EAR NOSE AND THROAT NURSING

MRS BEATY

COURSE OUTLINE:

- Introduction and definition of ENT terminologies
- Review of anatomy and physiology of the ear – functions of the ear, physiology of hearing and balance.
- History taking – demographic data, history of presenting illness, chief compalints, past medical history, surgical history and review of systems.
- Assessment of the auditory system – inspection, direct palpation, otoscope examination.
- Evaluation of gross auditory activity – whisper test, weber test, rinne test.
- Diagnostic evaluation – audiometry, tympanogram
- Tests to detect vestibular problem – Romberg test, Caloric ear test stimulus, electronystagmography

- Hearing loss and deafness
  - Types and classification of hearing loss
  - Assessment of hearing loss
  - Clinical manifestations – early and late
  - Risk factors for hearing loss
  - Management of hearing loss
- Conditions of external ear
  - Cerumen impaction
  - Foreign bodies
  - External otits media
- Conditions of the middle ear
  - Tympanic membrane perforation
  - Acute otitis media
  - Serrous otitis media

  - Chronic otitis media
  - Otosclerosis
  - Nursing care of a patient undergoing middle ear surgery
- Conditions of the inner ear
  - Motion sickness
  - Meinieres disease
  - Labyrinthitis
  - Ototoxicity
  - Acoustic neuroma
- The nose and paranasal sinuses
  - Anatomy and physiology of the nose
  - Functions of the nose
  - Physical assessment of the nose and sinuses

- Conditions of the nose
  - Epistaxis
  - Sinusitis
  - Rhinitis
  - Nasal polyps
  - Nasal fracture
  - Deviated septum
- The throat
  - Tonsilitis and adenoiditis
  - Laryngitis
  - Cancer of the larynx
  - Peritonsillar abcess
  - Epiglottitis
  - Nursing process for a patient with partial layngectomy

Terminologies in ENT

1. Acute otitis media – inflammation of the middle ear lasting less than 6 weeks
2. Cholesteatoma – a benign tumor of the middle ear or mastoid or both.can destroy structures of temporal bone
3. Chronic otitis media – repeated episodes of acute otitis media causing irreversible tissue damage and persistent tympanic membrane perforation.
4. Conductive hearing loss – loss of hearing in which effective sound transmission to the inner ear is obstructed.
5. Dizziness – altered sensation of orientation in space.
6. Endolymphatic hydrops – dilation of the endolymphatic space of the inner ear.
7. Extoses – small, hard bony protrusions in the lower posterior bony portion of the ear canal.

8. Labyrinthitis – inflammation of the inner ear
9. Vertigo – an illusion of movement in which the individual or surroundings are perceived to be moving.
10. Tinitus – subjective perception of sound with internal origin, unwanted noises in the ear
11. Menieres disease – a condition of the inner ear characterised by a triad of symptoms i.e. episodic vertigo, tinnitus, fluctuating sensorineural hearing loss
12. Middle ear effusion/serrous otitis media – effusion of fluid in the middle ear without evidence of infection
13. Myringotomy – incision of the tympanic membrance
14. Ossiculoplasty – surgical reconstruction of the middle ear bones to restore hearing.
15. Otalgia – ear pain
16. Otitis externa – inflammation of the external auditory canal

17. Otorrhea – drainage from the ear
18. Otosclerosis – a condition characterised by abnormal spongy bone formation around the stapes
20. Presbycusis – progressive hearing loss associated with aging
21. Rhinorrhoea – drainage from the nose
22. Sensorineural hearing loss – loss of hearing due to damage of the organ of hearing or cranial nerve 8 or both.

Review of anatomy and physiology of the ear

- It is the organ of hearing and balance/equilibrium. Except the pinnae, the structures of the ear are within the petrous portion of the temporal bone.
- Its divided into three parts:

OUTER EAR

- Consists of the auricle or pinnae and external auditory canal.
- The auricle is the expanded portion projecting from the side of the head composed of fibroelastic cartilage, covered with skin.
- The lobule/earlobe is the soft pliable part at the lower extremity.
- The external acoustic meatus is a slightly ‘S’ shaped tube about 2.5cm long, extending from the auricle to the tympanic membrane.
- It is lined with skin containing hairs.

- The lateral third has numerous sebaceous and ceruminous glands. Ceruminous glands secrete cerumen/wax – a sticky material containing lysozyme and immunoglobins.
- Movements of the temporomandibular joint during chewing and speaking massage the cartilagionous meatus, moving the wax towards the exterior.
- The tympanic membrane- completely separates the external acoustic meatus from the middle ear.
- it is oval in shape with three layers – outer covering of hairless skin, middle layer of fibrous tissue and an inner lining of mucous membrane.
- Normally it appears pearly grey and translucent.

INNER EAR

- It is an irregularly shaped air filled cavity within the petrous portion of the temporal bone.

- The medial wall is a thin layer of temporal bone with two openings, the round and oval window.
- Air reaches the cavity through the eustachian or auditory tube, which is about 4 cm long and lined with ciliated epithelium. It connects the middle ear to the nasopharynx and equalises pressure on both sides of the membrane.
- It also drains the middle ear.
- In children it is shorter and wider thus making children more susceptible to middle ear infections. It is also more easily blocked by allergies, enlarged adenoids or inflammation of the nose and throat.
- The middle ear has three bones called ossicles.
- Malleus: hammer shaped. Its handle is in contact with the tympanic membrane and the head forms a movable joint with the incus.

- Incus: is the middle anvil shaped bone. Its bony articulates with the malleus & its long process with the stapes. Its held to the wall of the cavity by its short process.
- Stapes: it is the medial stirrup shaped bone. Its head articulates with the incus and its footplate fits into the oval window.

