

THE ENC-EYE-CLOPEDIA

THE BIOBUS BOOK OF EYE DISEASES.

Did You Know?

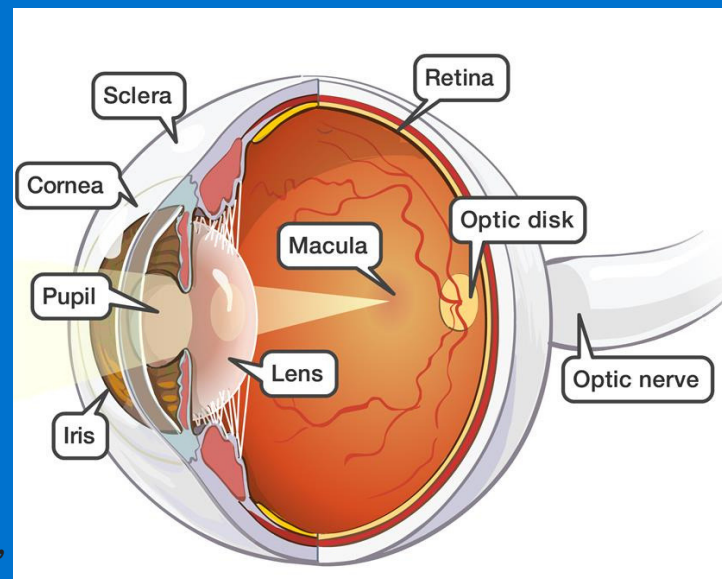
When our retina receives an image, it is actually received upside down. Our brain figures this out and corrects the image!



THE EYE-DEAL EYE.

The eye is the body's own personal camera. It takes snapshots of the world and sends these images to the brain to process what is being seen. About the size of a ping-pong ball, it sits in the hollow sockets of the skull. When we focus on an object, light rays bounce off of the object of focus and into our eyes. From colors and shapes to movement, the eye is a complex device with an anatomy that creates a pathway of visual information for us to fully understand what is going on around us.

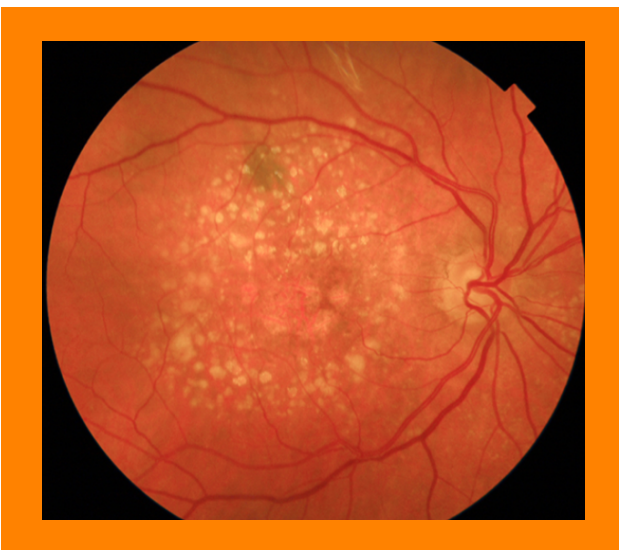
Although the eyes function like a camera, sometimes the picture it creates just isn't perfect. For this reason, it is important to have them examined regularly, as many vision problems and infections can be treated if detected early. This is an encyclopedia of eye diseases that can occur within a lifetime.



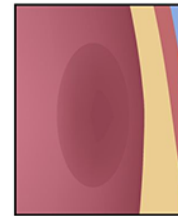
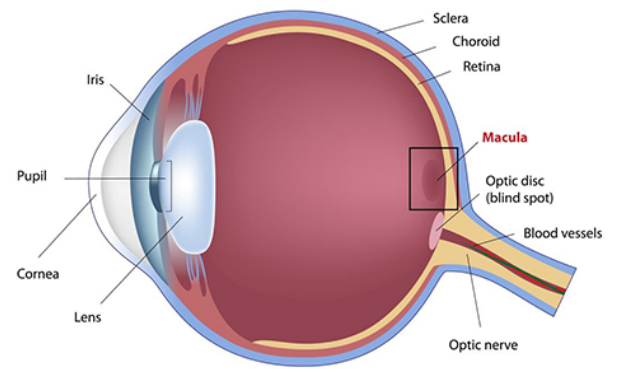
AGE RELATED MACULAR DEGENERATION

Age related macular degeneration (AMD) is the leading cause of vision loss amongst people 50 years and older. It is an inherited disease that affects the paper-thin tissue at the back of the eye called the retina. The macula is a small but important area of the retina because it contains the greatest concentration of light-sensitive cells called cones. Cones create the focused details used to do activities such as walking, reading and driving.

