

Green Bay / Appleton LASIK Eye Surgery and Cataracts Specialist - Dr. Alexander AEI Glossary of Terms I – Q

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I

ICL (Implantable Contact Lens) - The name used for the STAAR Myopic Visian ICL™, created by the STAAR Surgical Company and approved by the FDA in 2005 for treating myopia. It's a refractive lens for use in a [phakic](#) eye (i.e., an eye that has its natural crystalline lens intact) and is implanted in the [posterior chamber](#) of the eye.

Intacs - The trade name for new-moon-shaped plastic implants. They're an alternative to LASIK surgery, to correct [myopia](#). They're inserted beneath the side edges of the [cornea](#) to flatten its surface by raising the periphery (whereas LASIK flattens the surface by removing tiny pieces from the cornea's center). However, unlike LASIK, they're not a permanent change to the cornea, as their prescription can be changed or they can be removed altogether. They're especially used for people with [keratoconus](#), to correct myopia.

IntraLase - A type of laser used to create the corneal flap in an [IntraLASIK](#) procedure. In a traditional LASIK surgery, the flap is created by a hand-held device called a [microkeratome](#), with an oscillating blade. In IntraLASIK, it's created by the IntraLase™ FS laser, a cool light which passes through the corneal surface to the exact location beneath the surface which your LASIK surgeon has programmed into the computer. This ensures that the flap is not cut too deeply or unevenly. For the treatment itself, the excimer laser is used as in traditional LASIK procedures.

IntraLASIK - A variation on a LASIK procedure. See IntraLase.

Intraocular - Inside the eye.

Intraocular lens - An artificial lens which is implanted in the eye to replace the natural crystalline lens. Intraocular lenses are used to treat [cataracts](#) and

[presbyopia](#)

. Traditionally they were monofocal, so that you needed glasses for either close-up vision or distance vision. Newer ones are multifocal, with different areas designed for different distances, or can accommodate in a way similar to how the natural lens accommodates for distance.

Intraocular pressure - The pressure inside the eye. Besides containing its structures like the lens, the eye contains fluids and when the pressure builds up too high, it can gradually impair vision, a condition known as [glaucoma](#) .

IOL - See [Intraocular lens](#) .

Iris - The colored part of the eye which encircles the pupil.

Iris Registration - When we go from a sitting position to lying down, as for a LASIK treatment, our eyes move slightly. So if our eyes were measured and diagnosed for treatment while we were sitting up, how can the laser adjust for the slight change in their positions after we lie down? Iris Registration does this, and it keeps the laser targeted correctly throughout the treatment, even if our eyes move during treatment. It's a hardware addition to the VISX STAR laser system for CustomVue LASIK and was approved by the FDA

K

Keratotomy - The surgical removal of part of the [cornea](#) .

Keratitis - Inflammation of the [cornea](#) caused by bacteria or a virus. Can leave scarring and cause loss of vision.

Keratoconus - (kehr-uh-toh-KOH-nus) A thinning of the central [cornea](#) . Instead of being smooth and round, it develops a bulge in the center which deflects light entering the eye, severely impairing vision. It is an inherited disease and may require [corneal transplant](#) surgery.

Keratometry - (kehr-uh-TAH-mih-tree) Measurement of the cornea's curvature. It's done with a keratometer.

Keratoplasty - See [corneal transplant](#) .

Keratomileusis - (KE-ruh-toe-my-LOO-suhs) A name for the way a LASIK procedure is done. Before the

[excimer laser](#)

made LASIK possible, this procedure was done by totally removing the small corneal flap, rather than just partially, and then freezing it, reshaping it, and replacing it on the cornea.

Keratotomy - (keh-ruh-TAH-tuh-mee) Surgical incision of the cornea. This is done for a radial keratotomy (RK) procedure, treating nearsightedness by flattening the cornea slightly. Several tiny incisions are made around the periphery of the cornea, extending further inwards to the center in more severe cases of nearsightedness.

L

Lacrimal gland - The small structure in each eye which produces tears. It's above the outer corner of the eye, and lacrimal ducts run from the inner corner to the nose. See also

[punctum](#)

and

[nasolacrimal duct obstruction](#)

LASEK - See [Laser Assisted Epithelium Keratomileusis](#) .

