Non-Arteritic Anterior Ischemic Optic Neuropathy

What is non-arteritic anterior ischemic optic neuropathy?

Non-arteritic anterior ischemic optic neuropathy (NAION or NA-AION) is caused by decreased blood flow to the front part of the optic nerve. It typically causes optic nerve swelling and sudden vision loss. NAION typically affects one eye, though the other eye sometimes suffers similar loss months or years later. If there is sudden blood loss, both eyes may be affected together.

The blood supply to the optic nerve comes from a branch of the carotid artery called the ophthalmic artery. The ophthalmic artery has smaller branches; loss of the blood supply within those branches damages the optic nerve, causing the optic nerve to swell. The swelling goes away, but part of the optic nerve is permanently damaged.

Why does the optic nerve lose blood flow in NAION?

We do not completely understand the cause of the loss of blood supply to the optic nerve. We do know that it happens more often in patients born with small optic discs (the front part of the optic nerve). This crowded optic disc structure makes the nerve more vulnerable to blood supply problems. NAION is likely caused by a sudden or transient drop in blood pressure (following an operation or associated with blood loss after an accident). Other risk factors may include:

- Smoking
- Diabetes
- High blood pressure
- Sleep apnea
- Anemia
- Kidney disease

Certain drugs used for erectile dysfunction may be associated with NAION. In young patients, a history of migraine or a blood clotting disorder might play a role.

In most cases, nothing you did or did not do caused this problem.
How does NAION affect my eyes and vision?

Most people with NAION experience **sudden painless vision loss in one eye**. The vision loss often consists of a gray or dark spot that does not move or change or a severe blur. For many people, the vision loss affects the top or bottom half of the vision in one eye.

Your eye doctor may describe your optic nerve as swollen. A normal optic nerve is round, pink, and flat; when there is decreased blood flow to the optic nerve, the optic nerve swells.

![Normal optic nerve (left eye) and Optic nerve swelling from NAION (right eye)](image)

Courtesy of Dr. Kevin E. Lai, M.D.

**Left:** Normal optic nerve (left eye)

**Right:** Optic nerve swelling from NAION (right eye)

Why do I need to see a neuro-ophthalmologist?

A neuro-ophthalmologist is a medical doctor whose specialty includes the optic nerve. The diagnosis of NAION is a clinical one, meaning that there is no one test that gives us the diagnosis. A number of features are taken into consideration. Neuro-ophthalmologists are experts at making this clinical judgement.

The neuro-ophthalmologist will evaluate your vision and may perform or order additional tests to rule out other causes of optic nerve swelling and vision loss. **Visual acuity** measures the sharpness of your central vision (ability to read the eye chart). **Color vision** is tested using figures or numbers composed of colored dots. A **visual field** test maps your field of vision, sometimes
called your side or peripheral vision. The response of the pupil to a bright light is assessed. Additional tests measure the thickness of the optic nerve fibers.

What non-visual tests might my doctor order?

Your doctor may recommend testing to assess the risk factors for NAION such as measuring blood pressure and obtaining blood tests for diabetes and high cholesterol. Tests, such as a CT or MRI scan of the brain, are sometimes ordered to rule out other potential causes of vision loss.

A specific kind of inflammation, called giant cell arteritis, can cause vision loss very similar to NAION. To check for this disease, your doctor may ask you questions about other symptoms, order blood tests and perform a biopsy of an artery on your scalp.

What will happen to my vision? What is my prognosis?

- Most people with NAION do not lose further vision after the initial vision loss. However, about 1 in 10 people will lose additional vision during the first weeks while the optic nerve is still swollen. If your vision continues to worsen over more than a few weeks, contact your doctor.
- The optic nerve swelling goes away by 1-2 months, leaving behind permanent changes to the optic nerve and to your vision.
- Around 40% of people with NAION have some improvement in central vision over time. Unfortunately, the area of visual field loss does not usually improve. It may, however, become less noticeable with time, especially if the other eye is normal.
- Your other eye may develop NAION in the future. Approximately 20% of people with NAION in one eye will develop NAION in the other eye within 5 years. Diabetes may increase your risk of developing NAION in the other eye.
- A repeat attack of NAION in the same eye is rare.
What treatments are available for NAION?

Unfortunately, there is no proven effective treatment for NAION. Many research studies have looked at different medications and surgical operations to treat NAION with no measurable effect on vision. Likewise, there is no proven preventive treatment at this time.

Despite this, many neuro-ophthalmologists recommend some basic steps for your health:

- It is helpful to talk with your primary care provider about the risk factors that can affect NAION. Screening for diseases such as diabetes, high cholesterol, high blood pressure, and sleep apnea are important for your overall health.
- While high blood pressure is a risk factor for NAION, it is also important that your blood pressure not run too low, especially during the night. You may want to talk with your primary care provider about better blood pressure control. Sometimes it involves changing the timing of your blood pressure medications.
- Many neuro-ophthalmologists also recommend taking daily aspirin (low-dose or full-dose). Aspirin reduces the risk of heart attacks and strokes, which can also occur in people with NAION.
- If you smoke, you should work with your primary care provider to stop smoking.