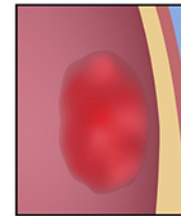
Cells in the macular region begin to die, creating blind spots and distorted central vision. As the condition progresses, the blurred area grows and objects do not appear to be as bright as they used to be. Dry AMD is the most common form, affecting 80% of the people with the disease. Dry AMD is when parts of the macula become thinner with age and tiny clumps of protein called drusen grow. Wet AMD is the less common, but more serious form. Wet AMD is when abnormal blood vessels grow under the retina. These vessels may leak blood or other fluids, which scar the macula. Vision is lost faster with wet AMD than with dry AMD.



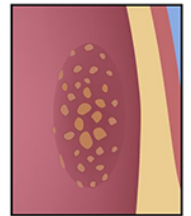
Macular Degeneration



Normal



"Wet" Macular Degeneration



"Dry" Macular Degeneration

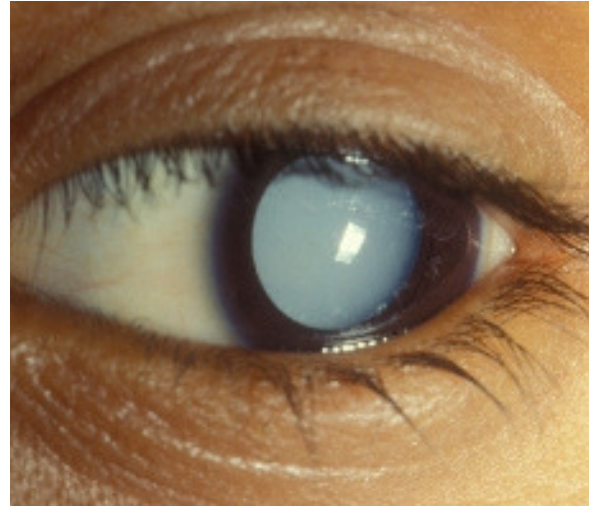
SYMPTOMS:

- The center of a person's visual field becomes fuzzy, both close up and far. This causes problems with reading, driving, watching TV and recognizing faces.
- Blind spots make it hard to see colors and fine details.
- Straight lines, such as sentences on a page, appear wavy or distorted.
- Extra sensitivity to glare. It may become difficult for your eyes to adjust when driving and walking at sunset, reading in low light settings or when going from a well-lighted room to a darker one.
- Need for higher light levels for activities such as reading, cooking and performing day-to-day tasks.

CATARACT

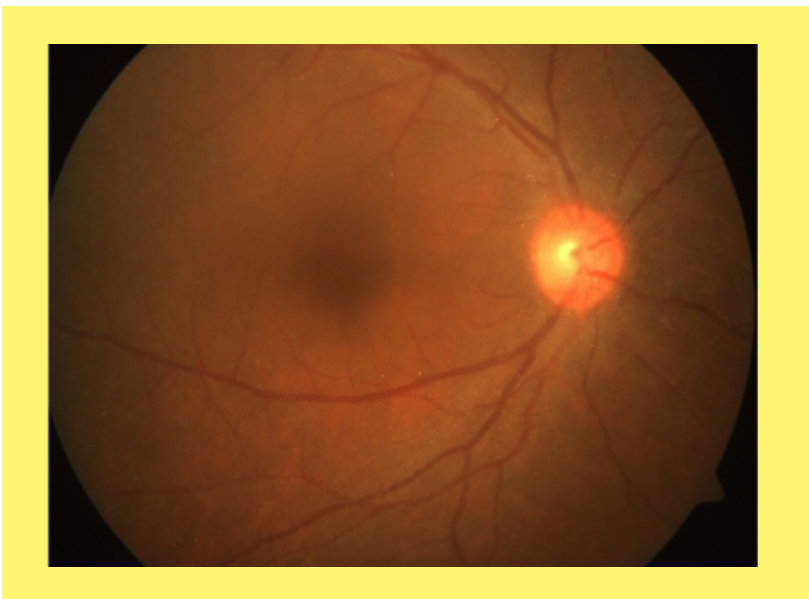
The lens in a healthy eye is clear to allow light to shine through it. The lens is mostly made of water and protein. As we age, the protein in the lens may clump and start to cloud the lens, causing blurry vision. The clouded lens is called a cataract. Cataracts tends to grow slowly, so they are not always detectable when they first develop. Overtime, vision worsens as the cloudy area in the lens grows larger. The lens may also change to a yellow/brownish color, adding a brownish tint to vision.

