

كلية التقنيات الصحية و الطبية - الدور
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Primary Eye Care

Introduction:

Primary eye care (PEC) is a vital part of comprehensive healthcare. It focuses on preventing, diagnosing, and treating eye conditions early, playing a crucial role in maintaining eye health and reducing vision problems.

What is Primary Eye Care?

Primary eye care involves a range of healthcare services aimed at preserving eye health and detecting visual problems early. These services include routine eye exams, providing guidance on eye care, prescribing glasses or contact lenses, and referring patients to specialists if needed.

Components of Primary Eye Care

1. Routine Eye Examinations:

Regular eye exams are crucial for the early detection of eye problems such as glaucoma and cataracts, as well as refractive errors like myopia and hyperopia.

2. Education on Eye Health:

This includes advice on maintaining healthy eyes, such as eating a balanced diet, protecting the eyes from harmful UV rays, and avoiding smoking.

3. Early Treatment:

If an eye problem is detected during the exam, appropriate treatment is provided, or the patient is referred to a specialist.

4. Preventing Eye Diseases:

PEC aims to prevent eye diseases by implementing actions such as offering vaccinations and

providing protective eyewear.

Importance of Primary Eye Care

- Early detection: Early detection prevents the progression of eye diseases like glaucoma.
- Awareness: Educating people about factors affecting eye health such as lighting and nutrition.
- Improving vision quality: Providing treatment options such as glasses or contact lenses to enhance vision.

Role of PEC in Preventing Blindness

Studies suggest that blindness or visual impairment can be prevented in about 80% of cases through primary eye care programs, which focus on early detection and providing necessary treatments.



Eye History & Exam

- [Ophthalmology](#)
- [No Comments](#)

This is intended for junior doctors on the ward or in ED, covering how to approach the eye history & exam as it is often poorly taught at medical school or in an OSCE.

History

A detailed history allows the ophthalmologist to triage patients appropriately. In addition to the classic [clerking](#), important red flags meriting discussion with the on-call [ophthalmology](#) team include any of:

- Sudden vision loss
- Photophobia
- Pain on eye movement
- Double vision ([diplopia](#)) – especially if binocular (see below)
- Flashing lights
- Associated headache/fever
- Abnormal pupil reactions
- Bleeding/trauma to the eye
 - Consider whether an acute [red eye](#) could be a foreign body or chemical injury as these could be sight-threatening
- Temporal tenderness/jaw claudication

Beyond these questions, do include

- Past ocular history: previous eye surgery, laser, trauma, contact lens/prescriptions & any known conditions
- Any history of chronic or autoimmune conditions (as many have eye manifestations)
- Drug history: patients don't often volunteer the [eye drops](#) they take without asking!
- Smoking

Examination:

You'll be surprised how many people don't examine the "normal" eye. Ensure you examine both! Document clearly what is right & left. By convention, everything is documented as though you are looking at the patient (right eye on the left of the page). The exception is visual fields which are recorded as though the patient is looking through the page (so right eye is on the right of the page).



Ensure you have an order to not miss anything e.g. general inspection of the face, vision, pupils, the eyelids, anterior surface of eye +/- fluorescein staining. Direct ophthalmoscopy is frequently done poorly and is usually not crucial.

General Inspection:

- Facial asymmetry & brow position
- Globe position – vertical or horizontal displacement, proptosis
- Facial swelling/erythema/rashes

Vision:

- Visual acuity
 - Ensure they're wearing their corrective glasses/contact lenses (and document this or if they're unaided). Pinhole is usually difficult to find.
 - If a Snellen chart is unavailable, you can use printed material
- Colour vision with Ishihara (available on the internet or [apps](#))
- Visual Fields – any field losses or obvious enlargement of the blind spot

A good app to use is Eye Test Free

Eye movements:

- Check with both eyes open
- If diplopia is present, check whether it is monocular or binocular
 - Binocular diplopia disappears if either eye is covered. It indicates a more serious central/cranial neuropathy as the eyes are not synchronised. Refer this urgently.
 - Monocular diplopia may indicate issues with the cornea, lens or macula
- Nystagmus (which can be normal on maximal adduction/abduction)

Pupils:

- Assess their shape
- Pupillary reflexes such as their reaction to light (measure their size in the light & dark)
- Afferent defects: both pupils will constrict in response to light shone in the normal eye, but not if shone in the abnormal eye. The eyes still respond to accommodation



- Efferent defects: fixed dilated pupil in the abnormal eye. However, the other "normal" eye still constricts to light being shone in the abnormal eye
- Relative Afferent Pupillary Defect (RAPD)
 - Indicates unilateral or asymmetrical optic nerve dysfunction
 - Move a light source back and forth between the eyes. In an eye with RAPD, the pupil will initially dilate when light is shone on it. This is due to the brain perceiving the light as dimmer than in the normal eye due to optic nerve dysfunction
- Reaction to accommodation

Lid/lashes:

- Review any lumps, swellings, erythema or cellulitis
- Always escalate inflammation around the eye as cellulitis around this area could represent preseptal or orbital cellulitis. The latter is sight-threatening.
- The lid may be everted/outward turning (ectropion) or inverted (entropion)
- Inward turning of the lashes can be irritating (trichiasis). Loss of eyelashes can be associated with malignant lesions e.g. BCC.
- Ptosis
 - Often due to an ineffective levator muscle
 - Can be due to Horner's syndrome (mild ptosis, miosis)
 - Oculomotor palsy (eye movements affected & dilated pupil)

Conjunctiva:

- Circumferential injection (redness) is suggestive of intraocular pathology e.g. acute angle-closure glaucoma, keratitis, uveitis
- Diffuse/sectoral injection usually suggests conjunctivitis (bacterial, viral & allergic)
- Discharge can be purulent (bacterial) or watery (foreign body, allergic/viral conjunctivitis, corneal abrasion or lacrimal tissue)

Cornea:

- Assessment can be useful to identify clarity, opacities & with fluorescein staining epithelial defects such as corneal abrasion or ulcers.



- Corneal ulcers often appear as white opacities whereas dendritic ulcers are tree-branch shaped suggestive of herpetic disease

Anterior chamber:

- Hypopyon – sedimentation of white cells and debris in the inferior part of the anterior chamber, which can be due to inflammatory or infective processes. Typically severe corneal ulcers, endophthalmitis but can be secondary to anterior uveitis.
- Hyphaema – blood in the anterior chamber between the cornea and iris. This can occur as a result of trauma

Direct ophthalmoscopy:

This is rarely done well & rarely helpful due to absent or poorly functioning equipment, suboptimal conditions & as doctors don't regularly use it. It rarely changes the management of a patient in whom other components of the history or examination already necessitate urgent ophthalmology review.

For completeness the components are:

- Red reflex (absence may suggest cataract or vitreous haemorrhage)
- Ideally dilated **fundoscopy** (after checking pupils) – do document which eye, the drug used and time of dilation
- Optic disc – haemorrhages, pallor or oedema
- Retinal vessels – flame-shaped haemorrhages, silver wiring, tortuosity, emboli
- Retina – cotton wool spots, haemorrhages, pallor
- Macula – drusen, haemorrhages, cherry-red spot

Glossary of Common Ophthalmic Terminology

Abbe Number – A measure of lens light dispersion.

Aberration - The failure of a refracting surface or lens to produce an exact point-to-point correspondence between an object and its image.

Accommodation - Adjustment by the eye for focusing clearly on near targets, which is accomplished by changing the shape of the crystalline lens through action of the ciliary muscle.

Add – The total dioptric (see Diopter) power added to a distance prescription to supplement accommodation for reading

Against-the-rule Astigmatism – When the steepest meridian of a lens/ prescription lies near the 0°-180° line.

Age-Related Macular Degeneration (AMD/ARMD) – Age related, deterioration of the macula.

Albinism - A hereditary absence of pigment in the skin, hair, iris, and retina; usually associated with a loss of visual acuity, nystagmus and photophobia; often accompanied by refractive errors.

Amaurosis – Partial or total blindness

Amblyopia - Decreased visual acuity in one or both eyes, usually due to lack of sensory input during childhood. Often occurs without any apparent disease of the eye.

Ametropia - An optical error of the eye in which the image of an object does not focus on the retina, when the visual system is at rest. (See refractive error)

Amsler Grid – A diagram with horizontal and vertical lines used to detect macular distortion.

Anesthetic – A drug that induces an insensitivity to pain.

Aniseikonia - The images of an object, which appear on each retina, are unequal in size or shape and cannot be fused into one image

Anisometropia – A difference in refractive error between the two eyes.

Anterior Chamber - The aqueous-filled space in the forward portion of the eye, bounded in front by the cornea and behind by the iris.

Anterior Chamber Angle – The junction between the cornea and the iris where aqueous filters out of the eye.

Anterior Segment – referring to the front part of the eye (i.e. the lens forward).

Antihistamine – Drug used in the treatment of allergies.

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Antireflective Coating (ARC) – Reduces light reflections and increases the transmission of light through a lens.

Aphakia - Absence of the crystalline lens of the eye.

Applanation Tonometry – A method for determining intraocular pressure (IOP) by measuring the force required to flatten an area of the cornea.

Aqueous Humor (Aqueous) - Clear, watery fluid which fills the anterior chamber of the eye.

Aspheric Lens - A non-spherical lens, in which the radii of curvature increase towards the periphery rather than remaining equal at all points. Aspheric lenses reduce optical aberration and improve resolution.

Asthenopia - Ocular fatigue caused by tiring of the muscle in and around the eye.

Astigmatism - A refractive error in which light rays fail to come to a single focus on the retina because of differing amounts of refraction in the various meridians of the eye.

Atoric Lens – Ophthalmic lens with aspheric curves on the back surface.

Auto-refractor – A computerized machine that estimates the eye's objective refractive power.

Axial length – Length of the eyeball.

Bandage Contact Lens – Soft contact lenses used to protect the cornea.

Base Curve – the curvature of the central portion of the posterior surface of a lens.

