Module 4 Sensory Perception Study Guide

HCC3 Exam 2 Vision Hearing Medications Nursing Priorities

Built from the Module 4 recordings, Exam 2 Learning Map, PAINT learning models, and POAG concept map

Exam emphasis	How to study it
Assessment	Recognize hallmark cues and distinguish expected findings from emergencies.
Complications	Know what threatens permanent vision, hearing, balance, or safety.
Interventions	Prioritize immediate nursing actions, preop/postop care, and positioning.
Teaching	Know eye-drop technique, hearing-aid care, ear hygiene, activity limits, and prevention.
Medications	Connect each class to its purpose, major adverse effects, contraindications, and teaching.

EXAM SAFETY PRIORITY Treat sudden painful vision loss, flashes/floaters with a curtain over vision, or severe eye pain with nausea as urgent findings. Protect the patient from falls whenever vertigo or reduced vision is present.

Learning Map Checklist

- □ Assess cataracts, retinal detachment, and glaucoma.
- □ Provide nursing care before and after eye surgery and teach postoperative restrictions.
- □ Identify glaucoma contraindications and safely instill eye drops.
- □ Assess ear infection and care for a child with otitis media.
- □ Provide postoperative ear care, reduced-hearing interventions, and discharge teaching.
- □ Perform safe ear hygiene and irrigation for children and adults.
- □ Care for Ménière disease and prevent hearing loss.
- □ Teach proper use and care of hearing aids.

Fastest Way to Use This Guide

1. Start with the emergency comparison table and the eye/ear disorder comparison tables.
2. For each disorder, recite: cause, hallmark cues, priority action, treatment, and discharge teaching.
3. Study medication classes by what they do, what they can harm, and what the nurse must check.
4. Complete the practice questions without notes, then study the rationales for missed concepts.

Sensory Perception Foundations

Sensory perception is the ability to receive sensory input, transmit it through physiologic pathways, process it, and translate it into meaningful information. Sensation may remain optimal or become impaired anywhere along the pathway. This module focuses on vision and hearing, although taste, smell, and touch are also sensory functions.

Effects of Sensory Loss

Vision impairment	Hearing impairment
Ranges from minor distortion to blindness	Ranges from distorted speech to complete hearing loss
Injury risk and difficulty with ADLs	Communication and workplace difficulty
Learning difficulty	Learning or developmental delay
Depression, anxiety, reduced self-worth	Frustration, isolation, depression
Strained interpersonal relationships	Strained interpersonal relationships

Focused Assessment

Vision	Hearing
External inspection; visual acuity; extraocular movements; pupils; ophthalmoscopic exam	Inspect pinna/external canal; otoscopic exam of canal and tympanic membrane; hearing tests
Snellen for distance; Rosenbaum/Jaeger for near vision	Whisper test or tuning fork screening; audiometry is the most reliable formal measure
Visual field testing; slit-lamp exam; tonometry	Observe head tilting, leaning forward, mismatched answers, frequent requests for repetition
Ask onset: sudden versus gradual, unilateral versus bilateral, pain, halos, flashes, floaters	Ask about pain, drainage, tinnitus, vertigo, trauma, infections, surgeries, noise and ototoxic drugs

Primary and Secondary Prevention

Primary prevention

- Wear eye protection for chemical, projectile, or occupational exposure.
- Wear hearing protection around construction, firearms, loud music, machinery, or other high-decibel exposure.
- Newborn erythromycin ophthalmic ointment prevents ophthalmia that could damage vision.
- Control chronic disease, especially diabetes and cardiovascular disease.
- Avoid smoking and unnecessary exposure to ultraviolet light; use UV-protective eyewear.

Secondary prevention

- Routine age- and risk-appropriate vision and hearing screening supports early treatment.
- Older adults require regular hearing-acuity screening because loss may be gradual and unrecognized.
- Patients at glaucoma risk require periodic comprehensive eye examinations and IOP checks.

Emergency Versus Expected Findings

Finding	Meaning and priority
Sudden severe eye pain, red eye, blurred vision/halos, headache, nausea/vomiting	Acute angle-closure glaucoma: ophthalmic emergency; rapidly lower IOP.
Sudden flashes, floaters, or curtain/shadow over visual field	Retinal tear/detachment: urgent same-day ophthalmic evaluation; do not let patient drive.
Post-eye surgery severe pain or pain with nausea	Possible sharply increased IOP or hemorrhage: notify surgeon immediately.
Gradual painless cloudy vision and glare	Consistent with cataract; assess effect on ADLs and surgical need.
Gradual painless peripheral vision loss	Consistent with POAG; damage is irreversible, so treatment adherence is lifelong.
Vertigo with sudden drop attack	Immediate fall/injury risk; no driving; institute safety precautions.

Eye Anatomy and Visual Function

Key Structures and Fluid Flow

Structure	Main function
Cornea	Clear curved anterior surface; begins refraction of light.
Iris and pupil	Iris changes pupil size to control light entry.
Lens	Transparent elastic structure behind iris; changes shape for focus and directs image to retina.
Retina	Contains photoreceptors that convert light to neural signals.
Macula and fovea centralis	Central, detailed vision.
Optic nerve	Carries visual signals to brain; damaged by glaucoma.
Aqueous humor	Continuously produced by ciliary body; flows through pupil and drains at anterior chamber angle.
Vitreous humor	Gel in posterior segment; volume remains relatively stable in adults.

Normal IOP depends on balance between aqueous-humor production and outflow. The course materials list approximately 10-20 or 10-21 mm Hg as normal. Persistent elevation can compress retinal vessels and optic-nerve fibers, causing ischemia and irreversible loss.

Four Functions Needed for a Clear Image

Function	What happens
Refraction	Curved surfaces and transparent media bend light so it focuses on the retina. The retinal image is inverted and reversed.
Pupillary constriction	Miosis limits light entry; increased light in either eye normally causes both pupils to constrict.
Accommodation	Lens curvature changes to maintain focus when gaze shifts from far to near.
Convergence	Both eyes turn inward toward the nose to produce one image of a near object.