Laser - Although this is used as a word now, it was originally the acronym for Light Amplification by the Stimulated Emission of Radiation. There are many lasers, all man-made for specific purposes. Laser light has a single [wavelength](#) (i.e., color), rather than all colors like everyday white lights. Its waves are directional rather than scattered, and each wave is in step with the next one, which vastly increases the power of a laser light.

Laser Assisted In-Situ Keratomileusis - The full name for [LASIK](#) .

Laser Assisted Epithelium Keratomileusis - The acronym for LASEK, a variation on [cornea](#) is too flat or too thin for standard LASIK. Instead of using a [microkeratome](#) , it uses an instrument known as a [trephine](#) , with a finer blade, to make the [corneal flap](#) , and then the eye is soaked for a half-minute or so with an alcohol solution. This softens the [epithelium](#) so that it can be folded back more safely.

Laser Thermal Keratoplasty (LTK) - (KER-uh-tuh-PLAS-tee) LTK is a

refractive surgery treatment for mild [farsightedness](#)

. A Holmium laser is used to gently and precisely heat a circular area around the edge of the [cornea](#), so that this edge shrinks a little. The result is a steepening of the cornea, which in farsightedness is too flat. It's also used to treat [presbyopia](#).

LASIK - (LAY-sik) A refractive surgical procedure for correcting [myopia](#), [hyperopia](#) and [astigmatism](#)

. An excimer laser is used to recontour the [cornea](#), making it steeper to correct hyperopia, flatter to correct myopia, and more evenly curved to correct astigmatism. The laser works on the [stroma](#), the corneal layer below the surface cells (epithelium), and access to the stroma is gained by creating a tiny flap on the corneal surface and folding it back. After treatment it's replaced and heals by itself.

Lattice Dystrophy - A hereditary [corneal](#) condition where abnormal protein fibers appear on the [stroma](#). In an eye exam, they look like a latticework of curves and lines. They progressively become more opaque and larger, creating cloudiness in the cornea which obstructs vision. They can gather beneath the corneal [epithelium](#), causing it to erode and exposing nerves, which creates severe pain.

That pain can be alleviated with eye drops and ointments which reduce the friction when you blink, though in some cases an eye patch is necessary that prevents blinking until the erosions heal. By about the age of 40, there'll be scarring beneath the corneal epithelium which impairs vision by clouding up the cornea. Early lattice dystrophy can be treated with an [excimer laser](#), and in some cases a [corneal transplant](#) is done.

Legal Blindness - A definition of blindness which enables a person to apply for government disability benefits. It can be either a visual acuity of 20/200 (or worse), with corrective lenses, in the better eye, or [tunnel vision](#) in the better eye of 20 degrees in diameter. This level of blindness is severe, but does not necessarily

prevent a person from functioning at all.

Lens - The crystalline lens, inside the eye, which refracts (bends) light rays as they pass through the eye to the [retina](#). It's fully transparent and is convex on both sides (curves outwards). It's located between the iris, the colored part of the eye, and the [vitreous humor](#), the fluid which fills the main part of the eye's interior. It's the second part of the eye to refract light rays, the first being the cornea, which does about 65% of the refraction necessary for clear vision. The lens can change its shape to [accommodate](#) light rays coming from near or far distances, and these changes in shape are controlled by tiny muscles attached to each end of the lens.

Lower Order Aberrations - The name for [myopia](#), [hyperopia](#), and [astigmatism](#). These are the conditions measured to determine a prescription for glasses or contact lenses, and that can be corrected with refractive eye surgery such as LASIK. The [higher order aberrations](#) are more numerous and still be researched and some examples are: halos, glare, and double vision.

Low Vision - Visual impairment ; usually less than 20/200 which obstructs daily activities but cannot be corrected with glasses or contact lenses. (See [20/20](#))

LTK - See [Laser Thermal Keratoplasty](#)

M

Macula - An extra-sensitive area roughly in the center of the retina, which enables us to see fine detail and do activities such as reading. The center of the macula is the [fovea](#), which has no nerve cells or blood vessels to interfere with vision, and this makes it the most sensitive area of the macula. It's also the part of the eye which enables us to distinguish colors.

