

SUNLIGHT AND YOUR EYES

EVERYDAY STEPS TO SUN SAFETY



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Whether we view them as the windows to the soul or a good backdrop for our eye shadow, our eyes are obviously of incredible importance — for most, they represent the most cherished of all our senses, providing our most immediate and lasting impressions of the world.

Yet without realizing it, we may expose our eyes to danger every day, simply by going outside. Over time, the sun's rays can seriously damage the eyes and surrounding skin, leading to vision loss and conditions from cataracts and macular degeneration to eye and eyelid cancers. However, some simple protective strategies practiced daily can help keep our eyes and the sensitive skin around them healthy throughout our lives.

Don't Take the Sun Lightly

Certain types of light from the sun can wreak havoc in the eye area.

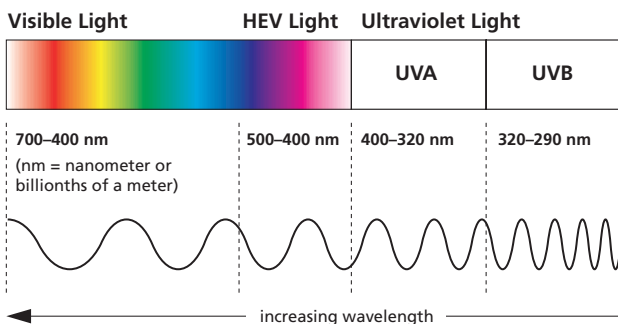
Ultraviolet A and Ultraviolet B light —

Long-range, ultraviolet A (UVA) and short-range, ultraviolet B (UVB) rays are the most dangerous forms of light produced by the sun. At 320-400 nm (nanometers, or billionths of a meter) and 290-320 nm, respectively, these powerful rays have wavelengths shorter than visible light, making them invisible to the naked eye. They are considered a major cause of cataracts, eyelid cancers and certain other skin cancers, and believed to play a part (along with high-energy visible light, which includes blue light, part of the visible light spectrum) in macular degeneration, one of the major causes of vision loss in the U.S. for people over age 60. In addition, UV rays can prematurely wrinkle and age the skin around the eyes.

High-Energy Visible Light (HEV light)/Blue Light —

Some of the latest eye research has implicated HEV light – high-energy visible light in the violet/blue spectrum – as a contributor to the development of cataracts, macular degeneration and other serious eye maladies. HEV falls into the near-UV range, from almost 400 to over 500 nm in the visible spectrum.

Blue light, roughly between 440 and 490 nm within the HEV spectrum, can damage the retina over time, leading to macular degeneration. The retina is the ocular membrane where images are formed and transmitted to the brain; the macula, the region of sharpest vision located near the center of the retina, is the most likely area to be damaged.



Are You at Risk?

The fairer your skin, the greater your age, and the lighter your eyes, the higher your long-term risk of sun damage to your eyes, especially if your work or recreation involves prolonged sunlight exposure. Light eyes are at increased risk for skin cancer and some eye diseases because they contain less of the protective pigment melanin.

According to the National Cancer Institute's SEER database, an estimated 2,390 men and women were diagnosed with, and 240 died from, cancers of the eye and orbit in 2008. With their thin and delicate structures, and greater lifetime exposure to the sun than any other part of the body, the eye and surrounding areas are particularly prone to cancers.

The reality is that *all of us* are susceptible to eye and eyelid cancers or other damage from the sun, and we need to find ways to help protect ourselves on a daily basis, because the damage keeps adding up over time.

How Sunlight Damages the Eyes

Although the eyelid is designed to protect the eye, its skin is exceedingly thin and contains many fragile tissues that may be injured by UV light. Inside the eye, the lens and the cornea, both transparent, filter UV rays, but by doing so for many years, they may become damaged. This is especially true for the lens, which through years of UV absorption, turns yellowish and cataractous. The lens is the eye's transparent focusing mechanism, located between the iris and the vitreous humor (the clear, thick gel in the posterior compartment of the eye that fills the space between the lens and retina, giving the eye its form and shape). The cornea, the transparent area in front at the outer layer of the eye, admits light and images to the retina. UV damage is instrumental in causing:

Eyelid cancers: Skin cancers of the eyelid, including basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) as well as melanoma, account for 5 to 10 percent of all skin cancers. Most occur on the lower lid, which receives the most sun exposure. BCCs make up about 90 percent and SCCs 5 percent or more of all eyelid cancers, while melanomas account for about 1-2 percent. BCCs of the eyelid affect an estimated 16.9 men and 12.4 women per 100,000 people in the U.S. each year, and while BCCs

elsewhere on the body rarely spread, eyelid BCCs have a significant risk of spreading to the eye itself and surrounding areas, causing major damage to the eye and disfigurement to the face.