Refractive Errors

Condition	Image location	Vision pattern
Emmetropia	Focused sharply on retina	Normal refraction
Hyperopia	Converges behind retina	Farsighted: distance clearer; near vision poor
Myopia	Converges in front of retina	Nearsighted: near clearer; distance vision poor

Condition	Image location	Vision pattern
Astigmatism	Uneven focus from irregular curvature	Blur or distortion at various distances

Normal Aging Changes

- Decreased extraocular muscle tone reduces ability to maintain a fixed gaze.
- Lower eyelid may relax away from the eye, contributing to dryness.
- Arcus senilis is an opaque blue-white ring at the corneal edge caused by lipid deposits; it does not impair vision.
- Sclera may yellow from fatty deposits or look bluish as it thins.
- Iris dilates less effectively, slowing dark adaptation; add lighting and remove trip hazards.
- Lens yellows, hardens, shrinks, and loses elasticity, reducing accommodation.
- Near point moves farther away and far point becomes closer, narrowing functional visual range.
- Color discrimination decreases, especially blue, green, and violet; more light is required.
- IOP may be slightly higher with age, but elevated pressure with optic-nerve changes is not normal aging.

Cataracts

A cataract is an opacity of the normally transparent lens. With aging, the lens loses water, becomes denser, and develops compressed older fibers and new fibers/crystals. As transparency falls, light transmission and visual sensory perception decline. Cataracts may be bilateral but progress at different rates.

Risk Factors and Cues

Risk factors	Expected assessment findings
Older age; diabetes; hypothyroidism; hypoparathyroidism; Down syndrome	Gradual, painless reduction in vision and color perception
Eye trauma; toxins; radiation, x-rays, UV exposure	Blurred/cloudy vision, glare, halos, poor night vision
Smoking; recurrent uveitis or other intraocular disease	Diplopia; frequent prescription changes; difficulty with ADLs
Prolonged corticosteroids, chlorpromazine, or some beta blockers	Mature cataract may appear blue-white; red reflex may be absent

EXAM SAFETY PRIORITY An uncomplicated age-related cataract is painless and is not associated with eye redness. Sudden pain or marked redness suggests another problem.

Diagnostics

- Visual acuity: Snellen for distance and Rosenbaum/Jaeger for near vision.
- Brightness acuity testing evaluates glare-related impairment.
- Ophthalmoscope identifies lens densities by size, shape, and location and evaluates the red reflex.
- Slit lamp visualizes the cornea, iris, anterior chamber, and lens.
- Retinal examination evaluates the posterior eye; a mature cataract can obstruct the view.

Management and Preoperative Care

Definitive treatment is surgical removal of the cloudy lens, generally when impaired vision interferes with ADLs or safety. Phacoemulsification uses ultrasonic energy to break the lens into pieces for suction; an intraocular lens is inserted.

- Assess how reduced vision affects ADLs, independence, and fall risk.
- Obtain baseline visual and physical assessment and vital signs.
- Verify informed consent and reinforce procedure and eye-drop teaching.
- Review previous surgery and medications. Report anticoagulants/antiplatelets, antidiabetics, and antihypertensives to the provider; do not independently stop them.
- Arrange transportation and help at home because the patient cannot safely drive immediately after surgery.

Postoperative Care and Teaching

Expected or routine	Report immediately
Mild itching, slight eyelid swelling, bloodshot appearance	Severe or increasing pain; pain with nausea/vomiting
Temporarily blurred vision from ointment or dilation	Sudden decrease in vision or loss of visual field
Prescribed antibiotic and steroid drops/ointment	Marked swelling, bruising, bleeding, purulent drainage
Dark glasses in bright light; eye shield as directed	Nonreactive pupil, flashes/floaters, new curtain-like shadow

- Avoid bending at the waist, heavy lifting, straining, forceful coughing/sneezing, nose blowing, vomiting, and head-dependent positions because they raise IOP.
- Use stool softeners if prescribed; bend at the knees rather than from the waist.
- Do not rub or press on the eye. Wear the protective shield as directed, commonly during sleep.
- Avoid aspirin for postoperative discomfort when instructed because it increases bleeding risk; use prescribed acetaminophen-based therapy.
- Do not drive or operate machinery until vision is adequate and the surgeon clears it.
- Keep follow-up appointments; vision and lens prescription stabilize over several weeks.

Glaucoma

Glaucoma is a group of disorders associated with optic-nerve injury, commonly related to increased IOP or impaired aqueous-humor drainage. Pressure compresses retinal vessels, photoreceptors, and nerve fibers. Damage begins in the periphery and progresses inward; lost vision cannot be restored.

Open Angle Versus Angle Closure

Feature	Primary open-angle glaucoma	Acute angle-closure glaucoma
Onset	Slow, chronic, usually bilateral	Sudden; emergency
Mechanism	Trabecular outflow is reduced while angle remains open	Iris moves forward and closes chamber angle, abruptly blocking outflow
Early symptoms	Often none; intermittent foggy vision, mild ache/headache	Severe eye pain, red eye, blurred vision, halos, headache
Vision	Progressive peripheral loss; central vision initially spared	Sudden reduction in vision
Pupil/cornea	Late optic-disc cupping and atrophy	Cloudy/edematous cornea; moderately dilated nonreactive pupil
IOP in course materials	Often 22-32 mm Hg	May be 30 mm Hg or higher
Priority	Lifelong adherence and monitoring	Rapidly lower IOP and prepare for definitive treatment

Risk Factors and Diagnostics

- Higher risk: family history; increased IOP; thin cornea; abnormal optic nerve; age over 60; Black/African American or Hispanic/Latino adults over 40; diabetes and other vascular risk factors.
- Tonometry measures IOP.
- Perimetry maps visual fields and peripheral loss.
- Gonioscopy determines whether the anterior chamber angle is open or closed.
- Ophthalmoscopy evaluates optic-disc cupping, depth, pallor, and atrophy.