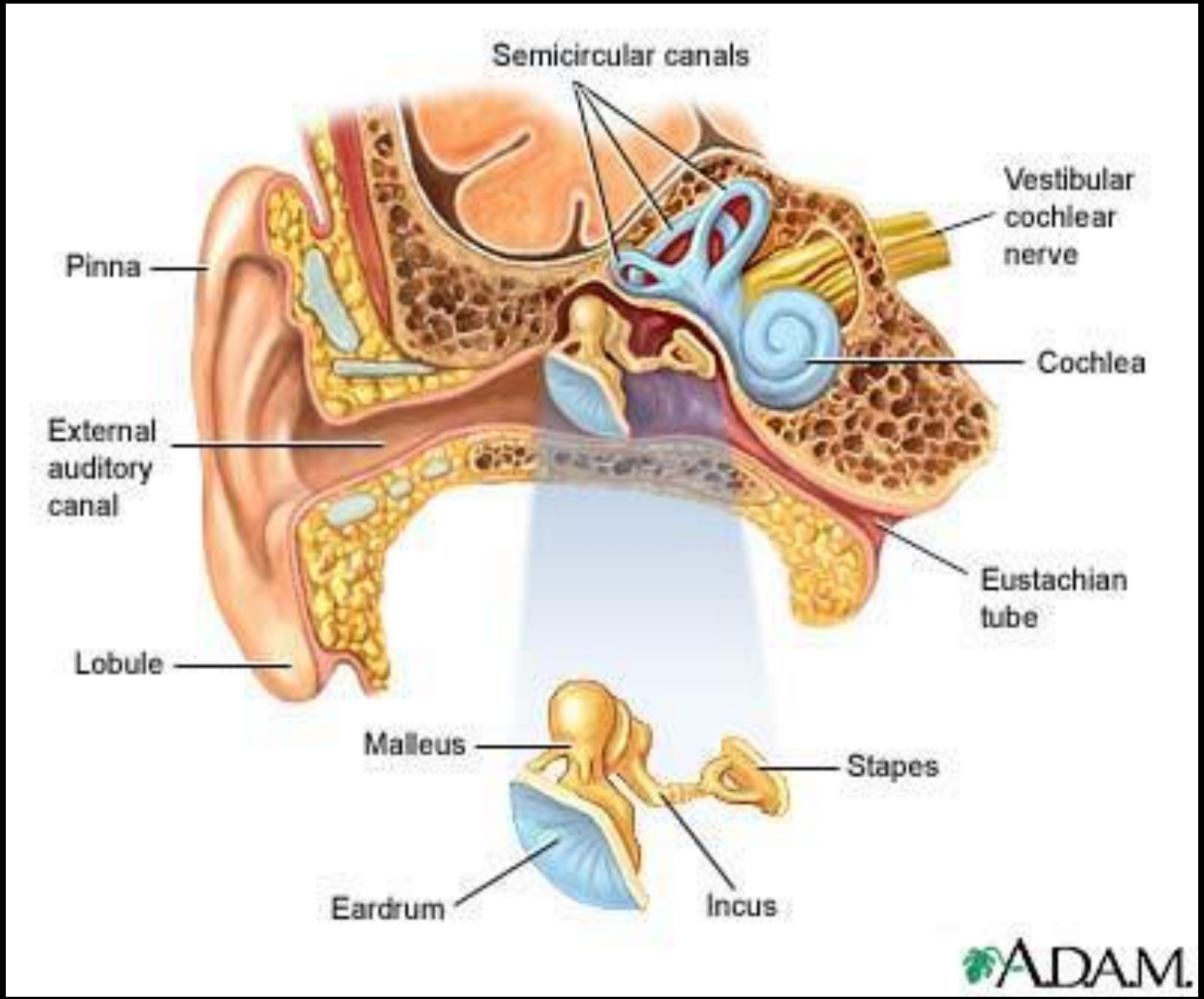
INNER EAR

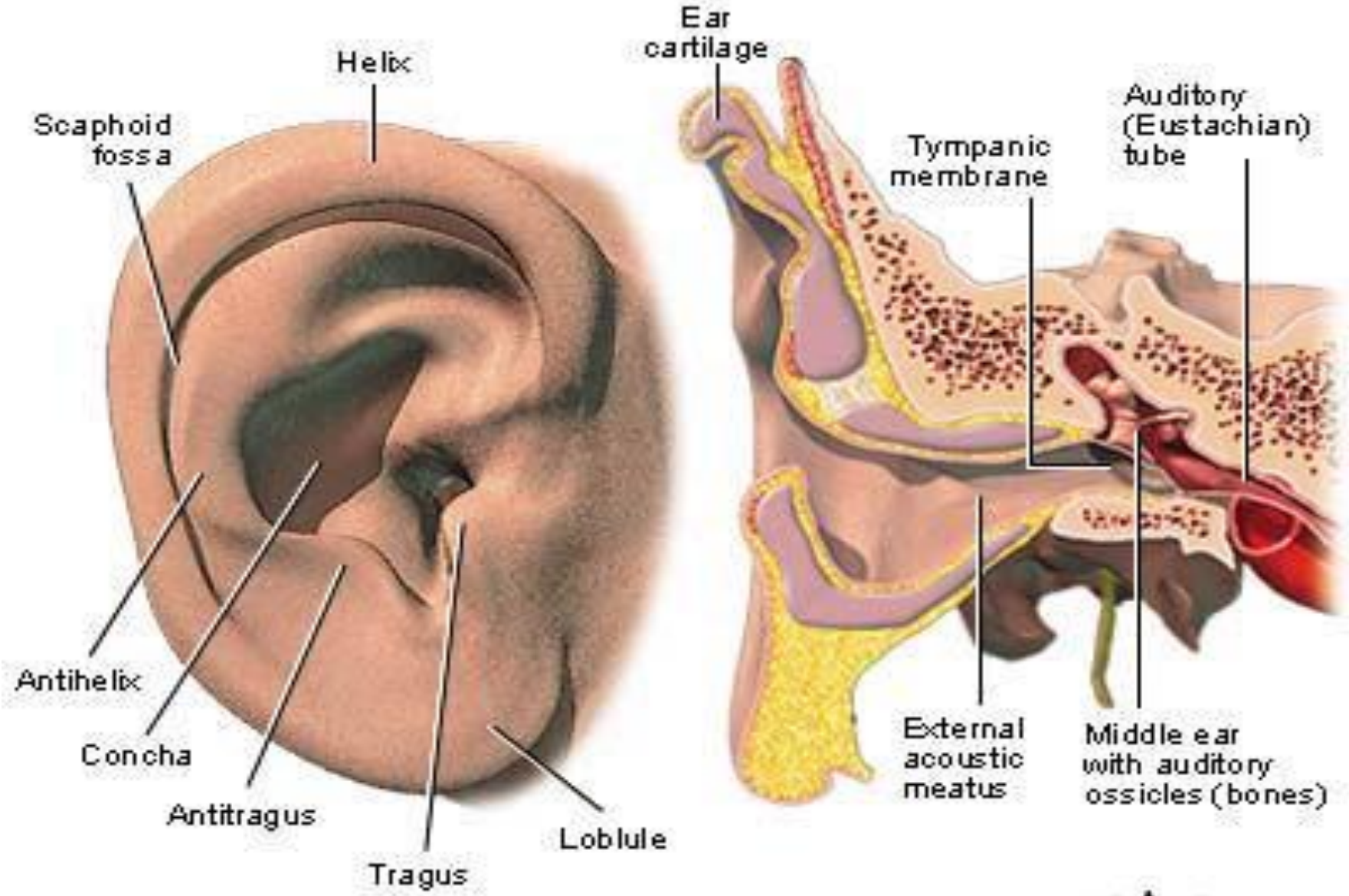
- It is filled with fluid. Between the bony labyrinth and the membranous labyrinth is filled with perilymph. The membranous labyrinth is filled with endolymph.
- The vestibule is the expanded part nearest the middle ear. It contains the oval and round window in the bony labyrinth and the utricle and saccule in the membranous labyrinth.
- The cochlea resembles a snail shell. It has a broad base continuous with the vestibule and a narrow apex. A cross section through shows three compartments : **the scala vestibuli, scala tympani and scala media or cochlear duct.**

- Scala vestibuli originates at the oval window and scala tympani ends at the round window
- The cochlear duct has supporting cells and specialised cochlear hair cells lying on the basilar membrane, they contain auditory receptors that are connected to the tectorial membrane. These cells form the spiral organ/organ of corti.

Semicircular canals:

- They are three, horse shoe shaped and lie in the three planes of space.
- They contain hair like nerve endings that are set in motion by the fluid in the canals.
- They transmit information about the body's position to the brain.


Semicircular canals
Vestibular cochlear nerve
Pinna
Cochlea
External auditory canal
Eustachian tube
Lobule
Malleus
Stapes
Eardrum
Incus
A.D.A.M.


Helix
Scaphoid fossa
Antihelix
Concha
Antitragus
Tragus
Loblule
Ear cartilage
Tympanic membrane
Auditory (Eustachian) tube
External acoustic meatus
Middle ear with auditory ossicles (bones)
A.D.A.M.

Physiology of hearing:

- Sound waves reach the inner ear through three routes:

1. Through the ossicular chain from the tympanic membrane to the oval window.
2. Directly across the middle ear by means of air waves.
3. Bone transmission through the walls of the external auditory canal to the inner ear.

- Sound waves enter through the external auditory canal and strike the tympanic membrane which vibrates at various speeds according to pitch.
- Ossicles in middle ear vibrate and transmit vibrations to the oval window.
- Fluid in the cochlea is set in motion.
- Wavelike motion of fluid passes the vibrations onto the tiny hair like nerve endings(receptors) in the organ of corti.

- Nerve endings stimuli are sent to the vestibulocochlear nerve to the temporal lobe of the cerebral cortex where sound is intepreted.

Balance and equilibrium

- Sense of static balance (when a person is at rest) is centered in the utricle and saccule of the inner ear.
- Balance with movement is associated with the semicircular canals.
- Balance depends on:-

Receptors in the ears (labyrinth-vestibular system)

Tactile skin receptors

Visual input (eyes)

Proprioceptors in muscles(muscles n joints)

Send info about equilibrium n balance to the brain(cerebellar) for coordination and perception in the cerebral cortex.

History taking

- An otologic history includes:-
  - Demographic data
  - Chief complaint e.g. hearing loss, pain, tinnitus, vertigo, dizziness, drainage, loss of balance.
    - Frequency, duration, onset, precipitating factors
  - Past medical history
    - Childhood illnesses – otitis media, eardrum perforations, mumps, measles, meningitis, tonsillectomy, ear surgery
  - Medications
    - Ototoxicity drugs – aminoglycosides, quinine, chemotherapeutic agents. Asprin causes tinnitus.
  - Allergies
  - Family history of hearing loss
  - Social history – occupation, leisure activities & hobbies.

Physical examination

1. Inspection and palpation

- Note size, configuration, inflammation, lumps, lesions, cysts.
- Palpate and manipulate pinna to detect tenderness, nodules or tophi (small, hard nodules in the helix that are deposits of uric acid crystals characterics of gout).

2. Direct observation

- Tip head slightly to the opposite side while pulling the pinnae up, back and out.
- Use penlight to inspect canal for abnormality – excess wax, redness, scaliness, swelling, drainage and cysts.

Assessment of the auditory system

1. Otoscopy – using an otoscope. It has a light source and magnifying lens. Hold the otoscope in the right hand, grasp auricle with opposite hand and gently pull outwards to straighten the canal.

- Insert the speculum and observe.
- A normal tympanic membrane appears pearly grey and translucent. It is positioned obliquely at the base of the canal.

2. Whisper test – the examiner covers the untested ear while testing the other ear.

- Whisper softly from a distance of 1-2 feet from the unoccluded ear out of patients sight.
- Patients with normal hearing can repeat what is whispered.

3. Weber test – it uses bone conduction to test lateralization of sound.

- A tuning fork is set in motion by striking it and is placed on the patients vertex or forehead.
- A patient with normal hearing hears the sound equally in both ears or describes the sound as centred in the middle of the head.
- A patient with conductive hearing loss (otosclerosis, O.M) hears the sound better in the affected ear.
- A patient with sensorineural hearing loss hears the sound better in the normal/better hearing ear.
- It is useful in detecting unilateral hearing loss.

4. Rinne test- useful for distinguishing between conductive and sensorineural hearing loss.

- A vibrating tuning fork is placed on the mastoid bone, once the patient signals he does not hear the sound, the fork is put 2 inches in front of the ear.

- Normally, air conduction is audible longer than bone conduction.
- In conductive hearing loss, bone conducted sound is audible as long as or longer than air conducted sound.
- In sensorineural hearing loss the air conducted sound is heard longer than the bone conducted sound.

5. Audiometry – it is the most important diagnostic tool.

- Types of audiometry –

I. Pure tone audiometry – the sound stimulus consists of a pure or musical tone.

II. Speech audiometry- ability to hear and discriminate sounds and words. The louder the tone before the patient perceives it, the greater the hearing loss. The patient wears earphones and signals when the tone is heard.

- When evaluating hearing, three characteristics are important:-

a) **Frequency** – refers to the number of sound waves produced per second. it is measured per cycle or Hertz(Hz) per second.

- a normal human ear perceives sound in frequencies ranging from 20 – 20,000Hz.
- Frequencies from 500 – 2000 Hz are important in understanding everyday speech and are referred to as speech range/frequencies

b) **Pitch –** used to describe frequency of a tone. 100 Hz is considered low pitch and greater than 10,000Hz high pitch.

c) **Intensity –** measures the loudness of sound in decibels(dB). It is the pressure exerted by sound. Hearing loss is measured in decibels.

- Sound louder than 80dB is perceived by the human ear as harsh and can damage the inner ear.
- The critical level of loudness is approximately 30dB.

TESTS TO DETECT VESTIBULAR CONDITIONS

1. ROMBERG TEST – assesses the inner ear for balance.

- The client stands with the feet together, arms by the side and eyes closed. Note the ability of the patient to maintain upright posture with only minimal amount of swaying.
- If the client loses balance, it is a positive Romberg, indicating vestibular problems.

