TEST

Schirmer test

The Schirmer test measures how much tear fluid your eyes produce in five minutes.

WHAT IT MEASURES
Tear production over five minutes using paper strips

SAMPLE
Tears absorbed onto paper strips

FASTING NEEDED?
No

HOW LONG IT TAKES
About 10 to 20 minutes

RESULTS IN
Immediately after the test

USED FOR
Diagnosing and monitoring low tear production

MAIN LIMITATION
Poor repeatability; strip irritation can trigger extra tearing

Overview

The Schirmer test measures how much tear fluid your eyes produce. It is mainly used when an eye care professional is assessing dry eye, especially dry eye caused by reduced tear production.

During the test, a narrow strip of absorbent paper is placed just inside each lower eyelid. After five minutes, the clinician measures how far tears have travelled along the paper. The result is recorded in millimetres.

There are different versions of the test. Schirmer I testing is the most common. It may be performed with or without numbing eye drops. Without numbing drops, the result includes both your usual tear production and extra "reflex" tears caused by the paper irritating the eye. Numbing drops reduce this reflex response, although they do not remove it completely.

A less common version uses stimulation inside the nose to measure reflex tear production. Your clinician should explain if this version is planned.

Why the test is ordered

The Schirmer test may be ordered when your symptoms or an eye examination suggest that you are not producing enough tears. Possible symptoms include burning, grittiness, fluctuating blurred vision, redness or discomfort. Watery eyes can also occur because an irritated eye may produce bursts of reflex tears.

The test can help with:

A Schirmer result cannot diagnose Sjögren disease or another condition by itself. It is interpreted alongside your symptoms, eye examination and, when appropriate, other tests.

- Assessing suspected dry eye caused by low tear production
- Comparing tear production between your two eyes
- Supporting an assessment for Sjögren disease, an immune condition that can affect tear and saliva glands
- Monitoring tear production over time in selected situations

Who should have the test

You may be offered a Schirmer test if dry-eye symptoms are persistent, affect daily activities or do not improve as expected with routine measures. It may also be used if your examination shows signs of a dry eye surface or if another health condition could affect your tear glands.

The test is not usually needed for every person with brief or mild eye irritation. Dry-eye symptoms can also result from tears evaporating too quickly, eyelid problems, contact lenses, allergies or environmental exposure. The Schirmer test may be normal in these situations.

Tell the clinician if you recently had eye surgery, an eye injury or an eye infection. These circumstances may affect whether the test should be performed immediately or postponed.

How to prepare

You do not need to fast. You can usually eat, drink and take your regular medicines as normal.

Ask the testing clinic whether you should avoid artificial tears or medicated eye drops before the appointment. Drops used shortly before testing can change the amount of moisture on the paper. Do not stop prescribed eye medicines unless the clinician responsible for them tells you to do so.

Remove contact lenses before the test. The clinic may ask you to leave them out for a period

beforehand, depending on the reason for testing and the type of lenses you use. Bring your glasses if you need them.

It may help to avoid heavy eye makeup on the day because the paper is placed against the lower eyelid. Tell the clinician about medicines you take, including antihistamines like cetirizine or loratadine , antidepressants and water tablets like furosemide or hydrochlorothiazide , because some medicines can reduce tear production.

What happens during the test

You will sit in an examination chair. If numbing drops are being used, they are placed in your eyes first, and excess fluid may be gently removed after the drops have taken effect.

The clinician bends the end of each paper strip and places it between the lower eyelid and the eye, usually toward the outer side. Both eyes are often tested at the same time.

You will normally be asked to close your eyes gently for five minutes. Looking around, squeezing your eyelids or talking may move the strips and affect the result. The strips can feel scratchy and may make your eyes water.

After five minutes, the clinician removes the strips and measures the length that has become wet. The result is available immediately.

Understanding your results

Results are reported as the number of millimetres of paper wetted in five minutes. Each eye has its own result.

For a commonly used Schirmer I method, wetting of 5 millimetres or less in five minutes is often considered evidence of reduced tear production. More than 10 millimetres is often regarded as reassuring, while results between these values may be less clear. These are not universal reference ranges.

Interpretation varies by testing method, whether numbing drops were used, the laboratory or clinic protocol, age, sex, pregnancy status, medicines and clinical context. The pattern of symptoms and the appearance of the eye surface also matter.