Glaucoma Medication Classes

Class and examples	How it lowers IOP	Major nursing points
Prostaglandin analogs: latanoprost, travoprost, bimatoprost	Increase aqueous outflow	Once-daily dosing is common. May darken iris/eyelid skin, lengthen lashes, cause redness or stinging. Remove contacts before use and replace as directed.
Beta blockers: timolol, betaxolol	Decrease aqueous production	Can cause bradycardia, hypotension, bronchospasm, fatigue. Check pulse/BP; use caution or avoid in asthma/COPD, bradycardia, heart block, or decompensated HF.
Alpha2 adrenergic agonists: brimonidine, apraclonidine	Decrease production and may increase outflow	May cause dry mouth, fatigue, hypotension, or allergic conjunctivitis. Avoid with MAO inhibitors; use caution with cardiovascular disease.
Cholinergic/miotic: pilocarpine; echothiophate	Constrict pupil and contract ciliary muscle to open drainage	Blurred/dim vision, brow ache, headache; poor night vision. Systemic cholinergic

Class and examples	How it lowers IOP	Major nursing points
		effects are possible. Use caution in asthma, GI obstruction/ulcer, bradycardia, and retinal-detachment risk.
Carbonic anhydrase inhibitors: dorzolamide, brinzolamide; acetazolamide	Strongly decrease aqueous production	Topical burning/bitter taste; systemic acetazolamide may cause paresthesia, electrolyte loss, kidney stones, metabolic acidosis. Assess sulfonamide reaction history and renal/electrolyte status.
Hyperosmotic: IV mannitol	Pulls fluid from eye into bloodstream for rapid pressure reduction	Used in acute angle closure. Monitor fluid status, renal function, electrolytes, lung sounds, and heart failure/pulmonary edema risk.

Contraindications and Drugs That Can Worsen Angle Closure

EXAM SAFETY PRIORITY Before giving medications with anticholinergic or pupil-dilating effects, determine whether the patient has narrow-angle/angle-closure glaucoma. Mydriasis can close a narrow chamber angle.

Medication or class	Why it matters
Anticholinergics: atropine, scopolamine, oxybutynin	Cause mydriasis and may precipitate acute angle closure in susceptible patients.
Mydriatic/cycloplegic eye drops	Can close a narrow anterior chamber angle; use only under ophthalmic direction.
First-generation antihistamines such as diphenhydramine	Anticholinergic action can worsen narrow-angle glaucoma; verify type of glaucoma.
Decongestants/sympathomimetics	May dilate pupil and precipitate angle closure.
Some antidepressants and antipsychotics with anticholinergic effects	May increase angle-closure risk; screen and consult prescriber.
Corticosteroids	Prolonged ophthalmic or systemic use can increase IOP; monitor patients at risk.

Do not assume every listed drug is forbidden in every patient with glaucoma. The highest concern is untreated narrow-angle or angle-closure glaucoma. Verify the glaucoma type and follow the prescriber/ophthalmologist's direction.

Surgery

Procedure	Purpose
Laser trabeculoplasty	Laser treatment changes/tightens trabecular meshwork to enlarge drainage spaces and increase aqueous outflow.
Trabeculectomy	Creates a new channel for aqueous drainage.
Drainage shunt	Tube drains aqueous to a plate where fluid is reabsorbed when other approaches fail.

- Potential surgical complications include choroidal hemorrhage and choroidal detachment.

- Postoperative care follows eye-surgery principles: protect the eye, avoid IOP-raising activity, administer drops, monitor vision and drainage, and report severe pain or nausea promptly.

Lifelong Teaching

- Drops prevent additional damage; they do not restore lost vision.
- Use every dose on schedule, even when no symptoms are present.
- Keep follow-up appointments for IOP and visual-field monitoring.
- Use adaptive bottle holders, large labels, color/shape coding, or caregiver help if vision or dexterity limits self-administration.
- Expected brief effects may include tearing, mild burning, temporary blur, or red sclera. Report persistent pain, marked swelling, discharge, allergy symptoms, chest pain, breathing problems, or significant visual change.

Eye Drop and Ointment Administration

Eye Drop Procedure

5. Verify medication, eye, dose, timing, allergies, and expiration. Explain that brief stinging or blurred vision may occur depending on the drug.
6. Perform hand hygiene. Position the patient sitting or supine with head tilted back; remove contact lenses when required.
7. Clean drainage from inner to outer canthus with a separate clean area for each wipe.
8. Ask the patient to look upward. Gently pull the lower lid down to form the conjunctival sac.
9. Hold the bottle about 1-2 cm above the sac. Do not touch the eye, lashes, lid, fingers, or any surface with the tip.
10. Instill the prescribed number of drops into the conjunctival sac, not directly onto the cornea.
11. Ask the patient to close the eye gently without squeezing or blinking forcefully.
12. Apply gentle pressure over the nasolacrimal duct at the inner canthus for at least 30-60 seconds, or as directed, to limit systemic absorption.
13. Blot excess fluid without rubbing. Recap without contaminating the tip.
14. Wait 5-10 minutes between different ophthalmic drugs. If both drops and ointment are prescribed, give drops first and ointment last.
15. Document medication, eye, response, teaching, and any difficulty with self-administration.

EXAM SAFETY PRIORITY Never place an eye medication directly on the cornea and never allow the applicator tip to touch the eye. Punctal occlusion is especially important for glaucoma drops because systemic absorption can cause serious cardiac or respiratory effects.

Eye Ointment

- Apply a thin ribbon along the lower conjunctival sac from inner to outer canthus without touching the tip.
- Ask the patient to close the eye gently and roll the eyeball to distribute medication.
- Expect temporary blurred vision; institute fall precautions and avoid driving until clear.