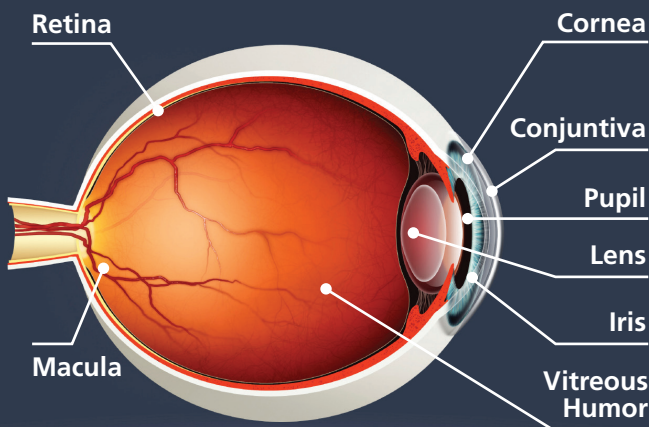
Patient immediately after eyelid skin cancer surgery

SCCs have a faster growth rate and a greater potential to spread. Both of these types of cancer are found mainly in patients with a history of sun exposure. Melanoma can spread rapidly in the eye area and can prove lethal if not treated promptly. Melanomas have been linked to a history of intense, intermittent sun exposure and sunburns.

When diagnosed and treated early, eyelid cancers usually respond well to surgery and follow-up care, with the eye and eyelid largely retaining normal function. With reconstruction, they generally remain cosmetically attractive. But left untreated, they are extremely dangerous and may even ultimately penetrate the brain. Watch for these early warning signs:

- a lump or bump that frequently bleeds or does not disappear
- persistent red eye or inflammation of the eyelids that does not respond to medication
- newly acquired flat or elevated pigmented lesions that have irregular borders and growth
- unexplained loss of eyelashes

If you have any of these warning signals, consult a skin cancer specialist or ophthalmologist, even if you feel no discomfort.



Intraocular melanoma: Although rare, it is the most common eye cancer in adults. It starts in the uveal tract, the middle layer of the eye containing the iris (the part of the eye responsible for eye color) and the pupil, which lies in the center of the iris. Symptoms may include a dark spot on the iris, blurred vision, or a change in the pupil's shape. Sometimes, however, there are no symptoms.

Conjunctival cancers: Once rare, these cancers have been rising rapidly in incidence in recent years, based on NCI data. Research covering 10 percent of the U.S. population showed that incidence among white men especially increased — 295 percent over a 27-year period.

Conjunctival melanomas may be more common in patients with atypical mole syndrome; these patients have 100 or more moles, one or more moles 8 mm (1/3 inch) or larger in diameter, and one or more moles that are atypical. All patients with cutaneous melanomas and/or atypical moles should have yearly ophthalmologic evaluations.

Cataracts: A progressive clouding and yellowing of the crystalline lens, the eye's focusing mechanism. At least 10 percent of cataract cases are directly attributable to UV exposure. In the U.S. alone, more than one million operations to remove cataracts are performed every year. Cataracts are the most common cause of treatable blindness worldwide, and UVB has been directly linked to cataracts.

Macular degeneration: Often referred to as age-related, or senile, macular degeneration, it is caused by damage to the retina over time. The retina is the ocular membrane where images are formed and transmitted to the brain; the macula, the region of sharpest vision near the center of the retina, is the most likely area to be damaged. Macular degeneration is one of the major causes of vision loss in the U.S. for people over age 60. While further research is required, some studies point to UVA and blue light as potential causes of macular degeneration.

Benign growths of the conjunctiva: Problems with the conjunctiva, the protective membrane covering the outside of the eye and the inside of the eyelids, usually develop later in life. Pterygia, fleshy benign growths on the conjunctiva that may ultimately interfere with vision, may require surgical removal. These unsightly growths most frequently occur in areas where UV is intense year-round.