Bicentric Grind - The grinding of the lower part of a spectacle lens to help compensate for a lens-induced vertical prism power that occurs with unequal power lenses.

Bifocal - A lens with two optical zones, one for near vision and one for distance vision.

Bilateral - Both eyes.

Binocular Vision - The ability to use both eyes simultaneously to focus on the same object and to fuse the images from both eyes into a single image.

Biomicroscope - A corneal microscope for examination of the front portions of the eye, which provides a narrow beam of strong light.

Blepharitis - Inflammation of the lid margins; also known as dandruff of the eyelids.

Blepharoplasty - Any plastic surgery performed on the eyelids.

Blindness - See "Legal Blindness."

Blind Spot – The natural sightless area of the visual field generated by the lack of photoreceptors where the optic nerve enters the eye.

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Blue Light – High energy visible light suspected of cause eye damage.

Bowman's Membrane – Layer of the cornea located between the epithelium and stroma.

Braille – Tactile writing system used by individuals who are visually impaired.

Bridge – The portion of the frame front that joins the two eye wires together. This part supports the frame on the patient's nose.

Canaliculi – Canal where tears pass from the puncta into the lacrimal sac.

Canthus - The angle formed by the meeting of the upper and lower eyelids; specified as outer or temporal, and inner or nasal.

Capsulotomy – A laser procedure used to remove capsular haze secondary to cataract surgery.

Cataract - A clouding of the crystalline lens of the eye or its capsule, or both, with consequent loss of visual acuity.

Cellulose Acetate – The most commonly used plastic frame material.

Center Thickness – Thickness of a lens (measured in millimeters).

Central Retinal Artery Occlusion (CRAO) – Disease of the eye where retinal arterial blood flow is blocked. Symptoms include sudden, painless, profound vision loss in one eye.

Chalazion - Inflammatory enlargement of a meibomian gland in the eyelid.

Chief Complaint – The main reason the patient has booked an appointment.

Chorioretinitis - Inflammation of the choroid and retina.

Choroid - The vascular, intermediate layer of the eye, lying between the retina and sclera, which furnishes nourishment to the other parts of the eyeball.

Choroiditis - Inflammation of the choroid.

Ciliary Body - A portion of the vascular layer between the iris and the choroid, which consists of ciliary processes and ciliary muscle.

Color Deficiency - Diminished ability to perceive differences in color - usually for red or green, rarely for blue or yellow.

Colour Vision – The ability to discriminate objects based on wavelengths of light.

Computer Vision Syndrome – Eye and vision related problems resulting from prolonged focus on a computer screen or digital device.

Concave Lens - A lens in which both surfaces curve inward, so it produces focal power by diverging parallel rays of light. It is also called a minus lens and is denoted by a minus sign.

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Congenital - Present at birth.

Conjunctiva - Mucous membrane which lines the eyelids and covers the front part of the eyeball.

Conjunctivitis - Inflammation of the conjunctiva.

Contact Lenses - Lenses that are placed on the corneal surface or sclera. They have either an optical, therapeutic or cosmetic purpose.

Contrast Sensitivity – A measurement which determines the observer’s ability to see a wide range of everyday objects under normal and reduced illumination conditions.

Convergence - The process in which the visual axes of the two eyes are directed toward the same near point, with the result that the eyes are turned inward.

Convex Lens - A lens in which both surfaces curve outward, so it produces focal power by converging parallel rays of light to a focal point. It is also called a plus lens and is denoted by a plus sign.

Cornea - The transparent, dome-shaped tissue covering the iris and the pupil. The front “window” of the eye, approximately 12mm in diameter, responsible for approximately 2/3 of the refractive power of the eye.

Corneal Abrasion - An erosion of the superficial layer of the epithelium of the cornea (missing or injured cells); normally quite painful.

Corneal Edema - Excessive accumulation of fluid in the cornea, due to disturbance in the mechanism of fluid exchange.

Corneal Topography – A non-invasive imaging technique for mapping the corneal curvature in three dimensions.

CR-39 – A conventional plastic ophthalmic lens material.

Crystalline Lens - The transparent lens which is suspended inside the eye immediately behind the iris. It is responsible for approximately 1/3 of the refractive power of the eye.

Cup-to-disc ratio (C/D) – the relationship between the size of the optic cup and the optic disc of the optic nerve.

Cycloplegic - A drug that temporarily paralyzes the ciliary muscle and dilates the pupil; often used to ascertain the refractive error.

Cylindrical Lens - A toric lens, that is, one which has differing radii of curvature in different meridians, which causes the refractive power to vary in the different meridians; used to correct astigmatism.

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Dacryocystitis - Inflammation of the lacrimal sac.

Daily Wear – Contact lenses worn during the waking hours (i.e. not overnight).

Dark Adaptation - The ability of the eye to adjust to a dimly lit environment.

Datum Line – The horizontal line that runs through the vertical center of a frame.

Decentration - The displacement of the optical centre of an eyeglass lens (i.e., not placing it in the geometric centre of the frame). This is done purposely to place the optical centre in line with the visual axis of the eye or to induce prism.

Depth Perception - The ability to perceive the relative position of objects in space.

Dermatochalasis – Excess eyelid skin drooping over eye.

Deuteranopia – A red-green colour deficiency resulting from an insensitivity to green light.

Diastolic Pressure – The pressure in the arteries when the heart is at rest between beats. It is the bottom number in a blood pressure reading (i.e. 120/80 – 80 is the diastolic pressure).

Diopter - A unit of measurement of strength or refractive power of lenses; also can refer to the relative curvature of a lens surface.

Diplopia - Double vision

Disposable Lens – Soft contact lens that is discarded after a specific period of time.

Distance Between Lenses (DBL) – The shortest distance between the nasal edges of 2 lenses.

Distometer – An instrument that measures vertex distance.

Drusen – Yellowish deposits under the retina made up of lipids (fatty protein).

Dyslexia - A dysfunction in which the ability to read is diminished due to neurological or other non-optical problems.

Ectropion – Turning out of eyelid.

Effective Diameter (ED) – Twice the distance from the geometric center of a lens to the furthest edge of a lens.

Emmetropia - The focal condition of the normal eye in which there is no refractive error.

Endophthalmitis - Inflammation of most of the internal tissues of the eyeball.

Endothelium – Innermost corneal layer which is a single layer of cells.

Endpiece – The outer part of the frame front where the temples are attached.

Entropion – Turning in of eyelid.

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Enucleation - Complete surgical removal of the eyeball.

Epi-retinal Membrane – Thin fibrous tissue that forms on the retina.

Epithelium – Outermost layer of the cornea.

Esophoria - A tendency of the eyes to turn too far inward under certain conditions.

Esotropia - A condition in which one or both eyes turn too far inward at all times; sometimes called convergent strabismus or crossed eyes.

Exophoria - A tendency of the eye to turn too far outward under certain conditions.

Exophthalmos - An abnormal protrusion of the eyeball.

Exotropia - A condition in which one or both eyes turn too far outward at all times; sometimes called divergent strabismus.

Extraocular/ Extrinsic Muscles – Six muscles that are responsible for moving the eye. Each eye has four recti and two oblique muscles.

Exudate – Yellowish lesions (lipid proteins) found within the retina from leaking blood vessels caused by systemic diseases.

Extended Wear (Continuous Wear) – Contact lenses that can be worn during sleep.

Eye Dominance - The tendency of one eye to assume the major function of seeing, being assisted by the less dominant eye.

Eyewire – The portion of a frame that surrounds the lens.

Face Form – The curve on the front of a frame. Also referred to as “wrap”.

False Negative – Failing to see a stimulus that was previously seen (i.e. patients who become tired during visual field testing).

False Positive – Seeing a stimulus when one is not present (i.e. trigger happy patients during visual field testing).

Far-sightedness - See “Hyperopia.”

Field of Vision (Visual Field) - The entire area which can be seen without shifting the gaze.

Fitting Cross – The location of a lens sitting right in front of a patient’s pupil.

Fitting Triangle – When a frame touches the head only on the nose and against the sides of the head around the ears.

Fixate - The ability of an eye to move so an image is focused on the fovea.

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Floaters - Small particles consisting of cells or fibrin which move in the vitreous.

Fluorescein Angiography – Technique for examining the circulation of the retina and choroid using a fluorescein dye that is injected into the veins and viewed using a specialized camera.

Focus - The point at which rays are converged after passing through a lens.

Fornix - The pocket formed where the bulbar conjunctiva meets the palpebral conjunctiva.

Fovea - A small depression in the central retina at the back of the eye; the part of the macula adapted for most acute vision.

Frame PD – The horizontal distance between the geometric centers of two lenses.

Fresnel prism - A series of small prisms in a plastic sheet, which attach to eyeglass lenses to temporarily correct for eye misalignments.

Fundus - The back of the eye including the retina, optic nerve, macula and fovea.

Fusion - The power of coordinating the images received by the two eyes into a single image.

Gas Permeable Lenses - Contact lenses that allow oxygen and carbon dioxide to pass through them. This usually refers to a rigid lens, although soft lenses are also gas permeable.

Geocenter – The intersection of the datum line and horizontal centers of each lens shape.

Giant papillary conjunctivitis (GPC) - Is a long-term hypersensitivity or allergic reaction, resulting in bumps called papillae developing on the underside of the upper eyelid, usually accompanied by mucus discharge and itching.

Glare - Caused by a brightness greater than the eyes can adjust to.

Glaucoma - A disease in which vision is lost due to damage of the optic nerve, it is often associated with increased pressure inside the eye.

Gonioscope - A magnifying device which is placed on the cornea and, in conjunction with strong illumination, is used to examine the angle of the anterior chamber.

Grave's Disease – Autoimmune thyroid disease that causes protrusion of the eyes.

Half-eye – A frame designed to sit lower on the nose, to allow a patient to read and to look over the top to see distance.

Hemianopsia - Blindness of one half the field of vision of one or both eyes.

Hepatitis B – An infectious disease caused by a virus that affects the liver.

