

Blurred vision

What is blurred vision?

When patients present with a complaint of blurred vision it is first necessary to define exactly what they mean – there may be different understandings of what blurred vision is. History and examination can reveal a number of causes in the primary care setting but referral to an ophthalmologist may be needed for confirmation/diagnosis or management of the problem.

History

Identify the presenting complaint

- Blurred vision – a single image that is seen indistinctly. Establish whether this is at distance, near or both.
- Decrease in peripheral vision – the patient may describe bumping into things or frequent scrapes when parking the car.
- Alteration of a clear image – eg, micropsia/macropsia (image appears smaller or bigger) or metamorphopsia (distorted image).
- Interference with a clear image (eg, floaters, flashes of light – photopsia).
- **Diplopia** – monocular (the double vision remains when the uninvolved eye is occluded); binocular (the vision returns to normal on covering one eye), horizontal, vertical, oblique.
- Other disturbances of vision – eg, iridescent vision (haloes, rainbows), dark adaptation problems or night blindness (nyctalopia), colour vision abnormalities.

History of the presenting complaint

- Note whether it is unilateral or bilateral.

- Ask whether it was sudden or gradual in onset. If sudden, ask what the patient was doing at the time; ask what they have done recently that may have affected the eyes – eg, DIY, trauma. If gradual, ask over what period of time it has developed.
- Note whether it has happened before. Note when, and what, happened. Ask whether it has been diagnosed.
- Establish whether there are any associated factors. Examples include any of the other visual phenomena described above, pain (distinguish between ocular pain and pain in the head), associated ocular complaints (eg, red eye, discharge, abnormal appearances) or systemic complaints (eg, headache, other neurological problems, generalised malaise).

Other important factors in the history

- Other ocular history – note whether this could be a worsening of a pre-existing condition (eg, cataracts that have now become symptomatic) or a new condition arising from a recent problem (eg, infection after cataract surgery).
- Medical history – many systemic conditions affect the eye and may result in acute or chronic blurring of the vision. See also the separate [Eye in Systemic Disease](#) article.
- Medication – some drugs may be toxic to the eye or precipitate acute angle-closure glaucoma.
- Family history – it is helpful to know about atopy, diabetes, thyroid disease, certain malignancies and any hereditary syndromes.
- Social history – important in many ways; eg, a metal worker with arc eye, an elderly person whose cataracts are making it difficult for them to cope alone, an HGV driver who needs to contact the DVLA.

Examination

Please see also the [Examination of the Eye](#) article where there is a comprehensive description of eye examination. The essence of examination involves a look at the eye's structure and at its functioning.

Assessment of structure

- Work from front to back, ie start with the lids and examine as far back as the instruments you have will permit you to, looking at the anterior segment, lens, and vitreous through to the fundus. Don't forget to test for corneal sensation (a rolled cotton bud lightly touching the cornea) and then re-examine the cornea using fluorescein.
- Light from the outside world has to cross a series of transparent media to reach the retina, namely the cornea, the (crystalline) lens and the vitreous. These are the visual media. Try to decide whether the visual media are clear or not - this will be a good guide as to what the diagnosis might be. If you cannot obtain a red reflex, it is likely that the problem lies within one or more of these structures. This may be an intrinsic problem to the structure (eg, corneal oedema secondary to corneal trauma) or as a result of a more distant problem (eg, clouding of the lens due to uncontrolled diabetes). If you can obtain red reflex, the problem is more likely to lie at the level of the retina or the optic nerve.
- Look for evidence of trauma, infection or inflammation (generally manifesting themselves as a red eye ± associated features) - be guided by the history.

Assessment of function

- Check visual acuity. This is mandatory in both eyes of all patients. Exact previous visual acuity will probably not be on record but note strength of spectacles, if worn. Establish whether visual acuity is improved by a pinhole.
- Examine the pupils: sit the patient in a dimly lit room (to avoid pupillary constriction from the room light overriding that from your torch) and tell them to look at a far wall to overcome the accommodation reflex. Use a bright light source which should be directed from below to avoid the shadow from the nose. Compare them (size and shape) and assess for a direct response to light; carry out the swinging flashlight test to rule out a relative afferent pupillary defect and look for a light-near dissociation.
- Do a confrontational visual field test - this examines the peripheral vision.
- Assess macular function with an Amsler grid - this examines the central vision. ^[1]

- Note whether the external ocular movements are full.

Other examination

This is guided by your history and ocular examination but may include a full [neurological examination](#), examination of the pulse for atrial fibrillation, listening for any carotid bruits and checking blood pressure, and checking urine for glucose.