Keratitis, or corneal sunburn: Excessive exposure to UV from the sun or tanning machines can literally burn the cornea, the eye's clear refracting surface that admits light and images to the retina. UV-protective lenses are therefore especially a must for anyone who uses a tanning machine, as well as for skiers or snowboarders, since UV is more intense at high altitudes, and since snow reflects back the sun's rays, so that they hit your eyes a second time.

Virtually all of these UV-related eye conditions can be found by a qualified eyecare professional during a routine eye exam. Thus, it is important to have a complete ophthalmologic exam, including dilated funduscopy, on a yearly basis.





Best Defense

Lenses that absorb and block UV are one of the strongest defenses against eye and eyelid damage, so it's best to wear sunglasses (prescription or non-prescription) *year-round* whenever you are out in the sun. UVA light can damage the eyes and the skin around them year-round, and even on overcast days, damaging amounts of UV can penetrate through clouds and haze. But remember, fashion and high price do not guarantee safety.

For proper protection, sunglasses should have the following:

- Packaging or signage for the product indicating the ability to absorb and block 99 to 100 percent of both UVA and UVB light. Ideally, they should also guard against blue light.
- Sufficient size to shield the eyes, eyelids, and surrounding areas. The more skin you cover, the better. Wraparound styles with a comfortable, close fit and UV-protective side shields are ideal.
- Durability and impact resistance.
- Polarized lenses to eliminate glare, especially when driving. They also increase comfort when you are out in the snow or on the water, where reflection greatly magnifies glare. Continuing glare can lead to fatigue, headaches and even migraines.

Also look to see if the glasses meet ANSI and/or ISO standards for traffic signal recognition, which means that the lenses permit good color recognition, especially for tasks such as discriminating red from green traffic signals.

Sunglass lenses come in many shades; look for the lens color that provides you with the most comfortable vision.

Most importantly, when you purchase sunglasses, check the tags, labels, or packaging to make sure the lenses have proper UV protection. For an extra guarantee of safety, look for The Skin Cancer Foundation's Seal of Recommendation.

Today, UV absorption can be incorporated into most optical materials without hindering vision and at little extra cost. Ideally, all eyewear, including prescription glasses, contact lenses and even intraocular lens implants should filter out UVA and UVB.

Other Defenses



While sunglasses are essential for year-round sun protection, other safety measures are also important to protect against eye damage, skin cancers and premature aging of the skin.



Hats are an especially important strategy. Wearing a hat with at least a 3-inch brim all around can block as much as half of all UVB rays from your eyes and eyelids. Hats or tinted visors also help block UV from entering your eyes from above.



Since sunglasses and hats cannot cover your entire face, sunscreen is also important.



Finally, whenever you are outside, seek the shade, especially between 10 AM and 4 PM, when sunlight is the most intense.

Remember, practice all these strategies year-round. And don't forget them when you are on vacation, summer through winter. Keep in mind that both water and snow reflect back 80 percent or more of the sun's rays, so that they hit your eyes and skin a second time. Also, remember that UV intensity increases with altitude, so be sure to protect yourself during activities such as skiing and hiking.

Treatment

If you detect symptoms of any problems with your eyes or eyelids, be sure to see a physician. Ophthalmologists have the greatest knowledge of eye conditions, while dermatologists are experts on the skin.

At first, the physician may choose to observe an eye problem over time to see if the symptoms worsen or abate. Many lesser problems can also be solved with simple strategies like eyedrops. For more serious conditions, many forms of treatment are available. For example, **surgery** is the front-line treatment for cataracts, eye cancers and eyelid cancers. Different forms of **radiation** may also be used on cancers, especially if the patient is considered too sick or weak for surgery. Other forms of therapy may include lasers, cryotherapy or topical chemotherapy.

The prognosis is good for patients with small, non-metastasized tumors. So remember, for cancers as well as any other eye condition, the earlier you detect and treat the problem, the likelier it is that it will be completely cured.



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Medical Reviewer:

Réne S. Rodríguez-Sains, MD

The Skin Cancer Foundation

149 Madison Ave., Suite 901, New York, NY 10016