The majority of cataracts are related to aging, therefore the disease is more prevalent in older individuals around the age of 80. Other risk factors for cataracts include certain diseases like diabetes, personal behavior such as smoking or alcohol use, or environmental causes such as UV sunlight exposure.



SYMPTOMS:

- Cloudy or blurry vision
- Faded colors
- Glare
- Poor night vision



CHOROIDAL RUPTURE

The choroid is a layer of the eye that is located underneath the retina. Without looking through the pupil and fully examining the retina, it is not visible. Choroidal rupture is the splitting or breaking of the choroid. This rupture is a result of blunt trauma to the eye. Individuals who experience choroidal rupture are often younger and are involved in activities, such as ball sports, which expose them to a high chance of impactful trauma to the eye. Cases of it are also seen in car accidents where the passengers experience airbag injuries.

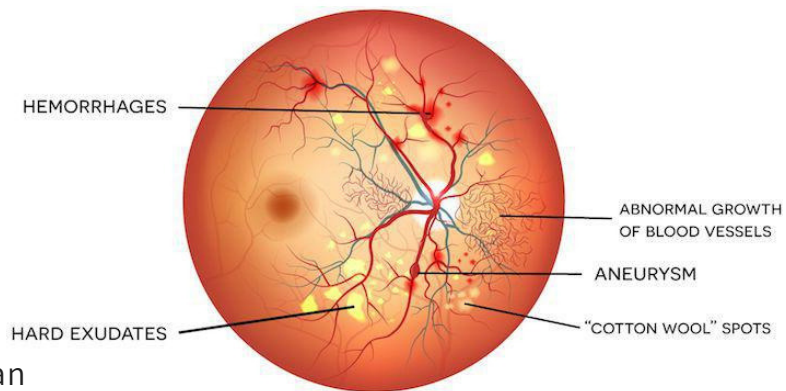


SYMPTOMS:

- Immediate bleeding in the choroid
- Decreased vision
- No symptoms in some cases



DIABETIC RETINOPATHY



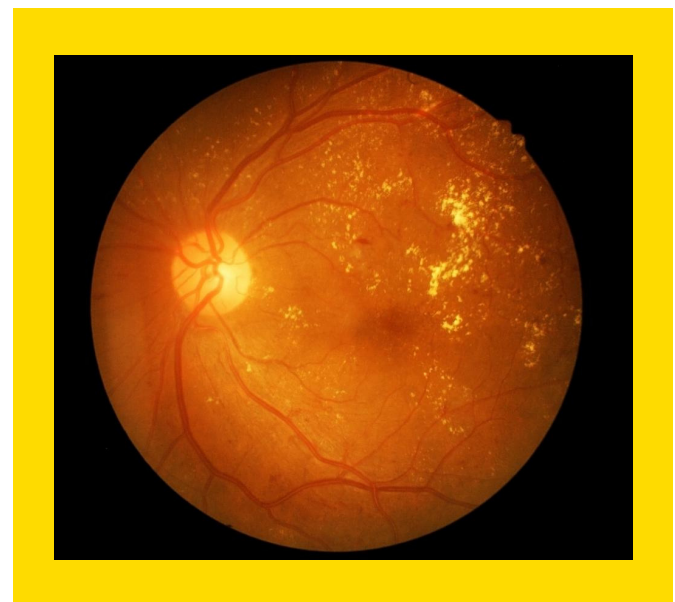
Individuals with diabetes are at risk for developing an eye disease called diabetic retinopathy. This eye disease occurs when high blood sugar levels cause damage to blood vessels in the retina. These blood vessels can swell and leak, or they can close and stop blood from passing through. Both of these factors can affect vision.

