SYMPTOM

Anisocoria

Anisocoria means one pupil is larger than the other.

WHAT IT FEELS LIKE
One pupil looks larger than the other

WHERE IT IS FELT
The pupils, black circles in the eyes

MOST COMMON CAUSES
Normal pupil variation, eye drops, previous eye injury

WHEN IT IS URGENT
Sudden onset with headache, weakness, drooping eyelid, or eye pain

USUALLY LASTS
Minutes to lifelong, based on the cause

SEE A DOCTOR IF
New, persistent, changing, or paired with vision symptoms

Overview

Anisocoria means that your pupils are different sizes. The pupils are the black circles in the centre of your eyes. They control how much light enters each eye.

A small, long-standing difference can be a normal feature. This is called physiological anisocoria. It usually does not affect vision or require treatment.

Anisocoria can also result from eye drops, medicines, an eye condition, nerve problems, or an injury. The size difference alone cannot show which cause is responsible. Whether it appeared suddenly, changes with lighting, or occurs with other symptoms provides important clues.

What it may feel or look like

Anisocoria usually does not cause a feeling by itself. You may notice it in a mirror, photograph, or video. Someone else may point it out.

The difference may be more obvious in bright light or darkness. This helps show which pupil may not be responding normally. The pupils can still react to light even when they are not equal.

Depending on the cause, you might also have:

Old photographs can help establish whether the difference has been present for years.

- Blurred or double vision
- Sensitivity to light
- Eye redness or pain
- A drooping upper eyelid
- Trouble moving one eye
- Headache or neck pain
- Reduced sweating on one side of the face

Common causes

Physiological anisocoria is a common explanation for a small, stable difference between pupils. Both pupils usually respond normally to light, and there are no other symptoms.

Medicines or chemicals can affect one pupil if they enter only one eye. Examples include certain prescription eye drops, motion-sickness patches transferred from a finger, inhaled medicines that leak around a mask, and some gardening chemicals. The pupil usually returns to normal as the substance wears off, although timing depends on the product.

A previous eye injury or operation can damage the iris, the coloured part of the eye that controls pupil size. The resulting difference may be permanent.

Less common causes include inflammation inside the eye, called uveitis, and a tonic pupil. A tonic pupil is usually larger and reacts slowly to light. It may also make close-up focusing difficult.

Horner syndrome causes a smaller pupil, often with a mildly drooping eyelid. It results from disruption of a nerve pathway between the brain and eye. There are many possible causes, ranging from long-standing or harmless problems to conditions needing prompt investigation.

A problem affecting the third cranial nerve can cause a large pupil together with eyelid drooping, double vision, or abnormal eye movement. Sudden cases require emergency assessment.

A painful, red eye with a poorly reacting pupil can occur in acute angle-closure glaucoma. This is a rapid rise in pressure inside the eye and is an emergency.

When to seek medical care

Seek emergency medical help if unequal pupils appear suddenly with:

These combinations may indicate a problem affecting the brain, nerves, blood vessels, or pressure inside the eye. Do not drive yourself if your vision or alertness is affected.

Arrange a same-day medical or eye assessment for new, unexplained anisocoria, even if you otherwise feel well. This is especially important if the size difference is changing.

A routine appointment is reasonable when the difference appears stable and long-standing but has never been assessed. Bring older photographs if possible. Children with new anisocoria should be examined promptly, particularly if there is eyelid drooping or a change in eye movement.

- A severe or unusual headache or neck pain
- Weakness, numbness, confusion, fainting, or trouble speaking
- A newly drooping eyelid, double vision, or abnormal eye movement
- Severe eye pain, redness, blurred vision, or rainbow-like halos
- A recent head or eye injury

How the cause is found

A clinician will ask when you first noticed the difference and whether it changes in light or darkness. They may ask about headaches, neck pain, eye pain, injuries, operations, and vision changes.

Tell them about all eye drops, patches, inhalers, creams, sprays, and other medicines you use. Include possible contact with another person's medicine or with chemicals at work or home.

The examination usually compares both pupils in bright and dim light. It may also check near focusing, eyelid position, eye movements, vision, eye pressure, and the inside of the eye.

Special eye drops may sometimes help identify how the pupil's nerve supply is working. Brain, neck, chest, or blood-vessel imaging is not needed for every case. It may be arranged when the examination suggests a nerve, blood-vessel, injury-related, or structural cause.

Treatment and self-care

Treatment depends on the reason for the unequal pupils. Physiological anisocoria needs no treatment. A pupil affected by accidental medicine exposure often returns to its usual size

after the medicine wears off.

Eye inflammation, raised eye pressure, nerve disorders, and injuries require treatment directed at the underlying condition. A tonic pupil may not need treatment, although tinted lenses or help with close-up focusing may reduce symptoms.

Do not try to test or correct anisocoria using someone else's eye drops. Avoid stopping prescribed medicine without advice. If accidental exposure is possible, wash your hands and note the product name for the clinician or poison information service.

Sunglasses may help if the larger pupil causes light sensitivity. Avoid driving if you have blurred vision, double vision, poor depth perception, or difficulty tolerating light.

What to expect

The outlook depends on the cause rather than the amount of size difference. Normal pupil variation can remain for life without causing harm.

A medicine-related change may last from hours to several days, depending on the substance. An injury-related difference may be permanent. Some nerve-related pupil changes improve gradually, while others remain even after the underlying condition is treated.

If your examination is reassuring, you may only need observation. Take a clear photograph in consistent lighting if advised, and seek reassessment if the difference increases or new eye, eyelid, vision, headache, or neurological symptoms develop.

Common questions

Can tiredness cause anisocoria?

Tiredness can make your pupils change size, but a persistent difference should not automatically be blamed on fatigue. New or changing anisocoria deserves medical assessment.

Can migraine cause unequal pupils?

Temporary pupil changes can occur around a migraine. However, sudden anisocoria with a new, severe, or unusual headache needs urgent assessment rather than being assumed to be migraine.

Why is the difference clearer in photographs?

Lighting, camera flash, angle, and red-eye correction can make pupils appear unequal. Compare several photographs taken at different times rather than relying on one image.

Is anisocoria always serious?

No. A small, stable difference is often a normal feature. Sudden onset or accompanying pain, eyelid drooping, abnormal eye movement, or neurological symptoms changes the level of concern.

Can anisocoria affect vision?

The size difference itself may not affect vision. The underlying cause can sometimes produce light sensitivity, blurred vision, double vision, or trouble focusing.

Sources

- American Academy of Ophthalmology EyeWiki. Anisocoria
- American Association for Pediatric Ophthalmology and Strabismus. Anisocoria and Horner's Syndrome
- Kawasaki A. "Diagnostic Approach to Pupillary Abnormalities." Continuum: Lifelong Learning in Neurology . 2014;20(4, Neuro-ophthalmology):1008-1022
- Merck Manual Professional Edition. Anisocoria