

## Green Bay / Appleton / Oshkosh LASIK and Cataracts Specialist - Dr. Alexander

### AEI Glossary of Terms R – Z

[A & dash; H](#) | [I & dash; Q](#) | R – Z

R

**Radial** - Pertaining to the radius of a circle, which is any line drawn from the center to the circumference.

**Radial Keratotomy (RK)** - (keh-ruh-TAH-tuh-mee) A surgical treatment for [myopia](#). A myopic eye has a [cornea](#) which is too steep, refracting light rays too much, so they land in front of the [retina](#), instead of on it, for clear vision. To make the cornea slightly flatter, tiny incisions are placed around the pupil, angled from the pupil out to the edge of the cornea. The number of incisions and their exact location depends on the degree of myopia.

**Reading glasses** - Framed lenses that increase visual acuity for close distances. They become necessary when [presbyopia](#) develops after about age 40. See also [Bifocals](#) and [Trifocals](#).

**Refraction** - The bending of light rays. To have clear vision, the eye must focus light rays on the [retina](#), which means bending them as they enter the eye. Two structures in the eye perform refraction: the [cornea](#) and the [crystalline lens](#).

**Refractive Error** - Too much or too little bending of the light rays entering the eye, so that they focus not on the retina, which would give clear vision, but either in front of it ([myopia](#)) or behind it ([hyperopia](#)). When the [cornea](#) is slightly oval-shaped, rather than perfectly round, it has two curvatures, a steeper one and a

flatter one. This also causes refractive error ([astigmatism](#)), bending the light rays in two different ways, so that they're skewed and unable to focus. Refractive error is measured in [diopters](#).

**Refractive Lens Exchange (RLE)** - Also known as Clear Lens Exchange (CLE). A surgery which removes the [natural lens](#) from the eye and replaces it with an [intraocular lens](#) (IOL). This is essentially the same surgery that is performed for [cataracts](#), where the cloudy lens is replaced with a clear one, except that it's done to correct the refractive error of myopia or hyperopia, rather than to remove cataracts.

**Refractive Surgery** - A surgery that permanently changes the focusing ability of the eye, done to improve or eliminate refractive errors. It could be either lens surgery such as [RLE](#) or [P-IOL](#), or corneal surgery such as [LASIK](#), [PRK](#), [Intacs](#) or [CK](#). The lens and the cornea are the two focusing structures in the eye.

**Regression** - Return of the cornea after [PRK](#) or [LASIK](#) to its original refractive error. Post-surgical healing happens on both the surface (epithelium) where the flap was created and in the [stroma](#) (next level down, treated by the laser), and these two layers heal at slightly different rates. The planned treatment is designed to slightly [overcorrect](#) the refractive error so that after healing, the eye will have no refractive error. But some patients heal more quickly and vigorously than was expected, so that the cornea restores itself back to its original shape, and this is known as regression. See also [undercorrection](#).

**Reis-Buckler's Dystrophy** - An inherited condition where a spontaneous erosion of the [cornea](#) [a](#) impairs vision and causes increased light sensitivity and eye irritation. It involves the surface layer of the cornea ( [epithelium](#) ) and part of the [stroma](#) . It can appear anywhere from ages eight to twenty, and becomes more severe after about age forty. Also called Buckler's Dystrophy and Buckler's Syndrome.

**Retina** - (RET-ih-nuh) The inside back surface of the eye, which is light-sensitive, and receives the visual information traveling in on the light waves which enter the eye. It converts the images into nerve impulses which are carried by the optic nerve to the visual center of the brain.

**Retinal Detachment** - The retina has a layer of nerve tissue, and another layer which contains the blood supply. When these two layers separate, vision is lost at the separated area. It can be restored if the detachment is diagnosed early enough.

**Retinal Vein Occlusion** - Blockage of a vein that carries blood from the [retina](#) . It can happen in a branch vein (branch retinal vein occlusion), or in the main vein that leaves the eye near the optic nerve (central retinal vein occlusion). Backed-up blood causes an increase of pressure within the vein and capillaries, leading to blood and fluid leakage on the retina. In some cases it can block the entire blood supply to areas of the retina, causing the cells to die and leading to [retinal detachment](#) .

**Retinitis Pigmentosa (RP)** - Hereditary degeneration of the [retina](#) . It usually leads to [blindness](#) [legal](#) by progressively reducing [peripheral vision](#) . There are three main forms:

- **dominant**, where about half of the family members develop the disease.
- **X-linked**, for which the females are carriers and males develop the disease in alternating generations.
- **recessive**, where there is no family history of the disease, but it occurs on occasion.

