TEST

Fluorescein eye stain

A fluorescein eye stain uses dye and blue light to reveal damage on the eye's surface.

WHAT IT MEASURES
Damage or breaks in the eye's surface cells

SAMPLE
None; dye is placed on the eye surface

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually 5 to 15 minutes

RESULTS IN
Immediately; no laboratory processing

USED FOR
Diagnosing corneal injury and assessing tear-film problems

MAIN LIMITATION
Shows surface damage, but not its cause or full depth

Overview

A fluorescein eye stain is a test of the front surface of your eye. A healthcare professional places a small amount of orange fluorescein dye into your tears, then examines your eye with blue light. Under this light, areas that take up the dye appear bright green.

The cornea is the clear window covering the coloured part of your eye. Its outer layer normally prevents fluorescein from soaking in. A scratch, ulcer, dry area, or other break in that layer allows the dye to collect.

The test may be done with a slit lamp, which is a microscope designed for examining the eye. A handheld blue light may be used when a slit lamp is unavailable.

Fluorescein can also show whether fluid is leaking through a wound in the eye. This use is called a Seidel test. It requires urgent specialist interpretation because a leak can indicate an open injury to the eyeball.

Why the test is ordered

The test helps identify and map damage on the cornea or the white part of the eye. It may be used after something has entered the eye or when you have pain, redness, watering, light sensitivity, blurred vision, or the feeling that something is still present.

Common reasons include:

Fluorescein may also be used during contact-lens fitting or before certain eye-pressure measurements.

- Looking for a corneal scratch or retained foreign object
- Assessing possible infection or inflammation of the cornea
- Checking irritation related to contact lenses
- Examining damage after a chemical splash
- Assessing dry eye or how quickly the tear film breaks apart
- Looking for leakage after an eye injury or procedure

Who should have the test

You may be offered this test if your symptoms or recent history suggest a problem on the eye's surface. It is often part of an examination after an eye injury, even when no damage is visible without dye.

Contact-lens wearers with a painful, red, light-sensitive, or suddenly blurred eye usually need prompt assessment. Contact lenses can be associated with corneal infections that may require treatment.

A fluorescein stain is not a routine screening test for everyone. Whether it is useful depends on your symptoms, eye history, recent surgery, contact-lens use, medicines, and the findings from the rest of your eye examination.

How to prepare

You do not need to fast. You can eat, drink coffee, and take your usual medicines unless you have received different instructions for another part of your appointment.

Remove contact lenses before the test. Fluorescein may stain soft lenses, and lenses can hide or contribute to surface damage. Bring your glasses and a lens case if needed.

Tell the healthcare professional about recent eye surgery, injury, chemical exposure, and any drops or ointments you have used. Mention previous reactions to fluorescein, local

anaesthetics, or other eye drops.

Do not delay rinsing your eye to prepare for an appointment after a chemical splash. Start flushing the eye immediately with plenty of clean, lukewarm water and seek urgent medical help.

What happens during the test

You will sit facing the examiner, often with your chin and forehead supported by a slit lamp.

Fluorescein may be supplied as a drop or on a paper strip. If a strip is used, it is moistened and gently touched to the inside of your lower eyelid. It should not need to scrape the cornea. You then blink to spread the dye through your tears.

A numbing eye drop may be given first if your eye is painful or if another procedure is planned. The examiner shines blue light onto the eye and looks for areas of green staining. They may ask you to look in different directions or gently turn your upper eyelid over to search for a hidden foreign object.

The examination usually takes several minutes. The result is seen during the test.

Understanding your results

A result without abnormal staining means no clear break was seen in the surface cells examined. This does not rule out every cause of eye pain or blurred vision.

Abnormal staining may appear as a patch, line, cluster of dots, or branching pattern. The shape and location help guide interpretation. For example, vertical scratches can occur when material is trapped under an eyelid, while many tiny dots may occur with dry eye or widespread irritation. These patterns are clues rather than diagnoses by themselves.

During a Seidel test, the examiner looks for clear eye fluid diluting the dye and creating a streaming pattern. A suspected leak needs urgent eye-specialist assessment.