Macular Degeneration - A deterioration of specialized cells in the [macula](#) of the [retina](#) which normally detect light and color to give us sharp central vision. With Macular Degeneration they deteriorate as we age, causing severe vision loss and even blindness after about age 65. There are two kinds:

- Wet (neovascular) – where new little blood vessels grow under the retina, leaking blood and fluid and causing further vision loss
- Dry (non-neovascular) – where new blood vessels do not grow, so that this is a less severe form of the disease; however, it sometimes progresses into the Wet form

Macular Degeneration is not fully understood, but it appears to be related to advancing age, smoking, heredity, high blood pressure, obesity, inactivity, and some drugs. Also called [Age-Related Macular Degeneration \(ARMD\)](#)

[Click to View the Interactive Macular Degeneration Vision Test](#)

Macular Dystrophy - A hereditary type of [macular degeneration](#). In a normal eye, the macula, the central part of the retina, has specialized cells that detect light and color. Macular Dystrophy is a deterioration of these cells so that we see less and less clearly. It is the most severe of the three main [Str](#)
[omal Dystrophies](#), but the least common.

Macular Edema - Pooling of fluid in and around the macular area of the retina, which causes swelling and impairs vision. It causes blurriness, waviness of straight lines, light sensitivity, and a pink tint to the vision. It usually happens as a result of disease or injury and sometimes after eye surgery. Most people recover from it in a matter of months.

Manifest Refraction - The eye examination which determines a person's degree of refractive error. The patient looks through a phoropter, an instrument with an array of lenses, at the eye chart set first at 20 feet away (for distance vision), then at 16 inches away (for near vision). The optometrist or ophthalmologist changes lenses and asks which ones give the clearest image.

Meesmann's Dystrophy - A rare hereditary eye condition where tiny cysts appear on the corneal surface which can rupture. [Visual acuity](#) is only minimally affected, but the eyes feel irritated, as if something is in them. It progresses slowly and a [corneal transplant](#) may be done in some cases.

Mesopic Pupil Size - The size of the eye's pupil (black circular area inside the iris) in medium lighting conditions, such as a typically lit room, or daylight.

Micron - A measurement of length equal to one-millionth of a meter.

Microkeratome - (My-krow-KEH-ruh-tome) A surgical instrument used to create a [corneal flap](#) during [LASIK](#) and some other [refractive surgeries](#)

There are two types: mechanical and laser. The mechanical microkeratome uses an extremely sharp and precise metal blade. The femtosecond laser microkeratome uses the laser beam to create microscopically tiny bubbles at a specific depth in the cornea. When thousands of such bubbles are placed next to each other, it creates an incision. A femtosecond is one millionth of a nanosecond, which is one billionth of a second.

Monocular - An adjective for vision out of one eye. Also the name of a type of telescope.

Monovision - The correction of one eye for far distance and the other for near distance. This is a treatment for [presbyopia](#).

Myopia - (mi_OH-pee-uh) Nearsightedness or shortsightedness. When the cornea is too steep, or when the eye is too long, from front to back, light rays focus in front of the retina, instead of on it. This creates blurriness in distance vision but clarity in close vision because the focusing mechanism is too strong, refracting the light too much. Glasses or contact lenses correct it by supplying a concave lens, which reduces the amount of refraction. Refractive surgery such as [LASIK](#) corrects it by flattening the cornea, thus changing the strength of refraction so that the light rays land on the retina.

N

Nasolacrimal duct obstruction - (NAY-zo-LAK-ruh-muhl) The nasolacrimal ducts are the tear ducts which carry tears out of the eyes to the nose. They can become clogged, usually in a child, so that the tears build up within the eyes and overflow. If not treated it can lead to infection. See also [punctum](#), [punctal plugs](#), and [lacrimal gland](#)

Nearsightedness - Another name for [myopia](#).

NearVision CK - A trade name for [Conductive Keratoplasty](#) (CK), which is a treatment for hyperopia.

O

Ocular Herpes - Herpes simplex, type I. This is the same virus which causes cold sores and it can infect the eyes also. It occurs on the [cornea](#), usually only on one eye, and is also known as Herpes Keratitis. It can affect only the surface, or deeper layers, and can heal well, or can cause scarring, loss of vision and even blindness. Occasionally it develops inside the eye and is then known as Herpes Retinitis or Herpes Uveitis. Symptoms are blurred vision, pain, redness, and light sensitivity.

Ocular Migraine - A rare type of migraine headache which occurs around the eye area and brings nausea, vomiting, and double vision. There may or may not be a headache. It usually affects one eye at a time. Vision can become greyed out or wavy and even temporarily lost on that side. The exact cause is not known. Also called Retinal Migraine.

