

WHAT IS THE DIFFERENCE BETWEEN AN OPHTHALMOLOGIST AND AN OPTOMETRIST?

OPHTHALMOLOGIST

The ophthalmologist is a medical doctor (M.D.) specializing in the prevention, diagnosis, and medical as well as surgical treatment of vision problems and eye diseases. The ophthalmologist has completed four years of medical school and four-seven years of advanced medical training and specialization. An ophthalmologist may attend to such diverse problems as eyeglass prescriptions, contact lens prescriptions, repair of torn eyelids, eye conditions such as dry, drooping, crossed, or lazy eyes; or eye disorders such as glaucoma, cataract, retinal detachment, diabetic retinopathy, and visual problems from brain tumors. Ophthalmologists not only diagnose and treat eye diseases but also try to preserve vision through educating the public and patients about the best way to care for their eyes.

Country Hills Eye Center ophthalmologists are capable of treating the entire spectrum of eye conditions, they all practice general ophthalmology (with the exception of Dr. Scott Richards) and also concentrate on conditions related to a specific area of the eye. Dr. Scott Richards focuses on the retina and sclera, Dr. David Brodstein on glaucoma, Dr. Felt on orbital and plastic surgery, Dr. Hale on external eye diseases and corneal, and Dr. Brad Richards is referred to as a subspecialist. Some subspecialists focus on orbital and plastic surgery, or corneal and external eye diseases, cataract surgery or glaucoma.

OPTOMETRIST

The optometrist (O.D.) is an independent practitioner who has completed a course of four years in optometry school, but they do not have a medical degree. Optometrists are trained in the prescription of eyeglasses and contact lenses as well as in the detection of eye disease. Optometrists may diagnose and medically treat some general eye diseases (in this state) but they may not perform surgery and/or laser and do not have the medical training of ophthalmologists in the diagnosis and management of eye diseases.

OPTICIAN

The optician is a professional who has received two years of training before being licensed to make and dispense eyeglasses and contact lenses according to the prescriptions supplied by an ophthalmologist or optometrist.

SIGNS, SYMPTOMS, AND SYNDROMES

Disease processes can affect the vision of individuals and prompt them to seek the help of an ophthalmologist. The changes in vision they experience and the pain or other effects they feel are called **symptoms**. Abnormal changes observed by the physician on examination of the patient are called **signs**. Some signs and symptoms may be the same in a particular condition. However, distinction between the two terms is useful because symptoms tend to be more subjective or personal, while signs are usually objective. Both signs and symptoms are important in the diagnosis of disease. **Syndrome** is the term given to a set of signs and symptoms that is characteristic of a specific condition or disease.

CHIEF COMPLAINT

The chief complaint is the reason for the patient's visit to the doctor, except in those cases where the comprehensive eye examination is a periodic asymptomatic (absent of signs and symptoms) evaluation.

Define the chief complaint with the following questions:

1. What problem (s) are you experiencing?
2. When did the problem start?
3. Does the problem seem to be getting worse?
4. Are you able to do anything to decrease the problem?

Additional questions to ask:

1. Is vision affected in one eye or both, near and far vision?
2. Did the problem start suddenly or gradually?
3. Have you ever been treated for this problem?
 - a. If yes, you ask – How, When, and by Whom?

THE EYE AS AN OPTICAL SYSTEM

The globe is an almost perfect sphere that houses the optical structures directly involved in the visual process. The globe is often divided anatomically into two parts:

1. The front of the eye, the **anterior segment**, includes the structures between the front surface of the cornea and the vitreous.
2. The remainder of the eyeball, the **posterior segment**, is composed of the vitreous and the retina.

A-SCAN

A-scan ultrasonography uses sound waves traveling in a straight line to reveal the position of and distances between structures within the eye and orbit. This method is especially useful as a means of measuring the length of the eyeball, which must be known to calculate the power of an artificial lens to be implanted in the eye at the time of cataract extraction. A probe is placed on the patient's globe. The probe is attached to a device that delivers adjustable sound waves. The measurements are displayed as peaks on the screen of an oscilloscope. The appearance of the peaks and the distances between them can be correlated to locations within the eye and the distances between them.

