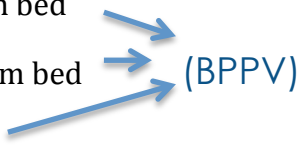
also result in vertigo, which usually goes away on its own. Cervical vertigo can be caused by neck problems such as impingement of blood vessels or nerves from neck injuries.

6) Decreased blood flow to the base of the brain

Bleeding into the back of the brain (cerebellar hemorrhage) is characterized by vertigo, headache, difficulty walking, and inability to look toward the side of the bleed. The result is that the person's eyes gaze away from the side with the problem. Walking is also extremely impaired.

History taking: cover what's suitable from SOCRATES

- **Onset:** When did it start and for how long and was it sudden occurrence or gradually.
- **Course:** is it continuous? Or on and off?
- **Duration:**
 - Seconds
 - Minutes
 - Hours to days
- **Time** (as in Frequency):
 - Recurrent (previous episodes)
 - Non - Recurrent (1st episode)
- **Associated auditory symptoms:** Tinnitus, Deafness, Fullness
- **Associated neurological symptoms such as:** weakness, visual disturbances, altered level of consciousness, difficulty walking, abnormal eye movements, or difficulty speaking – headaches, photophobia “Migraine”
- **Aggravating and relieving factors:**
 - Rolling over in bed
 - Getting up from bed
 - Looking up
 - Consume salty food
- **Constitutional symptoms:** Fever, nausea, vomiting, sweating, headache
- **Social history:** smoking, alcohol, stress, Diet (salty diet, fatty diet)



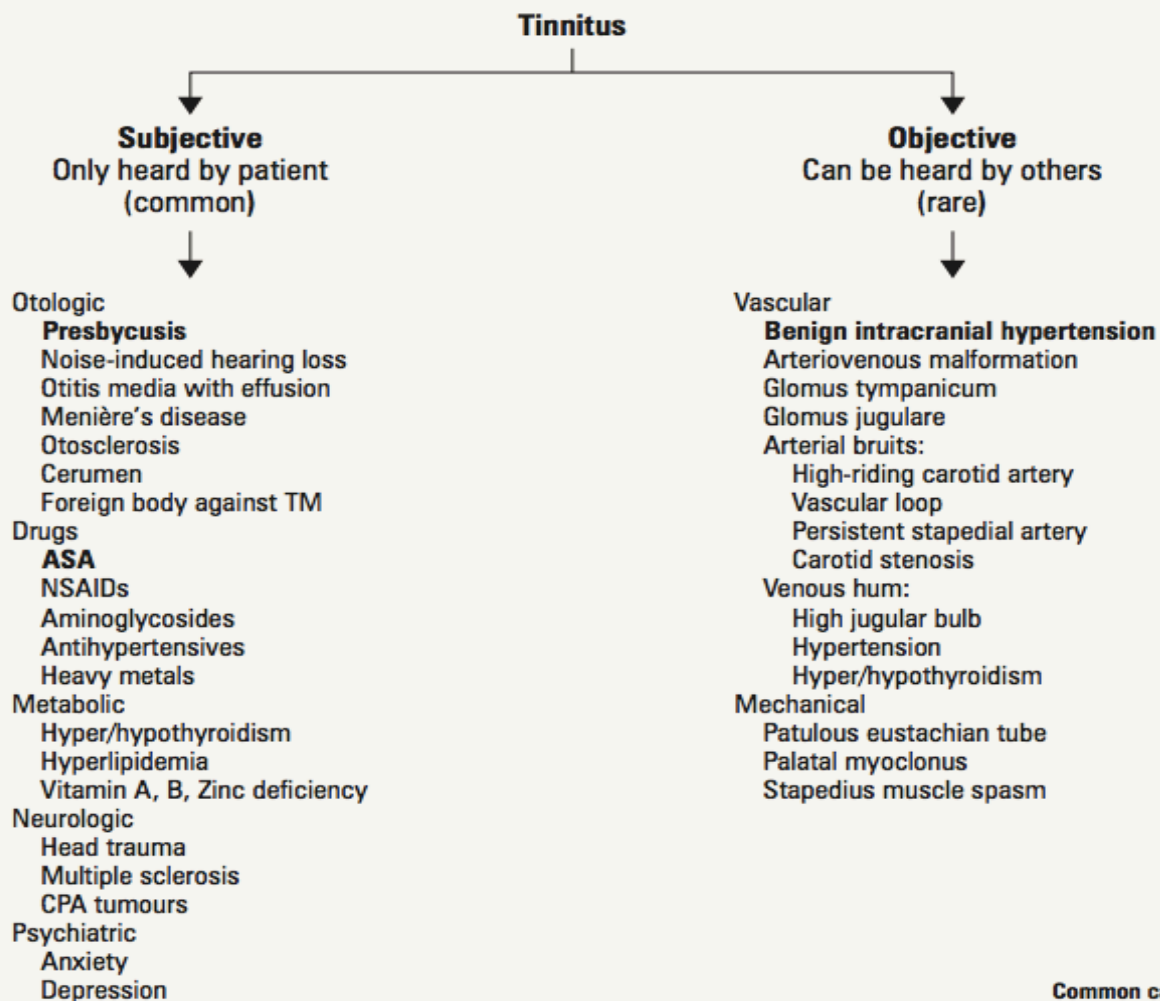
- **Medical History:** Ear diseases, Migraine, DM, HTN and cholesterol, brain tumors, MS
- **Trauma history:** Current cervical trauma or whiplash injury
- **Surgical History:** Ear surgeries
- **Medication history:** **any current new medications? Ototoxic drug intake (gentamycin)?** Herbal drugs? Over the counter drugs?
- **Family history:** sensorineural loss in the family, brain tumors, DM, HTN, Cholesterol, MS

