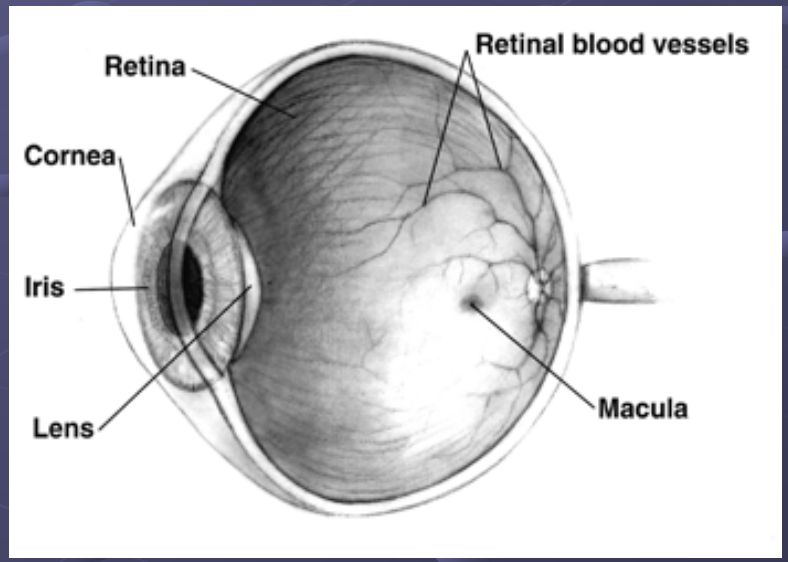
EYE‘S DISEASES



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- **AGE-RELATED MACULAR DEGENERATION**
- **ALBINISM**
- **CATARACT**
- **GLAUCOMA**

- Best's Disease, Charles Bonnet syndrome, Color blindness, Cone-rod dystrophy, Corneal disease, Diabetic retinopathy, Dry eye syndrome, Macular degeneration, Marfan Syndrome, Optic nerve atrophy, Optic nerve hypoplasia, Retinoblastoma, Rod-cone dystrophy, Stargardt's Disease, Sturge-Weber Syndrome, Trachoma, Usher Syndrome

AGE-RELATED MACULAR DEGENERATION (AMD)

What is age-related macular degeneration?

- AMD is a disease associated with aging that slowly destroys sharp central vision.
- AMD affects the **macula**, which is located in the center of the retina.
- AMD causes no pain.
- In some cases AMD advances so slowly that people notice little change in their vision. In others the disease progresses faster and may lead to a loss of vision in both eyes.

Kinds of AMD:

1. wet AMD

- occurs when abnormal blood vessels behind the retina start to grow under the macula
- with wet AMD, loss of central vision can occur quickly
- an early symptom of wet AMD is that straight lines appear wavy

2. dry AMD

- occurs when the light-sensitive cells in the macula slowly break down, gradually blurring central vision in the affected eye
- as dry AMD gets worse, you may see a blurred spot in the center of your vision and over time, as less of the macula functions, central vision is gradually lost in the affected eye
- the most common symptom of dry AMD is slightly blurred vision, you may have difficulty recognizing faces and may need more light for reading and other tasks

Normal vision

The same scene as viewed by a person with age-related macular degeneration.

Who is at risk for AMD?

- **age** – is the greatest risk factor, although AMD may occur during middle age, studies show that people over age 60 are clearly at greater risk than other age groups
- **smoking**
- **obesity**
- **race -** whites are much more likely to lose vision from AMD than African Americans
- **family history**
- **gender -** women appear to be at greater risk than men

Treatment

Wet AMD can be treated with:

- **laser surgery**
- **photodynamic therapy**
- **injections into the eye**

ALBINISM

What is albinism?

- The word "albinism" refers to a group of inherited conditions.
- People with albinism have little or no pigment in their eyes, skin, or hair.
- They haven‘t amounts of a pigment called **melanin**.
- Albinism affects people from all races.
- Most children with albinism are born to parents who have normal hair and eye color for their ethnic backgrounds.
- A common **myth** is that by definition people with albinism have red eyes. In fact there are different types of albinism and the amount of pigment in the eyes varies. Although some individuals with albinism have **reddish** or **violet** eyes, most have blue eyes. Some have **hazel** or **brown** eyes.

