

Solar (Photic) Retinopathy

What is solar retinopathy?

Solar, or photic, retinopathy occurs when intense light energy injures or damages the retina (the inner lining of the back part of the eye, see Figure 1). The most common cause of solar retinopathy happens from looking at the sun, which happens with sun-gazing or viewing a solar eclipse. It can also happen after any long exposure with a bright light. Solar retinopathy has been linked with using laser pointers, welding, and staring at bright lights. Exposure to intense light energy can cause damage to your vision, usually as a mild-to-moderate area of blurry vision (also called a “blind spot” or scotoma) in your central vision. While some people fully recover their vision slowly over months, others will have permanent vision loss.

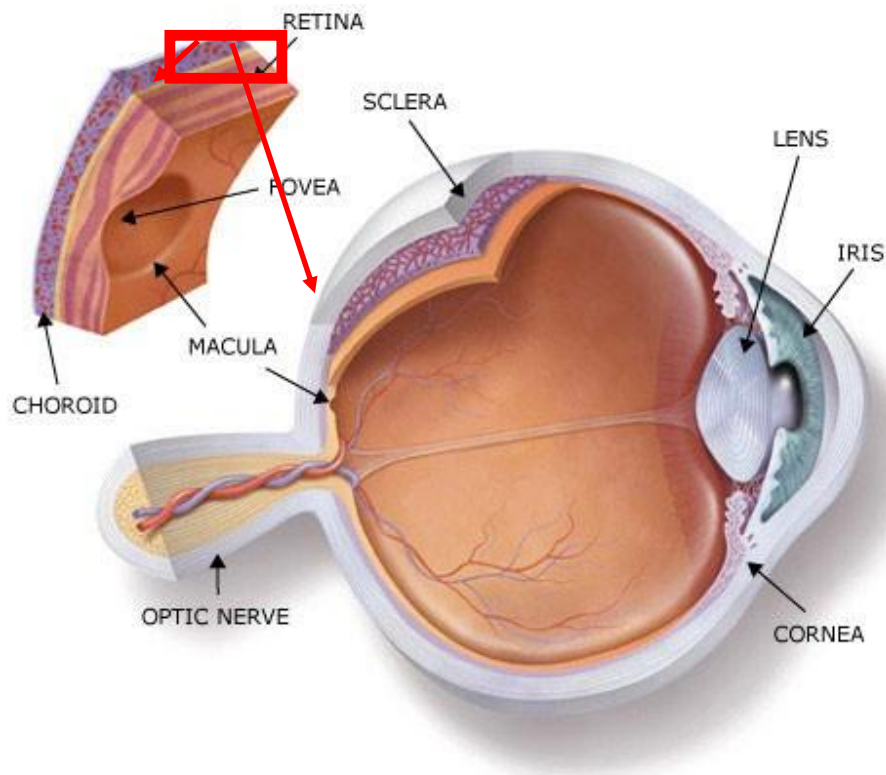


Figure 1: Eye Anatomy. The retina is the inner lining of the back part of the eye, shown by the red arrows. More information on eye anatomy can be found at <https://aapos.org/glossary/anatomy-of-the-eye>.

What are the symptoms of solar retinopathy?

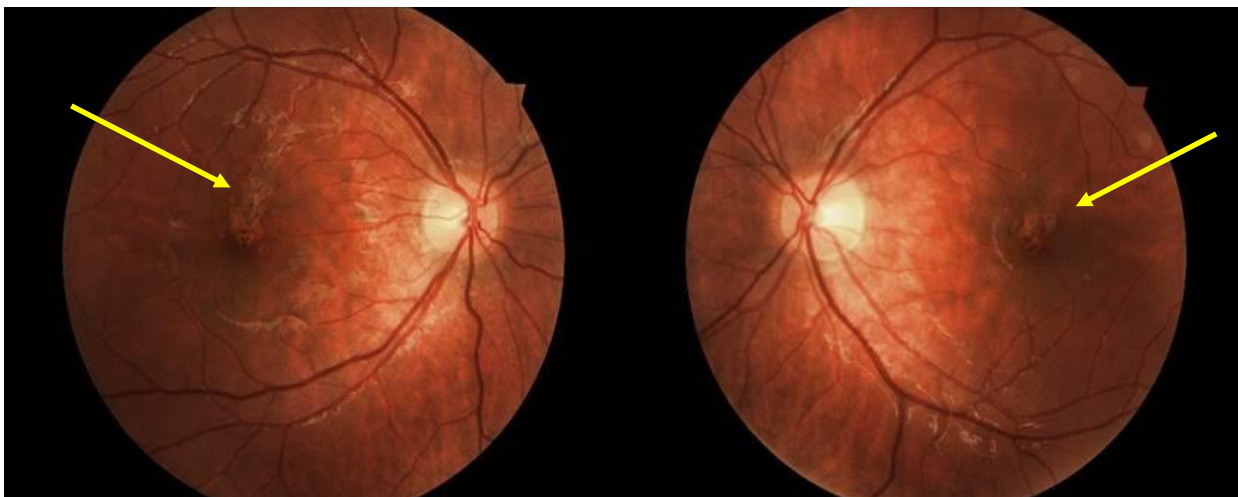
The most common symptom of solar retinopathy is a “blind spot” (also called a scotoma) in one or both eyes. Other complaints include: abnormal color vision (also known as dyschromatopsia), twisting or warping of the central vision (also known as metamorphopsia), seeing objects smaller than they actually are (also known as micropsia), and headaches. The retina does not have pain receptors, so we do not feel the injury when it is occurring. Symptoms of solar retinopathy typically happen within a few hours of the injury. If you or a loved one might have solar retinopathy, it is