Retinal Holes Tears and Detachment

Condition	Definition
Retinal hole	A break in the retina caused by trauma or aging.
Retinal tear	A jagged irregular break, often from traction.
Retinal detachment	Separation of the sensory retina from the underlying epithelium.
Posterior vitreous detachment	Age-related shrinkage/thickening of vitreous gel that pulls away from retina; may cause flashes and floaters.

Risk Factors and Hallmark Cues

- Older age; extreme myopia; inflammation inside the eye; eye trauma; prior cataract or laser eye surgery.
- Sudden, painless photopsia: flashes described as shooting stars or thin lightning streaks, often more visible in darkness.
- New floaters or dark spots.
- Curtain, veil, or shadow over part of the visual field; field loss corresponds to the detached area.
- Ophthalmoscopy may show gray folds/bulges and the causative tear or hole.

EXAM SAFETY PRIORITY A patient reporting sudden flashes, floaters, or curtain-like vision needs urgent ophthalmic assessment. Instruct the patient not to drive; another person should transport them.

Treatment

Situation	Treatment
Hole/tear before detachment	Laser photocoagulation or cryopexy creates a scar that seals the break and bonds retina to choroid.
Detached retina	Scleral buckle indents the sclera to relieve traction and hold retina against choroid; subretinal fluid may be drained.
Internal support	Gas bubble or silicone oil may be placed to tamponade the retina during healing.

Preoperative Priorities

- Assess visual acuity and orient the patient to the environment.
- Restrict activity and head/eye movement to prevent extension.
- Place an eye patch on the affected eye if prescribed.
- Administer prescribed mydriatic/cycloplegic topical drugs to inhibit constriction and accommodation.
- Reduce anxiety with clear information and support.

Postoperative Priorities

- Apply eye patch/shield and inspect for drainage; monitor vital signs.
- Maintain the exact head position prescribed so the gas/oil tamponade supports the retinal tear.
- Avoid reading, writing, and close work during the first week when ordered because rapid eye movement may stress repair.
- Avoid bending, lifting over 10 lb, straining, coughing, sneezing, nose blowing, vomiting, sexual intercourse, dependent head position, and tight collars until cleared.

- Avoid air travel and high altitude while an intraocular gas bubble remains because gas expansion can dangerously raise IOP.
- Report sudden reduction in vision, severe/increasing pain, pain with nausea, or a nonreactive pupil immediately.

Ear Anatomy Hearing and Balance

Structures

Region	Structures	Function
External ear	Pinna/auricle, tragus, lobule, helix, antihelix, concha, canal	Collects and directs sound to tympanic membrane.
Middle ear	Tympanic membrane; malleus, incus, stapes; eustachian tube	Vibrates and mechanically transmits/amplifies sound; equalizes pressure.
Inner ear	Cochlea, semicircular canals, vestibular apparatus, membranous labyrinth	Converts sound to nerve impulses and detects head movement/balance.
Cranial nerve VIII	Vestibulocochlear nerve	Carries auditory and vestibular information to brain.

How Hearing Occurs

16. Pinna collects sound waves and directs them into the ear canal.
17. Sound vibrates the tympanic membrane.
18. Malleus, incus, and stapes transmit the vibration through the middle ear.
19. Vibration enters the fluid-filled cochlea.
20. Fluid movement stimulates hair cells, which transduce mechanical energy into electrical impulses.
21. Cranial nerve VIII carries impulses to the brain for interpretation as sound.

How Balance Occurs

Head movement shifts endolymph within the membranous labyrinth and semicircular canals. Vestibular receptors signal the brain about motion and position so posture and balance can be adjusted. Abnormal fluid pressure or vestibular injury can cause vertigo, nausea, and falls.

Hearing Loss

Types of Hearing Loss

Type	Location and mechanism	Common causes	Pattern
Conductive	External or middle ear blocks sound transmission	Cerumen/foreign body, inflammation/fluid, bulging or retracted TM, perforation, fused ossicles, otosclerosis, scar/tumor	Often treatable with little permanent loss if cause corrected
Sensorineural	Inner ear hair cells, cochlea, or CN VIII damaged	Aging, prolonged noise, ototoxic drugs, vascular loss, trauma	Often permanent; speech discrimination may be impaired
Mixed	Conductive plus sensorineural components	More than one lesion or chronic disease	Features of both

Presbycusis

Presbycusis is age-related sensorineural hearing loss caused by degeneration of cochlear nerve cells, reduced basilar-membrane elasticity, and decreased inner-ear blood supply. Vitamin B12 and folate deficiency may increase risk. High-frequency sounds and speech discrimination commonly decline first.

Assessment

- Face the patient in adequate light so facial expression and lip movement are visible.
- Observe tilting the head, leaning forward, watching the speaker's mouth, inappropriate answers, or repeated requests for repetition.
- Ask about onset, unilateral/bilateral loss, pain, drainage, tinnitus, vertigo, trauma, surgery, infections, perforation, cerumen, noise, air travel, and ear-cleaning habits.
- Review occupation, family/genetic history, and disorders such as allergies, URIs, hypothyroidism, atherosclerosis, HIV, and diabetes.
- Inspect hearing aids for placement, battery, cleanliness, obstruction, feedback, and function.

Diagnostics

Test	Purpose
Otoscopy	Examines canal and tympanic membrane for cerumen, foreign body, infection, retraction, bulging, perforation, or drainage.
Tuning-fork tests	Screen conductive versus sensorineural patterns.
Audiometry	Most reliable measure; determines hearing thresholds at different frequencies and decibels.
Otoacoustic emissions	Assesses cochlear outer-hair-cell response.
Auditory brainstem response	Assesses neural transmission from auditory nerve through brainstem.
CT/MRI	Used selectively for soft-tissue lesion, tumor, or structural concern.

