

CATARACT

Fadi J. Zaben RN MSN

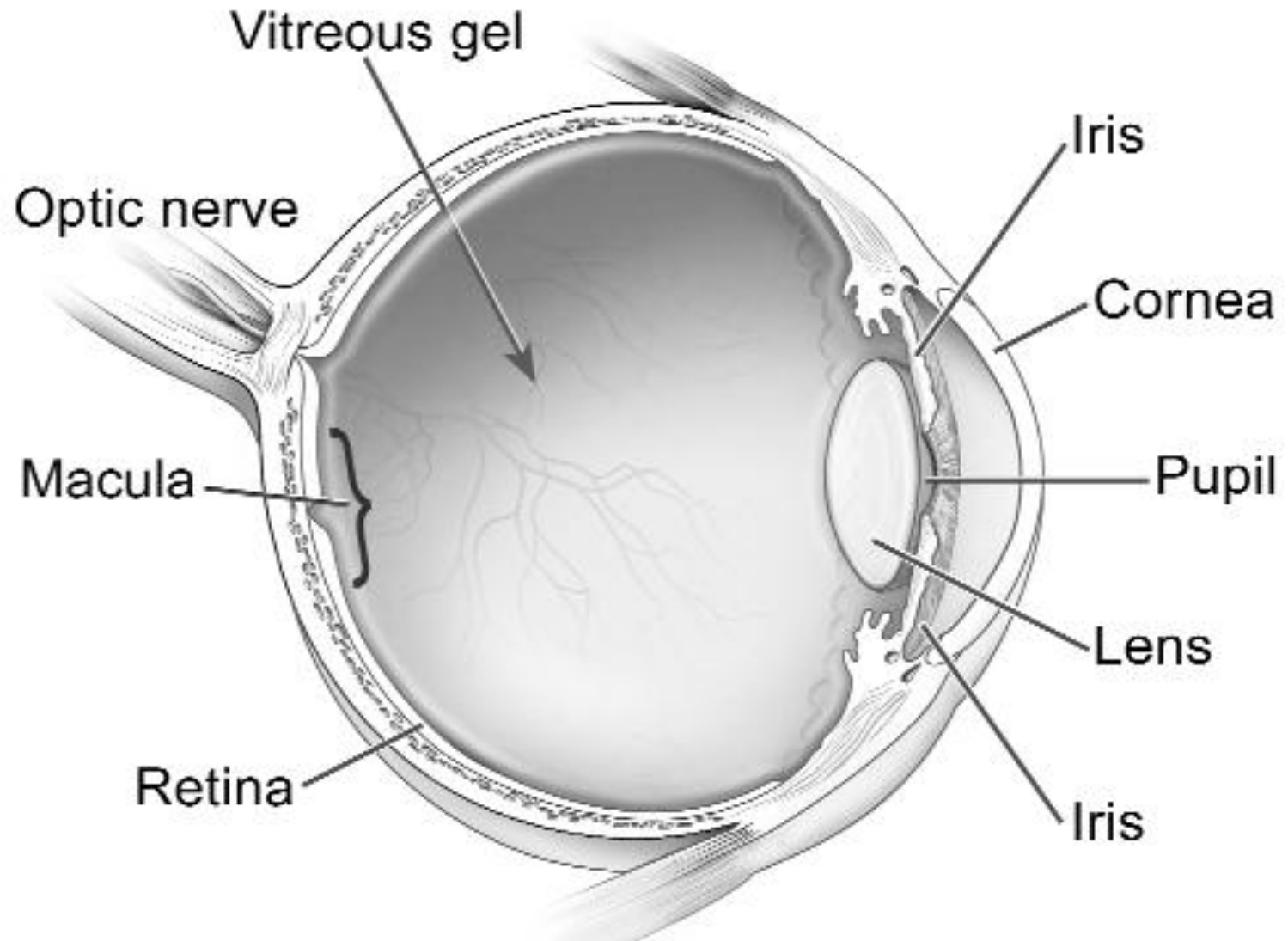
IMET2000, Ramallah

April, 2013

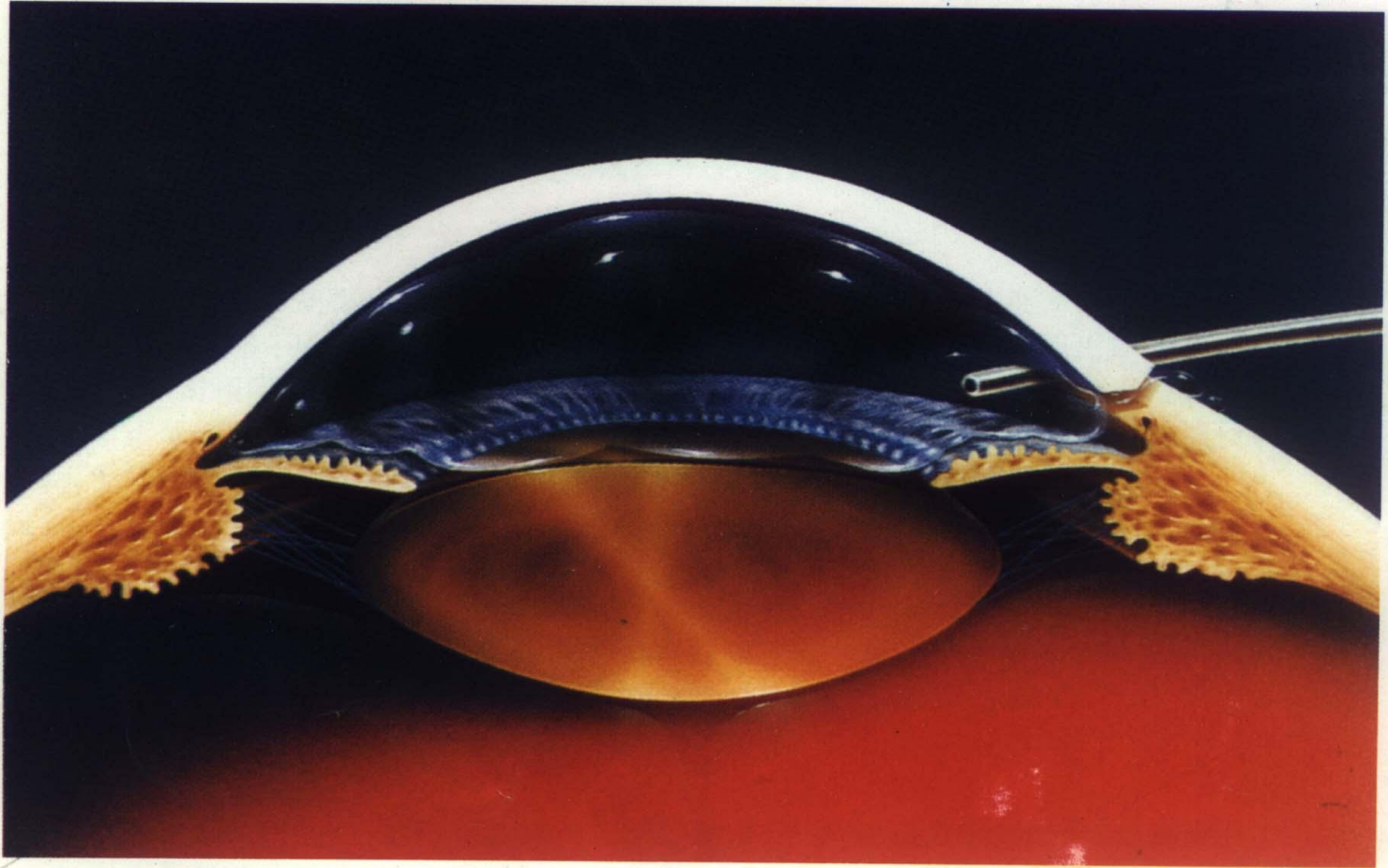
OUTLINE:

- Anatomy.
- Definition.
- Epidemiology.
- Types.
- Causes.
- Risk Factors.
- Clinical Manifestations.
- Diagnostic Evaluation.
- Management.
- Prognosis and Complications.
- Nursing Care Plan

Lens:



Lens:



Anatomy of Lens:

■ **Shape:**

- A biconvex lens and capable of changing shape.
- Colorless.
- Transparent.
- Avascular.

■ **Size:**

4mm thick and 9mm in diameter.

■ **Position:**

- Behind the iris and the pupil.
- In front of the vitreous.
- Suspended by suspensory ligament.

