

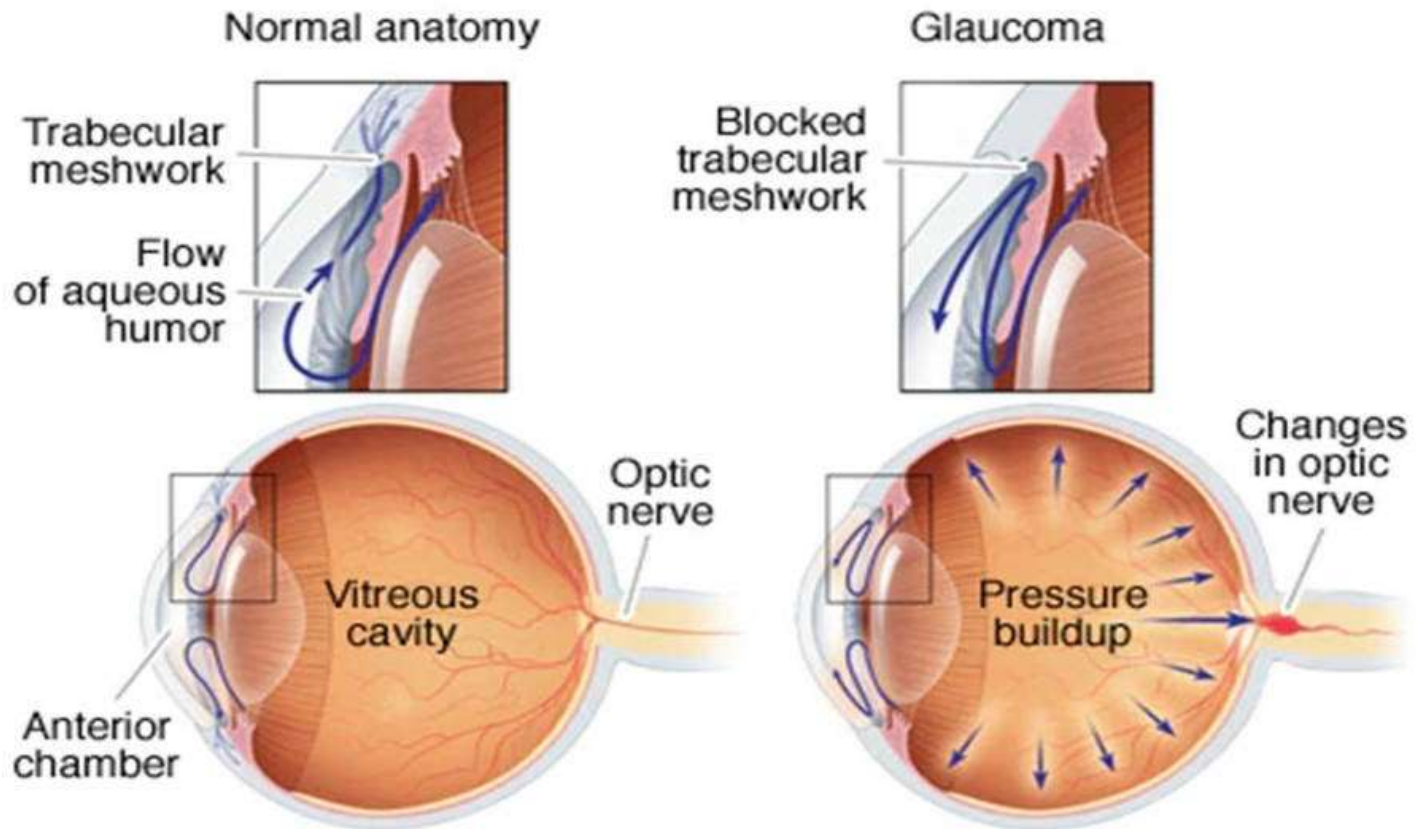


GLAUCOMA

DEFINITION

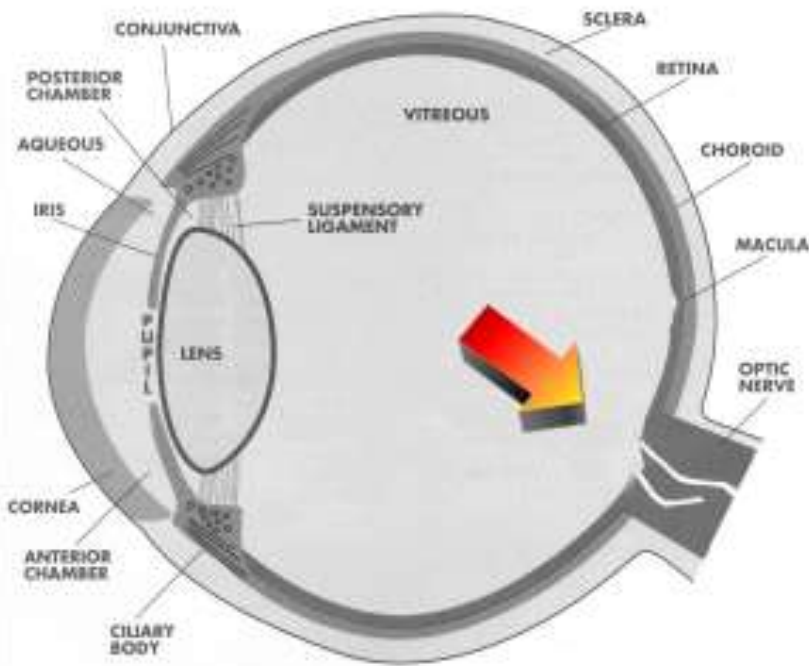
- It is a group of disorders characterized by an abnormally high intra ocular pressure (IOP), optic nerve dystrophy (weakness) and peripheral visual field loss (tunnel vision.)
- It is a symptomatic condition of the eye where the IOP is more than normal (above 25mm Hg).
- Untreated of glaucoma leads to permanent damage of the optic nerve and resultant visual field loss, which can progress to blindness.

- Glaucoma is an eye disease where the eye's optic nerve is damaged. It is one of the leading causes of blindness