Communication During Hospitalization

- Gain attention before speaking; approach from the side with better hearing.
- Reduce background noise and face the patient at eye level in good light.
- Speak clearly at a normal pace and slightly lower pitch. Do not shout, exaggerate mouth movements, or cover your mouth.
- Use short sentences and rephrase rather than repeatedly saying the same words.
- Verify understanding with teach-back; do not mistake hearing loss for confusion.
- Provide written instructions, captions, sign-language interpreter, communication board, or amplification device as appropriate.
- Keep call light and personal items accessible and institute fall precautions if vertigo is present.

Ototoxic Medication Review

Medication group	Examples and nursing implications
Aminoglycosides	Gentamicin, tobramycin, amikacin: tinnitus, hearing loss, or disequilibrium may be permanent; monitor levels and symptoms.
Loop diuretics	Furosemide, especially rapid IV/high dose or with another ototoxin: monitor hearing, renal function, and infusion rate.
Salicylates/NSAIDs	High-dose aspirin and some NSAIDs can cause tinnitus or reversible hearing change; report symptoms.
Platinum chemotherapy	Cisplatin/carboplatin can cause permanent sensorineural loss; baseline and follow-up audiometry may be needed.
Quinine-based drugs	May cause tinnitus and auditory change; review dose and symptoms.

Hearing Aids Ear Hygiene and Irrigation

Hearing Aid Care

- Keep the device dry; remove it before bathing, swimming, or using hair spray unless manufacturer says otherwise.
- Wash and dry hands before handling. Clean the earmold as directed; do not immerse electronic components.
- Turn the device off when not in use. Open the battery door for storage and remove the battery for prolonged nonuse.
- Store in a labeled, protective container away from heat, moisture, children, and pets.
- Avoid dropping, crushing, or exposing the aid to extreme temperature.
- Insert with volume off/low, then gradually adjust. Feedback may mean poor fit, cerumen, low battery, or excessive volume.
- If not working: check power, battery orientation/charge, volume/program, wax blockage, tubing, moisture, and fit. Seek authorized repair if unresolved.
- Never discard a hearing aid with linens or meal trays; document and secure it during procedures.

General Ear Hygiene

- Clean only the outer ear with a washcloth. Do not insert cotton swabs, hairpins, or other objects into the canal.
- Do not remove impacted cerumen with unapproved tools; use prescribed softening agents and clinician-directed removal.
- Keep ears dry when infection, tubes, perforation, or recent surgery makes water entry unsafe.
- Use hearing protection correctly, but avoid prolonged unnecessary earplug use that traps moisture.

Ear Irrigation

EXAM SAFETY PRIORITY Do not irrigate an ear with a known or suspected tympanic-membrane perforation, tympanostomy tube, recent ear surgery, severe pain, or when a vegetable matter/battery foreign body is present. Follow facility policy and provider direction.

22. Verify order/indication and assess pain, drainage, surgery, tubes, and perforation history. Inspect the canal and tympanic membrane when safe.
23. Use solution near body temperature. Cold or hot fluid can trigger vertigo, nausea, or nystagmus.
24. Position with affected ear up and protect clothing. For adults and children older than 3 years, pull pinna up and back. For children 3 years or younger, pull down and back.
25. Direct gentle flow along the superior/posterior canal wall, never forcefully at the tympanic membrane. Allow return into basin.
26. Periodically ask about pain, dizziness, nausea, or decreased hearing. Stop immediately if these occur.
27. When complete, position affected ear down for drainage and dry the outer ear. Reassess canal, symptoms, and hearing as indicated.

Otitis Media and Otitis Externa

Acute Chronic and Serous Otitis Media

Type	Key features
Acute otitis media	Sudden middle-ear infection/inflammation, usually 3 weeks or less; intense pain from pressure, fever, irritability, reduced conductive hearing.
Chronic otitis media	Repeated or persistent infection, sometimes involving bacterial biofilm; longer duration with scarring, ossicle necrosis, and greater hearing-loss risk.
Serous otitis media	Nonpurulent middle-ear fluid, often after infection or eustachian-tube dysfunction; fullness and conductive hearing loss may predominate.
Otitis externa	Inflammation/infection of external canal; pain, swelling, tenderness, and possible temporary hearing reduction. Usually treated topically.

Pathophysiology and Complications

A pathogen reaches the middle ear and causes mucosal swelling, ossicle irritation, and purulent exudate. The eustachian tube and mastoid air cells may become involved. Ongoing infection can perforate, thicken, and scar the tympanic membrane. Ossicle necrosis or extensive scarring can cause permanent conductive hearing loss.

- Early: vague discomfort and a retracted tympanic membrane.
- Progression: dilated vessels, red thickened bulging tympanic membrane, loss of landmarks, decreased mobility, and possible pus.
- Perforation: pus or blood drains and pain often decreases suddenly because pressure is relieved.
- Repeated perforation can scar the membrane; large perforation or ossicle damage impairs hearing.
- Headache, malaise, fever, nausea/vomiting, tinnitus, dizziness, or vertigo may occur.

Care for the Child with Otitis Media

- Assess ear pulling/rubbing, irritability, crying, poor sleep/feeding, fever, vomiting, and reduced response to sound.
- Administer analgesic/antipyretic as prescribed; pain control is a priority even when antibiotics are not immediately indicated.
- If antibiotics are prescribed, give the full course at correct intervals; do not stop when the child feels better.
- Use low external heat if age appropriate and ordered; prevent burns.
- Avoid bottle-propping and feeding an infant flat. Hold the infant upright to reduce reflux into the eustachian tube.
- Reduce tobacco-smoke exposure; reinforce immunizations and hand hygiene.
- Report swelling/tenderness behind ear, protruding pinna, persistent high fever, stiff neck, severe headache, facial weakness, or worsening symptoms.

Medication and Procedural Management

Therapy	Nursing teaching
Systemic antibiotics	Used for bacterial middle-ear infection when prescribed. Complete course; monitor allergy, diarrhea, and response.
Acetaminophen or ibuprofen	Treat pain/fever using weight-appropriate pediatric dose. Avoid aspirin in children due to Reye syndrome risk.
Antihistamine/decongestant	May be prescribed selectively; assess sedation, cardiovascular effects, and glaucoma contraindications.
Topical antibiotic ear drops	Common for otitis externa and some tube-related drainage; warm bottle in hands and avoid contaminating tip.
Myringotomy/tympanostomy tube	Small opening relieves pressure/drains fluid; tube permits ongoing ventilation/drainage in recurrent disease.

