PROCEDURE

Laser photocoagulation - eye

Eye laser photocoagulation uses focused light to seal retinal tears or treat abnormal retinal blood vessels.

PURPOSE
Seal retinal tears or treat abnormal retinal blood vessels

PROCEDURE TYPE
Therapeutic, minimally invasive laser treatment

WHERE IT IS DONE
Outpatient eye clinic

ANAESTHESIA
Local anaesthetic eye drops

HOW LONG IT TAKES
Usually 10 to 30 minutes per session

PREPARATION
Dilated pupil, medication review, and arranged transport home

RECOVERY
Same day; no driving until vision clears

MAIN RISKS
Reduced vision, field loss, retinal swelling, bleeding

RESULTS
Response assessed over weeks to months at follow-up

Overview

Laser photocoagulation is a treatment for the retina, the light-sensitive layer at the back of your eye. It uses a focused beam of light to make tiny, controlled burns. As these areas heal, they form scars that can seal a retinal tear or reduce leakage from abnormal blood vessels.

There are several patterns of treatment. A small ring of laser spots can surround a retinal tear. Focal or grid laser treats specific areas of leaking blood vessels. Panretinal photocoagulation, or PRP, treats many areas of the outer retina to reduce signals that promote harmful new blood vessels.

The procedure usually aims to protect the sight you still have rather than restore vision that has already been lost. Some people need more than one treatment session.

Why the procedure is performed

Your eye specialist may recommend laser photocoagulation for:

For a retinal tear, laser creates a scar around the damaged area. This acts like a barrier and lowers the chance of fluid passing through the tear and lifting the retina away from the back of the eye.

For proliferative diabetic retinopathy, PRP reduces the retina's demand for oxygen. This can make abnormal new blood vessels shrink and lowers the risk of serious bleeding or traction on the retina.

The expected benefit depends on the condition being treated, where it is located and how much retinal damage is already present.

- A retinal tear or hole that could lead to retinal detachment
- Proliferative diabetic retinopathy, which causes fragile new blood vessels
- Some forms of swelling in the central retina, called macular oedema
- Abnormal blood vessels caused by a retinal vein blockage
- Selected leaking blood vessels or other retinal conditions

Who should and should not have it

Laser may be suitable if your specialist can clearly see and safely reach the area requiring treatment. It is often offered when the risk of vision loss without treatment is greater than the expected risks of the procedure.

It is not the right treatment for every retinal problem. Laser may be avoided or delayed if:

An urgent retinal tear may still need prompt treatment despite other medical issues. Children and people unable to stay still may require treatment in an operating theatre with sedation or general anaesthesia.

Your specialist should explain the purpose of the laser, the likely benefit, the important risks and the alternatives before asking for your consent.

- A cataract, corneal problem or bleeding blocks the laser's view
- The eye is too inflamed or infected for treatment
- The affected area is too close to the centre of detailed vision
- A retinal detachment has progressed beyond what laser can contain

- You cannot keep your eye and head still enough for safe treatment
- Another treatment, such as an injection or operation, is more likely to help

How to prepare

The treating facility's own instructions take priority because preparation can differ by condition and anaesthesia plan.

Tell the eye team about your medicines, allergies, pregnancy and previous reactions to eye drops or anaesthetics. Do not stop aspirin, anticoagulants or other blood-thinning medicines unless the clinician responsible for the procedure specifically tells you to do so.

You usually do not need to fast when treatment is performed with anaesthetic eye drops alone. Fasting may be required if sedation or general anaesthesia is planned.

Your pupil will normally be dilated. This can blur your vision and make bright light uncomfortable for several hours. Bring sunglasses and arrange for someone to take you home. Do not plan to drive yourself.

What happens during the procedure

You will usually be awake. The clinician puts drops into your eye to widen the pupil and numb the surface. You sit at a laser machine similar to the microscope used during an eye examination.

A special contact lens may be placed gently on your eye. It helps keep the eyelids open, steadies the eye and focuses the laser. Lubricating fluid prevents the lens from rubbing the eye.

You will be asked to look in certain directions and keep your head still. You may see repeated bright flashes. Some people notice brief stinging, aching or a pinprick sensation, especially during PRP. Tell the clinician if you need a pause.

The laser spots are placed around a tear or across selected parts of the retina. Treatment commonly takes 10 to 30 minutes, although extensive treatment may be divided into separate sessions.

Your sight is checked afterward. You can usually leave the clinic the same day.

Recovery and what to expect afterward

Pain: Your eye may feel mildly sore, gritty or achy for several hours. Simple pain relief may be suggested by your treatment team. Severe or increasing pain is not expected.