There is no universal numerical reference range for a basic fluorescein stain. Tear-film timing measurements can vary with the method and clinic. Interpretation also considers age, sex, pregnancy status, medicines, eye products, and the wider clinical context. Sex and pregnancy do not usually determine whether an individual surface defect stains, but they may affect tear-film symptoms and the surrounding assessment.

What affects the results

The test is simple, but several factors can change what the examiner sees without anything being wrong with the dye or equipment.

Contact lenses may absorb fluorescein, obscure part of the surface, or create staining caused by lens irritation. They should normally be removed first.

The amount of dye matters. Too much can pool in the tears and hide a small defect. Too little may make a subtle area difficult to see. Blinking, watering, and the time between applying the dye and examining the eye also affect the pattern.

Eye ointments can coat the cornea. Drops, recent eye irrigation, and heavy tearing may dilute or wash away dye. Medicines that contribute to dry eye can indirectly change the staining pattern.

Mucus, debris, or an uneven tear film can hold dye and resemble surface damage. Dry eye itself may produce scattered staining rather than one distinct scratch.

Examination technique matters. Small defects may be harder to see without a slit lamp, the correct blue light, and an appropriate filter. A hidden foreign object may be missed if the eyelids are not fully examined.

Recent surgery, infection, and existing corneal disease can produce staining that must be interpreted in that specific context.

Accuracy and limitations

Fluorescein is good at showing exposed areas where surface cells are missing or damaged, but there is no single published accuracy percentage for every use. Its performance changes with the injury, dye amount, equipment, timing, and examiner technique.

The test can miss a very small defect, a problem hidden beneath an eyelid, or a wound that has temporarily sealed. A negative Seidel test does not completely exclude an open eye injury because tissue or another structure may plug the wound.

It may also appear positive when dye is sitting in mucus, folds, or an irregular tear film rather than a true scratch. Surface staining can show that damage exists, but usually cannot identify its cause on its own.

Fluorescein does not assess the retina, optic nerve, or most structures inside the eye. It also cannot reliably show the full depth of a wound. Depending on the concern, a complete eye examination, eyelid eversion, slit-lamp examination, pressure measurement, swab, or imaging may be more appropriate. CT imaging is often used when an object may have entered the

eyeball; MRI may be unsafe if metal is possible.

Risks and complications

The test is generally low risk. The dye may briefly sting, blur your vision, or leave temporary yellow-orange tears or nasal discharge. It can stain skin or clothing.

An allergic reaction is uncommon but possible. Seek immediate help for breathing difficulty, facial swelling, or rapidly worsening widespread symptoms after any eye drop.

If numbing drops were used, avoid rubbing the eye until normal feeling returns. Do not use leftover numbing drops unless they were specifically prescribed with instructions, because reduced sensation can hide further injury.

What happens next

If no significant abnormality is found, you may be advised to monitor your symptoms or attend routine follow-up. Follow any instructions about lubricating drops, contact lenses, work, exercise, or a repeat examination.

An identified scratch, foreign object, infection, dry-eye pattern, or leak may require different treatment or further testing. The stain alone does not determine the treatment.

Arrange prompt reassessment if pain, redness, light sensitivity, discharge, or blurred vision is worsening rather than improving. Contact-lens wearers with these symptoms should not put their lenses back in before assessment.

Seek urgent or emergency care for sudden loss of vision, a high-speed or penetrating injury, an eye that appears misshapen, severe pain with vomiting, or a chemical exposure. Continue immediate irrigation after a chemical splash rather than waiting for the fluorescein test.

Common questions

Can I drink coffee before the test?

Yes. Food, coffee, and other non-alcoholic drinks do not interfere with a routine fluorescein eye stain.

Does the time of day matter?

Usually not. However, dry-eye staining and tear-film measurements may change with screen use, contact-lens wear, the environment, and how long your eyes have been open.

Can I exercise beforehand?

Usually yes. If you recently had eye surgery or an eye injury, follow the activity restrictions you were given. Avoid activities that could worsen the injury.

Can I wear my contact lenses to the appointment?

Bring them, but expect to remove them before the test. Do not reinsert them until the healthcare professional says it is safe.

Will the test hurt?

You may notice a brief sting or mild irritation. A numbing drop may be used if the eye is already painful.

Can I drive afterwards?

The dye or other examination drops may briefly blur your vision. Wait until your vision is clear and you feel safe before driving.

Sources

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