After Myringotomy or Ear Surgery

- Keep external ear/canal clean and dry; follow surgeon's bathing and water precautions.
- Avoid straining, forceful coughing, rapid head movement, bending, and heavy lifting until cleared.
- Blow nose gently without occluding one nostril, or keep mouth open, as directed.
- Avoid air travel and pressure changes for the prescribed period after middle-ear surgery.
- A small amount of drainage may be expected after some procedures; report excessive, foul, purulent, bloody, or persistent drainage, fever, severe pain, facial weakness, or worsening vertigo.
- Administer drops exactly as prescribed and keep follow-up hearing appointments.

Ménière Disease

Ménière disease is a progressive inner-ear disorder associated with excessive endolymphatic fluid and distention of the membranous labyrinth. Cochlear-duct dilation distorts hearing; vestibular-system injury causes vertigo; abnormal stimulation causes tinnitus. Early hearing loss may fluctuate and be reversible, but repeated pressure injury can make it permanent.

Classic Triad and Attack Pattern

Hallmark	What to know
Episodic vertigo	Severe spinning sensation can incapacitate the patient for hours to days; nausea/vomiting and nystagmus may occur.
Tinnitus	Often roaring, buzzing, or ringing in affected ear.
Fluctuating hearing loss	Usually sensorineural; may become permanent with repeated attacks.
Aural fullness	Pressure/fullness may accompany the triad.
Drop attack	Tumarkin otolithic crisis: sudden fall without warning; major injury and driving risk.

During an Acute Attack

- Place patient on bed rest in a quiet, darkened room; reduce visual and auditory stimulation.
- Institute fall precautions; keep call light and emesis basin close; assist with all ambulation.
- Encourage stillness and slow head movement; avoid sudden position changes.
- Administer prescribed vestibular suppressant, antiemetic, antihistamine, or benzodiazepine and monitor sedation.
- Monitor hydration and electrolytes if vomiting is severe.

Long Term Management

Intervention	Purpose and teaching
Low-sodium diet	Reduces fluid retention; distribute intake consistently and read labels. Follow prescribed sodium target.
Avoid triggers	Limit caffeine, alcohol, nicotine, MSG, excess stress, and known allergens/triggers.
Diuretic	Helps reduce endolymph volume; monitor BP, hydration, renal function, and electrolytes.
Vestibular rehabilitation	Exercises improve balance and compensatory strategies between attacks.
Systemic/intratympanic glucocorticoid	Considered for persistent symptoms; monitor steroid adverse effects and infection.
Intratympanic gentamicin	Suppresses vestibular function but is ototoxic; may worsen hearing. Use for refractory disease after risk discussion.
Endolymphatic sac decompression/shunt	May control vertigo while attempting to preserve hearing.

Intervention	Purpose and teaching
Labyrinthectomy	Destroys labyrinth; stops vertigo but causes total hearing loss in treated ear. Reserved for disabling vertigo with major preexisting hearing loss.

EXAM SAFETY PRIORITY Patients with unpredictable drop attacks should not drive and must avoid ladders, chairs, heights, amusement rides, and unsupervised hazardous activity.

Sensory Medication Master Review

High Yield Medication Links

Medication	Sensory connection	Top nursing concern
Travoprost or latanoprost	POAG maintenance	Daily adherence; iris/skin darkening and lash growth; report severe ocular reaction.
Timolol	Lowers IOP	Bradycardia and bronchospasm; check pulse, respiratory history, and use punctal occlusion.
Pilocarpine	Miotic that improves drainage	Dim/blurred vision and brow ache; fall risk, especially at night.
Dorzolamide/acetazolamide	Decrease aqueous production	Sulfonamide history, renal status, electrolytes, acid-base effects.
IV mannitol	Acute angle-closure pressure reduction	Fluid shift, pulmonary edema, renal function, electrolytes.
Antibiotic ophthalmic/otic agents	Postop prophylaxis or bacterial infection	Correct route, contamination prevention, allergy, full prescribed course.
Ophthalmic corticosteroids	Reduce postoperative/inflammatory response	Infection masking, delayed healing, and increased IOP with prolonged use.
Diphenhydramine	May suppress vestibular symptoms	Sedation/falls; anticholinergic effects; caution in narrow-angle glaucoma and urinary retention.
Furosemide	Diuresis; listed ototoxin	Electrolyte loss, hypotension, renal status, tinnitus/hearing change; rapid IV dosing increases risk.
Gentamicin	Antibiotic; intratympanic option for refractory Ménière	Cochlear/vestibular toxicity and renal toxicity; monitor hearing/balance and drug levels when systemic.
Acetaminophen/ibuprofen	Otitis or postoperative pain	Dose safely; NSAIDs increase bleeding/GI/renal risk; pediatric weight-based dosing.
Aspirin	Can cause tinnitus at high doses; increases bleeding	Avoid in children and when prohibited after eye surgery; monitor salicylate toxicity.

Medication Administration Priorities

- Reconcile all prescription, OTC, and herbal products. Ask specifically about antihistamines, decongestants, anticholinergics, steroids, aspirin/NSAIDs, diuretics, antibiotics, and chemotherapy.
- Connect symptoms to drugs: tinnitus, hearing change, vertigo, bradycardia, bronchospasm, hypotension, blurred vision, or acute eye pain.
- Use punctal occlusion for ophthalmic drugs to reduce systemic effects.
- Never use leftover eye or ear drops and never interchange ophthalmic and otic products.
- For surgery, report anticoagulants and antiplatelets to the provider; do not independently hold prescribed therapy.