Vision problems

- Eye problems result from abnormal development of the eye because of lack of pigment.
- The retina does not develop normally before birth and in infancy.
- The nerve signals from the retina to the brain do not follow the usual nerve routes.
- The iris does not have enough pigment to screen out stray light coming into the eye.
- People with albinism always have problems with vision and many have low vision. Many are **"legally blind"** , but most use their vision for reading and do not use braille. Some have vision good enough to drive a car.
- Vision problems in albinism result from abnormal development of the retina and abnormal patterns of nerve connections between the eye and the brain.

How see people with albinism?

- People with albinism are sensitive to glare, but they do not prefer to be in the dark and need light to see just like anyone else.
- Sunglasses or tinted contact lenses help outdoors.
- Indoors, it is important to place lights for reading or close work over a shoulder rather than in front.

Eye conditions common in albinism include:

- **nystagmus** - irregular rapid movement of the eyes back and forth
- **strabismus** - muscle imbalance of the eyes ("crossed eyes" or "lazy eye")
- **sensitivity** to bright light and glare
- people with albinism may be either **far-sighted** or **near-sighted**, and often have **astigmatism** –di ortion of a viewed image)

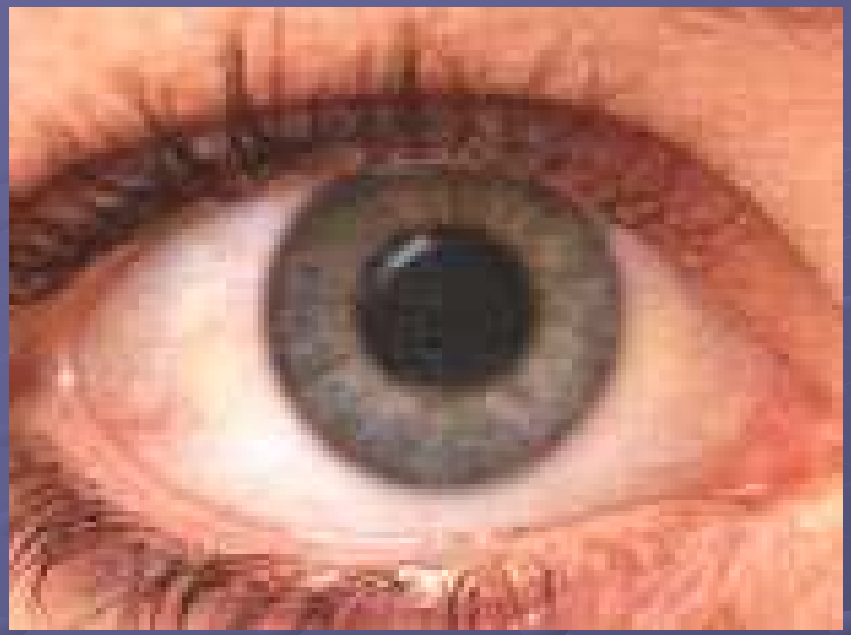
Treatment

- For the most part, treatment of the eye conditions consists of **visual rehabilitation**.
- Surgery to correct strabismus may improve the appearance of the eyes.
- In the case of esotropia or "crossed eyes," surgery may help vision by expanding the visual field.

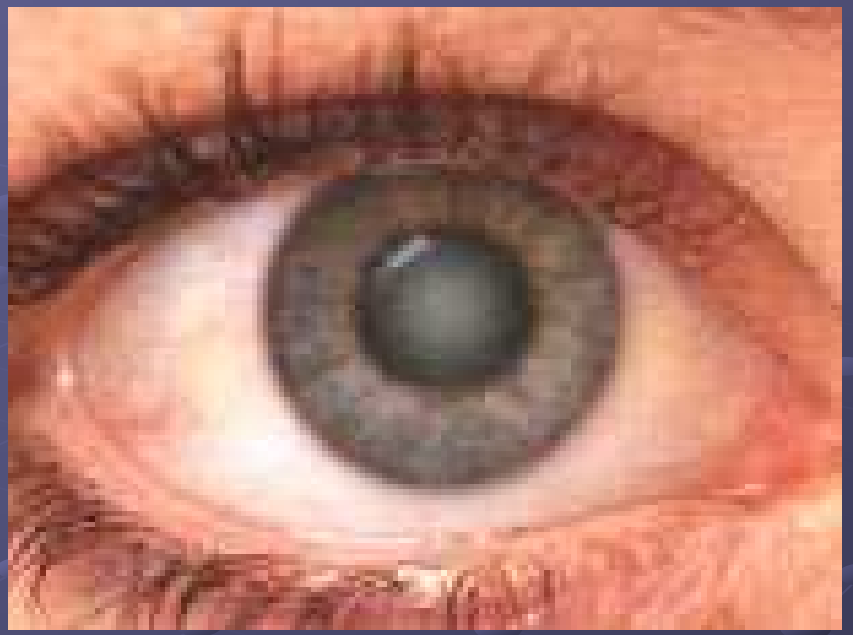
CATARACT

What is cataract?