Investigation

This will depend upon what is suspected. It may require urgent (same day) referral to an ophthalmologist for slit-lamp examination and a definitive diagnosis. If there is suspicion of giant cell arteritis (temporal arteritis) urgent, same day, CRP and plasma viscosity tests are required and treatment with steroids may be needed in primary care, if rapid access to a temporal artery biopsy is not available, which is often the case. Steroid treatment should not be delayed to wait for a biopsy.

If the onset of blurred vision is gradual and there is no suspicion of an acute emergency then an optician review may be an appropriate first option.

Differential diagnosis

It is helpful to divide possible diagnoses into laterality, speed of onset and associated pain. This is for guidance and is not absolute.

Acute angle-closure glaucoma may affect both eyes but usually only one at a time has an acute attack. Giant cell arteritis (temporal arteritis) may affect one eye initially and immediate starting of steroids is essential to protect the other eye. Chemicals or foreign bodies in the eye may be unilateral or bilateral (sometimes the symptoms are so intense on one side that the other is not noticed by the patient or practitioner until the worse symptoms have subsided – always examine both eyes).

Unilateral, sudden and painful

- [Trauma](#): history, associated injuries, inflammation ± hyphaema.
- [Orbital cellulitis](#): the area surrounding the eye will be hot, red, swollen and tender and the patient will be systemically unwell.

- **Endophthalmitis**: associated with accidental or surgical trauma which may be recent or old but may also be endogenous. Look for the painful red eye, reduced visual acuity and a hypopyon.
- **Corneal problems**: trauma, infection, severe dry eye or exposure keratopathy, contact lens problems.
- **Anterior uveitis**: red eye associated with photophobia, headache – may be previous episodes.
- **Acute angle-closure glaucoma**: often precipitated when the pupil is in mid-dilation (e.g. watching television in dim conditions), often associated with systemic malaise (headache, nausea, vomiting).
- **Arteritic anterior optic neuropathy – giant cell arteritis (temporal arteritis)**: (patients >50 years old) – the pain is often more a headache than acute eye pain; other features include jaw claudication, scalp tenderness, polymyalgia rheumatica ± anorexia, weight loss, fever.
- **Optic neuritis**: (can be bilateral) can be a very painful presentation of multiple sclerosis – look for pain, particularly on moving the eye. There may be other focal neurological symptoms.
- **Migraine**: when there are scintillations, the pain in the head often appears when the visual disturbance is ebbing or has disappeared.

Unilateral, sudden and painless

Ocular causes

- **Vitreous haemorrhage**: may also present as sudden floaters. It may arise as a result of diabetic retinopathy, a retinal break or detachment, retinal vein occlusion and, occasionally, a posterior vitreous detachment or age-related macular degeneration (AMD). Also, consider it in trauma, subarachnoid or subdural haemorrhage, intraocular tumours and sickle cell disease. It can occur in other more unusual situations too.
- **Central retinal artery occlusion** presents with painless, almost instantaneous, reduction of vision in one eye.^[2] The degree of visual impairment is usually very considerable – there may be a complete loss.

- **Central retinal vein occlusion** frequently presents with loss of vision or blurred vision, often starting on waking.
- **AMD** - in the majority of cases, this is the 'dry' form which is associated with a progressive decrease in visual acuity. However, in about 10% of cases, the 'wet' form occurs where a neovascular membrane forms which may be susceptible to bleeding, so causing a dramatic and rapid loss of vision.
- **Retinal detachment** tends to produce a 'curtain' coming across the visual field rather than blurring of vision.
- **Intermediate or posterior uveitis** - this tends to present with marked floaters ± blurring of vision rather than the painful red eye characteristic of anterior disease.
- **Anterior ischaemic optic neuropathy** - look for a relative afferent pupillary defect, a pale and oedematous optic disc, flame-shaped haemorrhages and possibly an altitudinal visual field defect.
- **Hydrops** - acute corneal oedema may arise in a number of conditions such as keratoconus.
- **Cerebrovascular disease** - this usually causes visual disturbance in both eyes but should be considered when a patient presents with unilateral blurred vision.

Systemic causes

- **Giant cell arteritis (temporal arteritis)** - may be associated with a painful or tender head but the eye is not usually painful. There is usually progressive but rapid unilateral loss of vision rather than a complaint of blurred vision.
- **Papilloedema** - optic disc swelling secondary to raised intracranial pressure may give rise to headache rather than eye pain. Visual abnormalities tend to be transient initially.
- **Amaurosis fugax** - this characteristically presents as a curtain across the vision and may be associated with intraocular emboli, atrial fibrillation and carotid bruits.
- **Migraine prodrome** - this may occur in some people without a following headache. It is usually unilateral but may progress to be homonymous.