Off Label Use - Use of a technology for a procedure which is legal but not specifically approved by the FDA. For example, [LASIK](#) was performed using an excimer laser when the FDA had approved use of that laser for

[PRK](#) but not yet for LASIK. A medical doctor is legally able to use a certain instrument or technology for any given procedure, whether or not the FDA has specifically approved that use. Manufacturers of excimer lasers have sought FDA approval of their laser for LASIK, but that is for marketing reasons and is unrelated to the legality of using it that way.

Ophthalmic - Relating to the eye.

Ophthalmologist - (ahf-thal-MAH-loh-jist) A medical doctor who specializes in diagnosing and treating eye conditions and diseases. Specialized training is required beyond medical school. Medical specialties are either medical or surgical, and ophthalmology is a surgical specialty, although not all ophthalmologists actually perform surgical procedures.

Ophthalmoscope - (ahf-THAL-muh-skohp) A hand-held instrument with a light, used to examine the eye. It was first devised in 1915 by William Noah Allyn and Frederick Welch, who also founded the company Welch Allyn, which today manufactures many medical diagnostic and therapeutic devices.

Optical Zone - That area of the eye where light passes through from the [pupil](#) to the [retina](#). Light passes through the [cornea](#), then the [aqueous humor](#) behind it, then the

[crystalline lens](#)

and the

[vitreous humor](#)

behind the lens, to the retina.

Optical Ablation Zone - That part of the optical zone corrected by a laser treatment.

Optic Disc - The circular area where the [optic nerve](#) meets the retinal nerve fibers, and where blood vessels enter the eye. It's also known as the "blind spot" because this intersection with the optic nerve and presence of blood vessels interferes with the retina's function as a camera film.

Optician - (ahp-TISH-un) A technician who fits eyeglasses, sometimes grinds them from raw materials, places them in the frames, and verifies their final accuracy. Opticians can fit contact lenses in some states. Each state determines optician qualifications and most require a license for which the person must pass an examination conducted by the [American Board of Opticianry](#) (ABO). Some states also have their own exam the person must pass.

Optic Nerve - A bundle of nerve fibers about one quarter of an inch wide, which runs between the [retina](#) and the brain, and connects with the retina's nerve fibers. It carries visual information to the brain.

Optometrist - (ahp-TAHM-uh-trist) A doctor of optometry (OD), which is not a medical degree. An optometrist diagnoses vision problems and eye diseases, and prescribes glasses, contact lenses, and drugs to treat disorders. They provide post-surgical care, but do not perform surgery. The education is at least three years and most optometrists have a B.A. or more. This is followed by four years at an optometry school, with an examination at the end. Some optometrists have further education and obtain M.A.s or Ph.D.s and can specialize in a variety of areas such as contact lenses, pediatric optometry, geriatric optometry and ocular disease.

Overcorrection - A possible complication of [refractive surgery](#), where the vision problem is over-treated, making, for instance, a nearsighted eye farsighted. Usually the overcorrection adjusts itself within months of the surgery. Sometimes overcorrection enhancement surgery can be done to correct the problem. See also

[undercorrection](#)

and

[regression](#)

P

Pachymetry - (puh-KIM-uh-tree) Testing of the cornea's thickness, done to determine whether the [cornea](#) is strong enough for a [LASIK](#) procedure. It's also done for some disorders where the cornea becomes thickened by excess water. The instrument used is a pachymeter.

Penetrating Keratoplasty (PK) - A corneal transplant. A full-thickness, circular piece of the cornea is removed and replaced by a similar piece from a donor. It can restore vision to an eye which had previously been blind.

Perioperative - Pertaining to the period of time between being admitted to hospital for surgery to being discharged afterwards. A perioperative nurse is one who cares for the patient throughout that time.

Peripheral Vision - Also called "side vision". Vision to each side of where the eyes are focused. Direct vision uses the fovea, the center part of the macula, which gives the most detailed vision. Peripheral vision uses the areas of the retina surrounding the macula which give less detail but better night vision. Without peripheral vision, a person would have only [tunnel vision](#), and would be [legally blind](#).