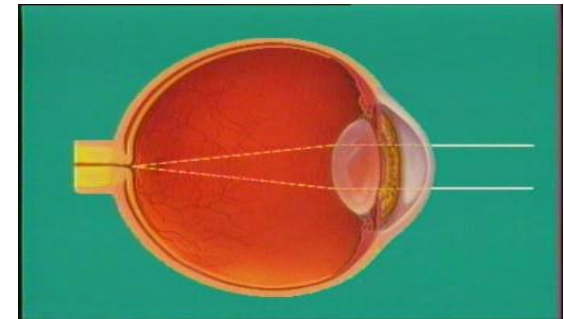
Continue..... Anatomy of Lens

■ **Composition:**

- water -64% The water content of the lens decreases with age.
- protein -35% the highest protein content in any body tissue:
 - soluble protein
 - insoluble protein:With age, the percent of it increases
- 1%- A trace of minerals are present (Potassium, Ascorbic acid and Glutathione).

■ **Function:**

- One of important refractive medias.
- Focus light rays upon the retina.
- Filter a part of ultraviolet rays ,it is beneficial to the retina.



Myths about cataracts:

Many mistaken ideas exist about cataracts In truth:

- ❑ A cataract does not spread from eye to eye, though cataracts may develop in both eyes at the same time.
- ❑ A cataract is not related to cancer.
- ❑ A cataract is not removed by laser.
- ❑ A cataract is not visible on the outside of the eye.
- ❑ A cataract is not caused by overusing the eyes and is not made worse by using the eyes.
- ❑ A cataract usually develops gradually over many years, rarely over a few months.

Definition:

- Cataract is a clouding or opacity of the crystalline lens that impairs vision.
- It is a common ocular disease and one of the main causes of blindness.
- Cataracts begin when proteins in the eye form clumps that prevent the lens from sending clear images to the retina.
- A cataract can occur in either or both eyes. It cannot spread from one eye to the other.

Epidemiology:

- Cataract is estimated that 30 to 45 million people in the world are blind, with cataract accounting for as much as 45% of this blindness.
- The prevalence of cataract varies widely with striking regional differences. It is more common in areas where people eyes expose to sunlight greatly.
- The prevalence rises with age and is higher in females.

Types of Cataracts:

1. Age-related cataracts (commonly):

Divided into three types, depending on their location:

- A. Nuclear cataracts form in the middle of the lens and cause the nucleus, in the center, to become yellow or brown.
- B. Cortical cataracts are wedge-shaped and form around the edges of the nucleus.
- C. Posterior capsular cataracts form faster than the other two types and affect the back of the lens.



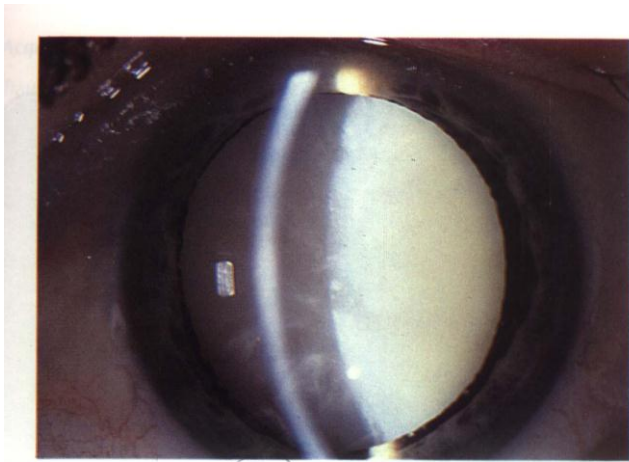


FIG 9 - Mature cataract.