Rapid Comparison Tables

Eye Disorders

Disorder	Onset/pain	Hallmark cue	Priority
Cataract	Gradual, painless	Cloudy vision, glare, poor night vision	Assess ADLs; surgical removal when function impaired
POAG	Gradual, usually painless	Peripheral loss; optic-disc cupping	Lifelong drops and monitoring; vision loss irreversible
Angle closure	Sudden, severe pain	Red eye, halos, cloudy cornea, fixed mid-dilated pupil, nausea	Emergency IOP reduction
Retinal detachment	Sudden, painless	Flashes, floaters, curtain/shadow	Urgent ophthalmic care; restrict movement; positioning after repair

Ear Disorders

Disorder	Location	Hallmark cue	Priority
Conductive loss	External/middle ear	Sound transmission blocked	Treat obstruction/infection; communicate effectively
Sensorineural loss	Cochlea/CN VIII	Noise, aging, or ototoxin history	Prevent further damage; assistive communication
Otitis media	Middle ear	Pain, fever, red/bulging TM; possible drainage after rupture	Pain control, prescribed antibiotics, monitor complications
Otitis externa	External canal	Painful swollen canal	Keep dry; topical therapy
Ménière disease	Inner ear	Vertigo + tinnitus + fluctuating hearing loss	Fall precautions, symptom control, low sodium

Postoperative Restrictions by Procedure

Procedure	Essential restrictions and teaching
Cataract/glaucoma surgery	Protect eye; no rubbing, bending, lifting, straining, or pressure-raising activity; use drops; report severe pain/nausea or vision loss.
Retinal repair with gas/oil	Maintain prescribed head position; no air travel/high altitude with gas; limit close work initially; report flashes, curtain, severe pain/nausea.
Middle-ear surgery/myringotomy	Keep ear dry; avoid pressure changes, forceful nose blowing, straining, rapid head motion; report excessive drainage, fever, severe pain, facial weakness.

Priority Nursing Frameworks

When the Question Asks What Comes First

- Sudden vision loss or acute eye pain: protect safety and obtain urgent ophthalmic evaluation.
- Retinal detachment symptoms: restrict activity/head movement and arrange immediate evaluation; patient should not drive.
- Acute angle closure: recognize emergency and rapidly administer prescribed IOP-lowering therapy while preparing for definitive care.
- Vertigo: prevent falls before teaching; assist ambulation and reduce stimulation.
- Hearing impairment: establish an effective communication method before delivering complex teaching or obtaining consent.
- Postoperative severe pain with nausea: notify surgeon; do not dismiss as expected discomfort.

Common Exam Traps

Trap	Correct thinking
Cataracts cause painful red eyes	Age-related cataracts are typically gradual and painless without redness.
Glaucoma drops restore vision	They slow/prevent further optic-nerve damage; existing loss is permanent.
More eye drops work better	Use only prescribed dose; extra drops increase effects and waste medication.
Place drops on cornea	Place drops in lower conjunctival sac and perform punctal occlusion.
Retinal detachment is painful	It is usually sudden and painless, with flashes, floaters, and curtain-like loss.
Shout at a person with hearing loss	Face patient, reduce noise, speak clearly in a lower pitch, and verify understanding.
Use cold irrigation solution	Use body-temperature solution; temperature extremes provoke vertigo.
Pain relief after TM rupture means infection resolved	Pressure fell, but infection and perforation still require evaluation and treatment.
Ménière affects hearing only	It affects cochlear hearing and vestibular balance; falls and driving are major risks.

Practice Questions

1. A patient reports sudden flashes, several new floaters, and a dark curtain over the left visual field. What is the nurse's priority response?

- A. Schedule a routine visual-acuity test
- B. Advise rest and reassessment tomorrow
- C. Arrange urgent ophthalmic evaluation and ensure another person drives
- D. Instill a miotic eye drop

2. Which finding most strongly supports primary open-angle glaucoma?

- A. Sudden severe eye pain and vomiting
- B. Gradual peripheral visual-field loss with optic-disc cupping
- C. Painless cloudy lens and glare
- D. Purulent ocular drainage

3. Which assessment requires immediate action in a patient after cataract surgery?

- A. Mild itching
- B. Slight eyelid swelling
- C. Temporary blurred vision after ointment
- D. Severe eye pain with nausea

4. Which instruction is correct for two prescribed ophthalmic medications?

- A. Instill both at the same time
- B. Wait 5-10 minutes between drugs
- C. Touch the dropper to the lower lid
- D. Apply ointment before drops

5. Why does the nurse perform punctal occlusion after timolol eye drops?

- A. To improve corneal absorption
- B. To prevent drainage onto the cheek
- C. To reduce systemic absorption and cardiopulmonary effects
- D. To dilate the pupil

6. Which history is most concerning before timolol ophthalmic therapy?

- A. Myopia
- B. Asthma and resting bradycardia
- C. Cataract surgery 5 years ago
- D. Seasonal dry eye

7. Which patient statement after retinal repair with a gas bubble shows a need for more teaching?

- A. I will maintain the prescribed head position
- B. I will avoid air travel until my surgeon clears me
- C. I will report severe pain with nausea
- D. I can fly next week if I wear my eye shield

8. Which assessment finding is expected with an uncomplicated age-related cataract?

- A. Sudden painful visual loss
- B. Gradual painless glare and poor night vision
- C. Fixed mid-dilated pupil
- D. New flashes and floaters

9. A child with otitis media suddenly has less ear pain and purulent drainage. What is the best interpretation?

- A. The infection has resolved
- B. The tympanic membrane may have perforated and relieved pressure
- C. The child developed sensorineural loss
- D. This is an allergic reaction

10. How should the nurse straighten the ear canal for irrigation in a 2-year-old child?

- A. Pull the pinna up and back
- B. Pull the pinna down and back
- C. Pull the tragus forward
- D. Do not move the pinna

11. Which situation is a contraindication to ear irrigation?

- A. Soft cerumen
- B. Intact tympanic membrane
- C. Known tympanic-membrane perforation
- D. Adult age