AMSLER GRID TEST

The Amsler grid test determines the presence and location of defects in the central portion of the visual field. The grid is printed square of evenly spaced horizontal and vertical lines in a grid pattern, with a dot in the center. The chart grid and dot may be either white on a black background or black on a white background. The patient covers one eye, holds the grid in the other hand, stares at the grid, and reports if there is any blurred, distorted, or absence of vision. The patient marks the nature and location of his central defect (visual difficulties) on the grid. The physician may have the patient repeat this procedure at home and report any changes to his office.

BIOMICROSCOPY

Biomicroscopy, also called a **slit lamp**, consists of a microscope of low magnifying power and a light source that projects a rectangular beam that can be changed in size and focus. This instrument allows close examination of the lids and lashes, cornea, crystalline lens, membranes, and clear fluids within the eye in layer-by-layer detail. Ophthalmic assistants may also use this instrument to perform certain tests and measurements.

KERATOMETRY

Keratometry is the measurement of a patient's corneal curvature. It provides an objective, quantitative measurement of corneal astigmatism. It is helpful in determining the appropriate fit of contact lenses.

LENSOMETRY

Lensometry is a procedure used to measure the prescription of a patient's existing eyeglass lenses or the power of contact lenses. Lensometry is performed with a specialized instrument known as a **Lensmeter**.

OPHTHALMOSCOPY

In this procedure, the physician uses an ophthalmoscope to examine the interior of the eye, particularly the vitreous and the fundus.

REFRACTION

The process of measuring a patient's refractive error and determining the optical correction needed to focus light rays from distant objects onto the retina and provide the patient with clear vision. Refractometry may be divided into three separate steps:

1. Retinoscopy – the initial step in refractometry. This is performed on one eye at a time and requires no response or participation from the patient. An instrument consisting of a light source. The patient may (cycloplegic refraction) or may not (manifest refraction) have had cycloplegic eye drops. The examiner watches the movement and reaction of the pupil.
2. Refinement - also performed on one eye at a time. This however requires patient participation and reaction. The patient view letters of various sizes on a special visual acuity chart placed at a distance of 20 feet from the patient. The examiner leads the patient by presenting a choice of lenses in the refractor or trial frame while asking a series of questions about the relative clarity of the images seen on the chart. The patient's responses guide the examiner to selecting the most appropriate lens to correct the refractive error of the patient's eye.
3. Binocular balancing – this is performed on both eyes at once, balancing helps ensure that the optical correction determined by refractometry for distance vision does not include an uneven overcorrecting or undercorrection for two eyes. (This process is not necessary for patients who have undergone cycloplegic refraction, patients with minimal or absent accommodation, patients over age 60, or those who have had cataracts removed, or unequal visual acuity).

RETINA

The retina is a transparent layer of tissue that forms the innermost lining of the globe. The layer consists mainly of nerve cells and is actually an extension of the brain. The posterior two thirds of the retina is called the "visual portion" because it is the surface on which images are focused by the cornea and lens.

TONOMETRY

Tonometry measures the force required to flatten a small area of the central cornea.

VISUAL ACUITY EXAMINATION

Visual acuity tests measure the patient's ability to see fine visual detail. A more extensive evaluation of visual acuity includes lensometry to measure the patient's existing optical correction, refractometry to determine the type and amount of refractive error and the proper optical correction, and keratometry to determine corneal curvature as an addition to refraction. Commonly performed by the ophthalmic assistant.

VISUAL FIELD

The visual field examination measures the expanse and sensitivity of vision surrounding the direct line of sight, that is, peripheral vision (the visual perception of objects and space that surround the direct line of sight). Unlike most losses of central vision, defects in peripheral vision can be subtle and are often unnoticed by the patient. Disturbances in peripheral vision are commonly due to diseases of the retina, optic nerve, or structures of the visual pathway in the brain.

VITREOUS

The vitreous is a clear, jelly-like substance that fills the intraocular cavity behind the lens. This substance acts as a shock absorber and maintains the spherical shape of the globe. Small particles of dead cells and other debris appear in the vitreous and degeneration of the vitreous occurs – all as part of the normal aging process. The patient sees the particles and vitreous collagen fibers, called floaters, as spots or cobwebs. If they suddenly increase in number, it may be an indication of a detachment of part of the vitreous from the retina. Depending on the severity and/or circumstances causing the floaters will determine whether this is a normal part of aging or an emergency situation. In any event the patient must see the ophthalmologist (Dr. Scott Richards) right away.