Phacoemulsification - (fay-koh-ee-mul-sih-fih-KAY-shun) A surgical procedure which breaks up a lens containing a [cataract](#), to make it easier to remove. It uses an incision of about 3 mm, through which the tip of an instrument delivers ultrasonic vibration. The resulting tiny pieces of lens material are removed by suction through that same instrument. A foldable artificial lens can be inserted through that same incision and the incision heals by itself.

Phakic - An adjective describing an eye which has its natural [crystalline lens](#) intact.

Phakic Intraocular Lens (P-IOL) - A removable artificial lens which is placed in front of the natural lens, to increase its focusing ability.

Phoropter - A vision-testing instrument with many lenses, through which a person looks at the eye chart. As the lenses are switched, the person is asked which one gives the clearest images of the letters on the chart. On this basis, a prescription is determined for glasses or contact lenses. The eye chart is set first at 20 feet away, then at 16 inches away, to test both far and near vision.

Phototherapeutic Keratectomy (PTK) - Use of an excimer laser to treat surface corneal irregularities, making the corneal surface smoother, and thus improving vision. This can be done along with a [LASIK](#) or other [refractive surgery](#).
. Sometimes use of this technique can avoid a corneal transplant.

Photoablation - The tissue removal done by an excimer laser in [refractive surgery](#).

This type of laser has a cool ultraviolet wavelength which is extremely strong. It breaks down the molecular bonds of the corneal tissue targeted, and also evaporates the remaining corneal fragments from the eye's surface. The term "photoablation" means "light removal".

Photorefractive Keratectomy (PRK) - A refractive surgery like [LASIK](#), where an excimer laser is used to reshape the [cornea](#) and correct [myopia](#), [hyperopia](#) and [astigmatism](#). It's used for those who have corneas too thin to tolerate a LASIK procedure. Instead of the [microkeratome](#) being used to create the corneal flap, the laser is used, which can do it even more precisely and subtly than the microkeratome.

Pink Eye - See [Conjunctivitis](#).

Posterior Chamber - The area behind the [iris](#) and in front of the [vitreous](#). It's filled with [aqueous humor](#).

Presbyopia - (prez-bee-OH-pee-uh) An impairment of vision which is age-related. Over time, the tiny muscles controlling the convexity of the [crystalline lens](#) become weaker. At the same time, the lens becomes stiffer. The result of these changes is that the lens can't accommodate so well to changes in distance, and vision becomes blurry for near objects. This necessitates [reading glasses](#). When a person who is mildly [myopic](#) develops presbyopia, the two conditions tend to cancel each other out. Presbyopia can't be treated by refractive surgeries like LASIK, but can be treated by implanting an [intraocular lens](#).

Presbyopic Lens Exchange (PRELEX) - A term for a refractive lens exchange, where an intraocular lens is implanted to replace the eye's natural crystalline lens. It's a treatment for presbyopia.

PRK - See [Photorefractive Keratectomy](#).

PTK - See [Phototherapeutic Keratectomy](#).

Punctal Plugs - Very small plugs of collagen, silicone or plastic that are inserted into any of the [punctum](#) (tear drains) as a treatment for dry eyes. One type is absorbable, lasting anywhere from a few days to several months, and if this makes the eyes better lubricated, non-absorbable plugs can be inserted as a long-term treatment. Placement is painless, taking less than a minute.

Punctum - A tear drain in the eye. There are two in the upper lid and two in the lower lid. Tears are made by the [lacrimal gland](#) in the area above and outside the eye, and spread over the eye with each blink. If the eye is making insufficient tears, becoming dry and itchy, [punctal plugs](#) can be inserted, to keep tears within the eye. See also [nasolacrimal duct obstruction](#)

Pupil - The circular black opening in the center of the [iris](#). It allows light to enter the eye. In dim lighting conditions, it opens wider and is controlled by tiny iris muscles. Testing the pupil dilation is often part of a neurological evaluation.

[A ‐ H](#) | [I – Q](#) | [R ‐ Z](#)

At Dr. Alexander's Appleton / [Wisconsin laser eye surgery](#) offices, patients can expect to receive the highest quality treatments in the safest, most comfortable manner possible. In addition to LASIK, Dr. Alexander also performs

[PRK](#)

and

[CK](#)

. For mature individuals suffering from cataracts, Dr. Alexander offers cataract surgery with premium IOLs, such as

[ReSTOR in Green Bay](#)

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