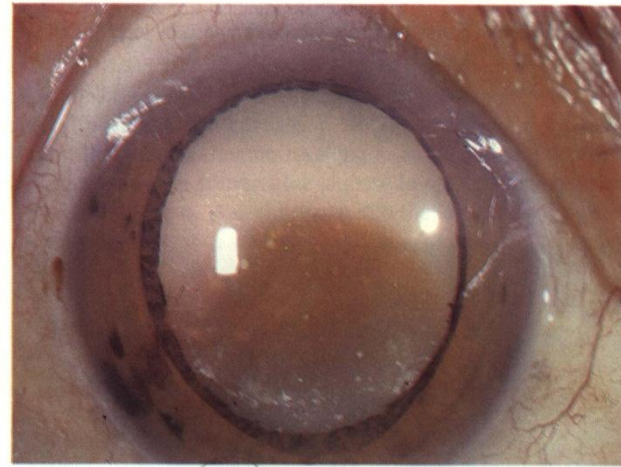
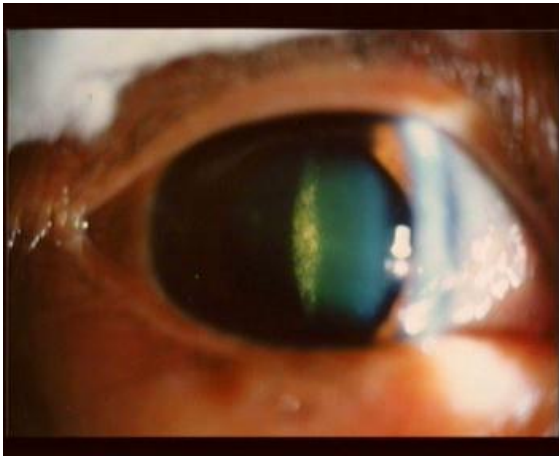
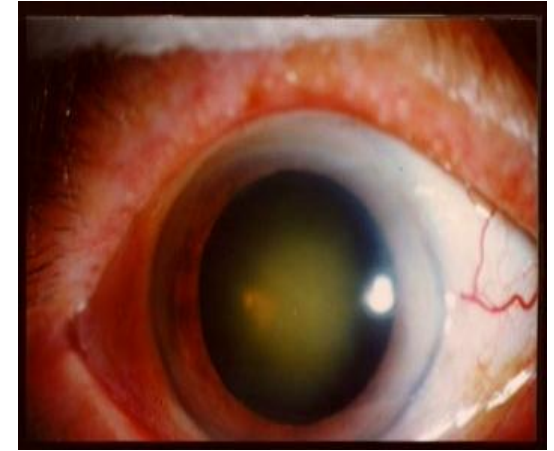
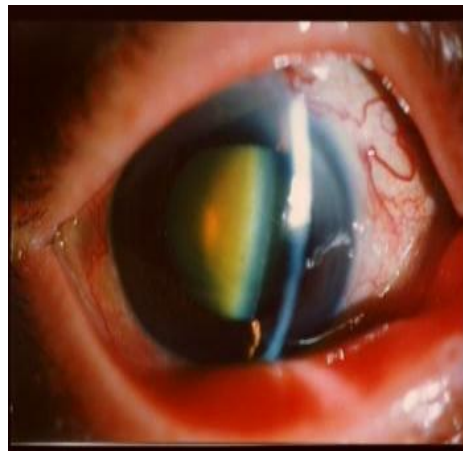


FIG 10 - Morgagnian cataract.

Cortical Cataract



Posterior Subcapsular Cataract

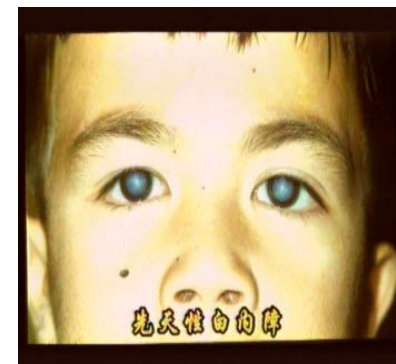


Nuclear Cataract

Continue.....

2. Congenital cataracts:

- A. They are present at birth or form during the first year.
- A. less common than age-related cataracts.
- B. They occur in roughly one in every 10,000 infants.
- C. This type of cataract does not always have symptoms .
- D. It can be removed if it interferes with the baby's vision.
- E. These cataracts can develop if the mother has an infection or uses drugs or alcohol while pregnant.

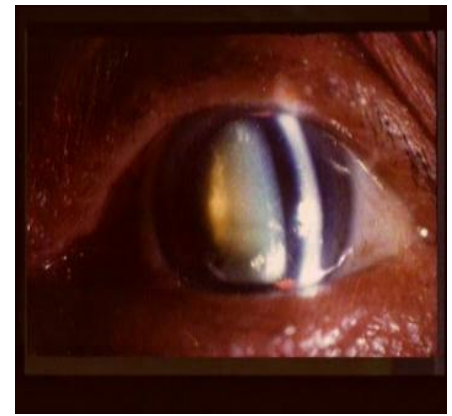


Continue.....

3. Secondary cataracts:

They are caused by:

- A. Disease: glaucoma and diabetes.
- B. Medications: steroid prednisone and other medications.



