Laser Eye Surgery

What is a laser?

A laser is an intense beam of light. It is made when an electric current passes through a special substance, like a gas or a crystal. That substance determines the light's color and how it can be used.

An ophthalmologist often uses lasers in surgery to treat certain eye problems.

How is a laser used in surgery?

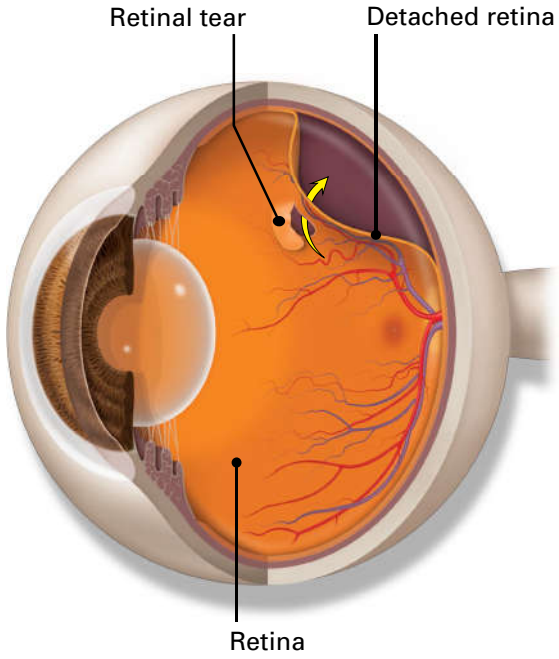
There are two different kinds of lasers used in eye surgery.

With a **thermal laser**, the light becomes heat energy when it reaches the eye. This heat can be used to:

- close leaking blood vessels
- destroy abnormal tissue, such as a tumor
- seal torn or detached tissue
- treat the eye's drainage system to allow fluid to flow out of the eye properly

With a **photodisruptive laser**, the light is used like a knife to cut or sculpt eye tissue. It can be used to:

- cut thin tissue in the eye that blocks vision
- improve vision by changing the shape of your cornea (the clear dome-shaped window at the front of the eye)



A laser may be used as part of surgery to repair retinal detachment.

Eye problems often treated with laser surgery

Ophthalmologists treat many eye conditions and diseases using lasers. Here are some of the most common conditions treated with laser surgery.

Retinal tears or detachment. The retina is a layer of nerve cells lining the back wall inside the eye. This layer senses light and sends signals to the brain so you can see. If the retina tears or detaches from the back of the eye, you lose vision. Ophthalmologists often repair the retina with a thermal laser. The heat from this laser is used to seal the retina to the back wall of the eye again.

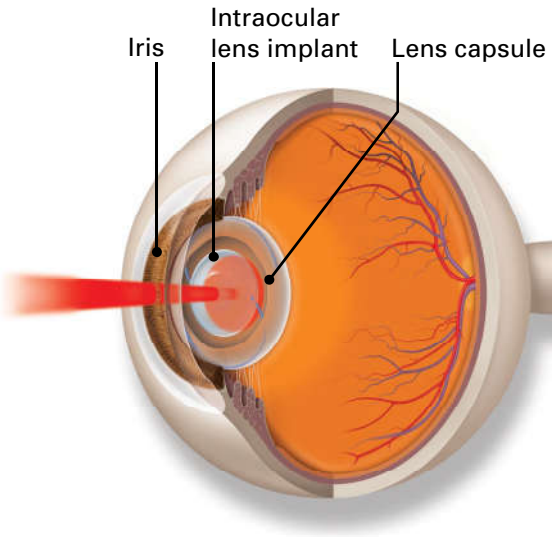
Diabetic retinopathy. Diabetes can damage blood vessels in the eye, or cause new, abnormal ones to grow. Ophthalmologists can use a thermal laser to seal leaking blood vessels. It can also be used to slow or stop the growth of abnormal blood vessels.

Macular degeneration. The macula is a small area of your retina. It is the part of the retina that gives you your central vision. This is how you read, sew or recognize a face. With macular degeneration, the macular tissue breaks down or is affected by abnormal blood vessels growing under the retina. This causes a loss of central vision. When abnormal blood vessels grow and leak, ophthalmologists may use a thermal laser to stop this bleeding and prevent further damage.

Glaucoma. This is a common, serious eye problem that causes blindness if not treated. It happens when fluid inside the eye does not drain as it should. Pressure in the eye rises, damaging the optic nerve that connects the eye to the brain. Ophthalmologists may use a thermal laser to treat the eye so that fluid can drain properly again.

Cataracts. This is when the eye's normally clear lens becomes cloudy, affecting vision. Some ophthalmologists might use a laser to assist in some steps of cataract removal surgery. After the cloudy lens is removed, it is replaced with a clear, artificial lens. And sometimes after cataract surgery, the part of the eye that holds the artificial lens can become cloudy. The eye surgeon uses a laser to treat this cloudiness and improve vision again.

Refractive surgery. Some people have difficulty focusing on objects either close up or far away. This is called a refractive error. With LASIK and other refractive surgery procedures,



A laser can make an opening in a cloudy lens capsule to restore normal sight.

ophthalmologists use a photodisruptive laser to reshape the eye's cornea. Light is then focused properly in the eye, improving vision.

Advantages of laser eye surgery

Surgery using lasers has advantages over other types of surgery. With some laser surgery there is much less risk of infection from the laser light. And the surgeon has greater control and can be more precise using a laser rather than a surgical knife. Also, laser surgery can be done in an outpatient surgery center or sometimes right in the doctor's office. This means you can go home sooner, and recovery time is often much shorter.

Laser eye surgery can be very helpful in treating certain eye problems. But, as with all surgery, there are risks of side effects and complications. Talk with your ophthalmologist about the benefits and risks of having laser eye surgery.

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Summary

A laser is an intense beam of light. In surgery, one type of laser can be used to create heat energy, and another can be used to cut or sculpt. Ophthalmologists often use lasers in surgery to treat certain eye problems, including glaucoma, diabetic retinopathy, macular degeneration, refractive errors, and others.

Laser surgery has advantages over other types of surgery. With some laser procedures, there is much less risk of infection from the laser light. Also, it offers the surgeon greater control and more precision than a surgical knife. And with laser procedures you can go home sooner and recover more quickly. Like any surgery, however, there are risks of side effects and complications. Your ophthalmologist can talk with you about those.

If you have any questions about your eyes or your vision, speak with your ophthalmologist. He or she is committed to protecting your sight.

Get more information about laser eye surgery from EyeSmart, provided by the American Academy of Ophthalmology at **aao.org/lasik-link**.

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