CONDITION

Neuroretinitis

Neuroretinitis is inflammation that causes optic nerve swelling followed by fatty deposits in the central retina.

WHAT IT IS
Inflammation of the optic nerve and nearby retina

BODY SYSTEM
Eyes and nervous system

MAIN SYMPTOMS
Blurred vision, blind spot, faded colours, visual haze

WHAT CAUSES IT
Infection, immune inflammation, or unknown

HOW IT IS DIAGNOSED
Dilated eye examination, OCT, and cause-directed tests

MAIN TREATMENT
Cause-specific antimicrobials; sometimes corticosteroids

CAN IT BE CURED?
Sometimes - treatable causes may resolve

IS IT AN EMERGENCY?
Sometimes - sudden vision loss needs urgent assessment

LONG-TERM OUTLOOK
Vision often improves, but lasting blind spots can remain

Overview

Neuroretinitis is a type of inflammation affecting the optic nerve and the retina. The optic nerve carries visual information from your eye to your brain. The retina is the light-sensitive tissue lining the back of the eye.

The condition usually begins with swelling where the optic nerve enters the eye. This area is called the optic disc. Days later, fatty material may collect in a star-shaped pattern around the macula, the part of the retina responsible for detailed central vision. Clinicians often call this a macular star .

Neuroretinitis is a pattern of eye inflammation rather than one single disease. It can be triggered by an infection, an immune response, or an unidentified cause. It usually affects one eye, although both eyes can be involved.

It matters because several other conditions can also cause optic disc swelling or sudden visual changes. These include other forms of optic neuritis, raised pressure around the brain, retinal disease, and problems with blood flow to the optic nerve. Prompt assessment helps establish the cause and protect vision where treatment is available.

Symptoms

Vision commonly becomes blurred or dim over several days. The change is usually painless, although mild discomfort around the eye can occur.

Possible symptoms include:

Peripheral, or side, vision is often less affected than central vision. Some people notice that reading or recognising faces becomes difficult even though they can still see objects to the side.

The macular star may not be visible at the beginning. It often develops after the optic disc has already become swollen. For this reason, an early examination may resemble another form of optic nerve inflammation.

Symptoms elsewhere in the body can provide clues to the cause. For example, an infection may be associated with fever, swollen lymph nodes, a skin lesion, or recent contact with a cat or kitten. Many people have no obvious illness before their vision changes.

- Blurred or reduced central vision
- A grey, dark, or blurry area near the centre of sight
- Colours appearing faded or less bright
- Reduced contrast, making objects look washed out
- Small floating spots or visual haze
- Rarely, more extensive loss of vision

Causes and risk factors

The best-known infectious cause is Bartonella henselae , the bacterium associated with cat-scratch disease. People can encounter it after a scratch or bite from a cat, particularly a kitten, or through contact with cat fleas. A remembered scratch is not required, and most people exposed to cats do not develop neuroretinitis.

Other infections can occasionally produce the same eye findings. These include syphilis,

tuberculosis, Lyme disease, toxoplasmosis, and some viral infections. Which tests are useful depends on your symptoms, exposures, immune health, and where you live or have travelled.

In some cases, inflammation occurs without an infection being found. This is called idiopathic neuroretinitis. "Idiopathic" means that the cause remains unknown after appropriate assessment.

A small group of people have recurrent idiopathic neuroretinitis, meaning that inflammation returns in the same or the other eye. This pattern may involve an abnormal immune response, but it is not the same as an inherited eye disorder.

Having a weakened immune system can affect which infections are considered and how severe they become. Recent animal exposure, tick bites, travel, sexual exposure, or contact with tuberculosis may also guide testing. These are possible clues, not proof of a cause.

Diagnosis

An ophthalmologist examines the back of your eye after using drops to widen the pupil. The key findings are optic disc swelling and, often, the later appearance of hard yellow-white deposits around the macula.