Heterochromia – Different colored irises.

Human Immunodeficiency Virus (HIV) – A disease caused by a virus that weakens the immune system and can lead to AIDS.

Hybrid Lens – A contact lens that has both soft and gas permeable materials.

Hyperopia – Often called farsightedness. Also known as hypermetropia. A refractive condition resulting from the tendency of rays of light to be out of focus on the retina when accommodation is relaxed. If the light rays could do so, they would reach their focal point behind the retina. In mild amounts this causes blurred vision at near. In higher amounts, vision is blurred at all distances.

Hyperphoria - A tendency of one eye to deviate upward under certain conditions.

Hypertension – High blood pressure. A medical condition in which the blood pressure within the arteries is persistently elevated.

Hypertropia - A condition in which one eye deviates upward all the time.

Hyphema – Blood in the anterior chamber in the eye.

Hypophoria - A tendency of one eye to deviate downward under certain conditions.

Hypotropia - A condition in which one eye deviates downward all the time.

Injection - A term used sometimes to mean congestion of ciliary or conjunctival blood vessels; redness of the eye.

Inner Canthus – Inner corner of the eye where the upper and lower eyelids meet.

Instrument Myopia – Occurs when looking into an optical instrument and the person focuses their eyes closer than needed to see the image.

Interpupillary Distance (PD) – Also called pupillary distance (PD), is the distance between the centers of the pupils of each eye (measured in millimeters).

Intraocular Lens (IOL) – An artificial lens that is implanted in the eye during cataract surgery to replace the anatomical lens.

Intraocular Pressure (IOP) – The fluid pressure or tension within the eye measured in millimeters of mercury (mmHg)

Iris - Colored, circular muscle tissue behind the cornea and immediately in front of the crystalline lens. The iris regulates the amount of light entering the eye by changing the size of the pupil.

Iritis - Inflammation of the iris; the condition is marked by pain, inflammation, discomfort from light, contraction of pupil, discoloration of iris.

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Jaeger Test - A test for near vision; lines of reading matter printed in a series of various sizes of typeface.

K-readings - Corneal curvature measurements taken with a keratometer

Keratitis - An inflammation of the cornea.

Keratoconjunctivitis Sicca – Dry eye condition.

Keratoconus - A progressive disease where the central corneal tissue protrudes forward dramatically, making the cornea somewhat cone-shaped.

Keratometry - The measurement of the anterior curvatures of the cornea with a keratometer.

Keratoplasty - The graft of a donor cornea to replace a damaged or diseased cornea.

Lacrimal Gland - A gland which secretes tears.

Lacrimation - Production of tears.

Lacrimal Sac – Upper part of the nasal lacrimal duct; receives tears from the canaliculi.

LASIK - Lasik stands for “Laser-assisted in situ keratomileusis” which is commonly referred to as laser eye surgery. This is a type of corneal refractive surgery for the correction for myopia, hyperopia and astigmatism.

Lateral - Toward the ear, away from the midline of the body.

Lateral Geniculate Body (LGB) – Relay center that receives information from the retina and transmits it to the occipital lobe in the brain.

Lazy eye/Amblyopia; decreased visual acuity in one or both eyes with no detectable cause.

Legal Blindness - Having central visual acuity of 20/200 or less in the better eye after correction; or having visual acuity of better than 20/200, but having a visual field of no greater than 20 degrees in the better eye.

Lens - A refractive medium having one or both surfaces curved.

Lens Blank – A lens before it has been edged (or cut) to fit into a frame.

Lens Calipers – An instrument used to measure the center thickness of a lens.

Lens Clock – An instrument for measuring the base curve of a lens.

Lens Height (B) – The vertical distance between the furthest top and bottom edges of a lens.

Lens Size (A) – The horizontal distance between the furthest temporal and nasal edges of a lens.

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Lensometer – A device (manual or automated) used to determine the prescription of an ophthalmic lens.

Leukocoria – White pupil.

Light Adaptation - The ability of the eye to adjust to an increased amount of light in the environment.

Limbus - The boundary between the cornea and sclera.

Low Vision – Although many definitions exist, typically binocular vision less than 20/60.

Low Vision Aids - Optical devices of various types useful to persons with vision impairment.

Macula (Macula Lutea) - The small area of the central retina that surrounds the fovea; this region provides the most distinct vision in the retina.

Major Reference Point (MRP) – The point on the lens where the prism is equal to that called for by the prescription. If an Rx has no prism, the optical center and the MRP are located at the same place; in an Rx with prism, the OC and the MRP are at different places.

Meibomian Gland - A gland located within the eyelids which secretes an oily layer of tear fluid.

Medial - Toward the nose or toward the midline of the body.

Minimal Blank Size (MBS) – The smallest lens blank that can be used to edge a given prescription.

Miotic - A drug that causes the pupil to contract.

Monocular – Refers to one eye only.

Monovision - A type of contact lens fitting in which one eye is corrected for distance vision and the other is corrected for near vision.

Mydriasis – Pupil dilation. As part of the light reflex, pupils dilate (enlarge) in dim lighting.

Mydriatic - A drug that dilates the pupil.

Myodisc – Ophthalmic lens used to correct very high myopic prescriptions.

Multifocal Lens - Eyeglass lens that incorporates several different optical powers and allows the wearer to see clearly at multiple distances.

Multiple Sclerosis (MS) – Autoimmune central nervous system disease causing demyelination of nerves.

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Myopia - Often called nearsightedness; a refractive error in which, because the eyeball is too long in relation to its focusing power, the focal point for rays of light from distant objects is in front of the retina. Once the light rays reach the retina, they are out of focus.

Nasal - Towards the nose or toward the midline of the body.

Near Point of Accommodation - The nearest point at which the eye can perceive an object distinctly. It varies according to the power of accommodation.

Near Point of Convergence - The nearest single point at which the two eyes can direct their visual lines, normally about three inches from the eyes in young people.

Near Vision - The ability to perceive distinctly objects at normal reading distance, or about fourteen to sixteen inches from the eyes.

Nearsightedness - See "Myopia."

Neovascularization - Formation of new blood vessels in a part of the eye. Can occur in the cornea when it does not receive enough oxygen.

Nevus – Birthmark, freckle, or mole.

Night Blindness - A condition in which vision diminishes greatly in faint light.

Nystagmus - An involuntary, rapid movement of the eyeball; it may be lateral, vertical or rotary.

Oblique Astigmatism – When the strongest (steepest) and weakest (flattest) meridians of a lens are not at 90° and 180 but rather at 45° and 135°.

Occluder – An opaque or translucent device that is placed before an eye to block vision.

Oculus Dexter (O.D.) - Right eye

Oculus Sinister (O.S.) - Left eye

Oculi Uniter (O.U.) - Both eyes

Ophthalmologist – A medical doctor who specializes in diagnosis and treatment of defects and diseases of the eye, performing surgery when necessary or prescribing other types of treatment; formerly called an oculist.

Ophthalmoscope - An instrument used to examine the interior of the eye.

Optic Atrophy - Degeneration of the nerve tissue, which carries messages from the retina to the brain.

Optical Center – The location in a lens where light will pass through without being bent.

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Optical Cross (Power Cross) – Represents an imaginary lens in which the power is labeled for both principal meridians, which are always 90 degrees apart.

Optic Chiasm – Location where optic nerve fibres cross over in the brain.

Optic Disk - Head of the optic nerve in the eyeball where the retinal nerve fibres leave the eye; responsible for the physiological blind spot.

Optician - One who dispenses frames and lenses, based on a prescription written by an Optometrist or Ophthalmologist; grinds lenses, fits them into frames, and adjusts the frame to the wearer.

Optic Nerve - The nerve which carries visual messages from the retina to the brain.

Optic Neuritis - Inflammation of the optic nerve.

Optic Tract – Extension of the optic nerve within the brain located beyond the optic chiasm.

Optometrist - A primary health care provider specializing in diagnosing and treating diseases and optical disorders of the eye, prescribing lenses, vision training, medicines and other treatments.

Optyl – Plastic frame material that has a “memory”. It can be bent into any shape when heated and cooled. When heated again, it will return to its original shape.

Orbital Cellulitis – An infection of the soft tissue of the orbit posterior to the orbital septum.

Orthokeratology - The practice of purposely flattening the cornea with a specially designed contact lens. Primarily used to reduce or eliminate myopia.

Orthoptic Training - series of scientifically planned exercises for developing or restoring the normal teamwork of the eyes.

Outer Canthus – Outer corner of the eye where the upper and lower eyelids meet.

Pachymetry – Measuring the thickness of the cornea.

Palpebral - Pertaining to the eyelid.

Palpebral Fissure – The space between the upper and lower eyelids.

Panretinal Laser Photocoagulation – Heat from a laser used to destroy leaking blood vessels in the retina.

Pantoscopic Tilt - The angle of an eyeglass lens in relation to the vertical plane.

Perimeter - An instrument for measuring the field of vision.

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Peripheral Vision - The ability to perceive the presence, motion or color of objects outside of the direct line of vision.

Phacoemulsification – An ultrasound technique used during cataract surgery to remove the natural lens in the eye.

Phakic - Refers to an eye that still possesses its natural lens.

Phoria - A latent deviation in which the eyes tend to turn from the normal position for binocular vision. See “esophoria,” “exophoria,” “hyperphoria,” and “hypophoria.”

Phoropter – An instrument for determining the refractive and binocular state of the eye.

Photochromic – Lens tints that lighten and darken according to the amount of UV the lens is exposed to.

Photophobia/ Photosensitivity - Abnormal sensitivity to and discomfort from light.

Photopsia – Flashes of light.

Photoreceptors – See “Rods and Cones”.

Pingeculae – Yellow-white deposit on the conjunctiva.

Plano – A lens with no prescription.

Plano-Cylinder Lens – A lens where one principle meridian has no power. They are used for the correction of simple hyperopic astigmatism and simple myopic astigmatism.

Polarization – A type of ophthalmic lens coating that screens out horizontal reflections and reduces glare.

