GLAUCOMA

Increased intraocular pressure (*IOP*) is the result of inadequate drainage of aqueous humor from the anterior chamber of the eye. The increased pressure causes atrophy of the optic nerve and, if untreated, blindness. There are two primary categories of glaucoma: (1) open-angle and (2) closed-angle (or narrow angle). Chronic open-angle glaucoma is the most common type, accounting for 90% of all glaucoma cases. It develops slowly, may be associated with diabetes and myopia, and may develop in both eyes simultaneously. Chronic glaucoma has no early warning signs, and the loss of peripheral vision occurs so gradually that substantial optic nerve damage can occur before glaucoma is detected.

Narrow-angle, or angle-closure, glaucoma is the less common form and may be associated with eye trauma, various inflammatory processes, and pupillary dilation after the instillation of mydriatic drops. Acute angle-closure glaucoma is manifested by sudden excruciating pain in or around the eye, blurred vision, and ocular redness. This condition constitutes a medical emergency because blindness may suddenly ensue.

CARE SETTING

Community, unless sudden increase in IOP requires emergency intervention and close monitoring.

RELATED CONCERNS

Psychosocial aspects of care

Patient Assessment Database

ACTIVITY/REST

May report: Change in usual activities/hobbies due to altered vision

FOOD/FLUID

May report: Nausea/vomiting (acute glaucoma)

NEUROSENSORY

May report:	Gradual loss of peripheral vision, frequent change of glasses, difficulty adjusting to darkened room, halos around lights, mild headache (chronic glaucoma)
	Cloudy/blurred vision, appearance of halos/rainbows around lights, sudden loss of peripheral vision, photophobia (acute glaucoma)
	Glasses/treatment change does not improve vision
May exhibit:	Dilated, fixed, cloudy pupils (acute glaucoma)
	Fixed pupil and red/hard eye with cloudy cornea (glaucoma emergency)
	Increased tearing
	Intumescent cataracts, intraocular hemorrhage (glaucoma secondary to trauma)

PAIN/DISCOMFORT

May report:	Mild discomfort or aching/tired eyes (chronic glaucoma)
	Sudden/persistent severe pain or pressure in and around eye(s), headache (acute glaucoma)

SAFETY

May report:	History of hemorrhage, trauma, ocular disease, tumor (secondary to trauma)
	Difficulty seeing, managing activities
May exhibit:	Inflammatory disease of eye (glaucoma secondary to trauma)

TEACHING/LEARNING

May report:	Family history of glaucoma, diabetes, systemic vascular disorders
	History of stress, allergies, vasomotor disturbances (e.g., increased venous pressure), endocrine imbalance, diabetes
	History of ocular surgery/cataract removal; steroid use
Discharge plan	May require assistance with transportation, meal preparation, self-care, homemaker/maintenance tasks

considerations: Refer to section at end of plan for postdischarge considerations.

DIAGNOSTIC STUDIES

Ophthalmoscopy examination: Assesses internal ocular structures, noting optic disc atrophy, papilledema, retinal hemorrhage, and microaneurysms. Slit-lamp examination provides three-dimensional view of eye structures, identifies corneal abnormalities/change in shape, increased IOP, and general vision deficits associated with glaucoma.

Visual acuity tests (e.g., Snellen, Jayer): Vision may be impaired by defects in cornea, lens, aqueous or vitreous humor, refraction, or disease of the nervous or vascular system supplying the retina or optic pathway.

Visual fields (e.g., confrontation, tangent screen, perimetry): Reduction of peripheral vision may be caused by glaucoma or other conditions such as cerebrovascular accident (CVA), pituitary/brain tumor mass, or carotid or cerebral artery pathology.

Tonography measurement: Assesses intraocular pressure (normal: 12–20 mm Hg). In acute angle-closure glaucoma, IOP may be 50 mm Hg or higher.

Gonioscopy measurement: Helps differentiate open-angle from angle-closure glaucoma.

Provocative tests: May be useful in establishing presence/type of glaucoma when IOP is normal or only mildly elevated.

Glucose tolerance test/fasting blood sugar (FBS): Determines presence/control of diabetes, which is implicated at times in secondary glaucoma.

NURSING PRIORITIES

1. Prevent further visual deterioration.
2. Promote adaptation to changes in/reduced visual acuity.
3. Prevent complications.
4. Provide information about disease process/prognosis and treatment needs.

DISCHARGE GOALS

1. Vision maintained at highest possible level.
2. Patient coping with situation in a positive manner.
3. Complications prevented/minimized.
4. Disease process/prognosis and therapeutic regimen understood.
5. Plan in place to meet needs after discharge.

NURSING DIAGNOSIS: Sensory Perception, disturbed: visual

May be related to

Altered sensory reception: altered status of sense organ

Possibly evidenced by

Progressive loss of visual field

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Sensory Function: Vision (NOC)

Participate in therapeutic regimen.

Maintain current visual field/acuity without further loss.