12. Which action best supports communication with a hospitalized patient who has hearing loss?

- A. Shout from the doorway
- B. Speak rapidly into the poorer ear
- C. Face the patient in good light and reduce background noise
- D. Repeat the identical phrase louder

13. Which symptom should a patient receiving high-dose IV furosemide report immediately?

- A. Increased urine output
- B. Tinnitus or sudden hearing change
- C. Mild thirst
- D. Clear nasal drainage

14. Which findings form the classic triad of Ménière disease?

- A. Fever, ear pain, drainage
- B. Vertigo, tinnitus, hearing loss
- C. Headache, diplopia, photophobia
- D. Conductive loss, bulging TM, nausea

15. What is the first nursing priority during a severe Ménière attack?

- A. Begin hearing-aid cleaning
- B. Encourage hallway ambulation
- C. Institute fall precautions and reduce stimulation
- D. Increase dietary sodium

16. Which statement about glaucoma treatment is correct?

- A. Drops restore lost peripheral vision
- B. Treatment can stop once IOP becomes normal
- C. Lifelong adherence can prevent or delay additional damage
- D. Symptoms reliably indicate pressure changes

17. Which OTC medication warrants caution in a patient with untreated narrow-angle glaucoma?

- A. Saline nasal spray
- B. Diphenhydramine
- C. Calcium carbonate
- D. Topical petroleum jelly

18. Which postoperative instruction applies after both cataract surgery and retinal repair?

- A. Bend at the waist to put on shoes
- B. Avoid straining and heavy lifting
- C. Rub the eye if it itches
- D. Stop prescribed drops when vision clears

19. Which hearing-loss pattern is most consistent with presbycusis?

- A. Acute conductive loss from cerumen
- B. Progressive age-related sensorineural loss
- C. Temporary loss from middle-ear fluid
- D. Sudden loss after TM rupture

20. Which hearing-aid action is correct?

- A. Immerse the entire device in water
- B. Store it loose in bed linens
- C. Turn it off when not in use and keep it dry
- D. Use hair spray while wearing it

Answers and Rationales

1. C These are classic retinal-detachment cues. Delay can cause permanent vision loss, and the patient should not drive with impaired vision.

2. B POAG progresses gradually and often silently, causing peripheral loss and optic-disc cupping.

3. D Severe pain with nausea may indicate increased IOP or another serious postoperative complication.

4. B Spacing prevents one medication from diluting or washing out the other. Drops are given before ointment.

5. C Occluding the nasolacrimal duct reduces systemic exposure; timolol may cause bradycardia and bronchospasm.

6. B Topical beta blockers can still be systemically absorbed and cause bronchospasm or bradycardia.

7. D Reduced atmospheric pressure can expand intraocular gas and dangerously raise IOP.

8. B Cataracts gradually cloud the lens and commonly cause glare and declining night vision without pain.

9. B Pain often falls after spontaneous TM perforation because middle-ear pressure is relieved; infection still requires care.

10. B For children age 3 or younger, pull down and back. For adults and children older than 3, pull up and back.

11. C Fluid can enter the middle ear through a perforation and cause infection or injury.

12. C Visual cues, reduced noise, clear normal-paced speech, and rephrasing improve understanding.

13. B Loop diuretics can be ototoxic, particularly with rapid IV or high-dose therapy.

14. B Excess endolymph affects vestibular and cochlear structures, producing episodic vertigo, tinnitus, and fluctuating hearing loss.

15. C Severe vertigo creates immediate fall and injury risk; safety precedes teaching.

16. C POAG may be asymptomatic. Treatment controls pressure and protects remaining vision but does not reverse damage.

17. B Diphenhydramine has anticholinergic effects that may precipitate angle closure in susceptible patients.

18. B Straining and lifting raise IOP and may disrupt healing.

19. B Presbycusis reflects age-related cochlear and neural degeneration and is usually permanent.

20. C Moisture and chemicals damage hearing aids; safe labeled storage prevents loss.

Final Exam Day Review

Know These Without Hesitation

- Cataract: gradual, painless cloudy vision; surgery when ADLs are affected; prevent postoperative IOP increases.
- POAG: silent peripheral loss and optic-disc cupping; lifelong drops; lost vision is permanent.
- Angle closure: sudden painful red eye, halos, fixed mid-dilated pupil, nausea/vomiting; emergency.
- Retinal detachment: sudden painless flashes, floaters, curtain; urgent evaluation; positioning is procedure-specific.
- Eye drops: conjunctival sac, sterile tip, gentle closure, punctal occlusion, 5-10 minutes between drugs, ointment last.
- Conductive loss is an external/middle-ear transmission problem; sensorineural loss involves cochlea/CN VIII and is often permanent.
- Otitis media: pain and bulging TM; decreased pain plus drainage may mean perforation.
- Ear irrigation: body-temperature solution; up/back over age 3, down/back age 3 or younger; never irrigate a perforated TM.
- Ménière: vertigo, tinnitus, fluctuating hearing loss; low sodium, trigger control, fall precautions, no driving with drop attacks.
- Ototoxic warning signs: tinnitus, hearing loss, imbalance, or vertigo after aminoglycosides, loop diuretics, salicylates, platinum chemotherapy, or quinine drugs.

One Minute Safety Scan

If you see	Think
Pain + nausea after eye surgery	Increased IOP or complication; notify surgeon
Flashes + floaters + curtain	Retinal detachment; urgent evaluation
Red painful eye + halos + fixed pupil	Acute angle closure; emergency
Vertigo or drop attack	Fall precautions and driving restriction
Tinnitus after an ototoxic drug	Hold/clarify per order and notify provider promptly
Pain during ear irrigation	Stop immediately and reassess

Use the course Learning Map as the final boundary for exam preparation. Apply these facts through case studies and practice questions, focusing on assessment cues, complications, priority interventions, and health-promotion teaching.