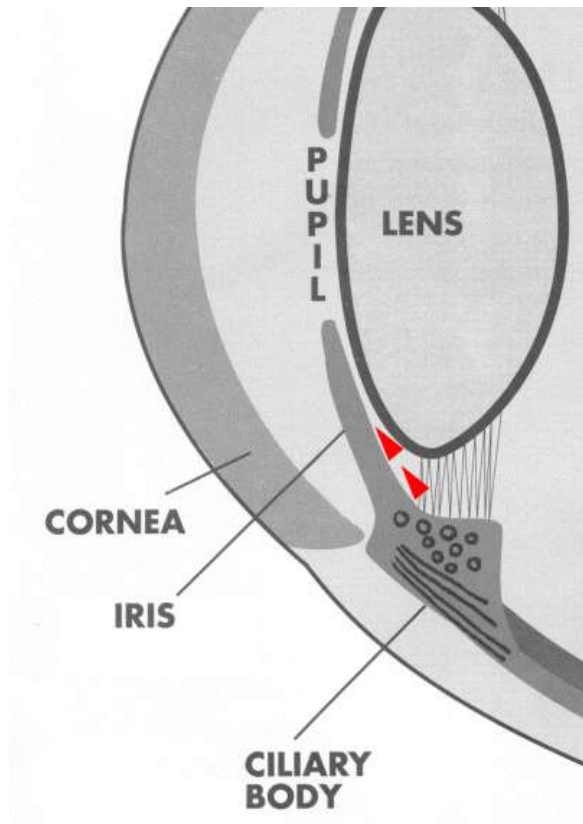
EYE ANATOMY

THE HUMAN EYE



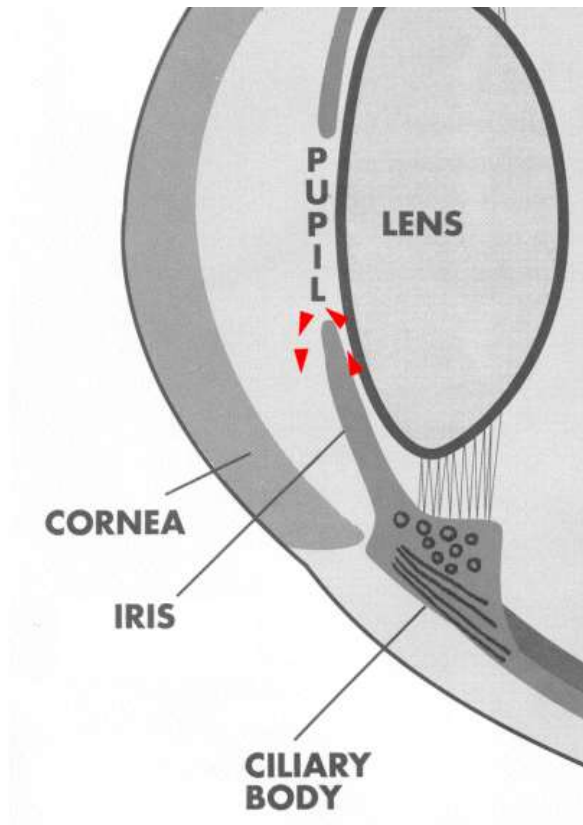
- The optic nerve is a bundle of nerve fibers
- It carries visual information from the retina to the brain

Fluid Circulation



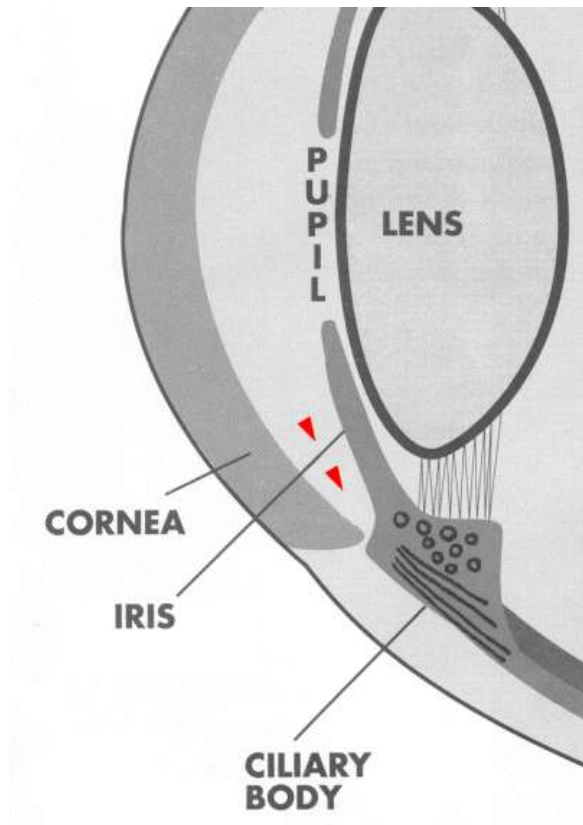
- The eye has an internal fluid circulation system
- Fluid is produced at the base of the iris

Fluid Circulation



- The fluid flows through the pupil to the front of the iris

Fluid Circulation



- The fluid exits the eye at the angle between the iris and the cornea where it drains through a spongy meshwork

CAUSES AND RISK FACTORS

- **Genetics:-** Family history of glaucoma
- Ageing
- **Ocular hypertension** is a condition where the pressure in your eyes, or IOP, is too high. Continually high pressure within the eye can eventually damage the optic nerve and lead to glaucoma or permanent vision loss.
- **Severe myopia:-** It is associated with an increased risk of pathological ocular complications and may lead to blinding disorders like glaucoma

- **Eye trauma:-** It is most commonly caused by blunt trauma, which is an injury that doesn't penetrate the eye, such as a blow to the head or an injury directly on the eye. This can lead to an increase in **eye** pressure, which can damage the optic nerve.
- **Ocular surgery:-** can cause a change in the eye's pressure. Sharp increases in eye pressure are called “pressure spikes” and sometimes occur in patients after cataract surgery. Often these pressure spikes are short-term and can be treated with medicines.

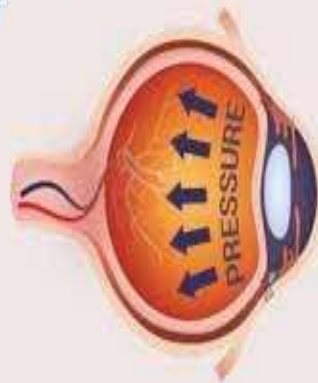
- **Migraine:-** Prolonged increased pressure can lead to visual loss if not corrected.
- **Black ethnicity:-** African Americans are also more likely to develop glaucoma at a younger age and suffer blindness from the disease. The genetic causes underlying glaucoma remain unclear, but these ethnic disparities in the risk of developing glaucoma suggest a genetic basis that is ethnicity-specific

- **Prolonged use of local or systemic corticosteroids:-** Long-term use of topical and systemic steroids produces secondary open-angle glaucoma similar to chronic simple glaucoma. The increased intraocular pressure [IOP] caused by prolonged steroid therapy is reversible but the damage produced by it is irreversible. (edema glucocorticoid receptors on trabecular meshwork cells.)

DIABETES AND GLAUCOMA

Diabetes can lead to blood vessel development in the drainage angle of the eye.

This can raise eye pressure and cause glaucoma.