There are two stages of diabetic retinopathy: proliferative, and non-proliferative. The non-proliferative stage occurs first and has more minor symptoms than the proliferative stage. In this stage, tiny blood vessels leak and the retina swells. The macula, a small but important area of the retina that allows the eye to clearly see details of objects, like faces and words, swells. When this happens, it is called macular edema, and this causes vision to become blurry. Sometimes, blood vessels in the retina close off, and blood cannot reach the macula. This is another cause of blurry vision called macular ischemia.

The proliferative stage of diabetic retinopathy happens when the retina starts to grow new blood vessels. These new vessels are fragile and often bleed. If they bleed only a little, you may see dark floaters. If they bleed a lot, vision can be completely blocked.

SYMPTOMS:

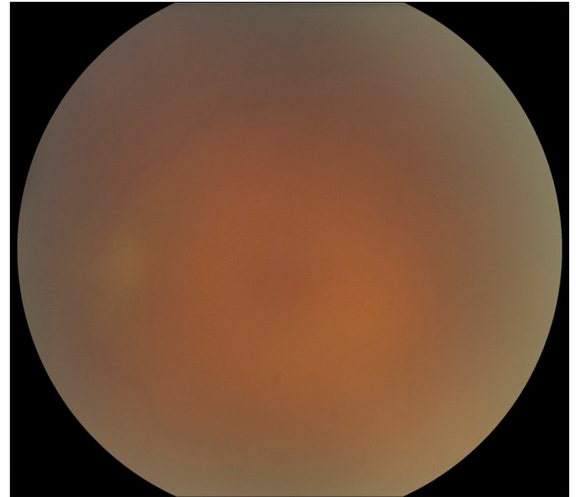
- Seeing an increasing number of floaters
- Blurry vision
- Vision that changes from blurry to clear
- Blank or dark areas in your field of vision
- Poor night vision
- Faded or washed out colors



EBOLA

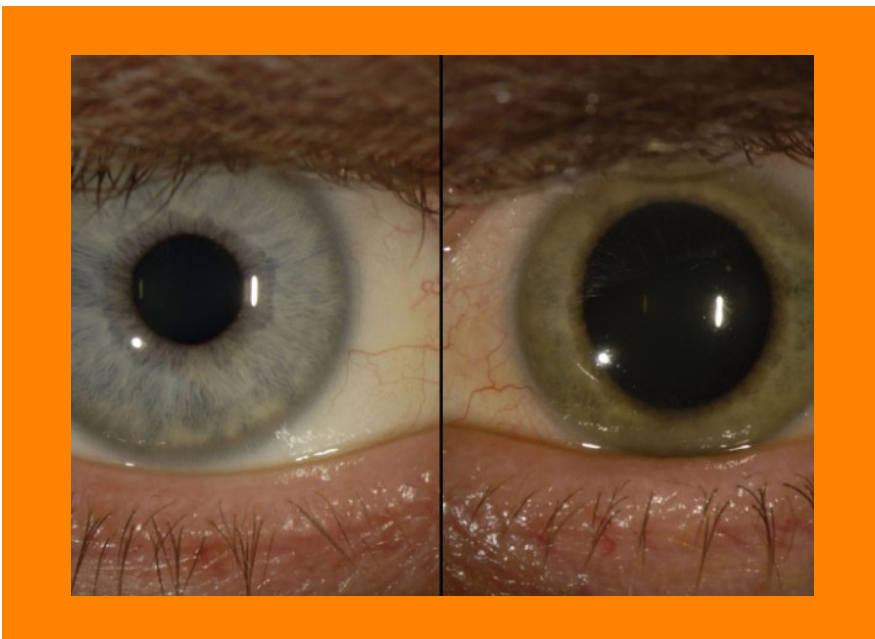
Ebola Virus Disease (EVD) is a rare, but often fatal disease that affects humans and primates. EVD is an infection caused by a group of viruses located in sub-Saharan Africa. It is transmitted through direct contact with bodily fluids of an infected animal (primates or bats) or with a sick or dead person with EVD. The virus gets in through broken skin or mucous membranes in the eyes, nose, or mouth.