ACTIONS/INTERVENTIONS	RATIONALE
Communication Enhancement: Visual Deficit (NIC)	
Independent	
Ascertain type/degree of visual loss.	Affects choice of interventions and patient's future expectations.
Encourage expression of feelings about loss/possibility of loss of vision.	Although early intervention can prevent blindness, patient faces the possibility or may have already experienced partial or complete loss of vision. Although vision loss cannot be restored (even with treatment), further loss can be prevented.
Recommend measures to assist patient to manage visual limitations, e.g., reducing clutter, arranging furniture out of travel path; turning head to view subjects; correcting for dim light and problems of night vision.	Reduces safety hazards related to changes in visual fields/loss of vision and papillary accommodation to environmental light.
Medication Administration: Eye (NIC)	
Demonstrate administration of eye drops, e.g., counting drops, adhering to schedule, not missing doses.	Controls IOP, preventing further loss of vision.
Collaborative	
Assist with administration of medications as indicated:	
Chronic, open-angle glaucoma	
Pilocarpine hydrochloride (Isopto Carpine, Ocusert [disc], Pilopine HS gel);	These direct-acting topical myotic drugs cause pupillary constriction, facilitating the outflow of aqueous humor and lowering IOP. *Note:* Ocusert is a disc (similar to a contact) that is placed in the lower eyelid, where it can remain for up to 1 wk before being replaced.
Timolol maleate (Timoptic), betaxolol (Betoptic), carteolol (Ocupress), metipranolol (OptiPranolol), levobunolol (Betagan);	[Beta]-blockers decrease formation of aqueous humor without changing pupil size, vision, or accommodation. *Note:* These drugs may be contraindicated or require close monitoring for systemic effects in the presence of bradycardia or asthma.
Acetazolamide (Diamox), methazolamide (Neptazane), dorzolamide (Trusopt).	Carbonic anhydrase inhibitors decrease the rate of production of aqueous humor. *Note:* Systemic adverse effects are common, including mood disturbances, GI upset, and fatigue.
Narrow-angle (angle-closure) type	
Myotics (until pupil is constricted);	Contracts the sphincter muscles of the iris, deepens anterior chamber, and dilates vessels of outflow tract during acute attack or before surgery.
Carbonic anhydrase inhibitors, e.g., acetazolamide (Diamox); dichlorphenamide (Daranide); methazolamide (Neptazane);	Decreases secretion of aqueous humor and lowers IOP.

ACTIONS/INTERVENTIONS	RATIONALE
Medication Administration: Eye (NIC)	
Collaborative	
Sympathomimetids, e.g., dipivefrin (Propine), bromonidine (Alphagan), epinephrine (Epifrin), apraclonidine (Lopidine), latanoprost (Xalatan);	Adrenergic drops also decrease formation of aqueous humor and may be beneficial when patient is unresponsive to other medications. Although free of side effects such as miosis, blurred vision, and night blindness, they have potential for additive adverse cardiovascular effects in combination with other cardiovascular agents. *Note:* Light-colored eyes are more responsive to these drugs than dark-colored eyes, necessitating added considerations when determining appropriate dosage.
Hyperosmotic agents, e.g., mannitol (Osmitrol), glycerin (Ophthalgan, Osmoglyn oral); isosorbide (Ismotic).	Used to decrease circulating fluid volume, which will decrease production of aqueous humor if other treatments have not been successful.
Provide sedation, analgesics as necessary.	Acute glaucoma attack is associated with sudden pain, which can precipitate anxiety/agitation, further elevating IOP. Medical management may require 4–6 hr before IOP decreases and pain subsides.
Prepare for surgical intervention as indicated, e.g.:	
Laser therapy, e.g., argon laser trabeculoplasty (ALT) or trabeculectomy/trephination;	Filtering operations (laser surgery) are highly successful procedures for reducing IOP by creating an opening between the anterior chamber and the subjunctival spaces so that aqueous humor can bypass the trabecular mesh block. *Note:* Apraclonidine (Lopidine) eye drops may be used in conjunction with laser therapy to lessen/prevent postprocedure elevations of IOP.
Iridectomy;	Surgical removal of a portion of the iris facilitates drainage of aqueous humor through a newly created opening in the iris connecting to normal outflow channels. *Note:* Bilateral iridectomy is performed because glaucoma usually develops in the other eye.
Malento valve implant;	Experimental ocular implant device corrects or prevents scarring over/closure of drainage sac created by trabeculectomy.
Cyclocryotherapy;	Separates ciliary body from the sclera to facilitate outflow of aqueous humor.
Aqueous-venous shunt;	Used in intractable glaucoma.
Diathermy/cryosurgery.	If other treatments fail, destruction of the ciliary body reduces formation of aqueous humor.

NURSING DIAGNOSIS: Anxiety [specify level]

May be related to

Physiological factors, change in health status; presence of pain; possibility/reality of loss of vision
Unmet needs
Negative self-talk

Possibly evidence by

Apprehension, uncertainty
Expressed concern regarding changes in life events

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Anxiety Control (NOC)

Appear relaxed and report anxiety is reduced to a manageable level.
Demonstrate problem-solving skills.
Use resources effectively.