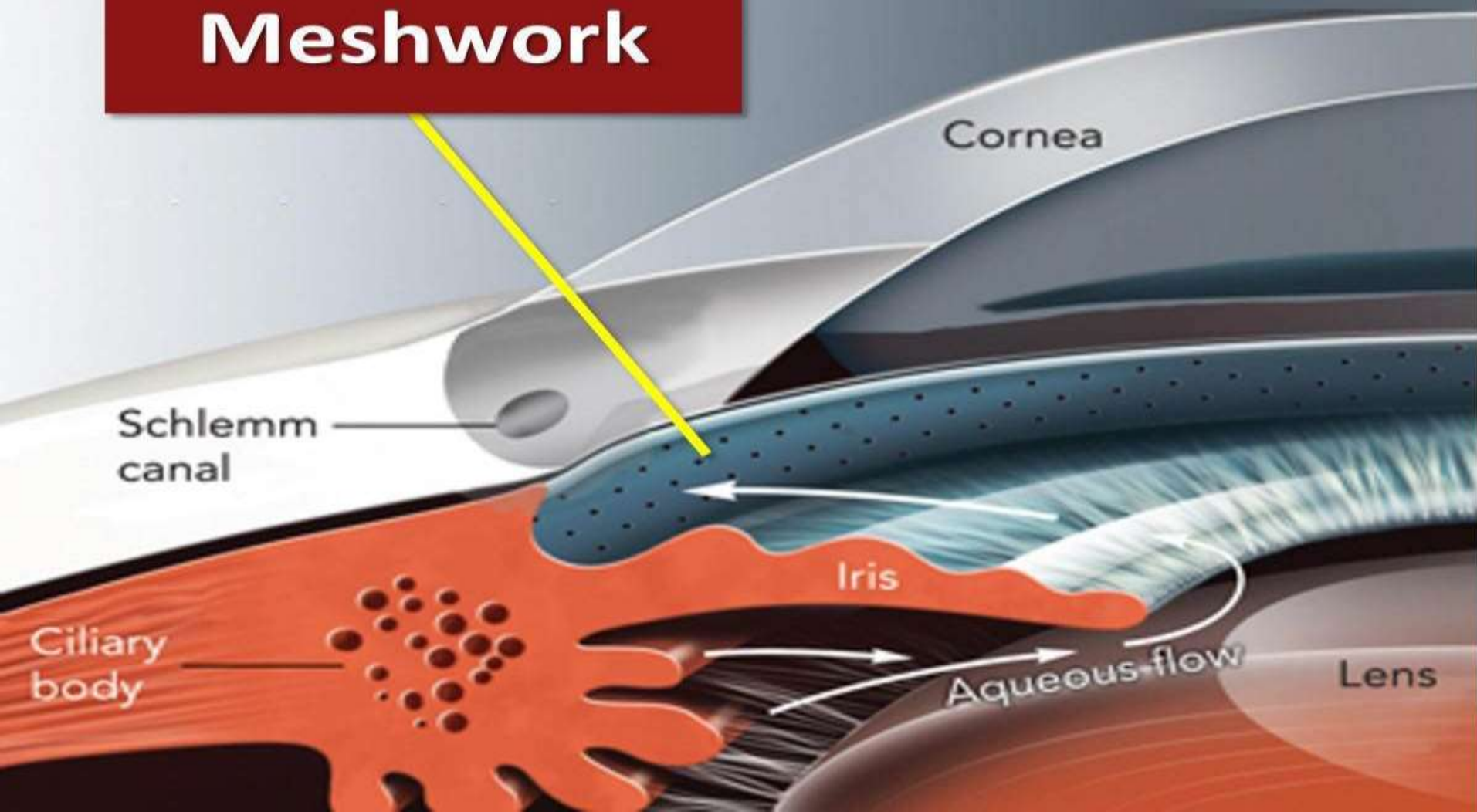
The optic nerve gets damaged and peripheral vision is lost.

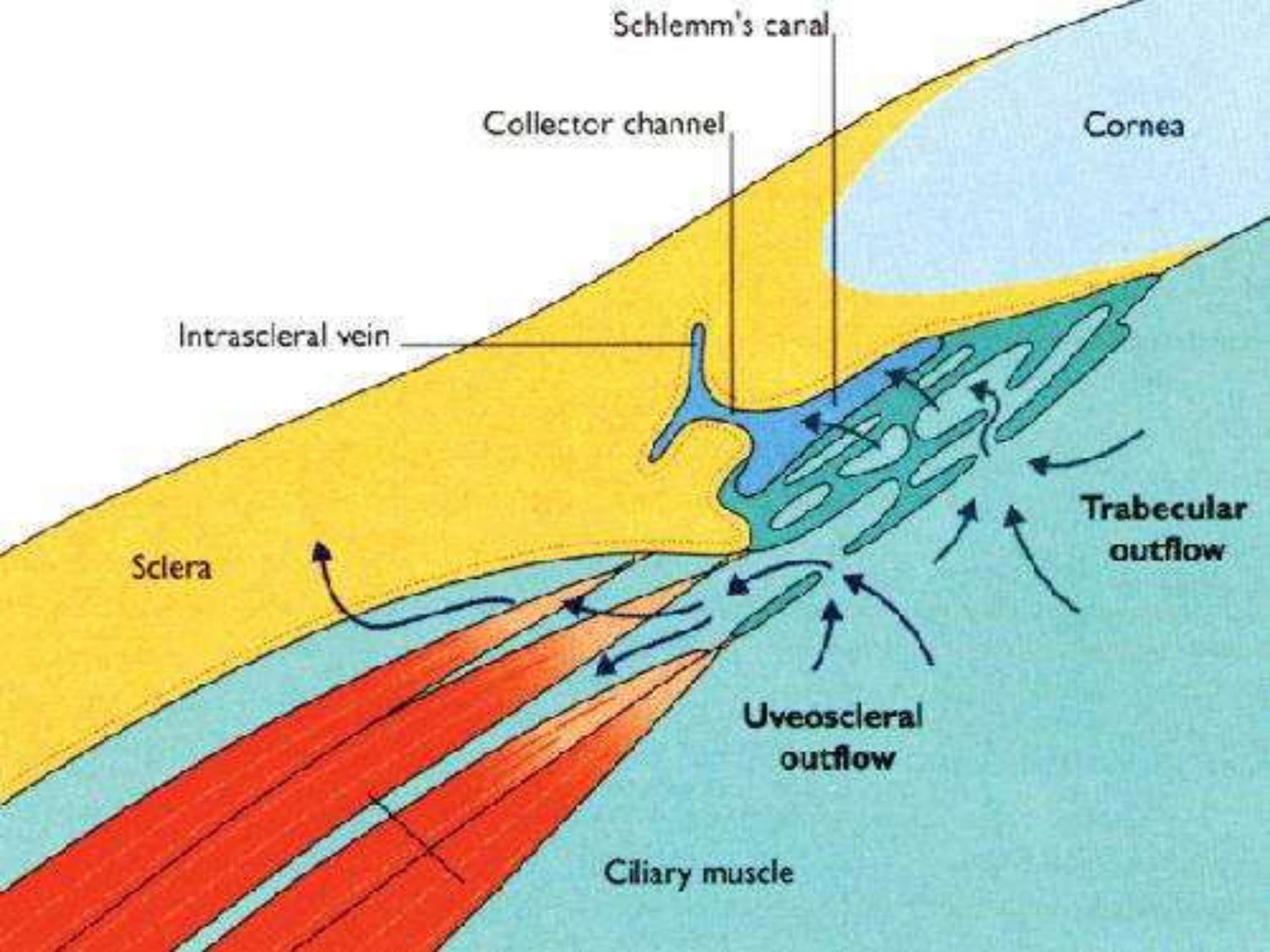


PATHOPHYSIOLOGY

- IOP is a function of production of liquid aqueous humor by the ciliary processes of the eye and its drainage through the trabecular meshwork.
- Aqueous humor is produced by the ciliary body and flow into the posterior chamber behind the iris.
- The trabecular meshwork filters the aqueous humor into Schlemm's canal. Where is picked up by the episcleral vessels and mixed with blood.