EVD can remain in certain bodily fluids including the aqueous humour in the eye, even after the rest of the body has recovered from infection. The areas of the body that contain these persistent viruses are called immunologically privileged sites. Ebola survivors still suffer from certain symptoms after recovery such as tiredness, muscle aches, eye and vision problems and stomach pain. Some of these symptoms may be caused by the immunologically privileged sites.



SYMPTOMS:

- Fever
- Muscle pain
- Weakness and fatigue
- Diarrhea
- Vomiting and abdominal (stomach) pain
- Unexplained hemorrhage (bleeding or bruising)
- Some Ebola survivors suffer from uveitis, which is an inflammation of the middle layer of the eye. This can cause vision loss or blindness. In these cases, the Ebola virus can be found in the eye up to one year post-infection.
- Symptoms of uveitis include: having a red eye with or without pain, being very sensitive to bright light, blurry vision, or seeing floaters in the visual field.



GLAUCOMA

Glaucoma is the increase of pressure inside the eye. This pressure depends on the volume of liquid content such as blood and other fluids. Changes in the body's blood pressure may cause changes to the eye pressure. Eye pressure greater than 23 mmHg is sufficient enough to cause the degeneration of the optic disk and permanent defects in the visual field. The major physical threat is visual impairment, which has an effect that varies from blurring to complete blindness.

Primary glaucoma is formed from an unknown cause and is typically hereditary, while secondary glaucoma forms from a known cause, such as a serious eye injury, cataract or diabetes. Although they have different causes, primary and secondary glaucoma both share the same signs and symptoms. Glaucoma usually appears later in life, and is a non-infectious disease that is genetically inherited.



SYMPTOMS:

- Slow progressive loss of peripheral vision (side vision) that is caused by lack of blood supply to the optic nerve.
- Foggy vision
- Colored halos around lights
- Decreased vision especially in low-light settings
- Eye pain
- Intolerable headaches



HERPES KERATITIS- HERPES SIMPLEX

Herpes keratitis is a corneal infection caused by the herpes simplex virus (HSV). There are two major types of the virus: HSV-1 and HSV-2. HSV-1 is the most contagious of the two, affecting about 90 percent of the population, and it is usually contracted during childhood. HSV-1 is primarily transmitted through direct skin contact and affects the face by causing cold sores and blisters. It is also the most frequent cause of corneal infections. The infection can be transferred to the eye by touching one of the active sores, and then contact with the eye. HSV-2 is a different strain of HSV and is sexually transmitted.

Most HSV keratitis infections happen after another part of the body, such as the mouth, has already been infected by HSV. It is the result of reactivation of an earlier infection. Reactivation can be triggered by stress, sun exposure, fever, trauma to the body, menstruation or medications. Once herpes simplex is present in the eye, it infects the eyelids and cornea, but can also infect inside the eye which is less common. If the infection is superficial, involving only the cornea's outer layer, it will heal without causing eye damage, but in more severe cases where the deeper layers of the cornea is involved, it can cause scarring of the cornea or blindness.



SYMPTOMS:

- Blurred vision
- Eye pain
- Eye redness
- Tearing
- Discharge
- Increased sensitivity to light



HYPERTENSIVE RETINOPATHY

Hypertensive Retinopathy is an eye disease caused by high blood pressure (hypertension), which damages the blood vessels in the retina. The amount of damage to the retina increases with the severity of high blood pressure and the length of time over which the patient has had the condition. The risk of developing hypertensive retinopathy increases with age because older people are more likely to develop high blood pressure. Other factors that contribute to high blood pressure are: being overweight, sedentary lifestyles, high salt diets, stress, family history of high blood pressure, diabetes and moderate to high amount of alcohol intake.

Cotton wool spots are one of the first signs of diabetic or hypertensive retinopathy. They appear as small yellow-white lesions which look like clouds on the fundus. Retinal hemorrhages develop when blood vessels start to bleed into either the nerve fiber layer (which produces a flame shaped hemorrhage) or the inner retina (which produces a dot blot hemorrhage).