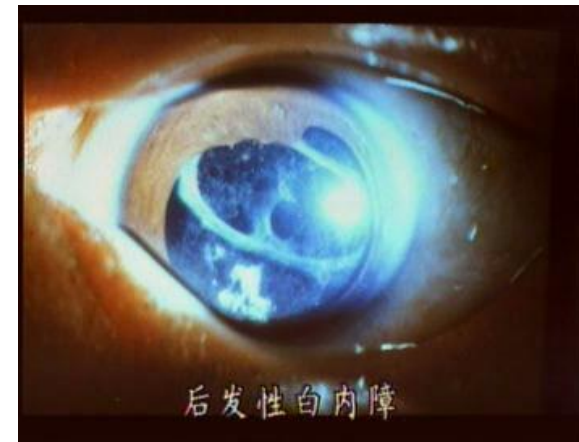
4. Traumatic cataract:

It develops after an injury to the eye, although it can take several years for this to happen.



5. Radiation cataract:

It can form after a patient undergoes radiation treatment for cancer.



Causes:

There are several underlying causes:

- ✓ Overproduction of oxygen-free radicals, or oxidants (an oxygen free radical is an oxygen molecule that has been chemically altered due to normal daily life).
- ✓ Smoking.
- ✓ Ultraviolet radiation.
- ✓ Long-term use of steroids and other medications.
- ✓ Certain diseases, such as diabetes.
- ✓ Trauma.
- ✓ Radiation therapy.

Risk Factors:

- ❖ Aging.
- ❖ Heavy drinking.
- ❖ Smoking.
- ❖ Obesity.
- ❖ High blood pressure.
- ❖ Previous eye injuries.
- ❖ Family history.
- ❖ Too much sun exposure.
- ❖ People with diabetes and those who have been exposed to radiation from X-rays and cancer treatments are also at higher risk.

Clinical Manifestations:



- ◆ Blurred or distorted vision (Cloudy).
- ◆ Glare from bright lights.
- ◆ Seeing colors as faded.
- ◆ Halos surrounding lights.
- ◆ Gradual and painless loss of vision.
- ◆ Previously dark pupil may appear milky or white.

Cloudy vision



Diagnostic Evaluation:

- 1) **Slit-lamp examination:** to provide magnification and visualize opacity of lens.
- 2) **Tonometry:** to determine IOP and rule out other conditions.
- 3) **Direct and indirect ophthalmoscopy:** to rule out retinal disease.
- 4) **Visual acuity test:** This eye chart test measures how well you see at various distances.

Management:

- 1. Surgical Procedures.**
- 2. Intraocular Lens Implantation.**
- 3. Contact Lens.**

General:

- Surgical removal of the lens is indicated.
 - A. A patient with one cataract can usually manage without surgery.
 - B. If cataract occurs in both eyes, surgery is recommended when vision in the better eye causes problems in daily activities. Surgery is done on only one eye at a time.
- Cataract surgery is usually done under local anesthesia.

Continue.....

- Preoperative eye drops produce decreased response to pain and lessened motor activity (neuroleptanalgesia). Oral medications may be given to reduce IOP.
- IOL implants are usually implanted at the time of cataract extraction, replacing thick glasses that may provide suboptimal refraction.
- If intraocular lens implant is not used, the patient will be fitted with appropriate eyeglasses or a contact lens to correct refraction after the healing process.

Cataract surgery



Surgical Procedures:

Two types of extractions:

- 1. Intracapsular extraction:** the lens as well as the capsule are removed through a small incision.
- 2. Extracapsular extraction:** the lens capsule is incised, and the nucleus, cortex, and anterior capsule are extracted.

Procedures for Extraction:

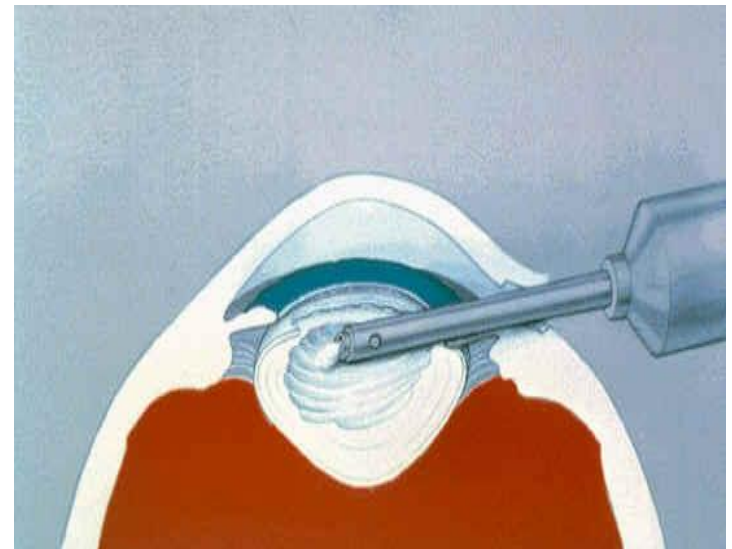
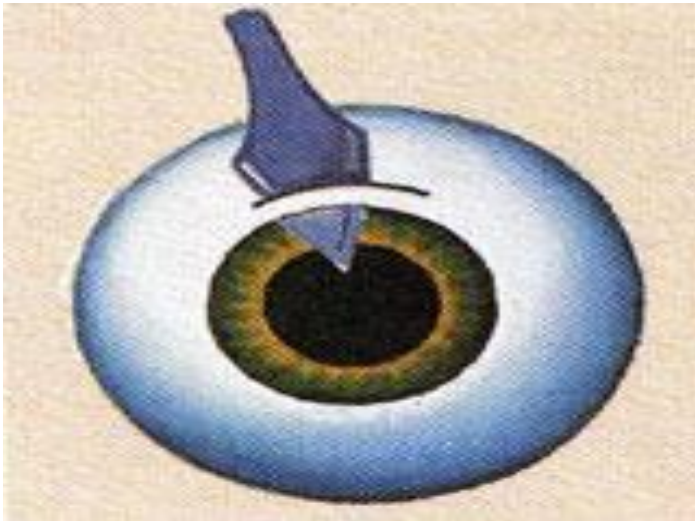
Two types of procedures for extraction are:

- 1. Cryosurgery:** a special technique in which a pencil-like instrument with a metal tip is supercooled ($-35\text{ }^{\circ}\text{C}$), then touched to the exposed lens, freezing to it so the lens is easily lifted out.

Continue.....Procedures for Extraction:

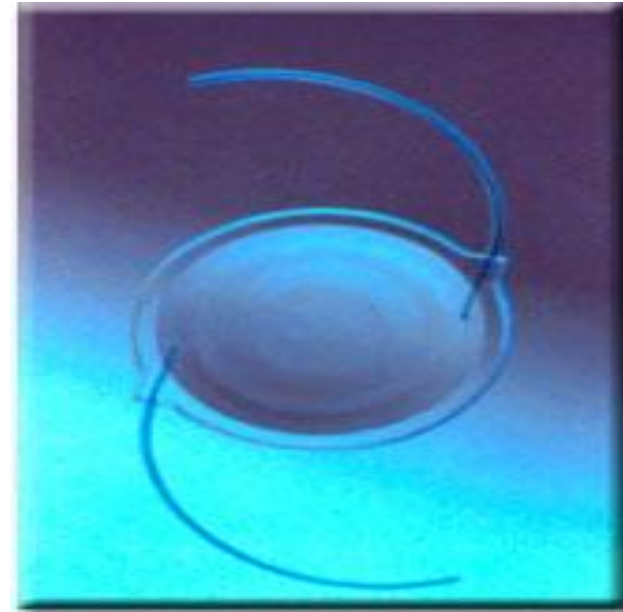
2. Phacoemulsification:

The mechanical breaking up (emulsifying) of the lens by a hollow needle vibrating at ultrasonic speed. This action is coupled with irrigation and aspiration of the emulsified particles from the anterior chamber.



Intraocular Lens Implantation

- The implantation of a synthetic lens (intraocular lens) is designed for distance vision; the patient may wear prescription glasses for reading and near vision.
 - A. Intraocular lens implant restores binocular vision.
 - B. Sophisticated calculations are required to determine the prescription for the lens.
- Numerous types of intraocular lenses are available.
- Advantages of intraocular lens include the following:
 1. Provides an alternative for the person who cannot wear contact lenses
 2. Cannot be lost or misplaced like conventional glasses
 3. Provides superior vision correction and better depth perception than glasses



Continue.....

- **Complications (specific to implantation):**
 1. Pain from inflammation of various eye structures usually controlled by nonsteroidal anti-inflammatory drugs, but systemic antibiotics and immunosuppression may be required.
 2. Rosy vision (glare) due to keeping pupil from full constriction; excessive light enters pupil, causing a dazzling of macula (minute corneal opacity).
 3. Degeneration of the cornea.
 4. Malpositioning or dislocation of lens.
- Implants may not be advisable for patients with severe myopia, history of chronic iritis, retinal detachment, diabetic retinopathy, glaucoma, and complications during surgery.