Polycarbonate – High index plastic ophthalmic lens material that is impact resistant.

Posterior Capsular Opacification (PCO) – Haziness of the lens capsule secondary to cataract surgery.

Posterior Chamber - The narrow space between the back of the iris and the front surface of the crystalline lens, bounded by the ciliary body and filled with aqueous.

PRK – Stands for “Photo refractive Keratectomy”. Is a type of laser eye surgery where the outer layer of the cornea is removed.

Prentice’s Rule - Formula for calculating the prismatic effect induced at any point in a lens; prism diopters equal decentration (in cm) times lens power in diopters.

Presbyopia - A condition common after age forty in which a gradual lessening of the eye’s power of accommodation causes difficulty in seeing near objects.

CCOA® Program

Primary Visual Cortex – Area within the brain responsible for processing visual information.

Prism - A triangular, wedge shaped lens that bends, but does not focus, light rays toward the position of its base.

Prism Ballast - When a contact lens is thicker and heavier at the bottom, so that it will remain oriented in a specific position.

Progressive Addition Lens – Also referred to as a “PAL”, a lens that gradually increases in plus power towards the bottom of the lens.

Prosthesis - An artificial substitute for a missing eye (or other missing part of the body).

Protanopia – A red-green colour deficiency resulting from an insensitivity to red light.

Pseudoisochromatic Charts - Charts with colors dots of various hues and shades indicating numbers, letters or patterns, used for testing color discrimination.

Pseudophakia – An eye whose natural lens has been replaced by an artificial one.

Pseudotumor Cerebri – Neurological disorder characterized by increased pressure within the skull in the absence of a tumor or disease.

Pterygium - A triangular fold of growing membrane which invades the cornea; usually on the medial side.

Ptosis - A paralytic drooping of the upper eyelid.

Punctal Plugs – Tiny plugs that are inserted into the lacrimal puncta to block drainage of tears as treatment of dry eye.

Puncta (Lacrimal puncta) – Small drainage holes located along the upper and lower eyelid margins.

Pupil - The circular opening in the centre of the iris which regulates the amount of light that enters the eye.

Pupillometer – A device that measures the interpupillary distance (PD).

Radial Keratotomy – Refractive surgical procedure that was used to correct myopia in the past by making several incisions into the cornea.

Refraction - In optics, refraction is the bending of light rays as they travel from one medium to another. Also, a test to determine the refractive error of an eye and the best corrective lenses to be prescribed.

Refractive Error - A defect in the visual system of the eye that prevents light rays from being brought to a single focus exactly on the retina.

CCOA® Program

Retina - A thin membrane lining the back of the eye where optical images are received. The retina converts these images into electronic impulses and transmits them to the brain along the optic nerve.

Retinal Detachment - A separation of the retina from the choroid.

Retinitis - An inflammation of the retina.

Retinitis Pigmentosa - A hereditary degeneration and atrophy of the retina, which is usually accompanied by misplaced pigment in the retina.

Retinoblastoma – Most common form of eye cancer affecting children.

Retinopathy - A disease of the retina, due to various causes.

Retinopathy of Prematurity – Disease of the eye affecting pre-maturely born infants resulting in abnormal retinal blood vessels.

Retinoscope - An instrument for determining the refractive state of the eye by observing the movements of lights and shadows across the pupil by the light thrown onto the retina from a moving mirror.

Retroscopic Tilt – Occurs when the bottom eyewires of a frame are further from the face than the top eyewires.

Rods and Cones - These are two types of nerve cells which form a layer of the retina and act as light receiving media. Cones are concerned with visual acuity and color discrimination; rods with motion and vision at low degrees of illumination (night vision).

Safety Glasses - Impact-resistant spectacles, which are available with or without visual correction for protection of the eyes in hazardous situations.

Schlemm's canal – Area within the eye where aqueous humor passes from the anterior chamber into the episcleral vessels.

Sclera - The white part of the eye - a tough covering which, with the cornea, forms the external protective coat of the eye.

Scleral Contact Lens – Rigid contact lenses that vault over the cornea and are supported by the sclera.

Scleritis - Inflammation of the sclera.

Scotoma - A blind or partially blind area in the visual field.

Segment – Also referred to as "seg", an area of a lens with power differing from that of the main portion.

CCOA® Program

Segment Height – The height at which a bifocal/multifocal is placed in a lens based on the relationship of the patient’s facial structure to the shape of a frame.

Silicone Hydrogel – Soft contact lens material.

Single Vision Lens – A lens having one focal length and spherical base curve.

Sjogrens Syndrome – An inflammatory disease characterized by dry eyes and mouth.

Slab-off - See “Bicentric Grind.”

Slit Lamp – See “Biomicroscope.”

Snellen Chart - Used for testing distance visual acuity. It consists of lines of letters, numbers or symbols in graded sizes drawn to Snellen measurements. Each size is labeled with the distance at which it can be read by the normal eye. Most often used for testing vision at 20 feet.

Soft Lens - A contact lens made of soft plastic that contains water and allows for oxygen transmission. Soft lenses are characterized by comfort and ease of adaptation.

Specific Gravity – Indicates the weight of a lens in grams per centimeter. The higher the number, the heavier the lens material.

Spherical Equivalent – Calculated using the sphere power plus half the cylindrical power.

Spherical Lens - A lens, which refracts rays of light equally in all meridians.

Spherocylinder Lens – The two principal meridians are different in power, and neither one is plano. They are used to the correction of compound hyperopic astigmatism, compound myopic astigmatism, and mixed astigmatism.

Sphygmomanometer – An instrument used to measure blood pressure.

Stereoscopic Vision/Depth Perception - The ability to use both eyes together to perceive the relative position of objects in space.

Strabismus/Tropia/Squint - This is a failure of the two eyes simultaneously to direct their gaze at the same object because of muscle imbalance.

String-Mounted Frame – A frame that holds a lens in place with only a small reinforcing arm and a very fine nylon cord. Also referred to as a nylon cord frame.

Stroma – Thickest corneal layer located between Bowman’s membrane and the Descemet’s membrane.

Stye/Hordeolum - Acute inflammation of a sebaceous gland in the margin of the eyelid, due to an infection and usually resulting in the formation of pus.

Surfactant – Cleaning agents that are used to remove contact lens deposits.

CCOA® Program

Systolic Pressure – The amount of pressure that blood exerts on a vessel while the heart is beating. It is the top number in a blood pressure reading (i.e. 120/80 – 120 is the systolic pressure).

Telescopic Glasses - Magnifying spectacles founded on the principles of a telescope; occasionally prescribed for improving very poor vision which cannot be improved by ordinary glasses.

Temple – Attaches to the frame front and wraps around the patient's ears.

Temporal - Toward the ear, away from the midline of the body.

Tonometer - An instrument for measuring pressure inside of the eye.

Toric - Lens with two different power curves at defined optical axes, used to correct astigmatism.

Trabecular Meshwork – Area within the eye responsible for draining aqueous humor.

Trabeculectomy – Surgical removal of part of the trabecular meshwork used in the treatment of glaucoma to lower the intraocular pressure.

Trabeculoplasty – Laser treatment on the trabecular meshwork used in the treatment of glaucoma to assist the flow of aqueous humor.

Transpose - To convert the prescription of a sphero-cylindrical lens into the oppositely powered cylinder form (a plus cylinders into minus, or vice versa).

Trichiasis – Eyelashes grow inward.

Trichromatic Colour Vision – Normal colour vision derived from having three types of functioning cones.

Trifocal – Lenses that have three areas of viewing, each with its own power.

Tritanopia – A rare form of colour blindness resulting from an insensitivity to blue light.

Trivex – Impact resistant ophthalmic lens material.

Truncation - A flattening of the lower edge of a contact lens, so that it will remain oriented in a specific position.

Tunnel Vision - Contraction of the visual field to such an extent that only a small area of central visual acuity remains, thus giving the affected individual the impression of looking through a tunnel.

Uveal Tract - The entire vascular layer of the eyeball, including the iris, ciliary body, and choroid.

Vasoconstriction – Narrowing of the blood vessels.

CCOA® Program

Vertex Distance - The distance from the front surface of the eye to the back surface of the spectacle lens.

Vision - The art or faculty of seeing; sight.

Visual Acuity - The resolving power of the eye, or the ability to see two separate objects as separate. Ability of the eye to perceive the shape of objects in the direct line of vision, usually measured in terms of a Snellen fraction, e.g. 20/20.

Vitreotomy – Surgical removal of the vitreous.

Vitreous Humor (Vitreous) – The gelatinous transparent, colorless substance filling the space in the eyeball between the crystalline lens and the retina.

With-the-rule Astigmatism – When the steepest meridian of a prescription/lens lies near 90 degrees.

Zonules - Radially arranged fibers that suspend the lens from the ciliary body and hold it in position.



