



HOW SUNGLASSES HELP WITH NIGHT DRIVING

BY GARY HEITING, OD

Most people know that good-quality sunglasses protect our eyes from the sun's harmful UV rays, reduce glare and increase visual comfort on bright, sunny days.

But something not widely understood is that wearing sunglasses during the day can also improve night vision.

SUNGLASSES AND DARK ADAPTATION

According to the American Optometric Association (AOA), studies have shown that two or three hours of bright sunlight can delay the onset of dark adaptation of rod photoreceptors by 10 minutes or more; and in some cases, full night vision sensitivity may not be reached for hours. Also, after 10 consecutive days of sunlight exposure, a 50 percent loss in visual acuity and losses in visibility range and contrast discrimination at night were reported in these studies. Wearing dark sunglasses that block 85 percent visible light during daylight hours was found to reduce or prevent degradation of night vision.

THE SWITCH FROM DAYLIGHT TO NIGHT VISION

In order to function at their maximum sensitivity in low-light conditions, our eyes have to undergo a change called dark adaptation.

In this process, there is a shift in reliance on high-resolution photoreceptor cells in the retina (cones) to lower resolution photoreceptors (rods).

Both cone and rod photoreceptors contain photopigments that are essential for vision. In bright daylight, pigments in cone cells are activated while the photopigment in rod cells (rhodopsin) is inactivated or “bleached” and the rods are essentially inactive. In low light, cones lose their sensitivity and rod cells must take over. But it takes some time for rhodopsin in the rods to regenerate and enable night vision.

Complete dark adaptation and maximum night vision can take 20 to 30 minutes or longer—sometimes much longer—to occur, and is affected by previous sunlight exposure. The longer the rods have been exposed to light and the brighter it is, the longer it takes to get your maximum night vision. In some cases, full night vision sensitivity may not be reached for hours.

Also, studies have shown that several consecutive days of sunlight exposure can cause significant losses in nighttime visual acuity, range of vision and contrast discrimination. But here's the good news: These same studies found that wearing sunglasses that block 85 percent visible light during daylight hours enabled faster dark adaptation and prevented degradation of night vision.¹

WHY DARK ADAPTATION IS IMPORTANT

According to the Insurance Institute for Highway Safety, the most dangerous time to drive is between 5 and 7 PM. More highway fatalities occur at this time than during any other time of the day.

During this evening “rush hour,” in addition to a large number of vehicles on the road, drivers have to deal with changing light conditions. When the sun is low in the sky, it can cause significant glare that affects visibility.

After sunset, drivers' eyes must adapt to low-light conditions and oncoming headlights.

It's possible that many auto accidents occurring at this time of day could be avoided if more people wore sunglasses during daylight hours. Doing so would enable drivers' eyes to adapt quicker to lower ambient light so they can see better and react quicker after the sun goes down.

And because our eyes' ability to adapt to changing light conditions diminishes with age, wearing dark sunglasses during the day is even more important after age 50. This is true not just for night driving, but also for tasks such as walking into a dimly lit restaurant or entering a dark theatre.

The best sunglasses to wear during the day to protect night vision would be polarized lenses that provide 100 percent UV, 85 percent of visible light and provide solar blue light protection. Coppertone polarized lenses would provide all three factors.

Resources:

¹Night Vision Manual for the Flight Surgeon; Chapter 3. Armstrong Laboratory; Brooks Air Force Base. August 1992.

Gary Heiting, OD, has more than 20 years experience as a clinical optometrist.

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