A low value supports reduced tear production but does not identify the cause. A result that differs between your eyes may lead to a closer examination of the eyelids, tear glands and eye surface.

A normal result does not rule out dry eye. You may produce enough tear fluid but have tears

that evaporate too quickly or do not spread properly across the eye.

What affects the results

Several factors can change the amount of wetting even when the test has been performed correctly:

These influences are important when comparing results from separate appointments. Whenever possible, repeat tests should use the same method and similar conditions.

- Reflex tearing: The paper can irritate the eye and trigger extra tears, making production look higher than it usually is.
- Numbing drops: These reduce irritation-related tearing and can produce a lower result than testing without them.
- Recent eye drops: Artificial tears and other drops can add moisture or temporarily change tear production.
- Strip position: Paper placed in a slightly different location can cause more irritation or absorb tears differently.
- Eyelid movement: Blinking, squeezing the eyes or moving the strips can alter wetting.
- Room conditions: Airflow, low humidity, heat and bright light can affect the tear response.
- Time of day: Tear production can change during the day, so repeat results may not be identical.
- Contact lenses: Recent lens wear may irritate the eye or alter the tear film.
- Medicines: Antihistamines, some antidepressants like sertraline or fluoxetine , certain bladder medicines, water tablets and other medicines may reduce tears.
- Age and hormonal changes: Tear production may change with age, pregnancy and hormonal status.
- Recent surgery or inflammation: Eye procedures, infection or surface inflammation can temporarily change tearing.

Accuracy and limitations

The Schirmer test is useful, but its repeatability is limited. The same person can receive different results on different days or even during repeated testing at one appointment.

There is no single reliable percentage describing how often the test is right or wrong. Studies

use different techniques, thresholds and patient groups. This makes accuracy estimates difficult to apply to an individual result.

The test may miss dry eye when tear production is normal but tears evaporate too quickly. It can also miss intermittent low tear production if reflex tearing raises the result during testing.

A low result can suggest reduced tear production when the main reason is a medicine, temporary environmental exposure, recent contact-lens irritation or differences in test technique. For this reason, one low measurement is not usually interpreted alone.

Other assessments may be more helpful for particular questions. These include examining the eye with a slit lamp microscope, using dyes to look for surface damage, measuring how quickly the tear layer breaks apart and assessing the eyelid oil glands. Blood tests and saliva-gland assessments may be considered when Sjögren disease is suspected.

Risks and complications

The test may cause brief stinging, watering or a scratchy feeling, and your eyes may remain mildly irritated for a short time afterward. A surface scratch is uncommon, but persistent pain, marked redness or worsening vision should be assessed promptly.

What happens next

Your clinician may discuss the result at the appointment. A normal or mildly abnormal result often leads to routine follow-up based on your symptoms and the rest of the eye examination.

If the result is low, further testing may be used to confirm reduced tear production and look for contributing factors. Management may include changes to your environment, review of medicines, lubricating eye products or treatment directed at eyelid and tear-film problems. The appropriate approach depends on the full assessment, not the Schirmer number alone.

Arrange prompt eye care if you develop significant eye pain, increasing redness, sensitivity to light or a sudden change in vision. These are not typical effects of ordinary dry eye testing.

A chemical splash is an emergency. Rinse the eye immediately with plenty of clean, lukewarm water and seek emergency help. Do not wait for a routine appointment.

Common questions

Can I drink coffee before a Schirmer test?

Usually, yes. Fasting is not required. Caffeine may affect some people's tear response, so keep your intake close to normal and tell the clinician if you have had much more or less than usual.

Can I use eye drops before the test?

Ask the clinic beforehand. Artificial tears and medicated drops can change the result, but you should not stop prescribed drops without instructions.

Does the time of day matter?

It can. Tear production may change through the day. If the test is repeated for comparison, having it at a similar time may make the results easier to interpret.

Can I exercise beforehand?

There is usually no specific exercise restriction. However, recent exposure to wind, fans, dry air or sweat around the eyes may temporarily affect irritation and tearing.

Can I wear contact lenses to the appointment?

Bring your lens case and glasses. You will need to remove the lenses for testing, and the clinic may ask you to leave them out beforehand or for a short time afterward.

Is the Schirmer test painful?

Most people describe discomfort or scratchiness rather than pain. The sensation usually stops when the paper strips are removed.

Sources

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