Common Ophthalmic Abbreviations

A	Applanation Tensions
a.c.	Before Meals
AACG	Acute Angle Closure Glaucoma
Abd	Abduction, Turn Out
AC	Allen Cards
Acc	Accommodation
ACG	Angle Closure Glaucoma
Add	Adduction, Turn In, Addition
AGFX	Air Gas Fluid Exchange
AION	Acute Ischemic Optic Neuropathy
ALN	Allen Pictures
ALP	Argon Focal Laser
ALT	Argon Laser Trabeculoplasty
AMD	Age Related Macular Degeneration (alternative)
APD	Afferent Pupillary Defect
ARC	Abnormal Retinal Correspondence
ARMD	Age Related Macular Degeneration
ARN	Acute Retinal Necrosis
ASC	Anterior Subcapsular Cataract
AT	Artificial tears
B	Bilateral
b.i.d. or b.d.	Twice Daily
BCVA	Best Corrected Visual Acuity
BD	Base Down
BI	Base In
BILT IOOA	Bilateral Inferior Oblique Over Action
BLR	Bilateral Lateral Rectus
BMR	Bilateral Medial Rectus
BO	Base Out
BOT	No Tears or Breaks in Retina
BRAO	Branch Retinal Artery Occlusion
BRVO	Branch Retinal Vein Occlusion
BSL	Bandage Soft Contact Lens
BU	Base Up
C/D	Cup to Disc Ratio
C/O	Complications
c/o	Complain of

CACG	Chronic Angle Closure Glaucoma
Cat	Cataract
CB	Ciliary Body
CC	Cortical Clouding, Cataract
cc	With Correction
CE/IOL	Cataract Extraction with Implant of Intraocular Lens
CELCT	Cell Count
CF	Counting Fingers
CHBL	Check / Change / Bandage Lens
CL	Contact Lens
CL THERA	Contact Lens Therapeutic Contacts
CME	Cystoid Macular Edema
CMV	Cytomegalovirus
CNVM	Central Neovascular Membrane
COAG	Chronic Open Angle Glaucoma
CORAB	Corneal Abrasion
CPC	Cyclophotocoagulation
CPM	Continue Present Management
CRA	Chorioretinal Atrophy
CRAO	Central Retinal Artery Occlusion
CRVO	Central Retinal Vein Occlusion
CS	Cortical Spokes
CSDME	Clinically Significant Diabetic Macular Edema
CSM	Central, Steady, Maintained
CSME	Clinically Significant Macular Edema
CSR	Central Serous Retinopathy
CT	Cover Test
D	Diopter
D&Q	Deep and Quiet
D/C	Discontinue
d/c	Discharge
DD	Disc Diameters
DFE	Dilated Fundus Exam
DM	Diabetes Mellitus
DME	Diabetic Macular Edema
DMR	Double Maddox Rod
DMVP	Disc, Macula, Vessels, and Periphery

*This list is not inclusive of all medical abbreviations used by the physicians and medical personnel of the Spokane Eye Clinic, but the most commonly used acronyms have been referenced.



Common Ophthalmic Abbreviations

DSEK	Endothelial Keratoplasty
dVA	Distance Visual Acuity
E	Esophoria
E	Endolaser
E (Circled)	Erythromycin
E(T)	Intermittent Esotropia Distance
E'	Esophoria at Near
E'(T)	Intermittent Esotropia at Near
E'(t)	Intermittent Esotropia at Near
ECP	Endoscopic Cyclophotocoagulation
EDTA	Chemical Removal of Calcium Deposits
EOM	Extraocular Movement
EOM	Extraocular Muscle
EOMB	Extraocular Muscle Balance
ERM	Epi-retinal Membrane
ET	Esotropia for Distance
ET`	Esotropia for Near
EUA	Exam under Anesthesia
F + F	Fix and Follow
F/U	Follow-up
FA	Fluorescein Angiography
FB	Foreign Body
FHx	Family History
Flt	Flat
FTMH	Full Thickness Macular Hole
Fuchs	Fuchs Endothelial Corneal dystrophy
GDX	Diagnostic Glaucoma Test
gl	Glasses
GLC	Glaucoma
GLREF	Glasses Refraction
GRREM	Growth Removal
GT	Glasses trouble
gtt(s)	Drop(s)
GVF	Goldman Visual Field
H/O	History of
HFH	Holy Family Hospital
HM	Hand Movements or Hand Motion

HSV	Herpes Simplex Virus
HZV	Herpes Zoster Virus
HVF	Humphrey Visual Field
I	Indirect Laser
i.c.	Between Meals
I.P.D.	Interpupillary Distance
IO	Inferior Oblique
IMG	Inspissated Meibomian Glands
INT-REQ	Interpreter Requested
IO	Inferior Oblique (Muscle)
IOAI	Intraocular Avastin Injection
IOFB	Intraocular Foreign Body
IOLI	Intraocular Lucentis Injection
IOOA OU	Inferior Oblique Over Action Both Eyes
IOP	Intraocular Pressure
IOSI	Intraocular Steroid Injection
IR	Inferior Rectus Muscle
J1,J2,J3 etc.	Test Types for Reading Vision
JRA	Juvenile Rheumatoid Arthritis
KC	Keratoconus
KCS	Keratoconjunctivitis Sicca
KP	Keratic Precipitates
L & A	Light and Accommodation
L Hypo	Left Hypotropia
L/M	Left Message
LGS	Lissamine Green Stain
LH	Lid Hygiene
LH	Left Hyperphoria
LHT	Left Hypertropia
LIO	Laser Indirect Ophthalmoscopy
LKP	Lamellar Keratoplasty
LMTCB	Left Message to Call Back
LOE	Loss of Eye
LOV	Loss of Vision
LP	Light Perception
LPI	Laser Peripheral Iridotomy
LR	Lateral Rectus (Muscle)

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Common Ophthalmic Abbreviations

LR	Lateral Rectus
LTG	Low Tension Glaucoma
LTP	Laser Trabeculoplasty
LWLID	Lower Lid Evaluation
M	Membrane Dissection
MACCK	Macular Degeneration Check
MACEV	Macular Degeneration Evaluation
MDF	Map Dot Finger Print Corneal Dystrophy
MH	Macular Hole
Mod.	Moderate
MR	Medial Rectus Muscle
MVA	Motor Vehicle Accident
N	Spokane Eye Clinic - North Clinic Office
N5, N6etc.	Test Types for Near Vision
NAG	Narrow Angle Glaucoma
ne rep.	Do Not Repeat
ni	No Improvement
NI, nl	Normal
NLD	Nasolacrimal Duct
NLD	Nasolacrimal Duct Obstruction
NLDO	Obstructed Nasolacrimal Duct
NP	New Patient
NPA	Near Point of Accommodation
NPC	Near Point of Convergence
NPDR	Non-proliferative Diabetic Retinopathy
NR	Non-reactive
NRC	Normal Retinal Correspondence
NS	Nuclear Sclerosis, Cataract
NTG	Normal Tension Glaucoma
NV	Neovascularization
NV or nVA	Near Vision
NVD	Neovascularization of Disc
NVE	Neovascularization Elsewhere
NVG	Neovascular Glaucoma
NVI	Neovascularization of Iris
OU	Both Eyes
O2	Oxygen

OAG	Open Angle Glaucoma
OCT	Ocular Coherence Tomography
oculent	Eye Ointment
OD	Right Eye
OHT	Ocular Hypertension
ON	Optic Nerve
ONH	Optic Nerve Head
Or, Orx	Over-Refracton
ORB	Orb Scan
OS	Left Eye
OT	Ocular Tension
p.c.	After Meals
P.D.	Pupillary Distance
PBK	Pseudophakic Bullous Keratopathy
PC haze	Posterior Capsular Haze
PCP	Primary Care Physician
PCT	Prism Cover Test
PD	Prism Diopter
PDG	Pigment Dispersion Glaucoma
PDR	Proliferative Diabetic Retinopathy
PDS	Pigmentary Dispersion Syndrome
PDT	Photodynamic Therapy
PED	Pigment Epithelial Detachment
PFO	Perfluoron
PG	Pigmentary Glaucoma
PH	Pinhole
PI	Peripheral iridectomy/iridotomy
PK	Corneal Graft (Penetrating Keratoplasty)
PMF	Premacular Fibrosis
PO or per os	Orally, by Mouth
POAG	Primary Open Angle Glaucoma
PP	Pars Planitis
PPV	Pars Plana Vitrectomy
PPVD	Painless Progressive Decrease of Vision
PR	Pneumatic Retinopexy
PRN	As Needed
PRP	Pan Retinal Photocoagulation

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Common Ophthalmic Abbreviations

PSC	Posterior Subcapsular Cataract
PV	Preservation
pvtoric	PureVision Toric
PXE	Pseudoexfoliation
PXF	Pseudoexfoliation
PXFG	Pseudoexfoliative Glaucoma
q.2h.	Every 2 Hours
q.h.	Every Hour
q.i.d.	Four Times Daily
q.s.	Quantity Sufficient
qd	Daily, Once a Day
qhs	Nightly
qo	Every Other
R Hypo	Right Hypotropia
R/B/MO	Risk/Benefits/Management Options
r/o	Rule Out
R/S	Reschedule
RA	Rheumatoid Arthritis
RAPD	Relative Afferent Pupillary Defect
RD	Retinal Detachment
RECK	Recheck
RECKO	Recheck and Orthoptic Exam
REF	Refraction
RH	Right Hyperphoria
RHT	Right Hypertropia
RK	Radial Keratotomy
Rnd	Round
ROP	Retinopathy of Prematurity
RP	Retinitis Pigmentosa
RPE	Retinal Pigmentary Changes
RPE	Retinal Pigment Epithelium
RT	Retinal Tear
RUSRI	Rust Ring
RWC	Rockwood Clinic
S	Spokane Eye Clinic - South Clinic Office (Main Office)
S/P	Status Post
SB	Scleral Buckle

sc	Without Correction
SCH	Subconjunctival Hemorrhage
SEC	Spokane Eye Clinic
SESC	Spokane Eye Surgery Center
SHMC EXM	Sacred Heart Laser Exam
Sihi	Silicone Hydrogel
Sihy	Silicone Hydrogel
SiO	Silicone IOL
sl	Slight
sl66	Soflens 66
SLE	Slit Lamp Exam
SLT	Selective Laser Trabeculoplasty
SN	Snellen Letters
SO	Superior Oblique Muscle
SOC	Spokane Optical Company
sol	Solution
SPK	Superficial keratitis
SR	Superior Rectus Muscle
SRF	Subretinal Fluid
SRN	Sub Retinal Neovascularization
SS	Scleral Spur
ST	Schiotz tension
stat.	At Once
STK	Subtenons Kenalog Injection
Sub heme	Subconjunctival Hemorrhage
Sx	Surgery
T	Tension (Pressure)
T & C	Thin and Clear
t.i.d.	Three Times Daily
TAC	Teller Acuity Cards
Tapp	Pressure by Applanation
TBU	Tear Break Up
TEARDUCT	Tear Duct Evaluation
TM	Trabecular Meshwork
Tono	Tonometer Pressure Check
topo	Topography
Tr, tr	Trace

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Common Ophthalmic Abbreviations

Trab	Trabeculectomy
TRD	Traction Detachment
Ttono	Pressure by Tonopen
Tx	Treatment
U/S	Ultrasound
um	Micron
Ung	Ointment
UPLID	Upper Lid Evaluation
US	Ultrasound
V	Spokane Eye Clinic - Valley Clinic Office
V, Va,VA	Vision or Visual Acuity
V, Vit	Vitreotomy
V2	Vigamox Vexol
VA COMP	VA Comp & Pension
VAc or VAcc	Visual Acuity with Correction
Vas or VAsc	Visual Acuity without Correction
VF	Visual Field
VM	Voicemail
VMC	Valley Medical Center
VMT	Vitreomacular Traction
W	Wearing
W/U	Systemic Workup
W4D	Worth 4 Dots
WAVE	Wave Scan
WC	Warm Compress
X	Exophoria for Distance
X(T)	Intermittent Exotropia Distance
X(t)	Intermittent Exotropia Distance
X'	Exophoria at Near
X'(t)	Intermittent Exotropia at Near
X'T	Exotropia at Near
XP	Exophoria
XT	Exotropia
YAG	Yttrium Aluminum Garnet Laser

*This list is not inclusive of all medical abbreviations used by the physicians and medical personnel of the Spokane Eye Clinic, but the most commonly used acronyms have been referenced.