SYMPTOMS:

- Double or cloudy vision
- Headaches
- Blindness, when the condition has progressed significantly



LEBER CONGENITAL AMAUROSIS

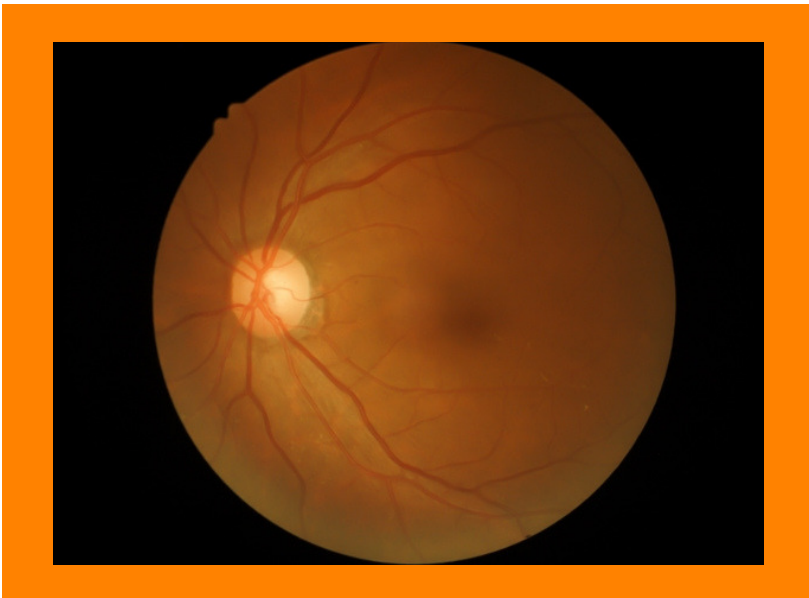
Leber congenital amaurosis (LCA) is an inherited disorder that affects the retina, which is the tissue at the back of the eye that detects light and color. In response to the amount of light entering the eye, the pupils usually expand and contract.

Instead, in LCA, they expand and contract slower than normal, or do not respond to light at all. The clear front that covers the eye, the cornea, appears to be cone-shaped and abnormally thin, which is a condition called keratoconus. A decrease of visual responsiveness during infancy is the first sign of the disorder. Visual impairment is slow in progression, but will worsen over time.



SYMPTOMS:

- Increased sensitivity to light
- Involuntary eye movement
- Farsightedness
- In children, they will poke and rub at their eyes with their knuckles and fingers to stimulate the retina to produce light.
- Child will show hearing loss, intellectual disability and developmental delay.
- Sunken or deep-set eyes.
- Sluggish or absent pupil reactions..



LOIASIS

Loiasis is an infection caused by the parasitic worm called Loa Loa. The parasite gets transmitted to the body through bites of infected deer flies, which are most commonly found in rainforests in West and Central Africa. Deer flies are most likely to bite during the day and are found mostly during rainy seasons. Smoke from wood fires and movement of people also tend to attract deer flies. Loiasis cannot be spread from person to person, however, a deer fly can become infected from biting an already infected human. The deerfly can then go on to infect other people.



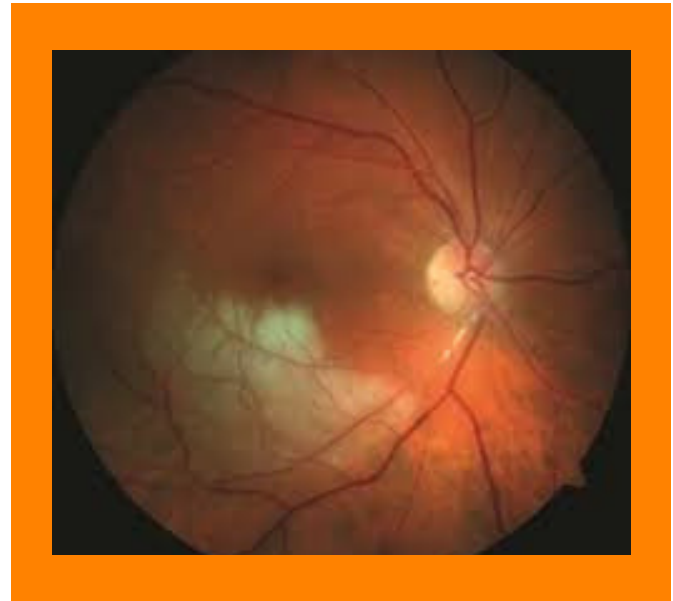
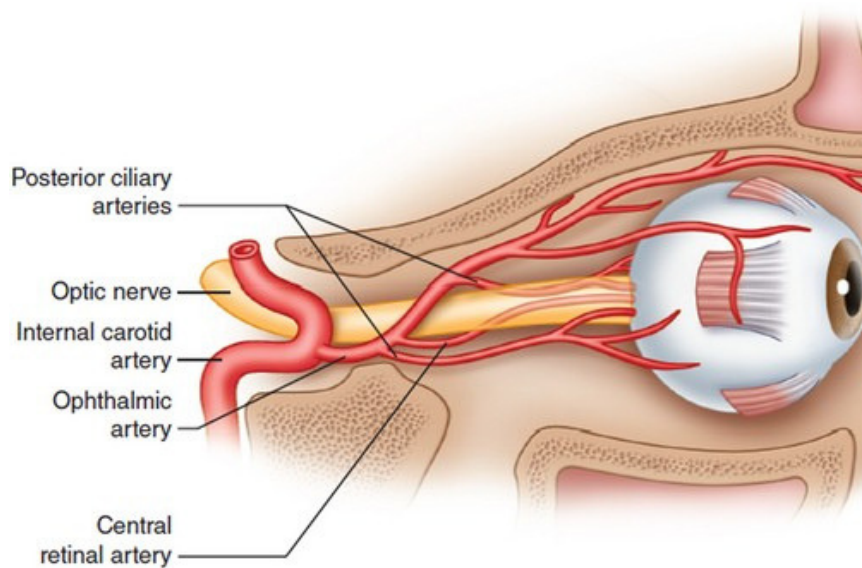
SYMPTOMS:

- Repeated occurrences of itchy, non-painful swelling of the body called Calabar swellings. Swellings can appear anywhere on the body but are more commonly found near joints.
- Worms may crawl across the surface of the eye or under the skin.
- Less common symptoms include:
 - Itching all over the body
 - Muscle pain
 - Joint pain
 - Fatigue
- Many people do not develop symptoms for many months after first getting infected.

RETINAL ARTERY OCCLUSION

Retinal Artery Occlusion (RAO) occurs when a retinal artery is blocked, and oxygen flow through blood is restricted. A lack of oxygen to the back of the eye can cause serious vision loss.

Men are more likely to develop RAO than women, and it is most commonly seen in people around 60 years of age. Cardiovascular disease, diabetes, high cholesterol, and high blood pressure increases the risk of developing RAO.



SYMPTOMS:

- Sudden painless loss of vision in one eye. The degree of vision loss depends on which artery is blocked:
- If the main (ophthalmic) artery is blocked, the most damage occurs. This is called central retinal artery occlusion (CRAO).
- A blockage in a smaller artery is called branch retinal artery occlusion (BRAO). This may cause loss of a section of the visual field, such as vision in one side.

RETINAL VEIN OCCLUSION

Retinal Vein Occlusion (RVO) occurs when a blood clot blocks the flow of blood from the retina. In most cases, it affects just one eye and happens when the veins in the eye are too narrow. When the main retinal vein is blocked it is called Central Retinal Vein Occlusion (CRVO), and when one of the smaller branch veins is blocked it is called Branch Retinal Vein Occlusion (BRVO).

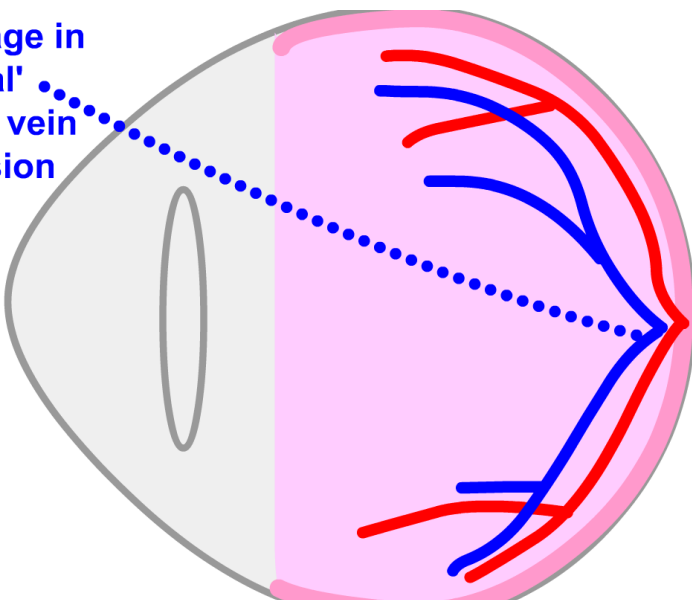
RVO is most likely to occur in people with health problems that affect blood flow. Such health problems include diabetes, high blood pressure and high cholesterol.