Trabecular Meshwork





CLASSIFICATIONS

1. CONGENITAL GLAUCOMA

2. ACQUIRED GLAUCOMA

- **PRIMARY GLAUCOMA**
- **SECONDARY GLAUCOMA**

1. CONGENITAL GLAUCOMA

- It is rare disease, occurs when a congenital defect in the angle of the anterior chamber obstructs the out flow of aqueous humor. If untreated, causes damage to the optic nerve and blindness. In most cases, surgery is required.

TRUE CONGENITAL GLAUCOMA

2. INFANTILE GLAUCOMA

3. JUVENILE GLAUCOMA

A.TRUE CONGENITAL GLAUCOMA

- It is labeled when IOP is raised during intrauterine life and child is born with ocular enlargement. It occurrence is about 40% of cases.

B. INFANTILE GLAUCOMA:-

- It is labeled when the disease manifests prior to the child's third birthday. It occurs in about 50% of cases.

C. JUVENILE GLAUCOMA

- It is labeled in the rest 10% of cases who develop pressure rise between 3-6 years of life.

2. ACQUIRED GLAUCOMA

A. PRIMARY GLAUCOMA

- 1. PRIMARY OPEN ANGLE GLAUCOMA
- 2. PRIMARY ANGLE CLOSURE GLAUCOMA

B. SECONDARY GLAUCOMA

A. PRIMARY GLAUCOMA

1. PRIMARY OPEN ANGLE GLAUCOMA

- POAG is the most common form of glaucoma
- It occurs when the fluid drainage is poor and fluid builds up in the eye and the internal eye pressure goes up
- This increased pressure can cause damage to the optic nerve and vision loss
- The exact mechanism of damage is still unknown

Symptoms of Primary Open Angle Glaucoma

- POAG develops gradually and painlessly and has no initial symptoms



Vision is normal in the early stages

Symptoms of Primary Open Angle Glaucoma

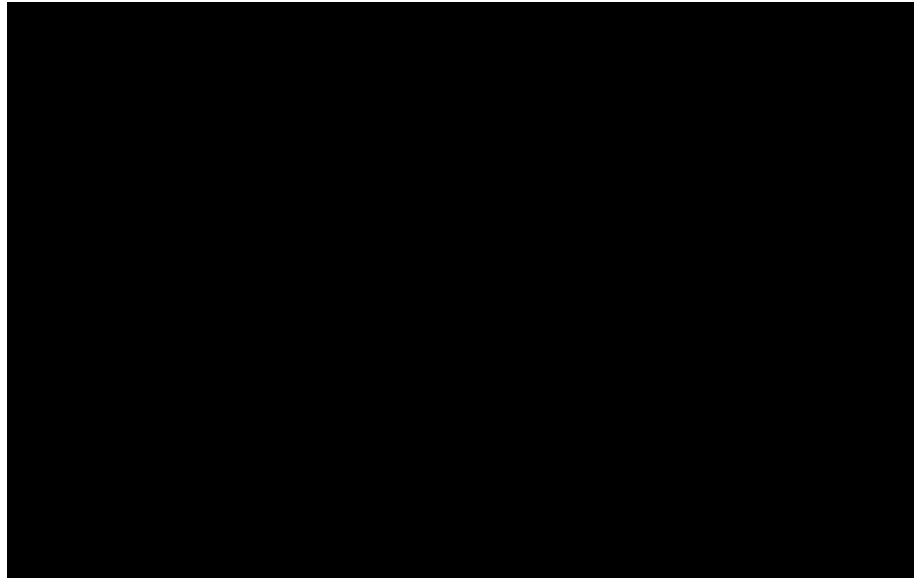
- If untreated, peripheral or side vision is slowly lost



Tunnel vision:-
Defective sight in
which objects cannot
be properly seen if
not close to the
centre of the field of
view.

Symptoms of Primary Open Angle Glaucoma

- Eventually, all vision may be lost



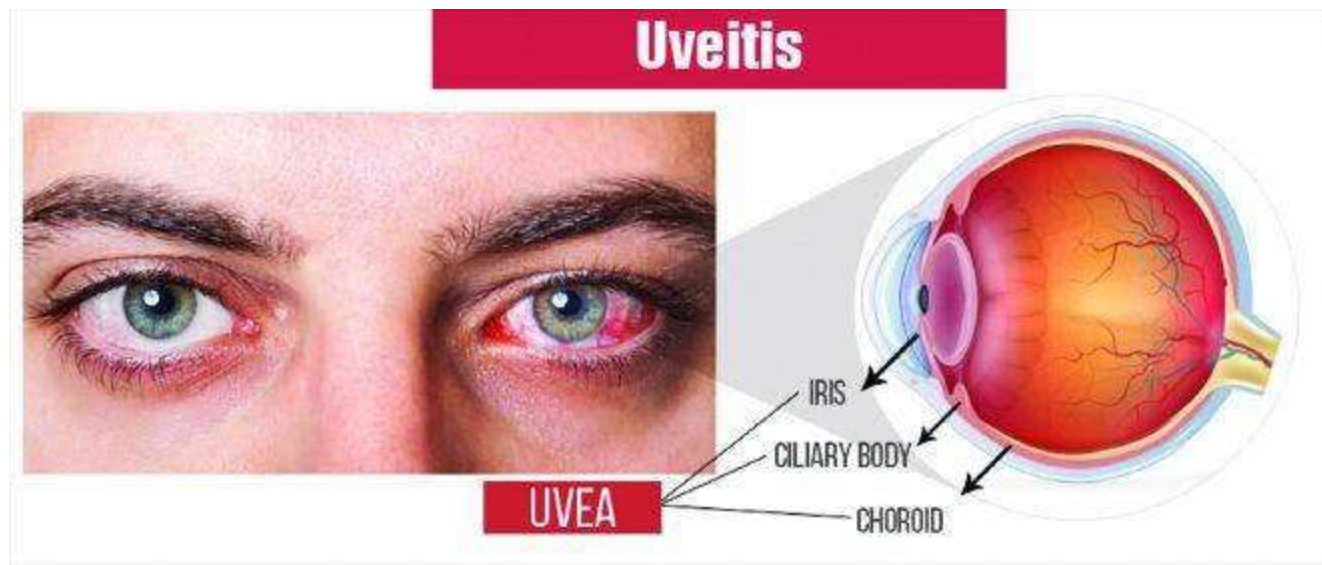
B. SECONDARY GLAUCOMA

2. PRIMARY ANGLE CLOSURE GLAUCOMA

- This type of glaucoma is an emergency situation
- It occurs when the iris itself blocks the drainage angle and results in a sudden increase in pressure
- Symptoms include severe eye pain, nausea, eye redness and very blurred vision
- Immediate treatment is required

B. SECONDARY GLAUCOMA

- Glaucoma can develop as a complication from other conditions including:
 - Eye injuries
 - Diabetes
 - Steroid use