Anatomy and Physiology of the Eye

Dr. Abeer Saleh Hasan
PhD in CLinical Biochemistry

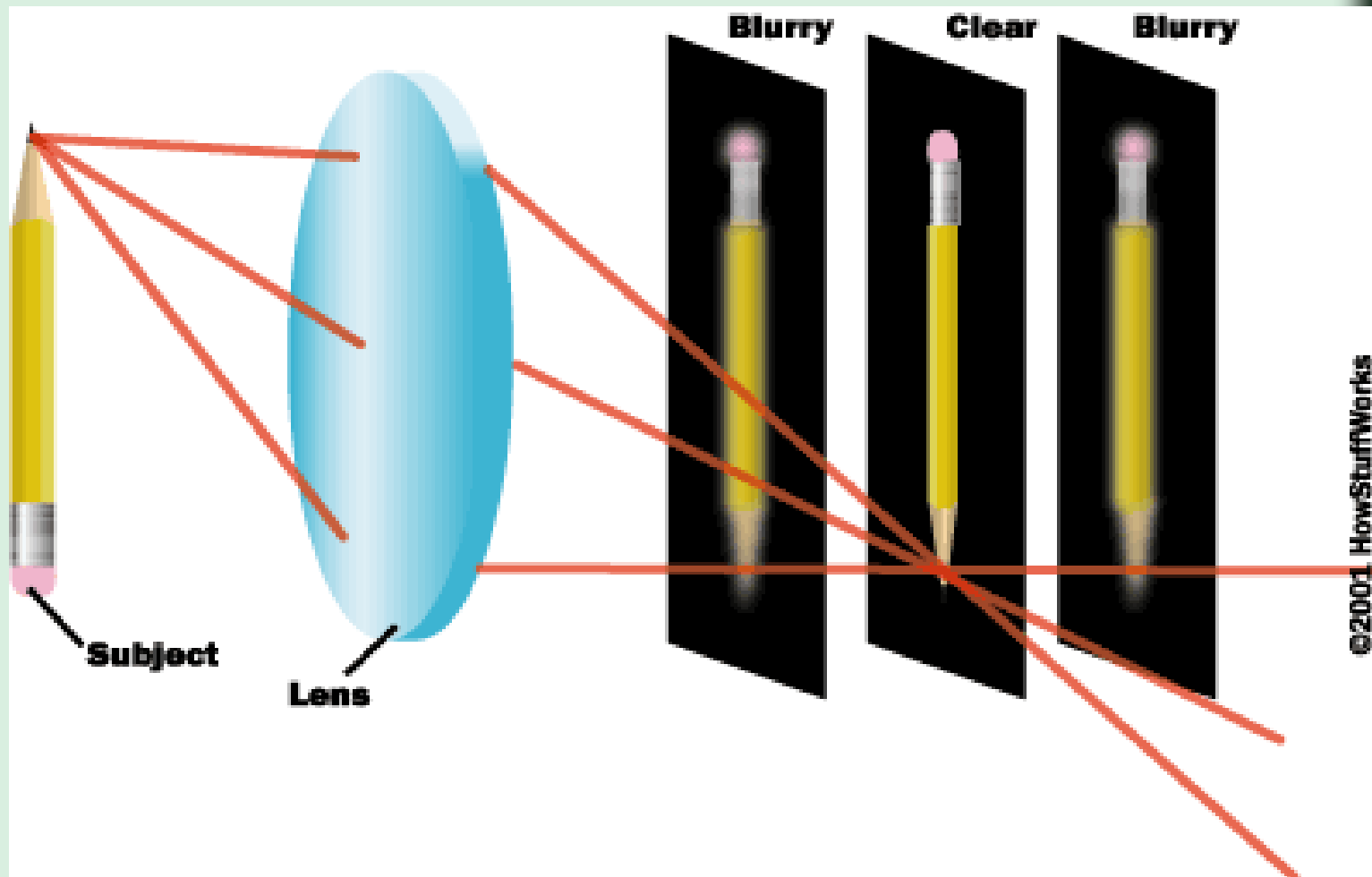


The Eye: The Body's Camera



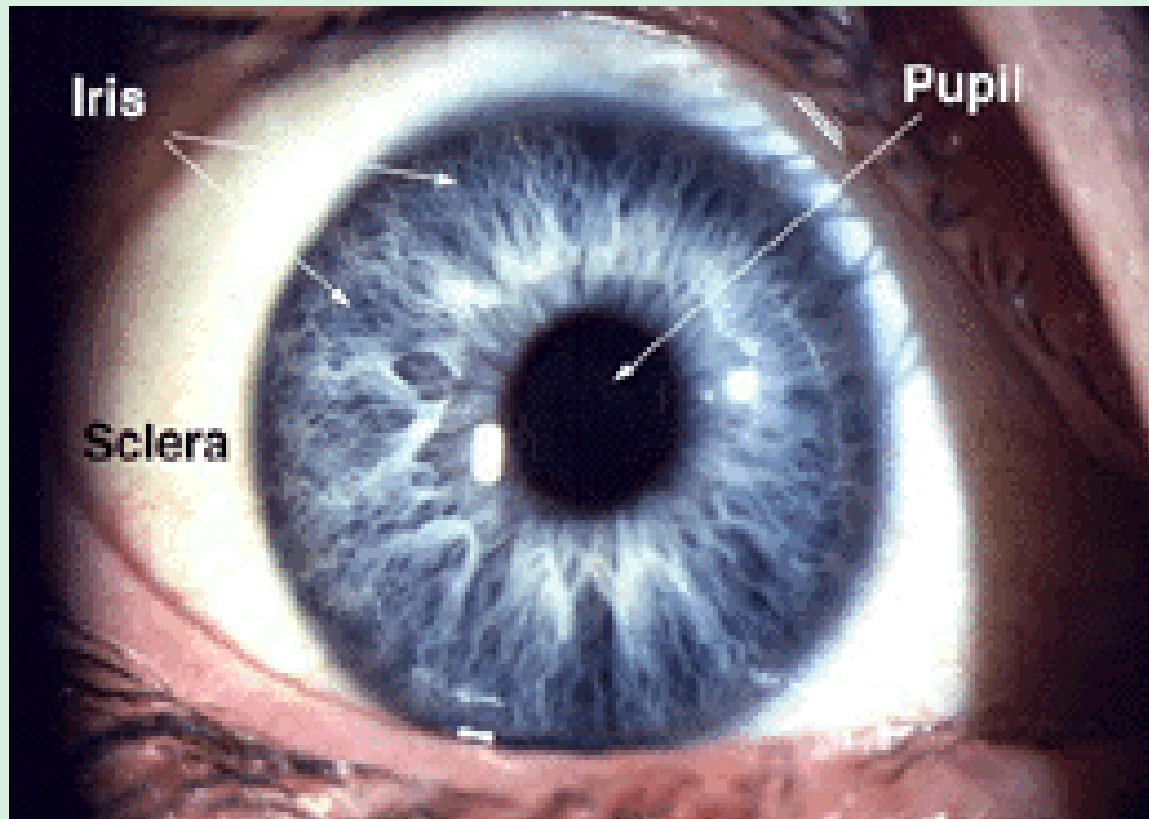
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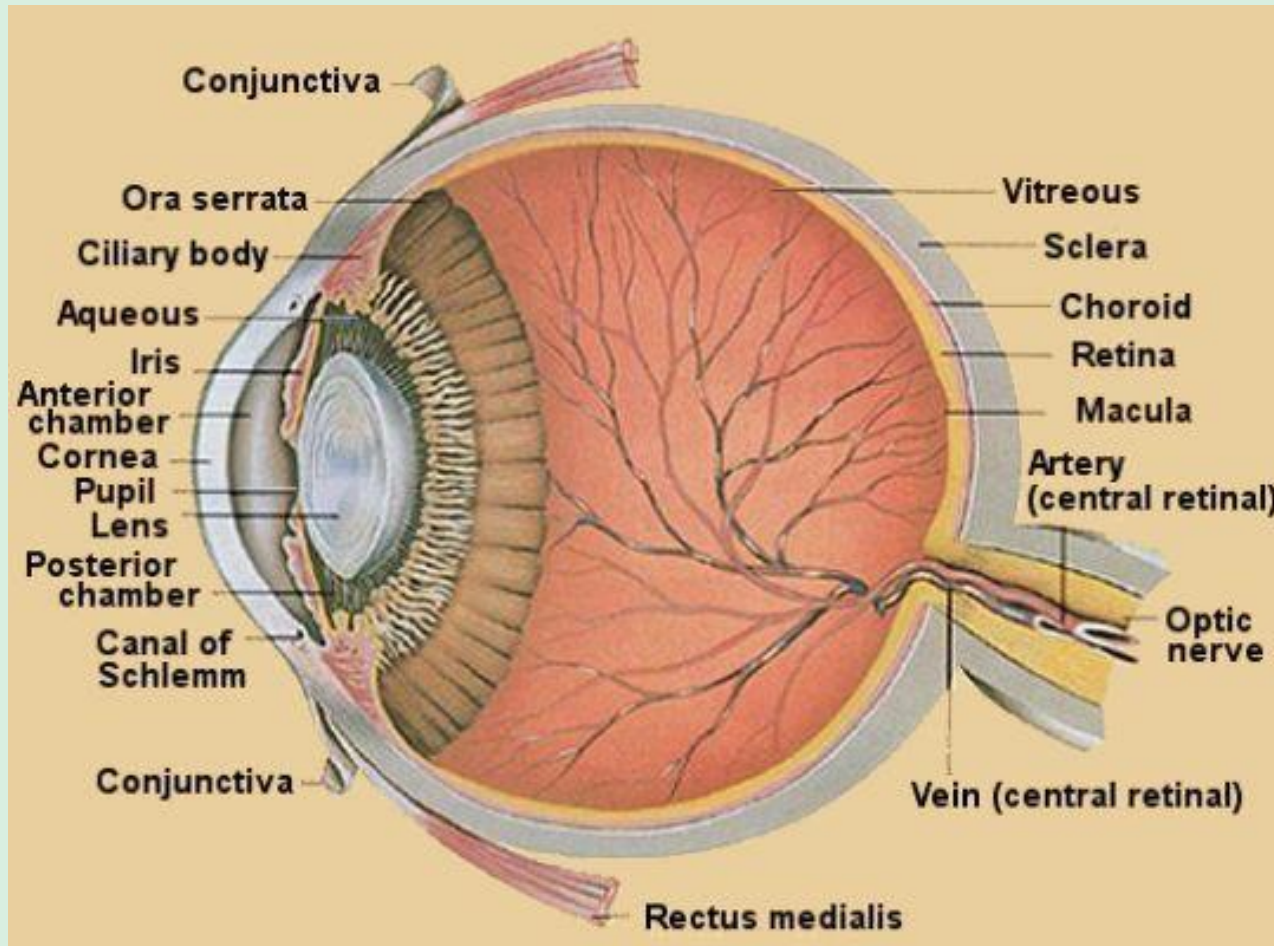