**Rigid Gas-Permeable (RGP) Contact Lenses** - Also known as Gas-Permeable (GP) or

oxygen-permeable contact lenses. Contact lenses which allows air to pass through them. They are hard, but more flexible than the older-style “hard” contact lenses which were used before 1971. They contain silicone, which is flexible and since it allows oxygen to pass through it, these lenses are more comfortable and healthier for the eye, which needs lots of oxygen.

**RK** - See [Radial Keratotomy](#)

**RLE** - See [Refractive Lens Exchange](#)

## S

**Sands of Sahara** - See [Diffuse Lamellar Keratitis](#)

**Sclera** - (SKLEH-ruh) The white outer layer of the eye, which is tough and protective. It joins smoothly with the [cornea](#) and continues in the back of the eye, connecting with the sheath that covers the optic nerve.

**Scotopic Pupil Size** - The size of the [pupil](#) in dim lighting conditions, as in moonlight.

**Secondary Implant** - In some [cataract](#) surgeries, the [crystalline lens](#) is not replaced. It can be replaced later with an [intraocular lens](#), in a secondary implant procedure.

**Sjogren’s Syndrome** - A chronic autoimmune disease where white blood cells attack glands which produce moisture, as in the eyes and mouth. About 90% of sufferers are female, and although it can occur at any age, it usually begins in the late 40s. About half the time it occurs along with certain other autoimmune diseases, such as Lupus and Rheumatoid Arthritis. It is systemic and can affect the digestive tract, blood vessels, liver, kidneys, and other organs. Symptoms include fatigue and joint pain, as well as dryness in the affected areas.

**Slit Lamp** - A microscope with a strong light and a variety of magnification settings. It can be sized down to a slit for examining an eye and gives detailed views of the structures and fluids in the eye.

**Snellen Chart** - The standard eye chart with one large letter at the top and lines of progressively smaller letters. It is used to measure central vision.

**Starbursts** - A visual condition where light sources appear blurred with spikes projecting from the center. It can be a complication of [refractive surgery](#) and

can also occur naturally.

**Strabismus** - (struh-BIZ-mus) Also known as crossed eyes and turned eye. A vision condition where the eyes cannot be aligned. One eye turns out, up, or down while the other looks ahead, or both eyes may turn. It can be constant or intermittent. Strabismus impairs vision, as it reduces [depth perception](#) .

**Stroma** - The central layer of cells in the [cornea](#) , thicker than the other layers. A [LASIK](#) or similar procedure targets this layer in correcting the shape of the cornea to improve vision.

**Stromal Dystrophies** - A group of hereditary [dystrophies](#) affecting the [stroma](#) , the middle layer of the [cornea](#) [co](#)

(where [LASIK](#)

surgery is done). There are three main ones:

[Macular Dystrophy](#)

, [Granular Dystrophy](#)

, and [Lattice Dystrophy](#)

. ([Click here to read more about Stromal Dystrophies...](#)

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T

**Tear Duct** - A tiny passage in the eye which carries tears. The [lacrimal gland](#) creates tears, the tear ducts carry them to the eye where blinking distributes them over the surface, and they drain out into the nose through the

[puncta](#)

, of which there are two in the upper lids and two in the lower lids.

**Topography** - (tuh-PAHG-ruh-fee) The contours of a surface; as in corneal topography, which can be recorded by a [corneal topographer](#) .

**Toric Contact Lenses** - Contact lenses designed to correct both myopia or hyperopia and astigmatism. They contain two curvatures at different angles and are effective

for astigmatism only if they don't rotate on the eye. Therefore they have a mechanism which keeps them stable. They can be soft or hard.

**Transition Zone** - In a laser procedure, the area between the [optical ablation zone](#) and the untreated area of the [cornea](#). The laser removes tissue more deeply in the center of the ablation zone, and gradually tapers off through the transition zone, to the original corneal tissue outside the ablation zone.

**Trephine** - (truh-FEEN) A surgical tool with serrated edges, used to cut circular pieces. It's used in a [LASEK](#) procedure instead of a [microkerator](#) to cut the corneal flap.

**Trifocals** - (TRI-foh-kul) Corrective eyeglasses with three powers of correction: far distance, near distance, and intermediate distance. Typical reading glasses are [bifocals](#) which use most of their surface to correct for far distance, and have a small area at the bottom edge which corrects for near distance (reading). Trifocals also have a middle area which corrects for intermediate distance. Bifocals and trifocals are usually prescribed for people with [presbyopia](#).