Optical coherence tomography, usually called OCT, takes detailed cross-sectional images of the retina and optic nerve. It can show retinal swelling, fluid, deposits, and changes in nerve fibres. Photographs may be used to follow these findings over time.

Other possible tests include:

There is no single blood test that confirms every case. Testing is tailored to the clinical picture rather than ordering every possible infection test.

Because the macular star may appear later, a repeat eye examination can be important when early findings are unclear. Blood pressure may also be checked because very high blood pressure can produce disc swelling and retinal deposits that resemble neuroretinitis.

- A visual field test to map missing or blurred areas
- Colour vision and pupil testing
- Fluorescein angiography to examine leakage from retinal blood vessels
- Blood tests chosen for likely infections or inflammatory conditions
- Brain and eye-socket MRI when the diagnosis is uncertain or another optic nerve condition is possible

Treatment and management

Treatment is based on the underlying cause, the severity of vision loss, and whether one or both eyes are involved.

A confirmed or strongly suspected bacterial infection may be treated with antibiotics like amoxicillin or doxycycline chosen for that infection. Cat-scratch disease can improve without treatment in some otherwise healthy people, but ocular involvement may lead to antimicrobial treatment, particularly when vision is significantly affected or illness is more extensive.

Syphilis, tuberculosis, and other specific infections require their own treatment plans. Completing treatment and follow-up is important because the infection may affect more than the eye.

Corticosteroids like prednisone or hydrocortisone reduce inflammation. They may be considered in selected cases, sometimes alongside antimicrobial treatment. They are not appropriate as stand-alone treatment for every person. Starting them before certain infections have been considered may mask or worsen infection.

If testing does not identify a cause and vision is stable, careful observation may be appropriate because many episodes improve as the inflammation settles. Recurrent idiopathic neuroretinitis may require longer-term treatment that changes immune activity. This is usually planned with ophthalmology or neuro-ophthalmology specialists.

Glasses cannot remove optic nerve swelling or a central blind spot. However, an updated prescription, brighter lighting, magnification, or low-vision tools may help with remaining visual difficulties.

Follow-up examinations and OCT scans track whether swelling and retinal deposits are clearing. They also help identify optic nerve thinning, recurrence, or another explanation for ongoing symptoms.

Complications

Inflammation can damage some of the nerve fibres carrying visual information. After swelling resolves, the optic disc may look pale because of this loss. This is called optic atrophy.

Possible lasting effects include:

The fatty deposits forming the macular star may remain visible for months after vision begins to improve. Their presence does not necessarily mean that inflammation is still active.

Severe or permanent visual loss can occur, particularly when diagnosis is delayed, infection is

difficult to control, or episodes recur. However, many people recover useful central vision. A normal letter-chart result does not always mean that colour vision, contrast, or the visual field has fully returned.

- A central or blind-spot-shaped gap in the visual field
- Reduced colour or contrast sensitivity
- Ongoing difficulty with fine detail
- Thinning of the retinal nerve fibre layer
- Recurrence in either eye

Prevention

Neuroretinitis itself cannot always be prevented. In many cases, no cause is found, and recurrent idiopathic neuroretinitis has no established preventive measure.

Reducing exposure to certain infections may lower risk:

These steps cannot prevent every case. Preventive antibiotics are not routinely taken simply because a cat has scratched you. Anyone with a bite, scratch, or infection concern should receive advice based on the wound and their overall health.

For recurrent neuroretinitis, regular specialist follow-up may identify a new episode early. This is monitoring rather than guaranteed prevention.

- Wash cat scratches or bites promptly with soap and water
- Avoid letting cats lick open wounds
- Use veterinary flea control for household cats
- Avoid rough play that encourages kittens to scratch or bite
- Use barriers during sex to reduce the chance of syphilis
- Take practical precautions against tick bites in areas where Lyme disease occurs

Living with it and what to expect

The active swelling often settles over weeks, while retinal deposits may take several months to clear. Vision can improve before the eye looks completely normal on examination.