Contact Lens

- Extended-wear contact lens is an option for those who do not receive intraocular lens implants. They restore binocular vision and result in magnification of images in the range of 7% to 10%.
- The patient will need to take the lens out for cleaning periodically, or, if patient is elderly or debilitated, he will need to follow up at intervals for cleaning at the ophthalmologist's office.

Prognosis:

- Cataracts can interfere with daily activities and lead to blindness when left untreated.
- The surgical removal of cataracts is a very common procedure and is highly effective roughly 90 percent of the time, according to the National Eye Institute.

Complications:

Possible complications that could occur during and after surgery include the following:

- ✘ Blindness (Loss of vision) or decrease in vision.
- ✘ Uncomfortable or painful eye.
- ✘ Vitreous Loss- 3.1%, Vitreous Hemorrhage-0.3%, Uveitis-1.8%, Increased Eye Pressure- 1.2%, Retinal Detachment- 0.7%, Endophthalmitis- 0.13%.
- ✘ Less attractive appearance, i.e. droopy eyelid.
- ✘ Need for laser surgery to correct clouding of vision.
- ✘ Need for additional treatment and/or surgery.

Preventive Measurement:

Most cataracts occur with age and can't be avoided altogether.

You can take steps to help slow or prevent the development of cataracts:

- ✘ Protect your eyes from UVB rays by wearing sunglasses outside.
- ✘ Have regular eye exams.
- ✘ Stop smoking.
- ✘ Eat fruits and vegetables that contain antioxidants.
- ✘ Maintain a healthy weight. Keep diabetes and other medical conditions in check.

Nursing Diagnoses:

1. Deficient Knowledge of operative course.
2. Acute Pain related to surgical complications.
3. Risk for infection related to surgical complications.
4. Risk for increases of intraocular pressure related to surgical complications.

Nursing Interventions:

Preparing the Patient for Surgery:

1. Orient patient and explain procedures and care plan to decrease anxiety.
2. Instruct patient not to touch eyes to decrease contamination.
3. Obtain conjunctival cultures, if requested, using aseptic technique.
4. Administer preoperative eye drops antibiotic, mydriatic-cycloplegic, and other medications; mannitol solution I.V., sedative, antiemetic, and opioid as directed.

Preventing Complications Postoperatively:

1. Medicate for pain as prescribed to promote comfort.
2. Administer medication to prevent nausea and vomiting as needed.
3. Notify health care provider of sudden pain associated with restlessness and increased pulse, which may indicate increased IOP, or fever, which may indicate infection.
4. Caution patient against coughing or sneezing to prevent increased IOP.

Nursing Interventions

5. Advise patient against rapid movement or bending from the waist to minimize IOP. Patient may be more comfortable with head elevated 30 degrees and lying on the unaffected side.
6. Allow patient to ambulate as soon as possible and to resume independent activities.
7. Assist patient in maneuvering through environment with the use of one eye while eye patch is on (1 to 2 days).
8. Encourage patient to wear eye shield at night to protect operated eye from injury while sleeping.

Preventing Infection and Reducing Swelling:

- **A topical antibiotic** (neomycin or, more effectively, gentamicin). This agent protects against infection.
- **Corticosteroid eyedrops or ointments** are often used to reduce swelling.
- **Nonsteroidal anti-inflammatory drugs**, such as diclofenac, ketorolac, naproxen, and voltaren, also reduce swelling.

Returning Home and Follow-up Visits:

- Patients usually leave the surgical site within an hour of surgery. Cataract surgery almost never requires an overnight hospital stay.
- They need to have someone drive them home and stay with them for a few days until their vision is acclimated.
- The patient is usually examined the day after surgery and then during the following month; additional visits are made as required.
- Vision usually remains blurred for a while but gradually clears, usually over a two to six-week period. (It can take longer.)
- When the physician decides the condition has stabilized, the patient will receive a final prescription for glasses or contacts.

Avoiding Glaucoma:

- Minimize vigorous exercise.
- Put on shoes while sitting and without lifting up the feet.
- Kneel instead of bending over to pick something up.
- Avoid lifting.
- Limit reading since it requires eye movement. Television is all right.
- Sleep on the back or on the un-operated side.