Tinnitus history:

Definition

An auditory perception in the absence of acoustic stimuli, likely related to loss of input to neurons in central auditory pathways and resulting in abnormal firing

DDX:



Investigations:

- Audiology
- If unilateral:
 - ABR (Auditory brainstem response), gadolinium enhanced MRI to exclude a retrocochlear lesion
 - CT to diagnose glomus tympanicum (rare)
 - MRI or angiogram to diagnose AVM
- If suspect metabolic abnormality: lipid profile, TSH

Management:

- If a cause is found, treat the cause (e.g. drainage of middle ear effusion, embolization or excision of AVM).
- With no treatable cause: 50% will improve, 25% worsen, 25% remain the same.
- Avoid loud noise, ototoxic meds, caffeine, and smoking.
- Tinnitus clinics.
- Identify situations where tinnitus is most bothersome (e.g. quiet times), mask tinnitus with soft music or “white noise”.
- Hearing aid if coexistent hearing loss.
- Tinnitus instrument: combines hearing aid with white noise masker.
- Trial of tocainamide.

N.B

Tinnitus is described by patients as a ringing or buzzing in the ears. Whilst a cause may not be found, treatable causes (e.g. drug related or acoustic neuroma) need excluding

| | |
|--|--|
| Personal data (name,age) | Age of specific importance due to presbycusis. |
| Onset | |
| Under what circumstances did the tinnitus start? | |
| Unilateral or bilateral * | |
| Constant or episodic * | |
| Is the sound pulsatile * | |
| Does the tinnitus fluctuate in intensity? | |
| What makes your tinnitus worse? | |
| What makes your tinnitus better? | |
| Do you find exposure to moderately loud sounds make your tinnitus worse? | |
| Risk Factors: | |
| Hearing loss | |
| Occupation | Noise induced hearing loss |
| Loud noise exposure | |
| Drugs (Aspirin, NSAIDs, amyniglycoside) | |
| Heavy metal exposure | |
| Hx of cerebrovascular disease | |
| Hx of multiple sclerosis | |
| Hx of head trauma | |
| Hx of depression or anxiety | |
| Hyper or hypothyroidism | |
| Foreign body | |
| Associated symptoms: | Hearing loss , vertigo, aural fullness , ear pressure or blockage*, otalgia, otorrhea, dizziness or balance problems, Visual changes* |
| Had any operations involving your ear or head? | |
| Have you consulted anyone about your tinnitus? | |

- **Unilateral** May be noted with vestibular schwannoma, unilateral cerumen impaction, otitis media, and otitis externa. While **bilateral** may be noted in patients with bilateral hearing loss.
- **Episodic ringing tinnitus**, aural fullness, fluctuating hearing loss, and episodic vertigo suggest Meniere's disease.

- **Pulsatile sounds** May be noted in AVM (arteriovenous malformation), severe anaemia, thyrotoxicosis, middle ear inflammation, glomus tumour, benign intracranial hypertension, and partial stenosis of a carotid artery.
- **Cerumen (ear wax)** impaction can cause conductive hearing loss with or without tinnitus. Otoscopy is required in all patients with tinnitus to rule out the presence of wax.
- **History of visual changes**, especially when these are accompanied by headaches, can lead to a diagnosis of arteriovenous fistula (AVF).

History of hearing loss:

Hearing loss can be categorized by which part of the auditory system is damaged. There are three basic types of hearing loss: **conductive hearing loss**, **sensorineural hearing loss**, and **mixed hearing loss**.

1) **Conductive hearing loss:**

Conductive hearing loss occurs when sound is not conducted efficiently through the **external auditory canal** to the **tympanic membrane** and the **ossicles** of the **middle ear**. This type of hearing loss can often be corrected medically or surgically.