3. Low Tension Glaucoma

- Low Tension (or Normal Tension) Glaucoma is not as common
- In these cases, the eye pressure is in the normal range but the optic nerve still gets damaged
- The exact mechanism of damage is still unknown

DIAGNOSTIC EVALUATION

- Regular eye examinations by an optometrist or ophthalmologist are vital to detecting glaucoma
- A number of tests are performed
- A patient's medical history, family history and background are important to determine the presence of risk factors

Glaucoma Tests:

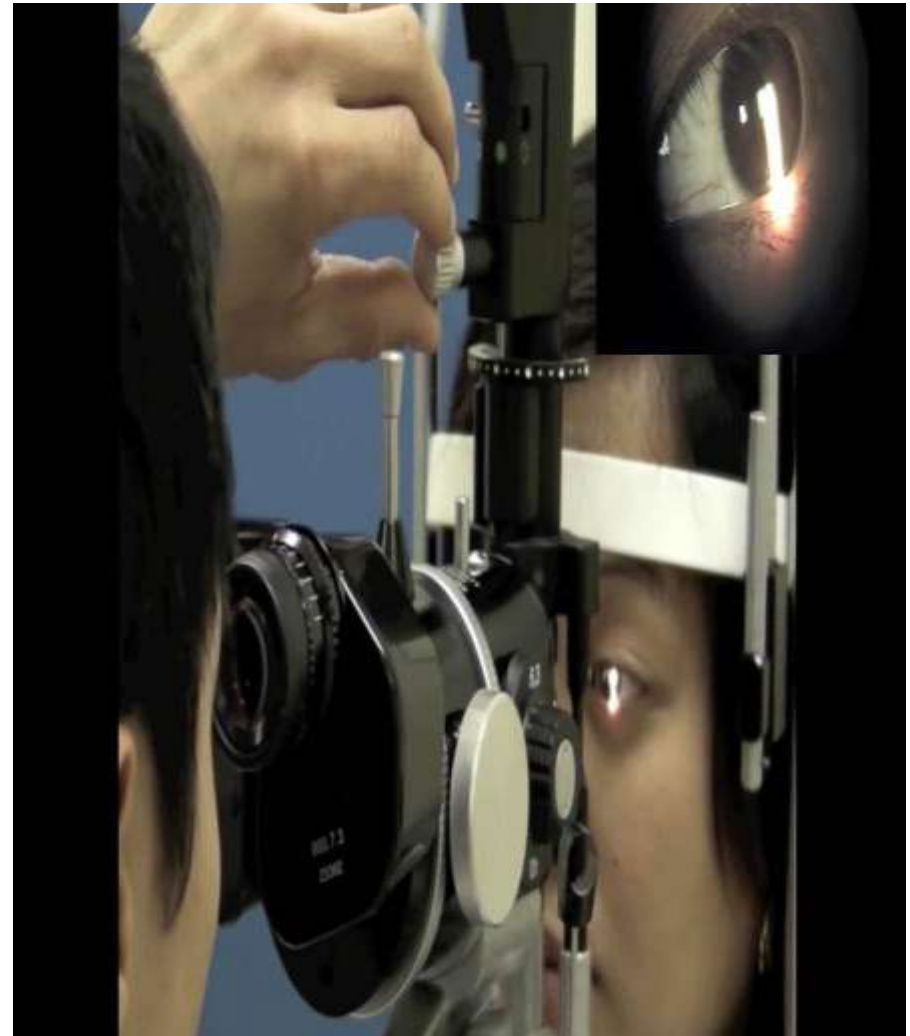
Slit Lamp & Gonioscopy

- A special microscope called a slit lamp is used to examine the structures of the eye
- A gonioscopy lens may be used to view the drainage angle



SLIT- LAMP EXAM

- Once patient in the examination chair, the doctor will place an instrument in front of patient on which to rest chin and forehead.
- This helps steady head for the exam. Doctor may put drops in eyes to make any abnormalities on the surface of cornea more visible.
- The drops contain a yellow dye called fluorescein, which will wash away the tears. Additional drops may also be put in eyes to allow pupils to dilate, or get bigger.

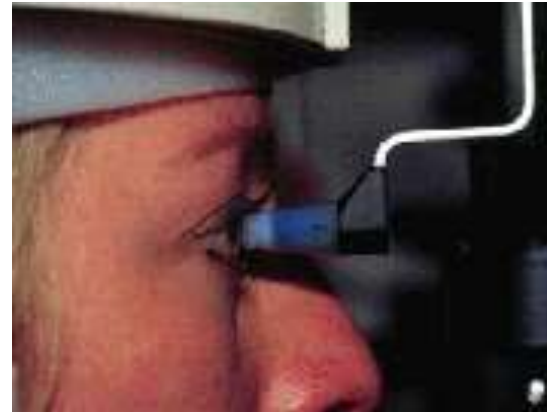


- The doctor will use a low-powered microscope, along with a slit lamp, which is a high-intensity light. They will look closely at eyes. The slit lamp has different filters to get different views of the eyes. Some doctor's offices may have devices that capture digital images to track changes in the eyes over time.
- During the test, the doctor will examine all areas of your eye, including the:- eyelids, conjunctiva, iris, lens, sclera, cornea, retina and optic nerve.

Glaucoma Tests:

Tonometry

- Eye pressure is measured with an instrument called a tonometer



TONOMETRY

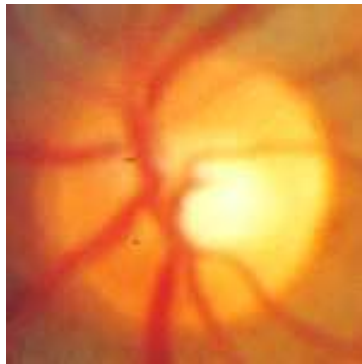
- Tonometry is the procedure eye care professionals perform to determine the intraocular pressure, the fluid pressure inside the eye. It is an important test in the evaluation of patients at risk from glaucoma.
- (normal pressure range is 12 to 22 mm Hg)

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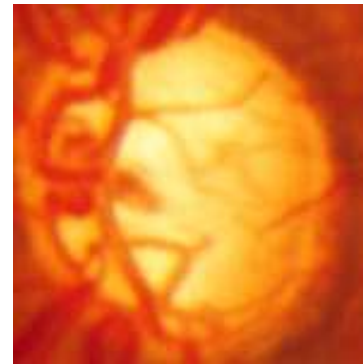


Glaucoma Tests: Ophthalmoscopy

- Eye drops may be placed in the eyes to dilate the pupils
- Special magnifying lenses are used to examine the retina and optic nerve for damage