important to see your ophthalmologist (a medical eye doctor). The ophthalmologist can help confirm the diagnosis and determine the amount of damage to the eye.

How is solar retinopathy diagnosed?

A history of light exposure and a complete eye exam are needed to diagnose solar retinopathy. During the eye exam, the eyes should be dilated so that your ophthalmologist can see the inside of the back part of your eye (the retina). In order to dilate your eyes, eye drops are used to make the pupil (the black space in the center of the colored part of the eye) bigger. If there is moderate to severe damage to your retina, your ophthalmologist should be able to see it during the examination. If the damage is very mild, your retina may look normal, so your ophthalmologist may need to perform other tests to confirm the diagnosis.

Sometimes photos taken of the back of your eye (called retinal or fundus photographs) can help show the location and amount of damage to the retina (see Figure 2).



Right eye

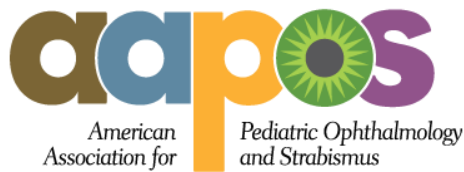
Left Eye

Figure 2: Retinal or fundus photos of the right and left eyes of a patient with solar (photic) retinopathy (as shown by the yellow arrows) caused by staring at a laser pointer. Photos courtesy of David L. Rogers, MD.

Other tests that may help diagnose solar retinopathy include visual field testing, optical coherence tomography (also known as OCT), and fluorescein angiography (also known as FA).

Visual field testing can check for blind spots (or scotomas) in your vision.

Optical coherence tomography (OCT) is a specialized imaging test that shows cross sectional images of the retina on a microscopic level. Solar retinopathy causes very specific changes to the retina that can be seen on OCT testing to help confirm the diagnosis of solar retinopathy. These changes involve damage to the outer layers of the retina, in the part of the retina responsible for your central vision (known as the fovea).



Fluorescein angiography (FA) is a test used by ophthalmologists to look at the blood flow in the retina. In solar retinopathy, there may be an area of damaged retina that can be seen on the FA as a “window defect” that can help confirm the diagnosis of solar retinopathy.

How can I prevent solar retinopathy

The most important way to protect yourself from solar retinopathy is to not look directly at the sun, laser pointers, or bright lights unless using proper eye protection. The sun can be viewed safely if approved solar filters are used. Proper eye protection is also necessary when viewing a solar eclipse. For more information on how to safely view a solar eclipse can be found here: <https://aapos.org/glossary/how-to-safely-view-a-solar-eclipse>

How is solar retinopathy treated?

There is no known treatment for solar retinopathy. Many people improve on their own over 3-6 months without any treatment. Steroids have been tried to improve and reverse symptoms, but there is no proof that they work for solar retinopathy.

What is the prognosis of solar retinopathy?

For most people with solar retinopathy, vision will improve in the first few months after the injury. Most people will have a final vision of 20/40 or better (which is around the level of vision needed to pass a driving license test). Unfortunately, vision changes that are still present 6 months after the injury will likely be permanent. Some people will continue to have permanent distortions (also known as metamorphopsia) and blind spots (also known as scotomas) in their central vision.

Is it safe to watch a solar eclipse?

When done safely, it is absolutely safe and fun to watch a solar eclipse! If you plan to look at the sun while viewing any type of solar eclipse, always use an approved filter. Only filters that meet the ISO 12312-2 standard will protect your eyes while viewing the sun. Never look directly at the sun without appropriate eye protection.

There are ways to safely view a solar eclipse without looking directly at the sun. More details on how to safely view a solar eclipse can be found here: <https://aapos.org/glossary/how-to-safely-view-a-solar-eclipse>

Where can I find more information?

- EyeWiki: https://eyewiki.aao.org/Solar_Retinopathy
- American Academy of Ophthalmology: <https://www.aao.org/eyenet/article/blink-mystery-image-10>