2. CALORIC TEST – used to determine if an alteration exists in the vestibular origin of the vestibulococchlear nerve.

- With the client either seated or supine, instil water into the external ear canal. Sometimes warm and cold water are alternated. Test the affected side first.
- Normal response to this is
  - Nystagmus (involuntary rapid rhythmic eye movements)
  - Feeling of falling

  - Vertigo (feeling of spinning)
  - Nausea
  - Vomiting
- Decrease or absence of these response within three minutes indicates abnormality.

Contraindications:

  - Perforated ear drum
  - Infection of the middle ear

NB: anticipate vomiting and provide an emesis basin.

3. ELECTRONYSTAGMOGRAPHY –electrodes are placed near the clients eyes to assess for alterations in the vestibular system.

- caloric test is performed while eye movements are recorded on a graph. it assesess occulomotor and vestibular systems and their corresponding interaction.

HEARING LOSS

- It ranges from minor difficulty in understanding words or hearing certain sounds to total deafness.

Types

A) Conductive hearing loss: Also called transmission hearing loss.

- Conduction of sound waves to the organs of hearing is disrupted.
- It is further classified as
    a. Air conduction loss – due to a defect in the external auditory canal
    b. Bone conduction loss – due to a defect in the bones of the middle ear.

Causes

1. Obstruction to the passage of sound through the external auditory canal.
   - Impacted cerumen
   - Otomycosis
   - Swelling of the canal walls(marked)
   - Foreign body
2. Abnormalities of the tympanic membrane
   - Perforation
   - Thickening
   - Retraction
   - Scarring
3. Pathologic change in the middle ear which interferes with the mobility of the ossicular chain.
   - Otosclerosis(fixation of the ossicle)

- Secretions
- Granulations
- Otitis media

B) <u>PERCEPTIVE/SENSORINEURAL HEARING LOSS</u>

- Involves a disturbance of the organs of the inner ear or the transmitting nerve.
- It is further classified as:
  - Sensory – due to damage in the cochlea
  - Neural – due to damage of the eighth cranial nerve

<u>Causes:</u>

1. Toxic neuritis of the acoustic branch of the auditory nerve. May occur in mumps, influenza, diptheria, rubella.

   mumps is a common cause of unilateral deafness.
2. Trauma – blow or falls causing
   - Concussions of the labyrinth

- Fractures of the base of the skull – injure labyrinth
- Industrial noise and gunfire

3. Drugs and poisons e.g quinine, salicylates, aminoglycosides, arsenic, mercury, lead.
4. Meningitis – destroys the nerves
5. Old age – presbycusis
6. Tumors – acoustic neuroma
7. Meniere's disease
8. Congenital predisposition

C) <u>CENTRAL HEARING LOSS</u>

- The brain is unable to intepret sound waves after they have been transmitted.
- May occur in atherosclerosis or after CVA
- The deficit is in the auditory nucleus of the cerebral cortex

D) **<u>FUNCTIONAL HEARING LOSS</u>** – No organic cause is found and there is no damage to the auditory nerve.

- It is believed to arise from psychological or emotional conditions.

E) **<u>MIXED HEARING LOSS</u> –** when the patient has both conductive and sensorineural hearing loss.

CLASSIFICATION OF HEARING LOSS

LOSS IN DECIBELS	INTEPRETATION
0 – 15 decibels	Normal hearing
16 – 25 Decibels	Slight hearing loss
26 – 40 decibels	Mild impairment
41 – 55 decibels	Moderate impairment
56 – 70 decibels	Moderately severe impairment
71 – 90 decibels	Severely impaired
Greater than 90 decibels	Profoundly deaf

Clinical manifestations

- Tinnitus
- Inability to hear in groups
- Answering questions inappropriately
- Cupping hand around ear
- Showing irritability with others
- Increased volume of TV or radio

Later manifestations

- speech deteroriation – slur words, speech may sound flat, loud or soft.
- Fatigue – due to straining while listening to conversation
- Indifference – disinterest as they cannot hear what is said
- Social withdrawl – keep to themselves as they don't hear what is said.

- Insecurity – lack of self confidence, fear that they will say the wrong things.
- Indecision and procrastination - can't hear thus they doubt their ability to make decisions
- Suspiciousness – hear part of conversations and think others are talking about them.
- False pride – conceal hearing loss by pretending not to be interested in conversations.
- Loneliness and unhappiness due to silence
- Tendency to dominate conversation

Risk factors

- Family history of sensory neural hearing loss
- Congenital malformation of the ear esp. cranial structure
- Low birth weight less than 1.5 kgs
- Use of ototoxic medication

- Viral infections e.g. mumps, measles, chicken pox
- Age
- Exposure to loud noise

MANAGEMENT

- It aims at restoring or assisting hearing, aural rehabilitation and managing tinnitus.

1. Restore hearing:

- Provide antibiotics for bacterial infections
- Acyclovir or oral corticosteroids for herpes virus infection
- Stop any ototoxic medications.This lessens the progress of hearing loss or reverses the hearing loss.

2. Assist hearing

- Use of hearing aids which amplify sound.
- A hearing aid has: - a microphone which receives sound waves from the air and changes them to electrical signals.

- An amplifier which increases the strength of the electrical signal
- Receiver / loudspeaker – which changes electrical signals into sound waves.
- Battery

3. Managing tinitus

- There is no proven treatment.
- Counsel the client and reassure

4. Aural rehabilitation

- Aims at maximising the hearing impaired clients communication skills.
- Rehab is directed towards teaching more effective use of other senses in communication e.g. vision.
- Speech or lip reading – involves integration of lip movements, gestures, clues.

- Sign language – using hands to represent words or phrases.
- Non verbal aids – draw attention with hand movements. Avoid chewing, careless expressions the patient may misintepret
- Verbal aids – speak normally and slowly. Don't exagerate facial expression, use simple sentences, write difficult words and avoid shouting and move closer to the better ear..

Implantable hearing devices:

1. Cochlear implant:- contains a small computer chip which changes spoken word to electrical impulses which are transmitted through the auditory nerve endings in the cochlea to the brain where they are intepreted.
2. Temporal bone stimulation:- for patients with conductive hearing loss. It has an internal and external part. the external part is above the ear and transmits sound to the inner device which is implanted to the skull.

Sound is transmitted to the inner ear through the skull.

PREVENTION OF HEARING LOSS

1. Primary – aims at minimizing risks e.g. noise, trauma, use of ototoxic drugs, and infection.
2. Secondary – early detection of hearing impairment through screening and referral of any hearing problems.
3. Tertiary – focuses on improvement of optimal functioning through rehabilitation programmes.

CONDITIONS OF THE EXTERNAL EAR

IMPACTED CERUMEN

- Wax may form a solid plug or may be of a large amount and blocks the external auditory canal.

Symptoms:

- Sense of blockage
- Conductive hearing impairment
- Otalgia

Management:

1. removed by syringing/irrigating the outer ear with water warmed to body temperature. The jet of water is aimed above and behind the foreign body.
2. Manual removal of the wax using instruments i.e cerumen curette or aural suction. Warm glycerine is instilled 30 minutes before to soften the wax. Or mineral oil

FOREIGN BODY

- A foreign body can either be animate or inanimate.
- Determine the nature of the foreign body i.e food stuff, insect, wood, plastic etc.
- If the foreign body is a food substance, do not attempt to irrigate as this will cause it to swell leading to pain and possible injury to the eardrum.
- If it is a small insect, shine a light, the insect may be drawn to the light. Alternatively, apply a few drops of mineral oil or glycerine and let the patient lie on the affected side.
- Visualise the foreign body and remove.
- Do not attempt to remove an object without visualising as this pushes it further in.

NB/irrigation,sunction and instrumentation are the mainstay management

OTITIS EXTERNA/EXTERNAL OTITIS

- It is inflammation or infection of the epithelium of the auricle and external auditory canal

Causes

- Water in the ear(swimmers ear)
- Trauma to the skin of the ear canal
- Systemic conditions e.g. vitamin deficiency, endocrine disorders.

Causative organisms

- Pseudomonas
- Staphylococcus
- Aspergillus

Clinical manifestations

- Pain
- Discharge from external auditory canal

- Aural tenderness(not present in middle ear infections)
- Fever
- Cellulitis
- Lymphadenopathy
- Pruritus

Otoscopy

- Ear canal is erythematous and edematous
- Discharge may be yellow or green, foul smelling
- Fungal infection – hairlike black spores may be visible.

Management

- Aims at relieving discomfort, reducing swelling and eradicating infection.
- Administer analgesics for pain
- Antibiotics specific to the causative organism e.g. CAF, neomycin

- Corticosteroids for inflammation
- Warm moist compress for comfort
- Fungal infections give nystatin
- If fever and cellulitis is present give systemic antibiotics.
- Advice the patient to avoid cotton tipped applicators to clean external auditory canal as they may cause trauma which leads to infection.
- Avoid getting ear canal wet, avoid swimming or wear ear plugs when swimming.

CONDITIONS OF THE MIDDLE EAR

TYMPANIC MEMBRANE PERFORATION

- It is caused by infection in the middle ear or by trauma.
- Sources of trauma include – skull fracture, explosive injury, severe blow to the ears, foreign objects.

Management:

- Most heal spontaneously within weeks after rupture.
- Some perforations may persist because scar tissue grows over the edges of the perforation, preventing extension of the epithelial cells across the margins and final healing.
- Incase of head injury or temporal bone fracture observe for CSF leakage (otorrhea or rhinorrhea) – a clear, watery drainage from the ear or nose.
- While healing, protect the ear from water.

- For perforations that do not heal spontaneously surgical intervention is required.
- Tympanoplasty – surgical repair of the tympanic membrane. It is based on:-
  - The need to prevent water from entering the middle ear.
  - Desire to improve patients hearing.
- Tissue, usually temporalis fascia is placed across the perforation to allow healing.

ACUTE OTITIS MEDIA

- It is an acute infection of the middle ear lasting less than six weeks.