RETINAL DETACHMENT

Retinal detachment is a vision threatening emergency requiring surgical repair. The condition may occur as the result of injury, from unknown causes, or, in rare cases, from vitreous detachment. The patient notices stars or flashes of light at one corner of the eye, followed several hours later by a sensation of a curtain moving across the eye and a painless loss of vision. The patient must be seen right away by an ophthalmologist (Dr. Scott Richards).

Ten general types of mechanism of diseases and injuries:

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|-----------------|------------------|
| 1. Infectious | 6. Congenital |
| 2. Inflammatory | 7. Developmental |
| 3. Allergic | 8. Degenerative |
| 4. Ischemic | 9. Neoplastic |
| 5. Metabolic | 10. Traumatic |

MYOPIA

Myopia is a condition in which the cornea and lens of the eye have too much “plus” power for the length of the eye. As a result, images of distant objects are focused in front of the retina and thus appear blurred. Various causes have been suggested to explain the development of myopia, ranging from excessive close work and reading to improper diet. However, research efforts to confirm the causes of myopia have been inconclusive. Most authorities agree that some myopia is genetic in origin and is the result of an eyeball inherently longer than normal. Near vision in people with myopia is almost always good. Because of the greater relative “plus” power of their optical system, myopic individuals not wearing corrective lenses require less accommodation for near vision than do people with normal eyes.

HYPEROPIA

Hyperopia is a condition in which the cornea and lens have too little “plus” power for the length of the non-accommodating eye. As a result, light rays from a distant object come to a focus at a point behind the retina and the image appears blurred. For many people, accommodation by the lens can supply the needed additional converging power and bring the distant light rays into focus on the retina. The problem, of course, is that the lens may not have sufficient additional accommodative power to focus light rays for near vision. Healthy children have an ample reserve of accommodation and if hyperopic can unconsciously accommodate both distant and near objects.

PRESBYOPIA

Presbyopia is the physiologic loss of accommodation in the eyes in advancing age. Literally translated to mean “old eye.”

ASTIGMATISM

A condition of unequal curvatures along the different meridians in one or more of the refractive surfaces (cornea, anterior, or posterior surface of the lens) of the eye, in consequence of which the rays from a luminous point are not focused at a single point on the retina. A lens or optical system having different refractivity in different meridians.

TYPES OF CORRECTIVE LENSES

1. Single- vision lenses – can focus at only one distance and are used to correct refractive error, such as myopia, hyperopia, or astigmatism, for one working distance, usually either far or near.
2. Multi-focal lenses – will focus not only at far distances but also near or intermediate distances as well. The other solution would be to have three different single visions, one for every working distance, but may not be convenient or practical for the patient.
 - a. Bifocal lens – has two powers, usually for correcting distance vision and one for correcting near vision.
 - b. Trifocal lens – has three power zones: one for correction of distance vision, one for intermediate range of sight, and one for near vision.
 - c. Executive bifocal – consists of a top distance band and a bottom near band, which divide the entire width of a lens into two parts

CONTACT LENSES

RIGID GAS-PERMEABLE LENSES (RGP): A hard lens made of materials that bend and flex only slightly allowing oxygen and carbon dioxide diffusion through the lens material and include a tear pump.

POLYMETHYLMETHACRYLATE (PMMA): was a plastic material used in the original hard contact lenses. It is still used with some patients today, but infrequently. This is a non-gas-permeable PMMA material, which allows oxygen to reach the cornea by pumping of oxygenated tears around and under the lens.

SOFT LENSES: also called “hydrophilic” are made of gel-like hydrogel materials, containing more than 10% water and silicone and owe their softness to the hydrogel’s ability to absorb and

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bind water, provide oxygen and carbon dioxide diffusion through the lens material itself with a minimal tear pump (the movement of tears under the contact lens).

EXTENDED-WEAR LENSES: include soft lenses that have increased oxygen permeability and certain RGP lenses of high oxygen permeability approved for overnight wear for up to seven days. Some patients choose to wear their extended-wear lenses on a flexible schedule of just one to two nights. Certain disposable lenses are also approved for extended wear; however, Country Hills Eye Center's Physicians do not recommend extended wear.

DAILY-WEAR LENSES: Comprise both rigid and soft lenses that are intended to be worn for fewer than 24 consecutive hours while awake.

DISPOSABLE LENSES: soft lenses designed for either daily or extended-wear and disposal after one day to three months of use. Because they are worn for only a short time, they require little to no cleaning.