Recovery is different for each person. It is shaped by the cause, the amount of optic nerve injury, treatment of any infection, and whether inflammation returns. Improvement may

continue gradually for months rather than occurring all at once.

Some people recover close to their previous visual sharpness. Others retain a small central blind spot, faded colours, or reduced contrast. These changes may be most noticeable in dim light, when reading small print, or when looking with the affected eye alone.

If only one eye is affected, the other eye may compensate during daily tasks. This can hide ongoing problems with depth perception or fine detail. Take care with driving, stairs, machinery, and other activities until you understand how your vision has been affected and have received appropriate advice.

Routine follow-up may include eye examinations, visual field testing, and OCT imaging. Report new changes rather than waiting for the next scheduled visit, especially if vision in the other eye becomes affected.

When to get medical help

Seek urgent same-day eye assessment for new, unexplained blurred vision, a central dark area, faded colours, or a rapid change in sight. These symptoms have several possible causes, and neuroretinitis cannot be confirmed from symptoms alone.

Go to an emergency department or use local emergency services if vision loss occurs with:

These combinations may indicate a neurological, pressure-related, or other emergency rather than routine neuroretinitis.

Contact your eye specialist promptly if vision worsens during treatment, symptoms appear in the other eye, or previous symptoms return. Stable vision during recovery and planned OCT monitoring are usually handled through routine follow-up.

- Facial weakness, arm weakness, speech difficulty, or severe imbalance
- A sudden, unusually severe headache
- Confusion, fainting, or repeated vomiting
- Rapid loss of vision in both eyes
- A serious eye injury or chemical exposure

Common questions

Is neuroretinitis the same as optic neuritis?

No. Both involve inflammation of the optic nerve, but neuroretinitis also produces leakage into

the nearby retina, often forming a macular star. Typical optic neuritis is more often painful with eye movement and has different associations, although symptoms can overlap.

Will my eyesight return to normal?

Many people have substantial improvement, but complete recovery cannot be promised. A small blind spot, reduced contrast, or faded colour vision may remain even when letter-chart vision improves. The cause and degree of optic nerve damage affect recovery.

Is neuroretinitis contagious?

Neuroretinitis itself does not spread from person to person. Some infections that can cause it may be transmissible, including syphilis. Cat-scratch disease is generally acquired from cats or their fleas rather than from another person with neuroretinitis.

Why am I being asked about cats?

Cat exposure can suggest infection with Bartonella henselae , a recognised cause of neuroretinitis. Not everyone recalls a scratch, and contact with a cat does not prove that Bartonella caused the eye problem. Testing and examination findings are considered together.

Can neuroretinitis come back?

Yes, recurrence is possible, particularly in recurrent idiopathic neuroretinitis. A new episode may affect the same eye or the other eye. New blurring, colour change, or a central blind spot needs prompt reassessment.

Can glasses fix the blurred vision?

Glasses correct focusing problems but cannot repair an inflamed optic nerve. They may help if you also have short-sightedness, long-sightedness, or astigmatism. Magnification, lighting changes, and low-vision support can help if visual effects remain.

Sources

- Purvin V, Sundaram S, Kawasaki A. Neuroretinitis: review of the literature and new observations . Journal of Neuro-Ophthalmology . 2011;31(1):58-68.
- Abdelhakim A, Rasool N. Neuroretinitis: a review. Current Opinion in Ophthalmology . 2018;29(6):514-519.
- Reed JB, Scales DK, Wong MT, et al. Bartonella henselae neuroretinitis in cat scratch disease: diagnosis, management, and sequelae. Ophthalmology . 1998;105(3):459-466.
- Centers for Disease Control and Prevention. Clinical Guidance for Bartonella henselae . Updated January 30, 2024.



- Centers for Disease Control and Prevention. Neurosyphilis, Ocular Syphilis, and Otosyphilis . Sexually Transmitted Infections Treatment Guidelines, 2021 .