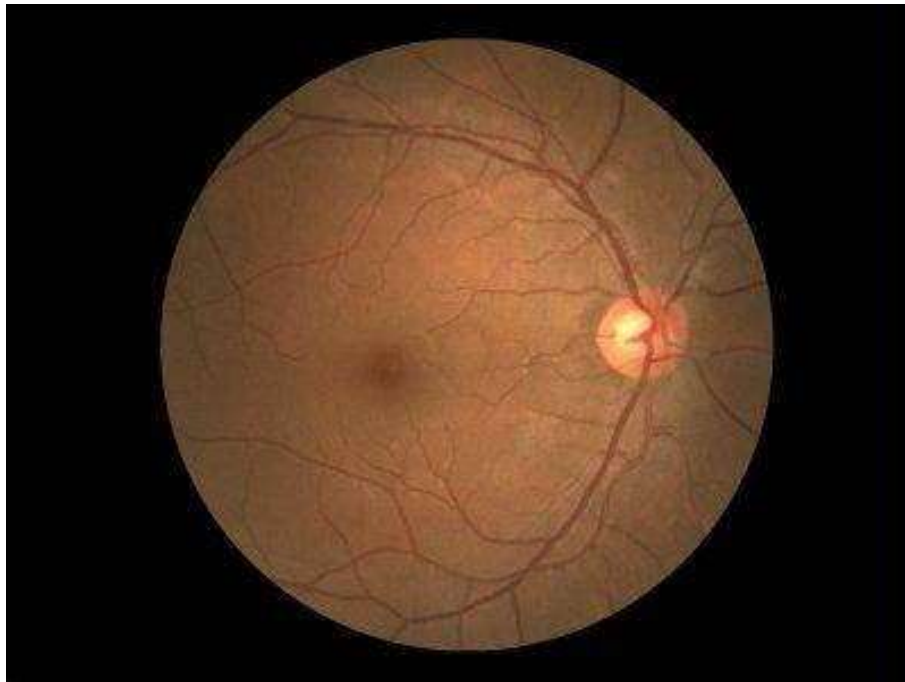
Normal Optic Nerve



Suspicious Optic Nerve

Glaucoma Tests: Ophthalmoscopy

- Advances are being made in digital imaging of the retina



COLOR FUNDUS PHOTOGRAPHY

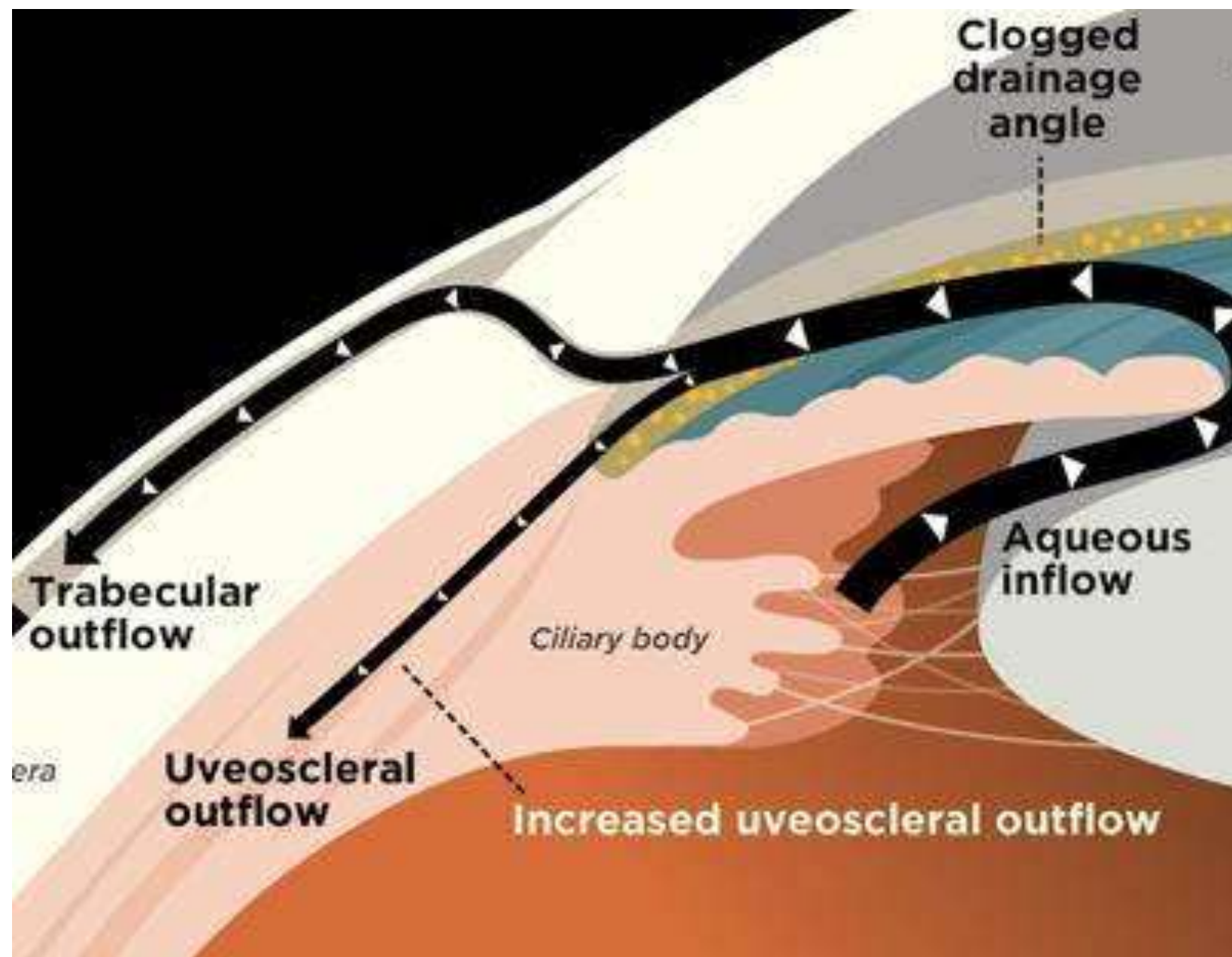
- Fundus camera to record color images of the condition of the interior surface of the eye, in order to document the presence of disorders and monitor their change over time.
- A fundus camera or retinal camera is a specialized low power microscope with an attached camera designed to photograph the interior surface of the eye, including the retina, retinal vasculature, optic disc, macula, and posterior pole (i.e. the fundus).

MANAGEMENT

MEDICAL MANAGEMENT:-

- **BETA ADRENERGIC BLOCKERS:-** Timolol, betaxolol are used to decreased aqueous humor production.
- **CHOLINERGIC (MIOTICS):-** Pilocarpine, carbacol are used to reduce IOP by facilitating the outflow of aqueous humor

- **CARBONIC ANHYDRASE INHIBITORS:-**
Dorzolamide, methazolamide or acetazolamide to decrease the formation and secretion of aqueous humor.
- **PROSTAGLANDIN ANALOGS:-** Latanoprost to reduce IOP by increasing uveoscleral outflow.

