TEST

Fluorescein angiography

Fluorescein angiography uses an injected dye and photographs to show blood flow and leakage at the back of the eye.

WHAT IT MEASURES
Blood flow and dye leakage in retinal and choroidal vessels

SAMPLE
None; photographs after dye is injected into a vein

FASTING NEEDED?
No, unless your eye clinic gives different instructions

HOW LONG IT TAKES
Usually 20 to 40 minutes, including delayed photographs

RESULTS IN
Often same day; turnaround varies by clinic or imaging laboratory

USED FOR
Diagnosing, planning treatment, and monitoring retinal or choroidal disease

MAIN LIMITATION
Blood, cataract, or pigment can block abnormal fluorescence

Overview

Fluorescein angiography is an imaging test of the blood vessels at the back of your eye. It is also called fundus fluorescein angiography, or FFA.

A yellow-orange dye called fluorescein is injected into a vein, usually in your arm or hand. As it travels through vessels in the retina and choroid, a special camera takes photographs. The retina is the light-sensitive layer at the back of the eye, and the choroid is the blood vessel layer beneath it.

The test can show blocked vessels, abnormal new vessels, and dye leaking into nearby tissue. It does not use X-rays or radiation. Fluorescein differs from the contrast dye used for many CT scans.

Why the test is ordered

Your eye specialist may order fluorescein angiography when an examination or scan suggests

a problem with blood flow or fluid leakage.

It may help assess:

The images can guide laser treatment, injections, or other care. Later testing may show whether abnormal vessels or leakage have changed after treatment.

- diabetic damage to retinal blood vessels
- age-related macular degeneration
- a blocked retinal vein or artery
- swelling in the macula, the centre of the retina
- inflammation inside the eye
- abnormal blood vessel growth
- unexplained bleeding or vision changes

Who should have the test

This test may be offered when a detailed view of blood vessel leakage could affect your diagnosis or care. It is not a routine screening test.

Tell the clinic if you have reacted to fluorescein before, have asthma or serious allergies, or have significant heart or breathing problems. These do not always prevent testing, but may require extra precautions.

Also tell the clinic if you are pregnant, could be pregnant, or are breastfeeding. Fluorescein crosses the placenta and enters breast milk. Whether to proceed, delay testing, or take temporary breastfeeding precautions requires individual advice.

Kidney or liver problems can slow removal of the dye. Tell the clinic about these conditions and all medicines you take.

How to prepare

You can usually eat and drink normally unless your clinic gives different instructions, particularly if another procedure is planned.

Take your usual medicines unless told otherwise. Bring a list of your medicines and allergies.

Your pupils will normally be widened with eye drops, causing blurred vision and light sensitivity for several hours. Bring sunglasses and arrange help with travel if needed. Do not drive until

your vision is normal and you meet local driving requirements.

You may need to remove contact lenses. Wear clothing that can be cleaned easily because spilled fluorescein can temporarily stain it.

What happens during the test

A staff member may check your vision and apply drops to widen your pupils. You then sit at a camera with your chin and forehead supported while baseline photographs are taken.

A small needle or plastic tube is placed into a vein in your arm or hand, and fluorescein is injected. Photographs are taken quickly as the dye reaches your eyes. You will need to keep still and look in different directions. More photographs may be taken several minutes later.

You may briefly feel warm or nauseated or notice an unusual taste. The dye can make your skin slightly yellow and your urine bright yellow or orange. This fades as the dye leaves your body.

Understanding your results

Your specialist examines how fluorescein fills the retinal and choroidal vessels and what happens on later images.

Bright areas may show leakage, staining, pooled dye, or deeper fluorescence. Dark areas can occur where blood flow is reduced or blood, pigment, or another structure blocks the view.

There is no universal normal range. Findings are interpreted alongside your eye examination, medical history, previous treatment, and other scans, especially optical coherence tomography, or OCT. OCT produces cross-sectional retinal images and can measure swelling or fluid.

What affects the results

A cataract, cloudy cornea, bleeding, marked inflammation, dense pigment, or scar tissue can block the camera's view or hide fluorescence.

Blinking, eye movement, poor focus, small pupils, or difficulty keeping your head still may blur the pictures. Standard cameras may not capture the far edges of the retina unless extra views are taken.

If dye leaks around the injection site, it may reach the eye more slowly or in a lower concentration. Kidney impairment can delay removal from the bloodstream and affect later

images.

Previous laser treatment, surgery, injections, inflammation, and scarring can resemble active disease. Image timing also matters because some abnormalities appear only during an early or late phase.

Food, coffee, routine medicines, and ordinary exercise do not usually alter the eye findings. Pregnancy affects the decision to perform the test more than image appearance.

Accuracy and limitations

Accuracy depends on the condition, area photographed, image quality, and the interpreter's experience. There is no single accuracy rate across all eye conditions.

The test can miss disease when fluorescence is blocked by blood, cataract, inflammation, or pigment. Abnormalities may also be missed if images are blurred, mistimed, or do not include the affected area.

Leakage does not identify one condition by itself. Inflammation, damaged vessels, and abnormal new vessels can produce similar appearances.

Other tests answer different questions. OCT is generally better for measuring retinal thickness and fluid. OCT angiography shows blood flow without an injection but does not show dye leakage. Indocyanine green angiography may show some choroidal vessels more clearly, particularly when blood or pigment blocks fluorescein.

Risks and complications

The needle can cause brief discomfort, bruising, or light-headedness. If dye leaks under the skin, it can cause pain, swelling, and temporary staining. Tell staff immediately if the injection site hurts or burns.

Nausea, warmth, itching, or a mild rash can occur. Serious allergic reactions are uncommon, but the clinic should have trained staff and treatment equipment available.

Seek emergency help for trouble breathing, swelling of the face or throat, collapse, or a rapidly worsening widespread rash after leaving the clinic.

Dilating drops can cause temporary blurred vision, glare, and stinging. Rarely, they trigger a sudden rise in eye pressure. Severe eye pain, a red eye, headache, vomiting, or rainbow-like rings around lights after dilation requires urgent eye assessment.

What happens next

Your specialist may review the images during the visit or after a formal report. Follow-up depends on why the test was requested.

The result may lead to observation, another scan, treatment, or a repeat angiogram. An unclear study may require extra photographs or different imaging.

Temporary yellow urine or mild light sensitivity can usually be monitored at home. Contact the clinic about continuing injection-site pain or swelling, or a rash that is not improving. Use emergency services for the serious symptoms described above.

Common questions

Can I drink coffee before fluorescein angiography?

Usually, yes. Coffee does not normally change the images. Follow your clinic's instructions if fasting is required for another procedure.

Does the time of day matter?

Usually not. The timing of photographs after the injection matters, but appointments can generally be performed at any time.

Can I exercise beforehand?

Ordinary exercise does not usually affect the result. Avoid arriving dehydrated or unwell, and tell the clinic about recent symptoms.

Can I drive home afterward?

Do not drive while your vision is blurred or you are sensitive to light from dilating drops. Arrange another way home if possible.

Is fluorescein dye radioactive or iodine-based?

No. Fluorescein is not radioactive or an iodine-containing contrast. Still report any previous reaction to an injected dye.

How long will my urine stay bright yellow?

The colour is temporary and often clears within a day or two. Stay hydrated, but follow any fluid restriction given for another medical condition.

Sources

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