ACTIONS/INTERVENTIONS	RATIONALE
Anxiety Reduction (NIC)	
Independent	
Assess anxiety level, degree of pain experienced/suddenness of onset of symptoms, and current knowledge of condition.	These factors affect patient perception of threat to self, potentiate the cycle of anxiety, and may interfere with medical attempts to control IOP.
Provide accurate, honest information. Discuss probability that careful monitoring and treatment can prevent additional visual loss.	Reduces anxiety related to unknown/future expectations, and provides factual basis for making informed choices about treatment.
Encourage patient to acknowledge concerns and express feelings.	Provides opportunity for patient to deal with reality of situatin, clarify misconceptions, and problem-solve concerns.
Identify helpful resources/people.	Provides reassurance that patient is not alone in dealing with problem.

NURSING DIAGNOSIS: Knowledge, deficient [Learning Need] regarding condition, prognosis, treatment, self-care, and discharge needs

May be related to

Lack of exposure/unfamiliarity with resources
Lack of recall, information misinterpretation

Possibly evidenced by

Questions; statement of misconception
Inaccurate follow-through of instruction
Development of preventable complications

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Knowledge: Illness Care (NOC)

Verbalize understanding of condition, prognosis, and treatment.
Identify relationship of signs/symptoms to the disease process.
Verbalize understanding of treatment needs.
Correctly perform necessary procedures and explain reasons for the actions.

ACTIONS/INTERVENTIONS	RATIONALE
Teaching: Disease Process (NIC)	
Independent	
Review pathology/prognosis of condition and lifelong need for treatment.	Provides opportunity to clarify/dispel misconceptions and present condition and something that is manageable.
Discuss necessity of wearing identification, e.g., MedicAlert bracelet.	Vital to provide information for caregivers in case of emergency to reduce risk of receiving contraindicated drugs (e.g., atropine).
Demonstrate proper technique for administration of eye drops, gels, or discs. Have patient perform return demonstration.	Enhances effectiveness of treatment. Provides opportunity for patient to show competence and ask questions.
Review importance of maintaining drug schedule, e.g., eye drops. Discuss medications that should be avoided, e.g., mydriatric drops (atropine/propantheline bromide), overuse of topical steroids, and additive effects of[beta]-blocking when systemic [beta]-blocking agents are used.	This disease can be controlled, not cured, and maintaining a consistent medication regimen is vital to control. Some drugs cause pupil dilation, increasing IOP and potentiating additional loss of vision. *Note:* All [beta]-blocking glaucoma medications are contraindicated in patient with greater than first-degree heart block, cardiogenic shock, or overt heart failure.
Identify potential side effects/adverse reactions of treatment, e.g., decreased appetite, nausea/vomiting, diarrhea, fatigue, “drugged” feeling, decreased libido, impotence, cardiac irregularities, syncope, heart failure (HF).	Drug side/adverse effects range from uncomfortable to severe or health-threatening. Approximately 50% of patients develop sensitivity/allergy to parasympathomimetics (e.g., pilocarpine) or anticholinesterase drugs. These problems require medical evaluation and possible change in therapeutic regimen.

ACTIONS/INTERVENTIONS	RATIONALE
Teaching: Disease Process (NIC)	
Independent	
Encourage patient to make necessary changes in lifestyle.	A tranquil lifestyle decreases the emotional response to stress, preventing ocular changes that push the iris forward, which may precipitate an acute attack.
Reinforce avoidance of activities such as heavy lifting/pushing, snow shoveling, wearing tight/constricting clothing.	May increase IOP, precipitating acute attack. *Note:* If patient is not experiencing pain, cooperation with drug regimen and acceptance of lifestyle changes are often difficult to sustain.
Discuss dietary considerations, e.g., adequate fluid, bulk/fiber intake.	Measures to maintain consistency of stool to avoid constipation/straining during defecation.
Stress importance of routine checkups.	Important to monitor progression/maintenance of disease to allow for early intervention and prevent further loss of vision.
Advise patient to immediately report severe eye pain, inflammation, increased photophobia, increased lacrimation, changes in visual field/veil-like curtain, blurred vision, flashes of light/particles floating in visual field.	Prompt action may be necessary to prevent further vision loss/other complications, e.g., detached retina.
Recommend family members be examined regularly for signs of glaucoma.	Hereditary tendency to shallow anterior chambers places family members at increased risk for developing the condition. *Note:* African-Americans in every age category should have frequent examinations because of increased incidence and more aggressive course of glaucoma in these individuals.
Identify strategies/resources for socialization, e.g., support groups, Visually Impaired Society, local library, and transportation services.	Decreased visual acuity may limit patient's ability to drive/casue patient to withdraw from usual activities.

POTENTIAL CONSIDERATIONS long-term/chronic concerns.

Trauma, risk for—poor vision.
Social Interaction, impaired—limited physical mobility (poor vision), inadequate support system.
Therapeutic Regimen: ineffective management—complexity of therapeutic regimen, economic difficulties, inadequate number and type of cues to action, perceived seriousness (of condition) or benefit (versus side effects).