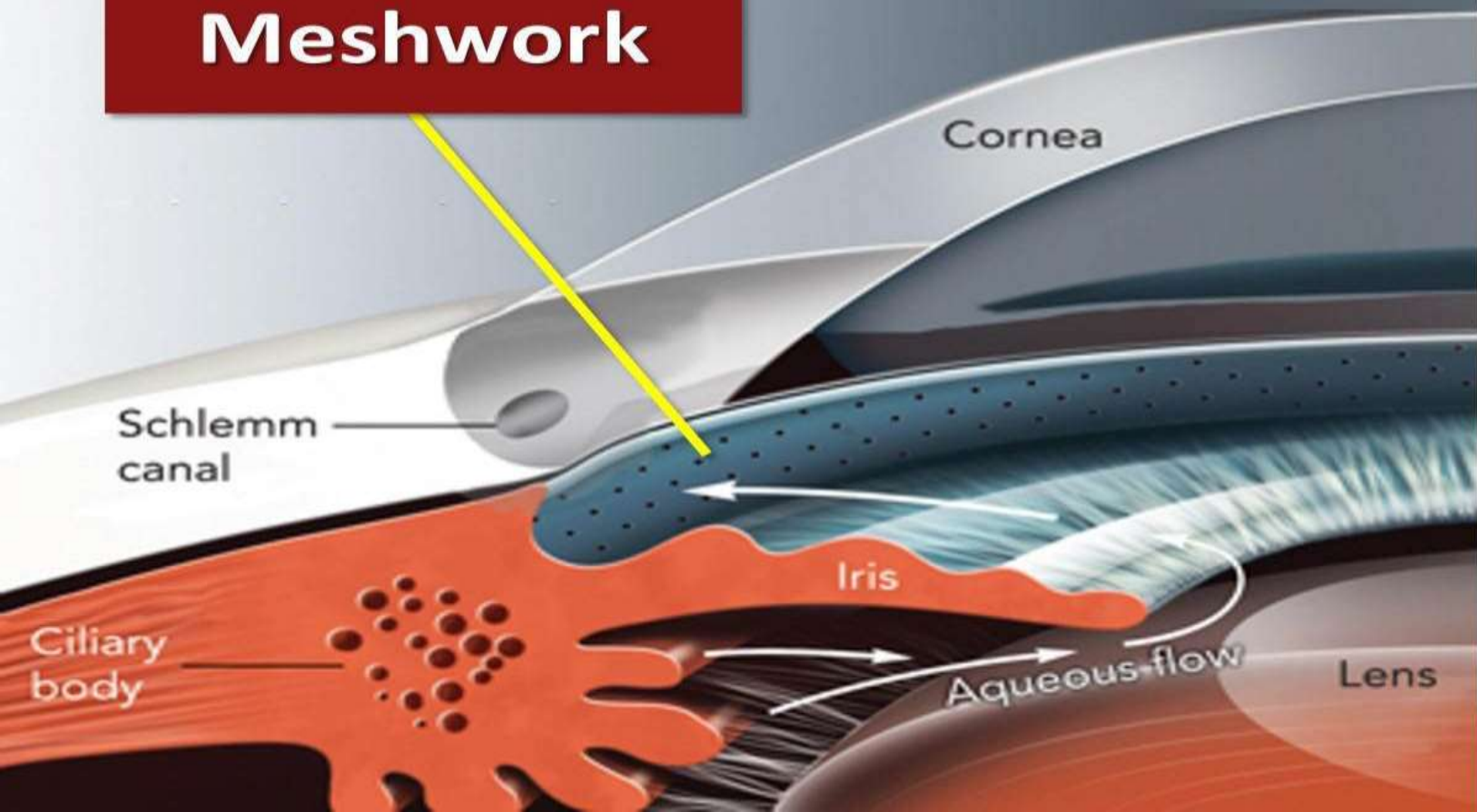


SURGICAL MANAGEMENT

ARGON LASER TRABECULOPLASTY:-

- It may be used to treat open angle glaucoma. In this, thermal argon laser burns are applied to the inner surface of the trabecular meshwork to open the intra trabecular spaces and widen the canal of Schlemm, thereby increasing the outflow of aqueous humor and decreasing IOP.