- from the Latin **cataracta** meaning **"waterfall"**
- from the Greek **kataraktes** and **katarrhaktes**, from katarassein meaning **"to dash down"**
- the **cataract** is an opacity that develops in **the crystalline line** of the eye or in its envelope
- for most people, cataracts are a natural result of aging
- cataracts typically progress slowly to cause vision loss and are potentially blinding if untreated
- with time the cataract cortex liquefies to form a milky white fluid in a **Morgagnian Cataract**
- nntreated, the cataract can cause **phacomorphic glaucoma**



Eye without a cataract



Eye with a cataract

Why cataract develop?

- **long-term ultraviolet exposure**
- **secondary effects of diseases** such as **diabetes**
- simply due to **advanced age**
- **genetic factors** are often a cause of congenital cataracts
- positive **family history** may also play a role in predisposing someone to cataracts at an earlier age
- cataracts can also be produced by **eye injury** or **physical trauma**

Kinds of cataracts:

- **partial** or **complete**, **stationary** or **progressive**, **hard** or **soft**
- there are various types of cataracts, e.g. **nuclear**, **cortical**, **mature**, **hypermature**
- cataracts are also classified by their location, e.g. **posterior** and **anterior**

Cataract surgery

- surgically remove the cloudy lens
- two types of surgery:

1. **extra-capsular -** consists of removing the lens but leaving the majority of the lens capsule intact
2. **intra-capsular surgery -** involves removing the entire lens of the eye, including the lens capsule, but it is rarely performed in modern practice

- in both types of surgery the cataractous lens is removed and replaced with a plastic lens which stays in the eye permanently

Cataract operations:

- **a multifocal lens**
- **monofocal**

Normal vision

Hazy view as seen by a person with a cataract

GLAUCOMA

What is glaucoma?

- disease involving loss of retinal ganglion cells in a characteristic pattern of optic neuropathy
- **raised intraocular pressure** is a significant risk factor for developing glaucoma - there is no set threshold for intraocular pressure that causes glaucoma
- untreated glaucoma leads to permanent damage of the optic nerve and resultant visual field loss, which can progress to blindness
- worldwide, it is **the second leading cause of blindness**
- glaucoma affects 1 in 200 people aged 50 and younger and 1 in 10 over the age of 80

A normal range of vision

The same view with advanced vision loss from glaucoma

Common types of glaucoma

1. **open angle = chronic open angle = primary open angle**
   - the most common type of glaucoma
   - the anterior structures of the eye appear normal, aqueous fluid builds within the anterior chamber
   - untreated, this may result in permanent damage of the optic nerve and retina
   - eye drops are generally prescribed to lower the eye pressure
2. **acute angle closure**
   - only about 10% of the population with glaucoma has this type
   - occurs because of an abnormality of the structures in the front of the eye
   - the space between the iris and cornea is more narrow than normal, leaving a smaller channel for the aqueous to pass through
3. **secondary glaucoma**
   - occurs as a result of another disease or problem within the eye such as: inflammation, trauma, previous surgery, diabetes, tumor, and certain medications
4. **congenital**
   - this is a rare type of glaucoma that is generally seen in infants

Risk factors and diagnosis

- people with a family history of glaucoma
- diabetics and African people
- Asians
- Inuit
- women

Treatment

- most patients with glaucoma require only medication to control the eye pressure
- in Europe, Japan and Canada laser treatment is often the first line of therapy
- in the U.S., adoption of early laser has lagged

vocabulary

- **macula** – skvrna
- **retina** – sítnice
- **blurring** – rozmazávat
- **a blurred spot** – rozmazaná tečka
- **braille -** Braillovo/slepecké písmo
- **the crystalline lens -** čirá čočka
- **a multifocal** and **monofocal lens**
- **intraocular pressure** – nitrooční tlak
- **far-sighted** and **near-sighted** – dalekozraký a blízkozraký