SYMPTOMS:

- Sudden loss of vision in part or all of an eye
- Dark spots or lines that float in the vision
- Pain and pressure in the eye

blockage in
'central'
retinal vein
occlusion



RIVER BLINDNESS (ONCHOCERCIASIS)

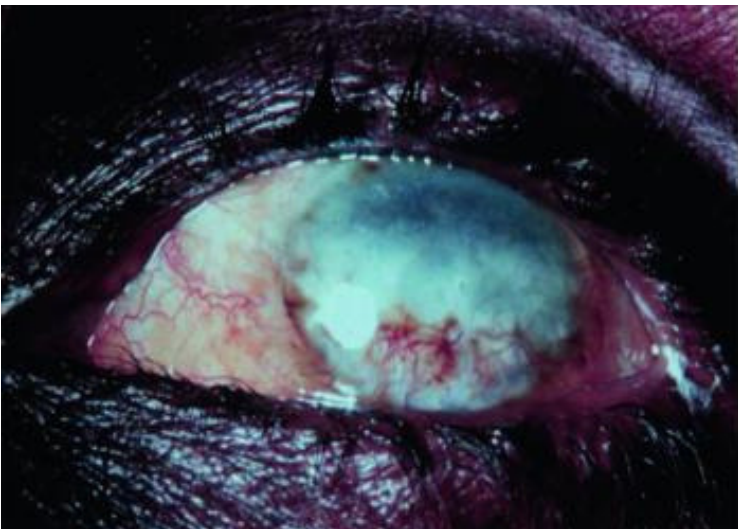
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TRACHOMA

Trachoma is the leading cause of preventable blindness by infectious origin. Caused by the bacterium *Chlamydia trachomatis*, it is highly contagious and can spread by direct contact through the eyes, eyelids, nose and throat of an infected person. Transmission also occurs through the handling of infected towels and cloths and through flies that have come in contact with infected people.

As the infection progresses, there is eye pain and blurred vision. All the signs of trachoma are more severe in the upper eyelid than in the lower lid. If left untreated, scarring inside the eyelid will occur, and the eyelashes will turn inwards towards the eye, which is a condition called trichiasis. The eyelashes will scratch against the cornea and this continuous irritation will cause the cornea to become cloudy. This will lead to corneal ulcers and irreversible vision loss. In addition, the lubricating glandular tissue of the eyelids, which include the tear-producing glands can be affected. This leads to extreme dryness, aggravating the condition even more. Generally, it takes years before trachoma causes vision loss.



SYMPTOMS:

- Mild itching and irritation of the eyelids and eyes
- Discharge from the eyes that contains mucus or pus
- Swelling of the eyelids
- Increased sensitivity to light
- Eye pain
- Pink eye
- Swelling of lymph nodes in front of the ears
- Ear, nose and throat complications



XEROPHTHALMIA

Xerophthalmia is a condition that occurs as a result of Vitamin A deficiency. Vitamin A is the leading cause of blindness in children, mostly in low income countries in Africa and South-East Asia. Although it is essential for the immune system and skin to function normally, in the eye, Vitamin A is necessary for the eye to produce certain pigments that allow the retina to work properly. Without these pigments, the eye cannot see the full spectrum of light. Vitamin A also nourishes parts of the eye like the cornea, which will become dry without it.

The body does not produce Vitamin A on its own, so we need to get it from food. Foods that are high in Vitamin A are most fruits, vegetables, oily fish, liver, cheese and butter. Deficiency can occur if the food you eat does not contain enough Vitamin A, or if your body does not metabolize and store it correctly. In addition to eye problems, Xerophthalmia is associated with increased morbidity, mortality, and can affect growth in children.



SYMPTOMS:

- Poor vision at night or in dim lights
- Extreme dryness of the eyes.
- Wrinkling, cloudiness, and softening of the cornea
- Whitish dots (Bitot's spots) may appear on the membrane lining the inside of the eyelid
- Without treatment, the softening corneas will lead to infection, perforation, and degenerative tissue changes, and ultimately blindness.