Causes

- *Streptococcus pneumoniae*
- *Haemophilus influenza*
- *Moraxella catarrhalis*
- These organisms reach the middle ear after:-
  - eustachian tube dysfunction caused by obstruction related to URTI
  - Eustachian tube dysfunction due to inflammation of surrounding structures e.g. sinusitis, adenoid hypertrophy
  - Obstruction due to allergic reactions
  - Tympanic membrane perforation

Clinical manifestations

- Otalgia relieved by perforation which can either be spontaneous or therapeutic.
- Drainage from the ear
- Fever
- Conductive hearing loss
- Otoscopic examination- reveals a normal external auditory canal. The tympanic membrane is erythematous and often bulging.

Risk factors

- Age i.e. less than one year
- Chronic upper respiratory tract infections
- Medical conditions that predispose to ear infections e.g. Down's syndrome, cleft palate.
- Chronic exposure to second hand cigarette smoke

MANAGEMENT

- Early and appropriate broad spectrum antibiotics therapy – amoxycillin, cotrimoxazole or erythromycin for 10 days.
- Analgesics for pain.
- If drainage occurs give antibiotic otic preparation.
- Permanent hearing loss rarely occurs
- Antihistamines for allergic reactions
- Complications are rare but include: meningitis, brain abscess
- Myringotomy or tympanotomy – incision of the tympanic membrane. It is done to relieve pressure and to drain serous or purulent fluid from the middle ear thus relieving pain.
- It is done under local anesthesia and microscope guidance.
- Drainage can be analysed for culture and sensitivity.
- Incision heals within 24 – 72 hours.

- If AOM recurs a ventilating tube or pressure equalizing tube is inserted. It is retained for 6 – 18 months. It is extruded with normal skin migration of the tympanic membrane with the hole healing.

SERROUS OTITIS MEDIA/MIDDLE EAR EFFUSION/GLUE EAR

- Involves fluid in the middle ear without evidence of active infection.
- Results due to negative pressure in the middle ear secondary to eustachian tube obstruction, which can occur with:-
  - Radiation therapy
  - Barotrauma – sudden pressure changes e.g. deep sea diving, airplane descent.
  - Eustachian tube dysfunction from URTI or allergy.
  - Carcinoma – nasopharyngeal cancer obstructing the tube.

Clinical manifestations:

- Conductive hearing loss
- Fullness of the ear or a sensation of congestion

- Popping or crackling noises – occur as the eustachian tube attempts to open
- **Otoscopy:** tympanic membrane is dull
  - air bubble may be visualised

MANAGEMENT

- No treatment is necessary unless infection occurs.
- If significant hearing loss occurs, a myringotomy is done and a ventilatory tube inserted.
- Low dose corticosteroids to reduce edema of the E.T incase of barotrauma.
- Valsalva maneuevor, forcibly opens the E.T by increasing nasopharyngeal pressure must be done cautiously as it may worsen the pain or cause tympanic membrane perforation.
- Teach methods of opening the E.T e.g yawning, blowing out against closed nostrils, swallowing often.

CHRONIC OTITIS MEDIA/ chronic suppurative otitis media

- It is repeated episodes of acute otitis media causing irreversible tissue damage and persistent tympanic membrane perforation.
- It damages the tympanic membrane, destroys the ossicles and may sometimes involve the mastoid.

Clinical manifestations:

- Varying degrees of hearing loss.
- Persistent or intermittent foul smelling otorrhea
- Pain – in case of acute mastoiditis. Postauricular area is tender and may be edematous and erythrematous.
- Nausea
- Dizziness
- Tympanic membrane perforation
- Facial palsy

- **Otoscopy:** may show perforation
    - Cholesteatoma can be identified as a white mass behind the tympanic membrane or coming to the external canal through a perforation.
    - Cholesteatoma is an ingrowth of the skin of the external layer of the ear drum into the middle ear. The skin forms a sac that fills with degenerated skin and sebaeous materials. The sac can attach to the structures of the middle ear, the mastoid or both.

Causes:

- Staphylococcus aureus
- Streptococcus
- Proteus
- Pseudomonas
- E.coli

Diagnosis

1. History and Physical exam
2. Otoscopy – shows a perforated T.M
3. Culture of drainage
4. Mastoid xray to rule out mastoiditis
5. Sinus xray
6. MRI or CT scan temporal lobe to check for bone destruction secondary to cholesteatoma.

Compications:

- Cholesteatoma
- Hearing loss
- Facial paralysis
- Lateral sinus thrombosis

- Subdural abcess
- Mastoiditis
- Labyrinthitis

Medical management:

- Suctioning the ear under otoscopic guidance.
- Dry the ear by wicking – roll a piece of clean absorbent cloth into a wick and insert into the ear. Leave for 1 – 2 minutes, remove and replace with another wick. Repeat until the wick is dry.
- Antibiotic drops or powder for purulent discharge. 2% acetic acid or boric acid, 5% caf,systemic antibiotics only in acute infxn

Surgical management:

1. Tympanoplasty – surgical reconstruction of the tympanic membrane. It aims at establishing middle ear function by closing the perforation, preventing infection and improving hearing

- it is done through the ear canal or through a post auricular incision.
- The middle ear contents are inspected for damage.

2. Ossiculoplasty – surgical reconstruction of the middle ear bones to restore hearing. Ossicles are reconnected using prosthesis made of stainless steel thus reestablishing the sound conduction mechanism.
3. Mastoidectomy – it aims at removing cholesteatoma and creating a dry /non infected ear.

- It is done through a postauricular incision. Infection is eliminated by removing mastoid air cells. There is risk of injury to the facial nerve.

OTOSCLEROSIS

- It is a condition characterised by abnormal spongy bone formation around the stapes.
- It results from the formation of new abnormal spongy bone especially around the oval window resulting in fixation of the stapes.
- The stapes does not vibrate thus sound cannot be transmitted.
- It is more common in women and is worsened by pregnancy.
- It is a hereditary condition.

Clinical manifestations

- Progressive conductive or mixed hearing loss
- Tinnitus
- Bone conduction is better than air conduction in the rinne test.

Management:

- Sodium flouride to mature abnormal spongy growth and prevent breakdown of bony tissue.
- Amplification with a hearing aid
- Calcium gluconate and vitamin D to retard bone resorption.
- Stapedectomy- removal of the stapes superstructure and part of the foot plate and inserting a tissue graft and a suitable prosthesis.
- Before surgery ensure that the client is free from infection.
- Pre and post op audiograms are performed to test hearing acuity levels.
- Post op the client should lie on the non operated ear with the head of the bed elevated. This reduces edema and prevents dislodgement of the prosthesis.
- Intravenous antibiotics

- On discharge the patient is adviced to avoid straining(exercise, lifting), to blow the nose gently, one nostril at a time, avoid air travel for one month and sneeze with the mouth open to prevent rupture of the oval window.

MASTOIDITIS

- It is inflammation of the mastoid process secondary to repeated middle ear infection.
- An inadequately treated infection reappears after two or more weeks after initial episode of otitis media.

Clinical manifestations:

- Tenderness and swelling over the mastoid process
- Ear pain
- Conductive hearing loss
- Fever
- Discharge
- Protrusion of the pinnae

Diagnosis

- History and physical exam
- CT Scan mastoid process – mastoid air cells filled with fluid.

Management

- Systemic antibiotics
- Surgical drainage of the abscess or mastoidectomy due to recurrent or persistent tenderness, fever, headache and discharge.

Complication

- deafness
- Brain abscess
- death

NURSING PROCESS FOR A PATIENT UNDERGOING MASTOID SURGERY

Assessment:

- Health history – describe the ear condition, infection, otalgia, otorrhea, hearing loss, vertigo.
  - Duration and intensity, causes, previous treatment, all medication the patient is taking, allergies, family history of disease.
  - Physical assessment – erythema, edema, otorrhea, lesions.

Nursing diagnosis

1. Anxiety related to surgical procedure, potential hearing loss, potential taste disturbance, potential loss of facial movement.
2. Acute pain related to mastoid surgery
3. Risk for infection related to surgery and surgical trauma to surrounding tissues

4. Disturbed auditory perception related to ear disorder, surgery, packing of the ear.
5. Risk for trauma related to impaired balance or vertigo during the immediate post op period.
6. Disturbed sensory perception related to potential damage to the facial nerve.
7. Impaired skin integrity related to ear surgery and incision sites
8. Deficient knowledge about mastoid disease, surgical procedure and post op care.

Interventions

1. Reduce anxiety – reinforce the information discussed with the surgeon.
    - Encourage patient to discuss any anxieties or concerns.
2. Relieve pain – administer analgesics

3. Prevent infection – impregnate the external auditory canal through wick/packing with antibiotic solution.
   - Prophylactic antibiotics are administered
   - Prevent water from entering the external auditory canal for 6 weeks. A cotton ball with insoluble substances e.g. petroleum jelly is placed loosely in the ear canal to prevent water from contaminating the external auditory canal.
4. Improving hearing and communication – hearing in the operated ear may be reduced for several weeks because of edema, accumulation of blood and tissue fluid in the middle ear and dressings or packing.
   - Reduce environmental noise
   - Face the patient when speaking
   - Speak clearly and distinctly without shouting
   - Provide adequate lighting if patient relies on speech reading.

- Use non verbal clues e.g. facial expression, pointing, gestures.
- Instruct family on effective ways to communicate with the patient.

5. Prevent injury – vertigo may occur if the semicircular canals are traumatized.
   - Give antiemetics
   - Antihistamines
   - Provide safety measures e.g. assisted ambulation to prevent injury/falls.
6. Preventing altered sensory perception – there is a potential complication of facial nerve injury.
   - Instruct the patient to report any evidence of facial nerve injury/weakness such as drooping of the mouth on the operated side, slurred speech, decreased sensation and difficulty in swallowing.

7. Promote wound healing – instruct the patient to avoid heavy lifting, straining, exertion and nose blowing for 2 – 6 weeks post op to prevent dislodging of the prosthesis or the tympanic membrane.
8. Teach the patient self care – instruct about prescribed meds
   - provide information about expected effects and potential side effects of the medication.
   - Instruct on activity restriction
   - Prompt reporting of complaints e.g. infection, facial nerve weakness, taste disturbance.