Eating: You can usually eat and drink normally after treatment with eye drops alone. Follow separate instructions if you received sedation or general anaesthesia.

Activity: Vision may be blurred, and you may see spots or after-images from the flashes. Bright light can be uncomfortable. Take it easy for the rest of the day. Your team may limit strenuous exercise if you are being treated for a retinal tear or bleeding.

Driving: Do not drive home. Wait until the dilating drops have worn off, your vision meets legal driving requirements and your eye team has not given a longer restriction.

Work: Many people return to desk-based work the next day. You may need longer if your vision remains blurred, your job involves driving or machinery, or treatment was extensive.

PRP can cause lasting reduction in night vision or side vision. This may affect driving even when central vision remains clear.

Risks and possible complications

Temporary blurred vision, glare, mild discomfort and visible spots are common shortly after treatment.

Other possible complications include:

With PRP, the balance is often between protecting against severe vision loss and accepting some loss of side or night vision. Your personal risk depends on the location and extent of treatment and the health of your retina.

- Reduced central, night or peripheral vision
- New or increased retinal swelling
- Bleeding inside the eye
- A blind spot where retinal tissue was treated
- A temporary rise in pressure inside the eye
- Accidental damage to nearby retinal tissue
- Failure to prevent a retinal tear from progressing
- Need for repeat laser, injections or retinal surgery

Results and follow up

The clinician can confirm immediately that the planned laser spots were placed, but the full effect is not immediate. Scars around a retinal tear strengthen over the following days. Abnormal blood vessels and retinal swelling may take weeks or months to respond.

A follow-up examination checks whether the treated area has healed, whether abnormal vessels have reduced and whether further treatment is needed. The timing is based on the condition being treated and how urgent it is.

Keep routine follow-up appointments even if your vision feels unchanged. Some retinal changes can progress without causing an obvious early difference in sight.

Laser cannot guarantee that a retinal detachment, bleeding or further diabetic eye disease will not occur. Ongoing eye examinations and control of conditions such as diabetes and high blood pressure remain important.

Alternatives

The realistic alternatives depend on why laser has been offered.

- Observation: Avoids treatment now, but a tear or abnormal blood vessels may worsen between examinations. It is suitable only when the untreated risk is considered low.
- Anti-VEGF eye injections: Often used for diabetic macular oedema and some abnormal retinal vessels. They may protect central vision better than laser in selected cases but usually require repeated injections and reliable follow-up.
- Steroid injections or implants: Can reduce certain types of retinal swelling. They may increase eye pressure or speed up cataract formation.
- Cryotherapy: Freezes the outside of the eye to seal some peripheral retinal tears. It can reach areas that laser cannot, but may cause more external swelling and discomfort.
- Retinal surgery: Vitrectomy, a scleral buckle or a gas-bubble procedure may be needed for retinal detachment, heavy bleeding or scar tissue. Surgery can treat problems that laser alone cannot, but is more invasive and has a longer recovery.
- No treatment: You may decline treatment after discussing the likely consequences. For high-risk tears or proliferative diabetic retinopathy, this can mean accepting a greater risk of permanent vision loss.

When to call your healthcare team

Mild grittiness, temporary blur and light sensitivity usually improve as the drops wear off. Mention symptoms that last longer than expected at your routine follow-up.

Contact your eye team urgently the same day if you develop:

A curtain-like loss of vision, severe sudden vision loss or severe eye pain needs emergency eye assessment. If you cannot reach your eye service promptly, use the local emergency department or emergency eye clinic. Do not drive yourself.

- New flashes or a sudden increase in floaters
- A shadow, curtain or missing area in your vision
- Vision that suddenly becomes much worse
- Increasing redness, swelling, discharge or pain
- Persistent headache, nausea or vomiting after treatment

Common questions

Will I be asleep?

Usually not. Most treatment is performed while you are awake using anaesthetic eye drops. General anaesthesia may be used when someone cannot safely remain still.

Can I drive home?

No. Dilating drops and the laser flashes can blur your sight. Arrange transport and wait until your vision has recovered before driving again.

How painful is it?

Many people feel little or no pain. Others notice brief stinging or aching, particularly with extensive PRP. Tell the clinician if you are uncomfortable.

When will I know if it worked?

The clinician knows whether the planned laser was delivered immediately. Healing and changes in abnormal vessels are assessed during follow-up over the following weeks or months.

Will the laser improve my eyesight?

It usually aims to prevent or limit further loss rather than recover sight already damaged. Vision may improve if retinal swelling settles, but improvement is not guaranteed.

Will I need another session?

Possibly. Extensive PRP is often divided into sessions, and additional laser may be needed if a

tear is not fully sealed or abnormal vessels remain active.

Sources

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