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The Eye



The Eye

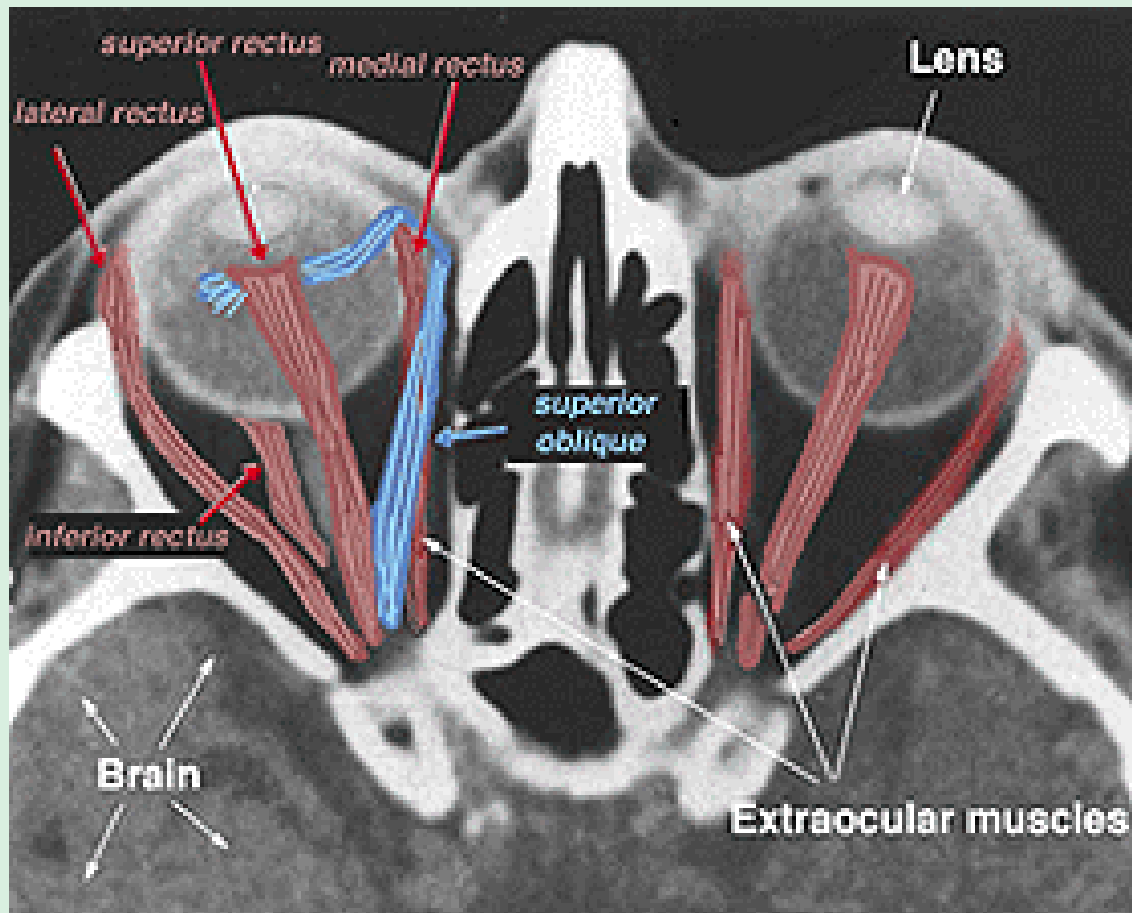


Protectors of the Eye

- Boney Orbit of the eye
- Exto-ocular muscles
- Eye lids
- Eye lashes
- Conjunctiva
- Tears (enzyme lysosyme inhibits bacterial growth)



Muscles of the Eye

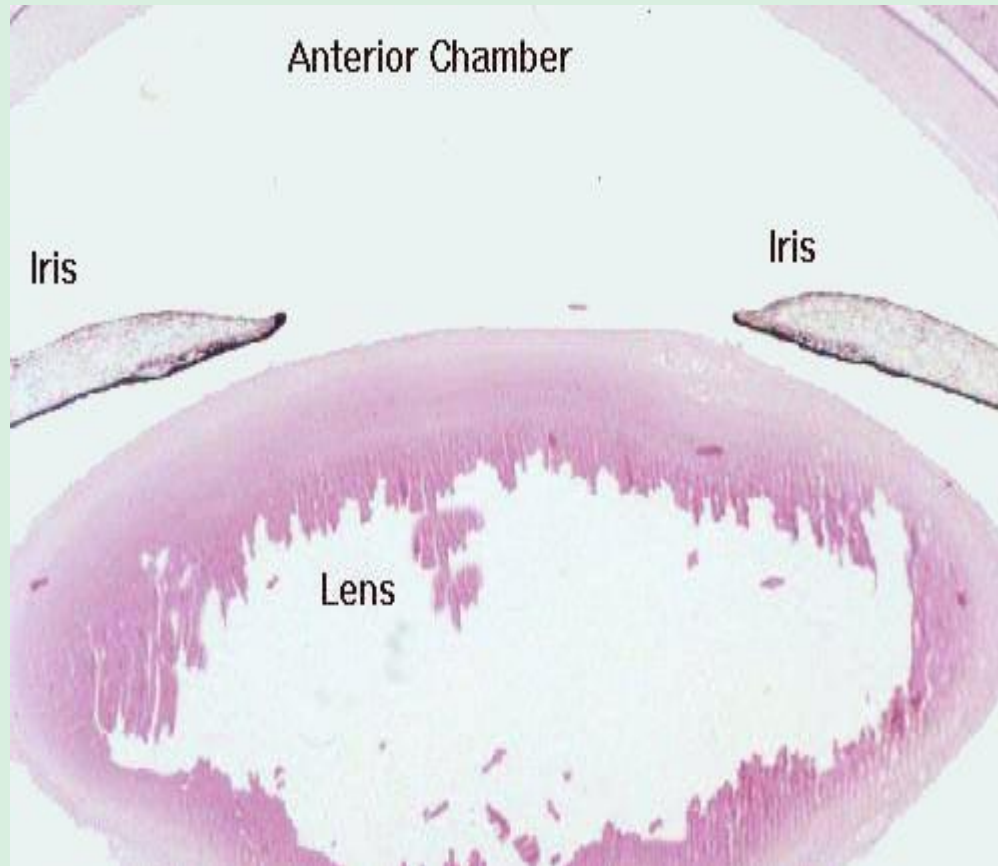


Extro-ocular Muscles of the Eye

- Attached to sclera and boney orbit of the eye
 - Lateral Rectus – outside side
 - Medial Rectus – nasal side
 - Superior Rectus – top
 - Inferior Rectus – bottom
 - Superior Oblique – diagonal on top
 - Inferior Oblique – diagonal on bottom



The anterior chamber



The Structure of the Eyeball

- The **Sclera**, - thick fibrous outer coat which gives resistance and durability to the eye.
- The **Chorioid** - delicate vascular coat which supplies nourishment to the inner layer of the retina.
- The **Retina** - photosensitive layer of the eye which translates the light impulses into electronic impulse which travels down the optic pathways to the brain.