CONDITIONS OF THE INNER EAR

MOTION SICKNESS

- Is a disturbance of the equilibrium caused by constant motion e.g. in a vehicle, merry go round or a ship.

Clinical manifestations

- Sweating
- Pallor
- Nausea
- Vomiting

Management

- Antihistamines e.g. dimenhydrinate. It relieves nausea and vomiting by blocking the conduction of the vestibular pathway of the inner ear.
- Anticholinergics e.g. scopolamine – it antagonises the histamine response.S/E dry mouth, drowsiness

MENIERE'S DISEASE

- It is abnormal inner ear fluid balance caused by malabsorption in the endolymphatic sac or in the endolymphatic duct.

Clinical manifestations

- Fluctuating, progressive sensorineural hearing loss
- Tinnitus or roaring sound in the ear
- Feeling of pressure or fullness in the ear
- Episodic, incapacitating vertigo accompanied by nausea and vomiting

Types

- Cochlear – fluctuating progressive sensorineural hearing loss associated with tinnitus and aural tenderness in the absence of vestibular symptoms.
- Vestibular- characterized by occurrence of episodic vertigo associated with aural pressure but no cochlear symptoms

Management:

- Low sodium diet(200mg/day)
  - Limit foods high in salt
  - Give plenty of fresh fruits, vegetables and whole grains.
  - Limit alcohol intake as it may change the volume of inner ear fluid and worsen symptoms.
  - Avoid aspirin as it increases tinnitus and dizziness
- Pharmacotherapy
  - Antihistamines to suppress the vestibular system
  - Tranquilizers e.g. diazepam in acute cases to help control vertigo.
  - Antiemetics e.g. promethazine to control nausea and vomiting and the vertigo because of the antihistamine effect.
  - Diuretics e.g. HCTZ to relieve symptoms by lowering the pressure in the endolymphatic system.

- Surgical management aims at eliminating the attacks of vertigo.
  - Endolympahtic sac decompression or shunting – equalises the pressure in the endolympatic space. A drain is inserted through a post auricular incision.
  - Middle and inner ear perfusion – ototoxic medication (streptomycin or gentamycin) are administered to the patient by infusion into the middle and inner ear. They destroy the vestibular function and decrease vertigo . There is risk of significant hearing loss.
  - Vestibular nerve sectioning – the nerve is cut thus preventing the brain from receiving input from the semicircular canals

LABYRINTHITIS

- Inflammation of the inner ear either due to bacteria or virus.
- Viral causes:
  - Mumps
  - Rubella
  - Influenza
- Bacterial is as a complication of otitis media. The bacteria get to the middle ear through the oval or round window.

Clinical manifestations

- Sudden onset vertigo with nausea and vomiting
- Sensorineural hearing loss
- Tinnitus

Management:

- For bacterial labyrithitis – intravenous antibiotics
  - Fluid replacement therapy
  - Antihistamines
  - Antiemetics
- Viral labyrinthitis treatment is based on the symptoms.

OTOTOXICITY

- Due to adverse effects of medication on the cochlear, vestibular apparatus or cranial nerve VIII.
- Most cause irreversible hearing loss except aspirin and quinine
- High doses of aspirin cause bilateral tinnitus.
- IV meds especially aminoglycosides are the most common cause of ototoxicity and destroy the hair cells of the organ of corti.

Prevention

1. Counsel patients on side effects of these meds.
2. Use with caution in patients at high risk of complications i.e. children, elderly, pregnant, patients with kidney or liver problems and patients with current hearing disorders.
3. Monitor hearing on those receiving long term IV antibiotics.

ACOUSTIC NEUROMA

- Slow growing benign tumors of cranial nerve VIII, usually arising from the Schwann cells of the vestibular portion of the nerve.
- Occurs where the nerve enters the internal auditory canal or temporal bone from the brain.

Clinical manifestations:

- Unilateral tinnitus
- Sensorineural hearing loss
- Mild intermittent vertigo

Diagnosis

- History and physical exam
- Vestibular tests
- Audiometry
- MRI or CT scan with contrast dye

Management:

- Surgical removal of tumor.
- These tumors don’t respond well to radiation or chemotherapy
- Complications of surgery include:

  >facial nerve paralysis

  >cerebrospinal fluid leakage

  >meningitis

  >cerebral edema

THE NOSE AND NASAL CAVITY

Anatomy and physiology:

- It is divided into two equal parts by a septum. The posterior bony part of the septum is formed by the perpendicular plate of the ethmoid bone and the vomer.
- Anteriorly it consists of hyaline cartilage.
- The roof is formed by the cribriform plate of the ethmoid bone, the sphenoid bone, frontal and nasal bones.
- The floor – roof of the mouth with the hard palate anteriorly and soft palate posteriorly.
- It is lined with highly vascular ciliated columnar epithelium which contains the mucus secreting goblet cells.

Openings into the nasal cavity

- Anterior nares or nostrils – the openings from the exterior into the nasal cavity

- Posterior nares – openings from the nasal cavities into the the pharynx.
- Paranasal sinuses – are cavities in the bones of the face and cranium which contain air. There are tiny openings between the paranasal sinuses and the nasal cavity.
- They are lined with mucus membrane continuous with that of the nasal cavity.
- The main sinuses are:-
  - Maxillary sinuses – in the lateral walls
  - Frontal and sphenoidal - in the roof
  - Ethmoidal - in the upper part of the lateral walls.
- The sinuses are used in speech resonance and they lighten the skull.
- Nasolacrimal ducts extend from the lateral walls of the nose to the conjunctival sacs of the eyes. They drain tears from the eyes

Functions of the nose

- Warms air – due to the high vascularisation
- Filters and cleans air – the hairs trap particles and smaller particles adhere to the mucus.
- Humidification
- Olfaction – nerve endings in the cribriform plate convey impulses to the olfactory nerves.

ASSESSMENT OF THE NOSE AND PARANASAL SINUSES

- Inspect the external nose for lesions, asymmetry or inflammation
- Examine the internal structures of the nose – the patient tilts back and the tip of the nose is pushed back. Note the mucosal colour, swelling, exudate or bleeding.
- Check the septum for deviation, perforation or bleeding.

- Inspect the inferior and middle turbinates
- Palpate the frontal and maxillary sinuses for tenderness
- Transilluminate to check for fluid or pus – light does not go through if present.

NB: transillumination is passing a strong light through a bony area to inspect sinuses.

RHINITIS

- It is a group of disorders characterised by inflammation and irritation of the mucus membranes of the nose.
- It can be acute, chronic or allergic.

Causes:

- Change in temperature
- Odors
- Infection – common cold
- Systemic diseases
- Drugs e.g cocaine
- Foreign bodies
- Medication e.g. nasal decongestants
- foods

Clinical manifestations

- Rhinorrhea – excessive nasal drainage/ runny nose
- Nasal congestion
- Sneezing
- Pruritus of the nose, roof of the mouth, throat eyes and ears
- Headache especially if sinusitis is present

Management:

- identify the cause
- Antihistamines for sneezing pruritus and rhinorrhea e.g chlopheniramine, cetrizine
- Oral decongestants for nasal congestion
- Saline nasal spray acts as a decongestant and liquefies mucus.
- Advice on avoiding allergens and irritants, technique for administering nasal meds and importance of handwashing .

- Nurse in a warm well ventilated environment to ensure fresh air and prevent spread of infection to others.
- Give pleny of hot fluids to soothe the throat and rehydrate.

ASSIGNMENT:read and make notes on viral rhinitis(common cold)

EPISTAXIS (NOSEBLEED)

- It is hemorrhage from the nose caused by rupture of tiny distended vessels in the mucus membrane of the nose.
- Common site is in the anterior septum, where 3 major blood vessels enter the nasal cavity i.e.
    - The anterior ethmoidal artery
    - The sphenopalatine artery
    - The internal maxillary branches

Risk factors

- local infections – rhinitis
- Systemic conditions e.g. hypertension
- Drying of the mucus membrane
- Nasal inhalation of illicit drugs e.g. cocaine
- Trauma – from a foreign body or direct injury

- Tumors
- Thrombocytopenia
- Use of aspirin

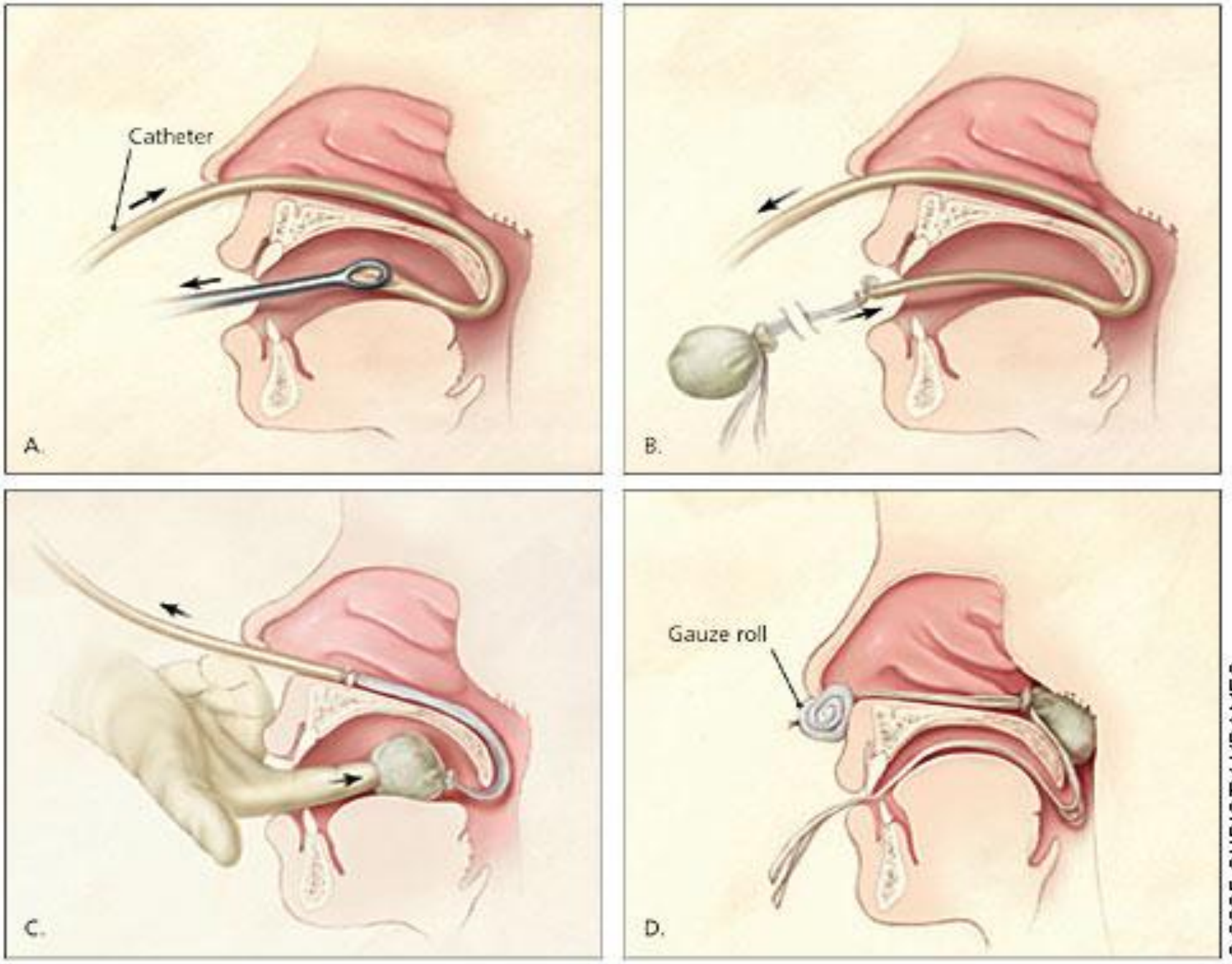
Management:

- Determine the site of bleeding(use nasal penlight or speculum)
- Apply direct pressure. The patient sits upright and tilts the head forward(this prevents aspiration and swallowing of blood) and pinches the nose for 5 – 10 minutes continuously.
- Apply cold compress on the patients forehead.
- If bleeding persists, a cotton ball soaked in vasoconstrictor solution(adrenaline, epinephrine) is inserted into the nose to reduce blood flow and allow examination. The bleeding vessels are then cauterized
- If the source is not identified – pack the nose with gauze impregnated with liquid paraffin, petroleum jelly or antibiotic ointment

- The pack may remain in place for 48 hours.
- A balloon catheter may be used to arrest posterior bleeding
- Antibiotics are prescribed due to the risk of sinusitis and toxic shock syndrome.

Nursing management

- Monitor vital signs
- Assist in the control of bleeding
- Relieve patient anxiety
- Teach on ways to avoid epistaxis – forceful noseblowing, straining, high altitudes and nasal trauma e.g. nose picking.
- Teach how to apply direct pressure.


Catheter
A.
B.
C.
Gauze roll
D.
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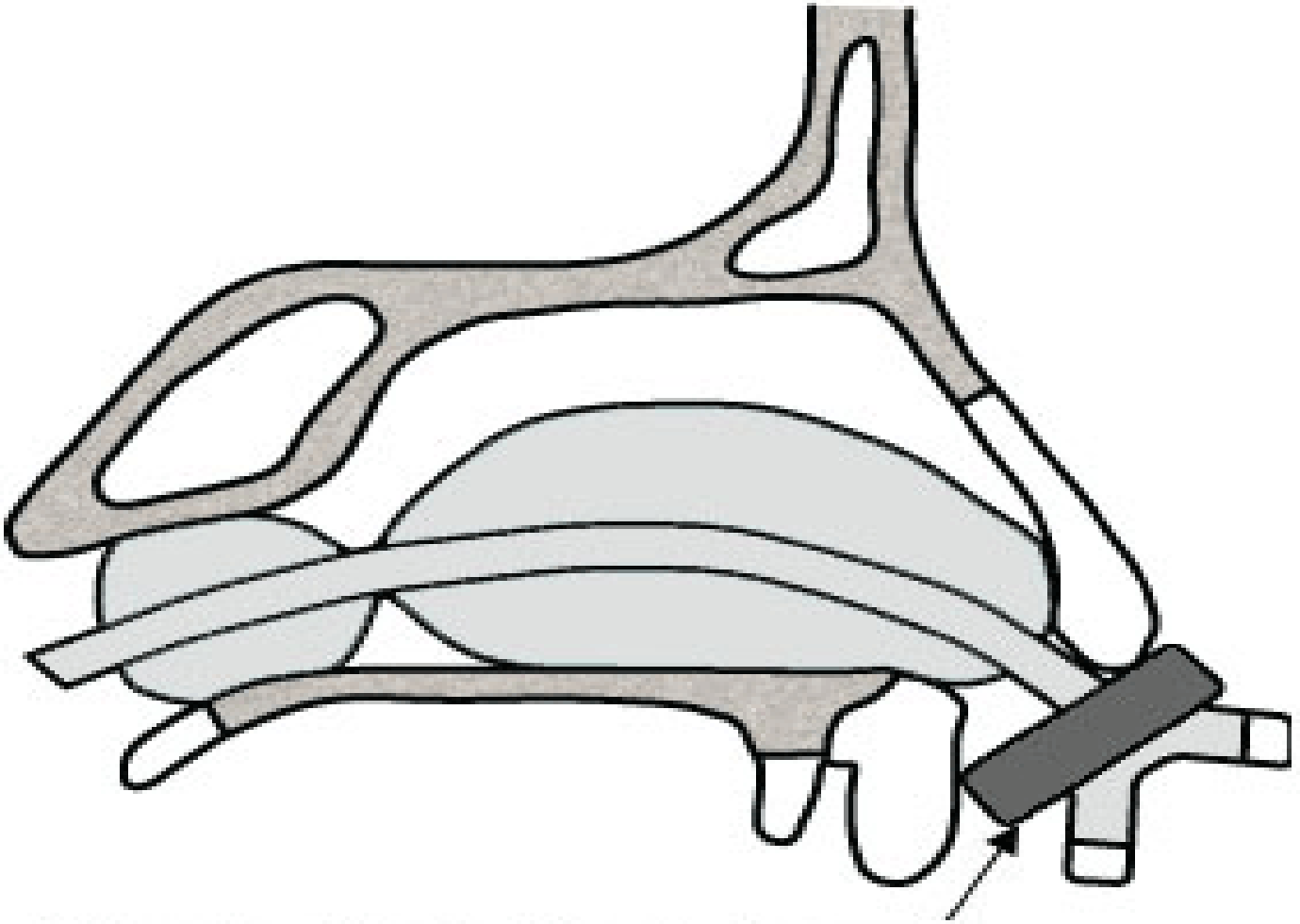

Nostril well padded with rolled gauze

NASAL FRACTURE

- It is the most common facial fracture
- It may affect the ascending process of the maxilla and the septum. the torn mucous membrane results in a nose bleed
- It is usually as a result of direct assault.

Clinical manifestations:

- Pain
- Bleeding from the nose internally into the pharynx
- Swelling of the soft tissues adjacent to the nose
- Periorbital ecchymosis(bruising)
- Nasal obstruction
- Deformity

Assessment:

- Internal examination of the nose to rule out fracture of the nasal septum and a submucosal septal hematoma
- Clear fluid draining from either nostril suggests a fracture of the cribriform plate with leaking CSF. It is differentiated from mucus through use of a glucostick. CSF contains glucose.
- Palpate for deviations of the bone
- X-ray to rule out extension of the fracture to the skull.

Management

- Control bleeding by packing.
- Cold compress to reduce or prevent edema
- Analgesics
- Ensure patent airway and rule out cervical spine fracture
- Uncomplicated fractures can be managed with antibiotics, analgesics and decongestant nasal spray.

- Refer to a specialist after 3 -5 days to allow edema to subside for reduction of fracture or rhinoplasty to reshape the external appearance of the nose especially where reduction is delayed past 7-10 days and bone healing begins

Nursing management:

- Apply ice pack or cold compress. Keep the head elevated.
- The patient breathes through the mouth because of the nasal pack thus give mouth rinses to help moisten oral mucous membranes.
- Analgesics e.g. NSAID's
- Advice patient to avoid sports activities for 6weeks

Complications

Hematoma, infection,abscess and avascular/septic necrosis

NASAL POLYPS

- Are benign mucus membrane masses that form slowly in response to repeated inflammation of the nasal mucosa.
- They appear as bluish grayish projections in the nares

Clinical manifestations:

- Nasal obstruction
- Nasal discharge
- Speech distortion
- Visible polyp

Management:

- Removed by endoscopy or nasal surgery
- Slow their growth by applying corticosteroids.

DEVIATED SEPTUM

- A condition in which the size of the septum is not proportional to the size of the nose or the septum is deflected from the normal straight position of the nasal septum.

Causes

- Trauma to the nose
- Congenital disproportion

Clinical manifestations:

- Obstruction or nasal breathing
- Nasal edema in cases of trauma
- Dryness of the nasal mucosa
- Bleeding incase of trauma
- In cases of severe deviation, it may block the sinus openings resulting in sinusitis

Management

- Nasal septoplasty – surgical reconstruction and proper alignment of the deviated septum.

SINUSITIS

- Inflammation of the mucus membranes of the sinuses.