**Tunnel Vision** - Loss of [peripheral vision](#), so that the eyes see only what is directly ahead. It can be caused by [glaucoma](#) or [RP](#) and may have other causes.

## U

**Undercorrection** - A complication of refractive surgery where the outcome is less than was expected. It can occur when the eye heals up more quickly and strongly than usual, so that it undoes some of the corrective work done in the surgery. See also [overcorrection](#) and [regression](#).

## V

**Variable Spot** - A method of applying the [excimer laser](#) energy during refractive surgery. The computer that controls the laser is programmed to have it focus on spots of varying sizes across the ablation area, rather than equal-sized [flying spots](#), or in a [broadbeam](#) fashion.

**Vision Therapy** - A way of treating vision disorders usually prescribed and planned by an optometrist to improve weak visual skills. It is thought that there are twenty visual skills, such as [accommodation](#), [peripheral vision](#), spatial relations, visual memory and visualization. When one or more of these skills is weak or non-existent, many activities can be impaired, like sports, computer work, and reading. Vision therapy was practiced in Europe in the mid-1800s and began in the U.S. in 1928 by an optometrist. Other names for vision therapy are: eye exercises, visual training, and orthoptics.

**Visual Acuity** - Clear vision with sharp details. Also called central vision.

**Visual Field** - The complete area that's visible when the eyes are looking straight ahead.

**VISX** - A company that manufactures ophthalmic equipment. [Their website](#) .

**Vitreous Detachment** - (VIT-ree-us) Separation of [vitreous humor](#) from the [retina](#) . If the gel pulls on the retinal surface, it can sometimes cause it to tear, which could lead to [retinal detachment](#) . Vitreous detachment occurs more often in older people and those with certain diseases such as diabetes.

**Vitreous Fluid** - The jelly-like fluid that fills the main part of the eye, between the lens and the retina. It's clear so as to give light rays an unobstructed path to the retina, and to keep that clarity, it contains phagocytes, cells which ingest and destroy foreign matter.

**Vitreous Humor** - The transparent gel that fills the space inside the eye behind the [lens](#) and in front of the [retina](#) .

W

**Wavelength** - The distance between the top of one wave and the top of the next. Used of light waves. Specific wavelengths equate to specific colors. The excimer laser used in LASIK procedures is 193 nm in wavelength, which is an ultraviolet light (beyond the violet area, and therefore invisible to our eyes).

**Wavefront** - Technology used to detect and measure higher order visual aberrations. These are the ocular aberrations other than the lower order aberrations of [myopia](#)

, [hyperopia](#)

, and

[astigmatism](#)

, which can be detected by a traditional eye examination. Some examples are glare,

[halos](#)

, and

[starbursts](#)

The wavefront system shines its specific laser into the eye briefly, and that light is reflected back from the [retina](#), through the [pupil](#), and on to a wavefront sensor. This is done multiple times. What began as a straight laser beam is now a distorted one, after it has passed through the irregularities of that particular eye. The wavefront system records and measures those distortions and creates a 3-D map of the eye. From this map, a treatment is developed to correct the irregularities and improve vision.

**Wavefront Supported Corneal Ablation** - The trade name for the Carl Zeiss Meditec WASCA aberrometer and the MEL 70 or MEL 80 excimer laser system when it's used for wavefront guided excimer laser ablation for Lasik, Epi-Lasik, LASEK, PRK, and IntraLasik.

**WaveLight** - An ophthalmic equipment company.

Y

**YAG Laser** - YAG is an acronym for neodymium Yttrium-Aluminum-Garnet, which is the material used to create this laser. It's a short pulsed and high-energy infrared light with a

wavelength of 1064 nm. It's used after [cataract surgery](#) to vaporize tissue. The [cry stalline lens](#) is inside a capsular bag, which holds it in place. Cataract surgery fragments and removes the clouded lens but not the bag. Afterwards, many patients develop clouding in that bag tissue. The YAG laser vaporizes it in a post-operative out-patient procedure.

Z

**Zyoptix** - Brand name for [wavefront](#) guided custom [ablation](#) on the Bausch & Lomb Technolas [excimer laser](#).

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Over the course of his career, Dr. Alexander has helped numerous LASIK and [cataracts Green Bay](#) / Appleton patients realize their dreams of clear vision without glasses. Specializing in premium IOLs cataract surgery, he has treated numerous ReZoom and [ReSTOR Appleton](#) / Green Bay patients. In addition, Dr. Alexander has extensive experienced performing [PermaClear](#)

,  
[CK](#)  
and  
[PRK in Green Bay](#)  
/ Appleton.

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