- **Toxic illness** – it is apparent that the patient is pyrexial and unwell.

Bilateral, sudden and painful

Arc eye, as in welders. There will probably be a history of welding a number of hours earlier with inadequate protection and often the patient will offer the diagnosis.

Beware of malignant hypertension in the susceptible patient who develops rapidly progressing blurring of vision bilaterally (not necessarily equally). Pain tends to be in the form of headaches.

Bilateral, sudden and painless

- **Papilloedema**.
- **Cerebrovascular disease** may lead to damage to the visual pathways and optic cortex. There may or may not be macular sparing. Visual disturbance is often homonymous
- **Drugs** – anticholinergic drugs but also sedative drugs like antipsychotics and anticonvulsants. The onset of effect of these drugs can be quite slow.
- Refractive errors tend to change very slowly over years but, in poorly controlled diabetes mellitus, they may change more rapidly. Drugs like steroids and anticholinergics can also have this effect.

Unilateral or bilateral, gradual and painless

- **Glaucoma** – this is characterised by asymptomatic but progressive peripheral visual field loss which is usually bilateral but asymmetric.
- **Refractive errors** – hormonal changes, such as occur during pregnancy, can affect the refractive error but this reverts on restoration of baseline hormone levels. Progression of corneal disease such as dystrophies or keratoconus can also cause gradual visual loss.
- **Cataracts** – the patient may also complain of dulling of colours (and may be noted by relatives to have a predilection for very bright or gaudy colours!). Think of cataracts in patients with diabetes and those on systemic steroids and immunosuppressants (eg, transplant patients).

- **AMD** – dry form.
- **Cystoid macular oedema** – this may occur as a result of surgery, inflammation or vascular disease.
- **Diabetic maculopathy** – ischaemia may lead to gradual decrease in visual acuity whereas oedema tends to result in more acute visual distortion.
- **Genetic disease** – there are many degenerative conditions that can cause blurring of the vision. These may affect the elements of the visual media (eg, the cornea in keratoconus) or the retina (eg, Best's disease).
- **Drug toxicity** – for example, hydroxychloroquine, methanol, ethambutol and, more recently, it has been described with COX-2 inhibitors.
- **Other toxic agents** – including exposure to organophosphates.
- **Inflammatory optic neuropathies** – these tend to be associated with systemic diseases such as **sarcoid**, vasculitis or **syphilis**.
- **Chronic eye strain** – as with excessive use of computers under adverse conditions, may produce blurred vision.

Unilateral, gradual and painful

Neoplastic or inflammatory disease of the orbit and globe.

Medically unexplained visual loss

This can occur in four circumstances:

- Organic disease has not been diagnosed.
- The patient has blurred vision as part of a syndrome of medically unexplained symptoms.
- The visual loss is psychosomatic.
- **Münchhausen's syndrome** (or fabricated or induced illness by carers – formerly known as Münchhausen's syndrome by proxy).

Note: deciding that there is no underlying organic disease is difficult and not advisable without a specialist opinion. You may note some features or be aware of some aspects of the patient's situation that raise the question in your own mind and, depending on circumstances, it may be worth mentioning these to the ophthalmology team. These may include:

- Ongoing litigation or compensation claim.
- Recent or ongoing stressful events.
- Previous, undiagnosed episodes examined in another part of the country.

Observe behaviour (evidence of self-harm, marked eye rubbing) and think about whether navigation is consistent with recorded visual acuity (typically reported between 6/12 and no perception of light).

Blurred vision treatment and management

This depends upon the cause – see the separate articles through links. If an adequate diagnosis cannot be made, and often when one can be made, the help of an ophthalmologist is required. As a rule of thumb, acute, painful conditions warrant same day referral. A suspected case of giant cell arteritis (temporal arteritis) – where the patient doesn't necessarily have an eye pain – and central retinal artery occlusion also need prompt referrals.

Driving

Check the guidance from the DVLA regarding a patient's ability to drive. This will depend on the nature of the visual problem and the underlying cause. [3]

Further reading

- [Marmor MF](#); Vision, eye disease, and art: 2015 Keeler Lecture. *Eye (Lond)*. 2016 Feb;30(2):287–303. doi: 10.1038/eye.2015.197. Epub 2015 Nov 13.

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