ACUTE SINUSITIS

- It is rapid onset infection in one or more of the paranasal sinuses that resolves with treatment.
- Subacute sinusitis: is persistent purulent nasal discharge despite therapy with symptoms lasting less than three months.
- Sinusitis occurs due to blockage/obstruction of the sinus cavities
- It often follows a URTI or an exacerbation of allergic rhinitis. Nasal congestion caused by inflammation, edema and transudation of fluid secondary to URTI leads to obstruction of the sinus cavities. This provides an excellent media for bacterial growth

- Other conditions that block the normal flow of sinus secretions:-
  - Abnormal structure of the nose
  - Enlarged adenoids
  - Tooth infection
  - Trauma to the nose
  - Tumors
  - Pressure of foreign bodies

<u>Clinical manifestations:</u>

- Facial pain or pressure over the affected sinus
- Nasal obstruction
- Fatigue
- Purulent nasal discharge

- Fever
- Headache
- Ear pain
- Sense of fullness
- Dental pain
- Decreased sense of smell
- Early morning periorbital edema

Diagnosis

- History and physical exam with emphasis on head and neck.
- Palpate the sinuses
- Percuss sinuses – pain
- Transillumination – there will be decreased transmission of light
- CT Scan
- Maxillary and frontal sinus aspirate for culture

MANAGEMENT

- The goals are to treat infection, shrink the nasal mucosa and relieve pain.
- Antibiotics – 1st line – amoxyl, ampicillin, septrin, erythromycin
    - 2nd line cefuroxime, augmentin. For those with prolonged symptoms.
    - They are given for 10 – 14 days in serious bacterial infection
- Nasal decongestants or nasal saline spray – improve patency of the openings of the sinuses and improve sinus drainage. Maximum use of 3 – 4 days.
- Antihistamines for allergy e.g. cetrizine
- Heated mist and saline irrigation to open blocked passages.
- Mucolytics.

Nursing

- Teach on signs of complications such as periorbital edema and severe pain.
- Teach methods of promoting sinus drainage e.g
    - Humidification of the air at home and use of steam inhalation
    - Warm compress to relieve pressure.
- Avoid swimming, diving, air travel during acute infection
- Stop smoking
- Side effects of nasal sprays – rebound congestion
- Completion and correct use of antibiotics
- rehydrate

Complications

- Meningitis
- Brain abscess
- Osteomyelitis

CHRONIC SINUSITIS

- It is due to prolonged, repeated or inadequately treated acute sinus infection with symptoms lasting more than three months. Irreversible mucosal damage may occur.

Pathophysiology

- Mechanical obstruction of the ostia of the frontal, maxillary and anterior ethmoidal sinuses.
- Obstruction prevents adequate draining and resultant stagnation of secretions which provides an ideal media for bacterial growth.
- Blockage that persists for more than three weeks in an adult may be due to:-
  - Infection
  - Allergy
  - Structural abnormalities

Clinical manifestations:

- Cough because of thick discharge constantly dripping backwards into the nasopharynx.
- Chronic hoarseness
- Chronic headache – periorbital and facial pain
- Mouth breathing – snoring and sore throat.
- Decrease in smell and taste
- Sense of fullness in the ears

Complications

- Orbital cellulitis
- Meningitis
- Encephalitis

MANAGEMENT

- Antibiotics – augmentin, clarythromycin. Macrolides increase mucocilliary clearance and improve sinus symptoms, decrease nasal secretions and polyp size associated with chronic sinusitis.
- Nasal decongestants / saline sprays
- Antihistamines

Surgical management:

- Endoscopy – to correct structural deformities that obstruct the openings of the sinuses.
- Excising and cauterising nasal polyps
- Correcting deviated septum
- Incising and draining the sinuses
- Removing tumors

Nursing management

- Teach gentle nose blowing as forceful blowing increases symptoms
  - Increase environmental humidity
  - Take plenty of fluids
  - Apply local heat
  - Elevate the head of the bed to promote sinus drainage
  - Importance of following medication regimen
  - Signs that require follow up.

THE PHARYNX

REVIEW OF ANAT & PHYSIO

- It is a tube 12 -14 cm long. It extends from the base of the skull to the level of the 6th cervical vertebra.
- It lies behind the nose ,mouth and larynx. It is wider in its upper end.
- It is divided into three:-
  - Nasopharynx – it lies behind the nose, above the level of the soft palate. On its lateral walls are the 2 openings for the auditory tubes. The posterior wall has the pharyngeal tonsils which consist of lymphoid tissue.
  - Oropharynx- it lies behind the mouth, from below the level of the soft palate to the level of the upper part of the body of C3. its lateral walls blend with the soft palate to form two folds, between which there is the palatine tonsils.

- laryngopharynx – extends from the oropharynx above and continues as the esophagus below.

- The pharynx is composed of three layers of tissue:-

1. The mucous membrane lining – the mucous varies slightly in different parts. In the nasopharynx it is ciliated columnar epth, in the oropharynx and laryngopharynx it is stratified squamous epithelium.
2. Fibrous tissue – it forms the intermediate layer . It is thicker in the nasopharynx where there is little muscle and becomes thinner towards the lower end where the muscle layer is thicker.
3. Muscle tissue – consists of several involuntary constrictor muscles that play a part in the mechanism of swallowing.

Functions

- Passage for air and food
- Warming and humidifying air
- Taste – nerve endings for the sense of taste in the epth. Of the oral and pharyngeal parts.
- Hearing – eustachian tube equalises pressure
- Protection – through tonsils
- Speech – provide a resonating chamber for sound.

LARYNX / VOICE BOX

- Extends from the root of the tongue and hyoid bone to the trachea.
- Lies infront of the laryngopharynx.
- It is composed of several irregularly shaped cartilages attached to each other by ligaments and membranes.

- The main cartilages are:-
    - 1 thyroid cartilage
    - 1 cricoid cartilage
    - 2 arytenoid cartilages
    - 1 epiglottis
- The thyroid cartilage forms the laryngeal prominence. It is incomplete posteriorly. Its upper part is lined with stratified squamous epithelium and its lower part with ciliated columnar epithelium.
- The cricoid cartilage is shaped like a signet ring. It is lined with columnar epithelium.
- Arytenoid cartilages – are roughly pyramid shaped hyaline cartilages. They form part of the posterior wall of the larynx. It gives attachment to the vocal cords and muscles. It is lined with ciliated columnar epithelium.

- The epiglottis is a leaf shaped fibroelastic cartilage lined with stratified sqaumous epithelium. It closes off the larynx during swallowing, protecting the lungs from accidental inhalation of foreign objects.
- The vocal cords are two folds of mucous membrane with cord like free edges which extend from the inner wall of the thyroid prominence anteriorly to the arytenoid cartilages posteriorly.
- When muscles are relaxed, vocal cords open and are said to be abducted. In this position they produce a low pitched sound.
- When muscles controlling vocal cords are contracted, vocal cords are stretched out tightly across the larynx and are said to be adducted. They produce a high pitched sound.
- When not in use the vocal cords are adducted.

Functions

- Production of sound
- Speech
- Protection of the lower respiratory tract
- Passageway for air
- Humidifying, filtering and warming air

Assessment of the throat

- History – sorethroat, discharge from the throat, sense of lump or swelling, dypnea, difficulty swallowing, hoarseness, cough
- Physical exam – ask client to open mouth wide, use a tongue depressor to lower the tongue. View the anterior and posterior pillars, palatine tonsils, uvula and posterior pharynx. Inspect for colour, size, symmetry, exudate and ulceration.

TONSILITIS AND ADENOIDITIS

- Tonsils are composed of lymphoid tissue and are situated on each side of the oropharynx. Acute infection of these glands is tonsilitis.
- Adenoids or pharyngeal tonsils consist of lymphoid tissue near the center of the posterior wall of the nasophaynx.
- Caused by Group A beta hemolytic streptococcus.

Manifestations;

- Sore throat
- Fever
- Snoring
- Difficulty swallowing
- Mouth breathing
- Ear ache

- Foul smelling breath
- Voice impairment
- Noisy respirations
- Nasal obstruction

Infection can spread to the middle ear through the eustachian tube causing acute otitis media.

<u>Management:</u>

- Antibiotics for bacterial infection – penicillins
- Increased fluid intake
- Analgesics
- Salt water gargles
- Surgery – tonsilectomy, adenoidectomy, adenotonsilectomy.

Indications for surgery

- Repeated episodes despite antibiotics
- Hypertrophy of the tonsils and adenoids that could cause obstruction and obstructive sleep apnea
- Repeated attacks of purulent otitis media
- Suspected hearing loss due to serous otitis media that has occurred in association with enlarged tonsils and adenoids.
- Peritonsilar abscess that occludes the pharynx, making swallowing difficult and endangering patency of the airway.

Contraindications

- age less than 5 years
- Cleft palate – done after repair
- Bleeding diseases
- Polio breakout – will create a port of entry and child will get flaccid paralysis

- Active PTB

NURSING MANAGEMENT

- Routine pre op care – consent, NPO for 6 hours before surgery, pre op checklist, vital signs, rehydrate patient, allay anxiety.
- Give analgesics for pain
- Warm water gargles to relieve pain and sooth the throat.
- Post op: nurse prone with the head turned to the side to allow drainage from the mouth and the pharynx
- do not remove the oral airway until the gag and swallowing reflex have returned.
- Apply an ice collar around the neck – this reduces edema and hemorrhage.
- Observe for signs of hemorrhage, direct visualisation or the patient swallowing a lot.
- Provide analgesics for pain and non pharmacologic pain mgt

- If there is no bleeding give cold water and drinks to the patient.
- Advice the patient to avoid too much talking and coughing as they will cause throat pain.
- Inform the surgeon if the patient vomits blood, if there is increased temperature or pulse.
- Teach the family on how to observe for signs of bleeding
- To give saline solutions for mouthwash/gargle to cope with the thick mucus and halitosis that may present after surgery.
- Explain that sorethroat , vomiting and stiff neck may occur in the first 24 hours.
- Liquid and semiliquid diet is given for several days.
- Avoid spicy, hot, acidic and rough foods.
- Avoid vigorous tooth brushing or gargling as this may cause bleeding.

PERITONSILLAR ABSCESS

- Is a collection of purulent exudate between the tonsilar capsule and surrounding tissues.
- It may develop after an acute tonsilar infection that progresses to local cellulitis and abscess. It is caused by beta hemolytic streptococcus.
- In severe cases, the infection can spread over the palate and to the neck and chest. Edema can cause airway obstruction, which can become life threatening and is a medical emergency.