Causes of conductive hearing loss:

- **Congenital anomalies:** microtia (deformity of the ear auricle), atresia of the external ear canal.
- **Trauma:** skull base fractures, trauma to the ear and surrounding structures.
- **External auditory canal:** impacted wax, presence of foreign body, otitis externa.
- **Tympanic membrane:** perforation, tympanosclerosis, drum retraction in adhesive otitis media.
- **Ossicles:** otosclerosis, ossicular chain dislocation.
- **Otitis media:** Acute suppurative (ASOM), otitis media with effusion (OME), chronic otitis media (CSOM).

2) **Sensorineural hearing loss:**

Sensorineural hearing loss (SNHL) occurs when there is damage to the **inner ear (cochlea)**, or to the **nerve pathways** from the inner ear to the brain. Most of the time, SNHL cannot be medically or surgically corrected.

Causes of sensorineural hearing loss:

- **Family history:** hearing loss that runs in the family (genetic or hereditary).
- **Aging:** presbycusis (age related hearing loss).
- **Congenital anomalies:** malformation of the inner ear.
- **Tumors:** acoustic neuroma.
- Noise induced hearing loss.
- **Ototoxic drugs:** antibiotics (aminoglycosides), diuretics, antineoplastics, antiinflammatories, antimalarial agents.
- Head trauma.

3) **Mixed hearing loss:**

Sometimes a conductive hearing loss occurs in combination with a sensorineural hearing loss (SNHL). In other words, there may be damage in the **outer** or **middle ear** and in the **inner ear (cochlea)** or **auditory nerve**.

Regardless of the type, the American National Standards Institute defines hearing loss in terms of decibels (dB) lost, as follows:

Degrees of hearing loss:

- Slight hearing loss → 16-25 dB
- Mild hearing loss → 26-40 dB
- Moderate hearing loss → 41-55 dB
- Severe hearing loss → 71-90 dB
- Profound → More than 90 dB

Personal data:

- Name
- Age
- Occupation

Chief complaint:

- What brought you here today?
- When did you first notice the problem?
- Route: ER/elective
- Time of admission

History of presenting illness:

- **Site:** unilateral or bilateral.
- **Onset:** gradual or sudden.
- **Character:**
 - What kind of sounds do you have difficulty in hearing?
 - 1) Pitch (high pitched sounds “women and children”, low pitches sounds “men”).
 - 2) Intensity (loud sounds, everyday noise, whisper).
- **Course:** continuous or intermittent.
- **Severity:**
 - 4) From a scale of 0-10, how severe is your hearing loss?
 - 5) Did anyone else notice it? Did someone tell you that you speak too loudly during a conversation?
 - 6) Do you have to ask people to repeat themselves?
 - 7) Did it affect your work or social life?
- **Frequency:** is this your first episode or did it happen before?
- **Progression:** same, progressing, improving?
- Relieving & aggravating factors
- **Diagnosis and medication:** have been seen by a doctor? What have you been diagnosed with? Are you taking any medications for this problem?

Associated symptoms:

- Pain
- Discharge, blood, increased wax production
- Itching
- Ringing (tinnitus)
- Vertigo
- Nystagmus
- **Constitutional symptoms:** fever, headache, nausea, vomiting, change in weight or appetite.

Risk factors:

- Did you have any recent ear infections and were there any complications? (ex: perforated tympanic membrane, middle ear effusion)
- Recent upper respiratory tract infections: rhinitis/sinusitis.
- Noise exposure (recent exposure of ear to loud noise or blasts)
- Recent trauma to the head, neck, or ear? (diving, swimming)
- Cleaning the ears with Q-tips or sharp objects.
- Ototoxic medications (aminoglycosides “gentamycin”, quinines, loop diuretics, salicylic acid).
- Family history of hearing loss.
- Chronic illnesses: Diabetes, Hypertension, vasculitis, hypothyroidism, asthma.

Past medical history:

- Chronic illnesses
- Have you been diagnosed with any tumors in the head or neck?

Past surgical:

- Previous hospital admissions.
- Previous surgical procedures.
- Blood transfusions.

Family history:

- Family members with similar complaints.
- Chronic diseases.

Social History:

- Smoking.
- Alcohol consumption.

Summary:

- Personal data.
- Chief complaint.
- Important +ves and -ves

A few notes I thought would be helpful while taking history of hearing loss.

- In children with hearing problems, one should enquire about other congenital conditions, a history of birth or neonatal trauma and anoxia, and other serious childhood infections such as meningitis.

- It is important to recognize pulsatile tinnitus, which may occur with serious vascular tumors or malformations.

- The nature of any discharge from the ears should be determined. For example, is it simple wax, purulent, blood-stained or watery? Each of these may suggest a differing pathology. Foul-smelling otorrhoea is characteristic of cholesteatoma.