TEST

Extraocular muscle function testing

An eye examination that checks how well your eyes move, align, and work together

WHAT IT MEASURES
Eye movement, alignment, and coordination in different directions

SAMPLE
None; direct eye examination

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually 5 to 15 minutes

RESULTS IN
Immediate; documentation timing varies by clinic, not laboratory

USED FOR
Diagnosis and monitoring of eye movement problems

MAIN LIMITATION
Subtle or intermittent problems may appear normal during testing

Overview

Extraocular muscle function testing checks the movement and alignment of your eyes. Six muscles around each eye move it up, down, left, right, and at angles. Three cranial nerves carry signals from the brain to these muscles.

The examination checks whether the eyes move fully, smoothly, and together. It is often part of a routine eye or neurological assessment and may be performed for double vision, an eye turn, a drooping eyelid, or difficulty moving an eye.

There is no blood sample, radiation, or scan. You usually follow a target while the examiner watches your eyes. The findings may locate a movement problem but do not always identify its cause.

Why the test is ordered

The test may be used to investigate:

It can also monitor a known disorder or recovery after an injury, illness, or operation. In children,

it may form part of an assessment for strabismus, also called a squint or crossed eye.

- Double vision
- An eye that turns inward, outward, upward, or downward
- Restricted or painful eye movement
- A drooping eyelid
- Shaking or repetitive eye movements
- Symptoms after an eye or head injury
- Possible problems involving the eye muscles, nerves, eye socket, or brain

Who should have the test

You may be offered testing for double vision, unusual eye movement, poor coordination between the eyes, or a change in eye position. It is also commonly included in comprehensive eye examinations without symptoms.

Children may need testing if an eye turns, they tilt or turn their head to see, close one eye, or have difficulty using both eyes together. Techniques can be adjusted for age, vision, attention, and ability to follow instructions.

Testing may also be appropriate for conditions affecting the nerves or muscles that control eye movement. How often it is repeated depends on the clinical situation.

How to prepare

No fasting is needed. You can usually eat, drink coffee, and take your regular medicines. Do not stop a prescribed medicine unless the clinician responsible for it tells you to.

Bring your glasses or contact lenses, a medicine list, and details of when symptoms occur. If you have double vision, note whether it is constant or intermittent, which direction worsens it, and whether it disappears when either eye is covered. Photos or videos of an intermittent eye turn or drooping eyelid may help.

The movement test does not require dilating drops. However, drops may be used during a wider eye examination. They can blur near vision and make bright light uncomfortable for several hours.

What happens during the test

You usually sit facing the examiner with your head upright. They first check the resting position of your eyes and eyelids.

You then follow a finger, pen, light, or small picture as it moves in different directions. You may be asked to keep your head still and report double vision, pain, or a pulling sensation.

The examiner looks for:

Other checks may be added. In a cover test, the examiner covers and uncovers each eye while you look at a target. Corrective movement may reveal constant or intermittent misalignment.

You may also look quickly between two targets, follow a slowly moving target, or focus on something brought toward your nose. Prisms may be placed in front of an eye to measure misalignment.

- How far each eye moves
- Whether the eyes move together
- Smoothness and speed
- Drifting away from the target
- Repetitive movement, called nystagmus
- Changes in eyelid position or pupil size

Understanding your results

Results are usually descriptive rather than one number. A normal result generally means both eyes move fully and smoothly, remain appropriately aligned, and do not produce unexpected double vision or abnormal shaking.

Possible terms include:

There are no universal numerical reference ranges for the full examination. Interpretation depends on the method, examiner, age, vision, medicines, and clinical context.

A pattern may suggest which muscle or nerve is involved. However, this test alone may not distinguish a nerve problem from muscle disease, swelling, mechanical restriction, or a brain disorder.

- Full movement: The eye reaches the expected positions
- Limited movement: The eye does not move fully in one or more directions

- Underaction or overaction: A muscle appears to move the eye less or more than expected
- Strabismus: The eyes are not aligned
- Nystagmus: Repetitive, uncontrolled eye movement
- Ptosis: Drooping of the upper eyelid

What affects the results

Fatigue can make some movement problems or drooping eyelids more noticeable. An intermittent problem may not appear during a short appointment.

Poor vision, missing or incorrect glasses, glare, target size, and testing distance can affect alignment or the ability to follow a target. Young children and people who are tired, distracted, confused, or unable to understand instructions may respond inconsistently. Moving the head can also hide restricted eye movement.

Alcohol and medicines that cause sleepiness may slow responses or reduce attention. Do not stop medicines before testing, but tell the examiner what you have taken.

Pain, eyelid swelling, recent surgery, trauma, and scarring can restrict movement. Small differences may also occur between examiners because some findings are judged by observation.

Accuracy and limitations

This is not one standardized test with a single accuracy rate. Results depend on the methods used, the examiner's experience, and whether the problem is present during the appointment.

Constant restrictions and larger misalignments are usually easier to detect. Small, brief, fatigue-related, or direction-specific problems may be missed.

Poor attention, head movement, reduced vision, pain, or difficulty understanding the task can also make normal movement appear limited. An unusual eye position does not by itself prove that a particular muscle or nerve is damaged.

An orthoptist may provide more detailed measurement of subtle or complex misalignment. Depending on the findings, pupil or visual field testing, blood tests, MRI, or CT may be needed to investigate the cause.

Risks and complications

The examination is non-invasive and is not expected to cause injury. Looking in a direction that triggers double vision, dizziness, eye strain, or discomfort may be unpleasant, but symptoms usually settle when you stop.

What happens next

If movement and alignment are normal, no further testing may be needed. Stable findings may be reviewed during routine follow-up.

Abnormal findings are considered alongside your symptoms, vision, pupils, eyelids, medical history, and neurological examination. You may be referred to an ophthalmologist, neurologist, or orthoptist, or offered imaging or other tests.

Arrange prompt medical assessment for new, constant binocular double vision-double vision that disappears when either eye is covered-especially with eyelid drooping or eye pain.

Seek emergency care for sudden double vision with weakness, numbness, difficulty speaking or walking, loss of vision, a severe new headache, a newly enlarged or unequal pupil, or symptoms after a significant head injury.

Common questions

Can I drink coffee before the test?

Yes. Fasting is not required. If caffeine changes shaking, dizziness, or other symptoms for you, tell the examiner.

Does the time of day matter?

Usually not, but intermittent or fatigue-related problems may be more visible later. Bring a photo or video if symptoms are not always present.

Can I exercise beforehand?

Yes. If exercise brings on double vision, drooping, or unusual movement, explain when this happens rather than deliberately provoking severe symptoms.

Should I wear my glasses or contact lenses?

Bring your usual correction. Clear vision helps you follow the target and can affect alignment.

Will I be able to drive afterward?

The movement test itself should not prevent driving. Driving may be unsafe if dilating drops

are used or you already have double vision.

Does the test hurt?

It should not. Tell the examiner if a particular direction causes pain, marked dizziness, or worsening double vision.

Sources

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