Trabecular Meshwork



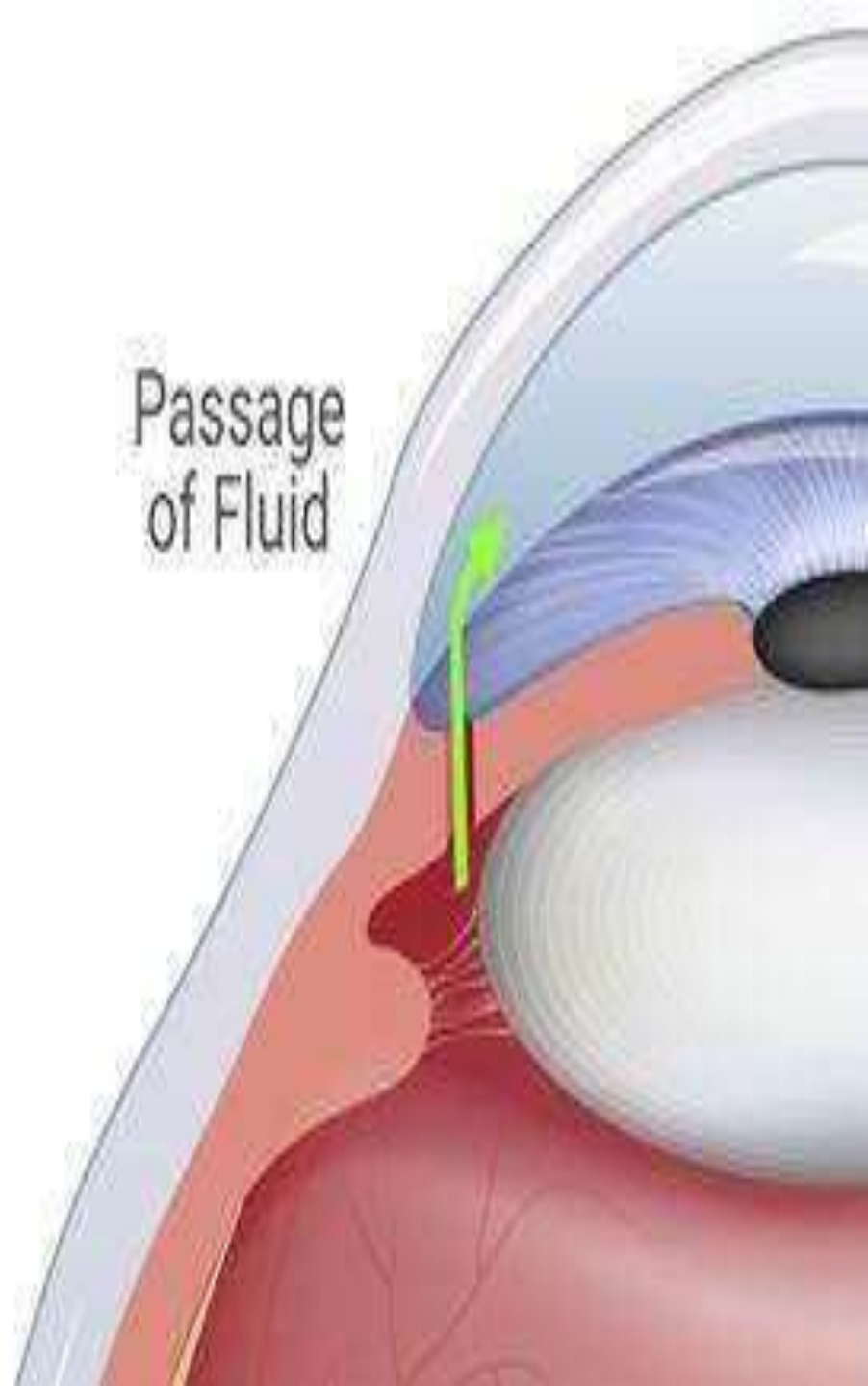
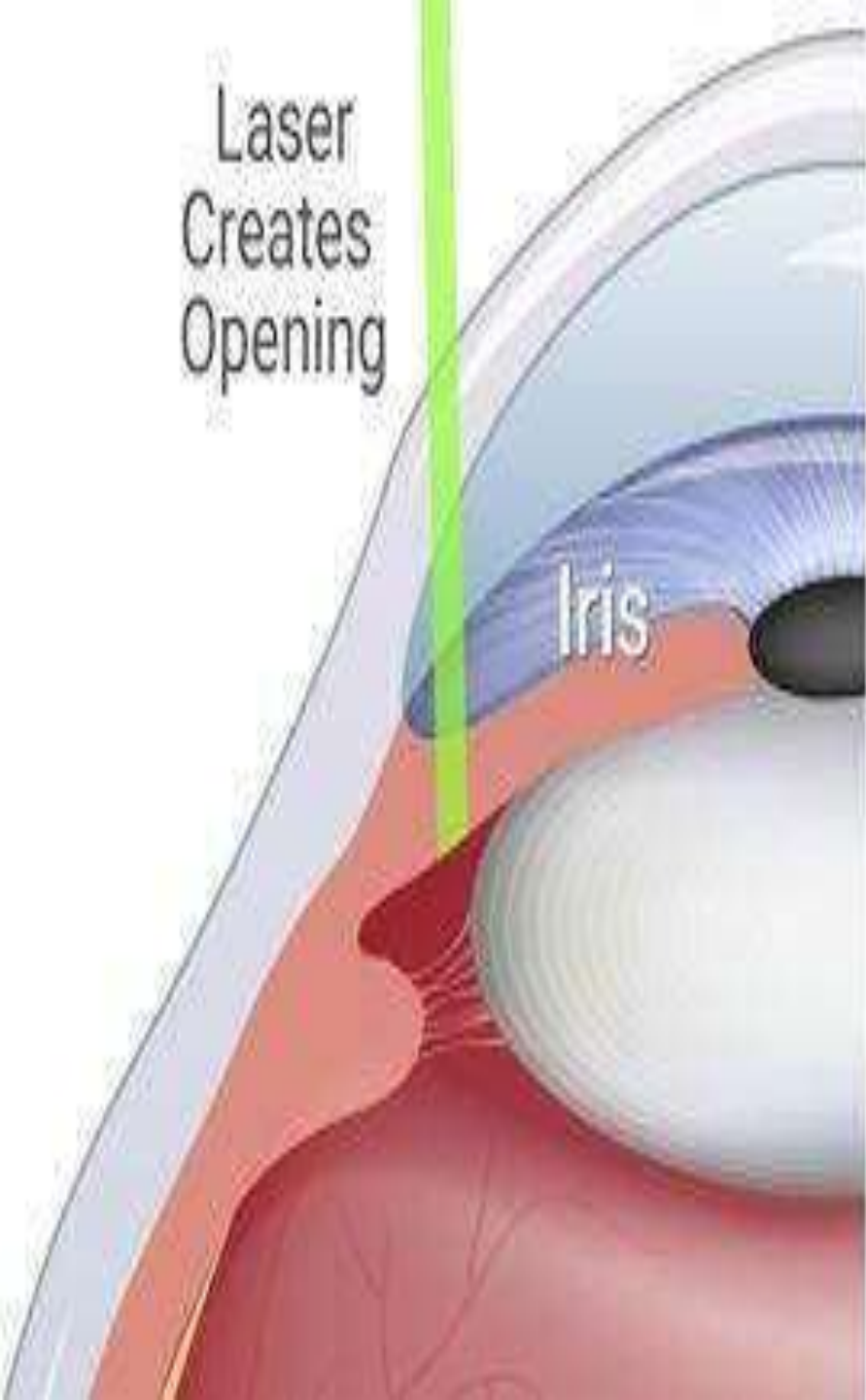
LASER IRIDOTOMY:-

- An opening is made by the laser beam in the iris to eliminate the pupillary block. It relieves pressure and preserves vision by promoting outflow of the aqueous humor.

Laser
Creates
Opening

Iris

Passage
of Fluid



CYCLOCRYOTHERAPY:-

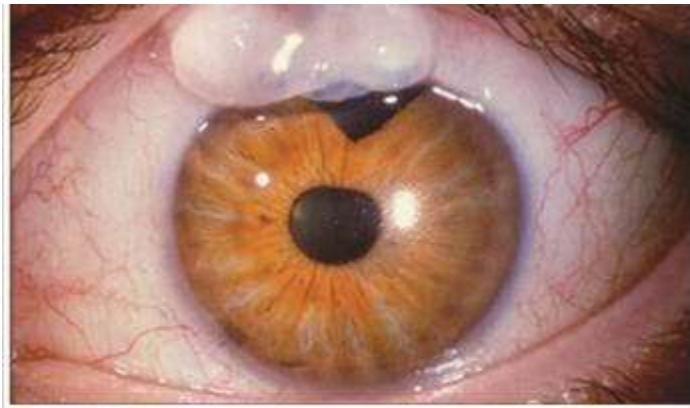
- Application of a freezing probe to the sclera over the Ciliary body that destroy some of the Ciliary processes, results in the reduction of the amount of aqueous humor produced.

CYCLODIALYSIS:-

- Through a small incision in the sclera, a spatula type instrument is passed into the anterior chamber, creating an opening in the angle.

- **FILTERING PROCEDURES:-** for chronic glaucoma filtering procedure are used to create an opening or fistula in the trabecular meshwork to drain aqueous humor.

- **TRABECULOTOMY:-** A partial thickness incision is made in the sclera and further section of sclera is removed to produce an opening for aqueous humor outflow under the conjunctiva, creating a filtering bleb.



Bleb

- **SCLERECTOMY:-** A partial thickness incision is made in the sclera and one or more openings are made with a punch. The top flap of sclera is closed over the punched holes.



NURSING MANAGEMENT

ASSESSMENT:-

- History or presence of risk factor:- positive family history, tumour of eye, haemorrhage, uveitis, trauma etc.
- Physical examination based on those in general assessment of the eye may indicate:- blurred vision, decreased light perception redness cloudy appearance etc.

DIAGNOSIS:-

- Acute pain related to increased IOP and surgical complications as evidenced by patient verbalization or facial expression of the patient

GOAL:- The pain of patient will be reduced.

INTERVENTIONS:-

- Monitor vital signs of the patient
- Monitor the degree of eye pain every 30 min during the acute phase.
- Monitor visual acuity at any time before instilling ophthalmic agent for glaucoma.
- Maintain the bed rest in semi- fowler position
- Give analgesic prescription and evaluation of its effectiveness.