Clinical manifestations

- Fever
- Trismus – inability to open the mouth due to spasm of the muscles of mastication.
- Drooling
- Raspy voice

- Odynophagia – a severe sensation of burning, squeezing pain when swallowing
- Dysphagia – difficulty or pain while swallowing
- Otalgia
- Enlarged cervical lymph nodes
- Swelling of the soft palate
- Tonsilar hypertrophy
- Dehydration

<u>Management</u>

- Antibiotics - effective in the early stages and resolves
- Surgical management to prevent rupture and aspiration
    - Fine needle aspiration of pus from the abscess
    - Incision and drainage
    - Tonsillectomy

- If the patient presents with acute airway obstruction they may require intubation – cricothyroidotomy or tracheotomy.
- Pre op give warm saline gargles and mouthwashes to provide relief.
- Post op cool saline gargles at intervals of 1 – 2 hours for 24 – 36 hours.
- Give plenty of fluids

LARYNGITIS

- It is inflammation of the mucus membrane lining the larynx accompanied by edema of the vocal cords.

Causes

- Voice abuse e.g. shouting
- Exposure to dust, chemicals and other pollutants.
- URTI
- Changes in temperature
- Smoking

Clinical manifestations

- Hoarse voice
- Aphonia – complete loss of voice
- Severe cough – dry , sore throat.
- Itching in the throat made worse by cold air

- Persistent urge to clear the throat

Management

- Rest the voice
- Avoid irritants – dust, smoking
- Inhale steam. Menthol may be added to sooth the throat.
- For bacterial infection, provide antibiotics.
- Increase fluid intake to thin the secretions

Chronic

- Rest the voice
- Eliminate any respiratory tract infection
- Stop smoking and 2nd hand smoking
- Topical corticosteroids or by inhalation eg beclomethasone dipropionate
- Advice the patient to stay in a well humidified environment.
- If laryngeal secretions are present, hydrate to thin secretions

- Teach on complications to report:-
  - Loss of voice with sore throat that makes swallowing saliva difficult
  - Hemoptysis
  - Noisy respirations
  - Continued hoarseness after resting the voice for more than 5 days.

CANCER OF THE LARYNX

- It is a malignant tumor in and around the larynx.
- It is mostly a sqaumous cell carcinoma

Predisposing factors

- Carcinogens – tobacco, alcohol, asbestos, smoking, tar products, cement dust e.t.c
- Straining the voice
- Chronic laryngitis
- Nutritional deficiencies
- Age more than 60years
- Family predisposition
- History of alcohol abuse

Signs and symptoms

- Hoarse voice for more than 2 weeks – harsh, raspy, low pitched
- Persistent cough
- Sore throat
- Pain and burning in the throat esp. consuming hot liquids or citrus juices.
- Lump may be felt in the throat.

Later symptoms

- Dysphagia
- Dyspnea
- Unilateral nasal obstruction or discharge
- Persistent hoarseness
- Foul breath

Metastasis: weight loss, cervical lymphadenopathy, pain to the ear.

Categories

- Supraglottic – involves the false vocal cords
- Glottic – involves the true vocal cords
- Subglottic – downward extension of the disease from the vocal cords.

Diagnosis

- History and physical exam
- Laryngoscopy
- Histology of tumor sample

Management

- Radiation – for early stages or together with surgery & chemo
- Surgery – laryngectomy – surgical removal of part or all of the larynx and surrounding structures.
  - Partial laryngectomy – remove part of the larynx, one vocal cord and tumor. Airway is left intact

- Supraglottic laryngectomy – remove the hyoid bone, glottis and false vocal cords. Tracheostomy tube is left in place until glottic airway is established. Enteral feeds are given until healing occurs. Aspiration is a potential complication. Voice is preserved though it may change.
- Hemilaryngectomy – remove one true cord, one false cord and the tumor. Pt has NGT and tracheostomy for several days post op, there is high risk of aspiration. Voice changes but airway and swallowing remain intact.
- Total laryngectomy – remove all laryngeal structures – hyoid bone, epiglottis, cricoid cartilage and 2 or 3 rings of the trachea. Voice changes and a permanent tracheostomy is inserted.

- Speech therapy – pre op counsel the patient on loss of voice and alternative methods of speech/communication e.g writing, lip reading, esophageal speech, artificial larynx etc.

NURSING CARE OF PATIENT UNDERGOING LARYNGECTOMY

ASSESSMENT

- Health history- hoarseness, sorethroat, dypnea, dysphagia, pain or burning in the throat.
- Physical examination-thorough head and neck examination with emphasis on patient airway. Palpate neck for swelling or adenopathy.
- General state- nutritional status and BMI
- Pre operative evaluation by a speech therapist
- Family Social history- history of cancer in the family, history of alcohol intake.
- Assess the psychological readiness of the patient and the family.

NURSING DIAGNOSES

- Deficient knowledge about surgical procedure and post-op care
- Anxiety and depression related to the diagnosis of cancer and impending surgery.
- Ineffective airway clearance related to excess mucus production secondary to surgical alteration of the airway.
- Impaired verbal communication related to anatomical deficit secondary to removal of the larynx and to edema.
- Imbalanced nutrition less than body requirements related to inability to ingest food secondary to swallowing difficulties.
- Disturbed body image and low self esteem secondary to major neck surgery, change in appearance and altered structure and function

Nursing diagnosis continued

- Self care deficit related to pain, weakness, fatigue, musculoskeletal impairment secondary to surgical procedure.
- Pain
- Potential for complications- respiratory distress (hypoxia, airway obstruction, tracheal edema), hemorrhage, infection, aspiration

NURSING INTERVENTIONS

- Teach the patient pre operatively.
  - Clarify misconceptions of disease, nature of surgical procedure and its effect on speech.
  - For complete laryngectomy make the patient understand that the natural voice will be lost but special training can provide a means of communication.
  - Review equipment and treatments for post op care with the patient and family. Teach important coughing and deep breathing exercises and assist the patient to perform a return demonstration.

INTERVENTIONS continued

- Reduce anxiety and depression
  - Provide the patient and the family with opportunities to ask questions and verbalise feelings.
  - Arrange for someone post laryngectomy to visit the patient.
  - Active listening to the patient and providing an environment that promotes open communication and allows patient to verbalise feelings.

Nursing interventions

- Maintain a patent airway
  - Position the patient in fowlers or semi-fowlers position after recovery from anaesthesia. It reduces surgical edema and promotes lung expansion.
  - Observe patient for restlessness, dyspnea…
  - Assess/ auscultate lung sounds
  - Use with caution drugs that depress respiration e.g opiates. However ensure adequate pain relief as pain may cause shallow breaths and ineffective cough.
  - Encourage to turn, cough and take deep breaths. Suction to remove excess secretions.
  - Early ambulation to prevent atelectasis, pneumonia and DVT

- Perform laryngectomy tube care (similar to tracheostomy care).assignment: review tracheostomy care.
- Clean stoma daily with saline solution or prescribed solution. Frequently patient coughs up large amounts of mucus through this opening. To prevent excess mucus production ensure the air is humidified.
- Laryngectomy tube may be removed after stoma is well healed, within 3 – 6 weeks.
- Teach how to clean and change tube.

- Promoting alternative communication methods
  - Establish means of communication pre op
  - E.g place a call bell within easy reach of the patient
  - Writing material, insert IV in the opposite hand
  - Hand signals
  - Give adequate time as this method of communication takes time and can be frustrating to the patient.
- Promote adequate nutrition and hydration
  - Post op the patient may be NPO for several days. Alternative feeding and hydration methods are used.
  - IV fluids, enteral feeding through NGT or gastrotomy tube, parenteral nutrition.
  - When starting oral feeds, start with thick liquids as they are easy to swallow. Keep suction near for initial feeding. Introduce solid foods as tolerated.

  - Observe for and report difficulty in swallowing. Appetite may be altered for sometime due to loss of sense of smell as taste and smell are closely related.
- Promoting positive body image and self esteem.
  - Due to disfiguring surgery and loss/altered communication pattern.
  - Encourage patient to express feelings and counsel or refer to a support group.
- Promoting self care management
  - Begin participation in care ASAP
  - Encourage participation and provide positive reinforcement
- Monitoring and managing potential complications
  - Respiratory distress and hypoxia – monitor for signs and symptoms e.g. restlessness, agitation, tachypnea, confusion, use of accesory respiratory muscles.

- Hypoxia causes:- restlessness, initial increase in BP followed by hypotension and somnolence. Cyanosis is a late sign.
- Immediately rule out obstruction by having the patient cough or breath in deeply.
- Reposition to ensure an open airway.
- Administer oxygen as prescribed.
- Prepare always for possible intubation and mechanical ventilation.
- Hemorrhage – notify the surgeon incase of active bleeding at the surgical site, drains or trachea.
- Monitor vitals for changes – increase in pulse, decrease in BP, rapid deep respirations, cold clammy skin may indicate active bleeding.
- Give IV fluid and blood components
- Manage shock

- Infection – monitor for signs of infection e.g. increase in temperature and pulse, change in type of wound drainage, increased areas of redness or tenderness at surgical site, purulent drainage, odor, increased wound drainage.
- Administer antibiotics and culture drainage
- Wound breakdown – caused by infection, poor wound healing, radiation therapy or tumor growth. It can create an emergency as the carotid artery is close to the stoma site and may be eroded and rupture.
- observe stoma site for wound breakdown, hematoma, bleeding and report to surgeon.
- Aspiration – risk due to depressed cough, sedating effects of anaesthesia and analgesics, alteration in the airway, impaired swallowing and the administration of tube feedings.
- Assess for nausea & administer antiemetics as prescribed.
- Keep suction nearby

  - During tube feedings position the head of the bed at 30 degrees or higher and remain so for 30 -45 minutes after feeding.
  - Check tube position before each feed.
- Teaching
  - Tracheostomy and stoma care. Importance of humidification at home, avoid air conditioned air as it may be too cold or too dry.
  - Hygiene and safety measure in the shower to prevent water entering the stoma. No more swimming.
  - Signs of infection
  - Handwashing before and after tracheostomy care. Proper disposal of mucus and soiled dressing.
  - Perform oral care regularly to avoid halitosis and infection.
  - Teach signs of complications.