Cornea

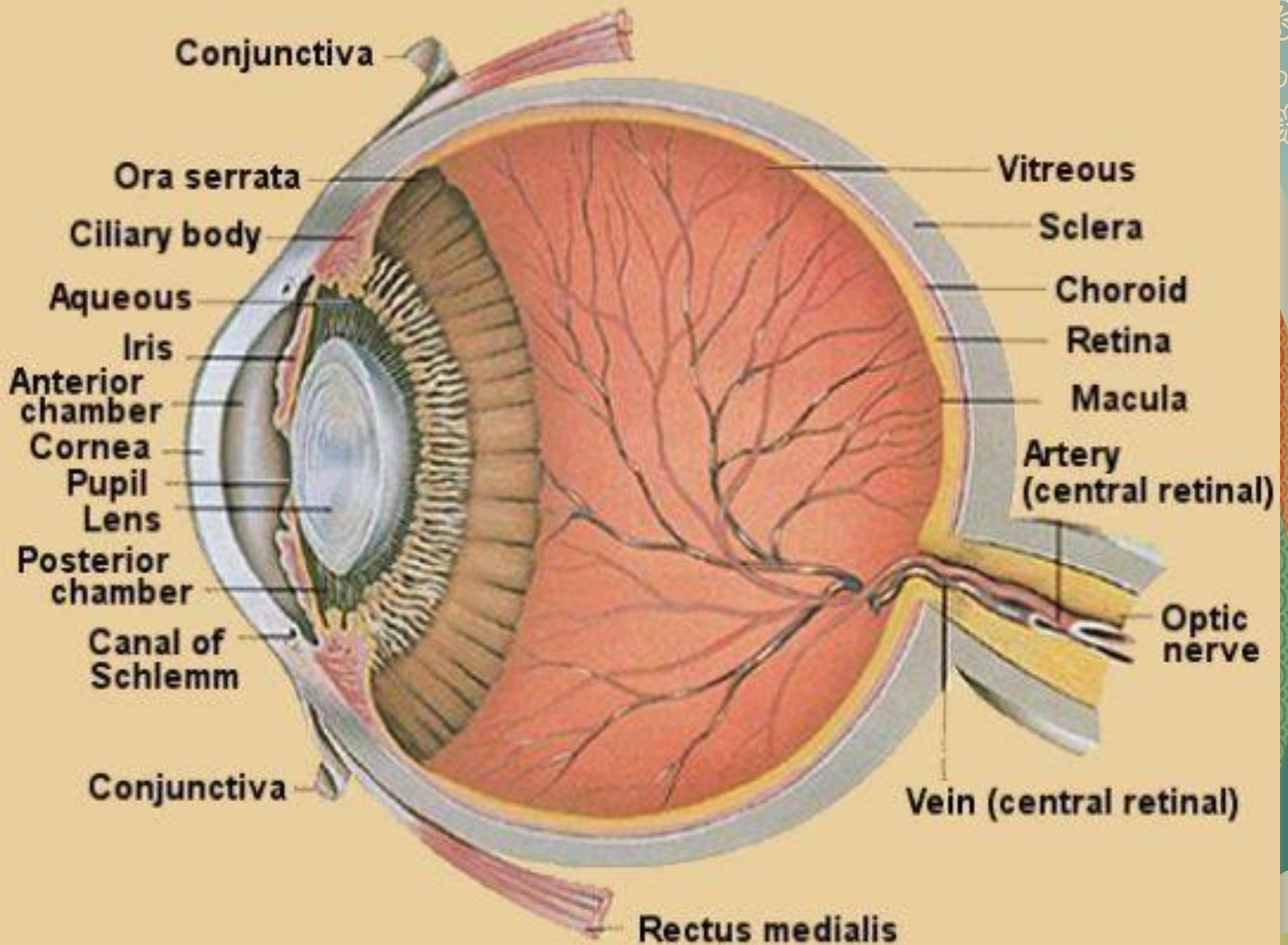
- Transparent avascular tissue with 5 distinct layers.
- Function is to allow light rays to enter the eye.
- Surrounded by a vascular layer known as the limbus which nourishes the cornea.
- Should be smooth and clear.



Layers of the Cornea

1. **Epithelium** (5-6 layers of cells)
2. **Bowman's layer**
3. **Stroma** (about 90% of the thickness)
4. **Descemet's layer** (clear membrane)
5. **Endothelium** (1 cell layer)





Flow of Aqueous Humor

- ⦿ Secreted by the **ciliary bodies** into the posterior chamber (between the iris and the lens).
- ⦿ Flows from the posterior through the opening of the iris (pupil) into the anterior chamber
- ⦿ Then flows through the **trabecular meshwork** into the **canal of Schlemm**
- ⦿ Then flows through the aqueous veins unto the surface of the eye, where is functions, in part, as a lubricant.



Tears

■ Normal Tears

- Lubricant
- Protect from bacterial infections
- Contain an **enzyme** called **lysozyme**

■ Reflect Tears

- Mostly water
- Back-up for irritation, emotions and dryness



Make-Up of Normal Tears

1. **Mucin**, which is a mucus like substance, produced by **goblet cells** that help adhere the tears to the eye and are produced deep inside the eyelids.
2. **Water**, which makes up about 90% of the tear, is produced by the **lacrimal glands** located under the brow of the eye.
3. Fatty oils called **lipids**, which are the outside layer, slow down the evaporation of the tears and are produced by the **meibomian** glands on the edge of the eyelids.



Iris and Pupil

- Iris is the colored part of the eye which acts as an aperture allowing more or less light in to the eye.
- The pupil is the opening at the center of the iris which changes size based on the action of the iris.



Lens

- The lens capsule is a biconvex, avascular, colorless almost clear structure which is suspended from ciliary bodies on the rim of the posterior section of the eye by tiny fibers called the zonules of Zinn.
- About 65% water and 35% protein
- Function is to help focus light waves onto the macula by changing the curvature of the lens
- No pain fibers, blood vessels or nerves in the lens.



Aqueous and Vitreous Humor

- Aqueous Humor is the clear liquid in the anterior chamber (front) of the eye.
- Aqueous humor is produced by the ciliary bodies.
- Vitreous Humor is the clear gelatinous fluid in the posterior chamber (back 2/3) of the eye.
- The outer surface of the Vitreous humor is attached to the retina.



Retina

- Thin semitransparent multi-layered sheet of neural tissue that lines the inner layer of the posterior section of the globe of the eye.



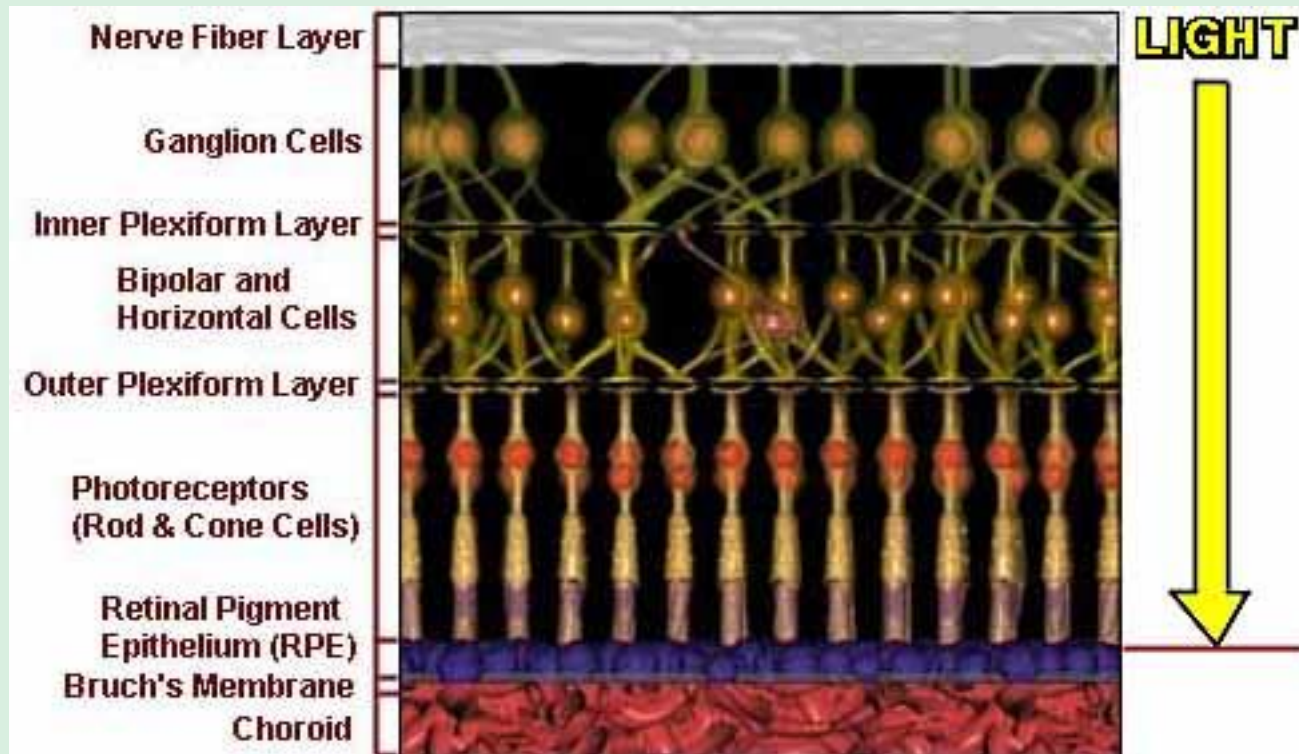
Layers of the Retina

(from the outside to the inner layer)

1. **Bruch's membrane**
2. **Retinal pigment epithelium**
3. **Photoreceptor cells layer (Rods and Cones)**
4. **External limiting membrane**
5. **Outer nuclear layer**
6. **Inner plexiform layer**
7. **Ganglion cell layer**
8. **Nerve fiber layer**
9. **Internal limiting membrane**



Layers of the Retina



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Web Sites

- ◎ American Academy of Ophthalmology
www.eyenet.org
- ◎ American Optometric Association
www.aoanet.org
- ◎ Fighting Blindness www.blindness.org
- ◎ Information About Specific Eye Diseases (RRTC)
www.blind.msstate.edu/irr/diseases.html
- ◎ National Eye Institute www.nei.nih.gov
- ◎ Prevent Blindness America
www.preventblindness.org

