SUNGLASSES: Truths and Myths

Are popular, name brand expensive sunglasses really worth the money? How good are the inexpensive "shades" from the drug store or the sunglass boutiques at the mall? Can you buy sunglasses that protect the eyes without costing a lot of money? What's the story about "Blue Blockers"---are they any good? What's so important about UV protection? Let's examine those issues, and more.

Health Aspects of Sunglasses

Ultraviolet radiation (UV) is high-energy short wavelength light. Another name for UV is blacklight. It is called this because it is light that is not seen, at least by humans! UV is a normal part of the radiation which comes to earth from the sun. UV-C, the shortest wavelength does not reach the earth's surface. UV-B does effect us. It is this wavelength that causes sunburns and is implicated as one of the causes of cataracts (the clouding of the crystalline lens inside the eye) and may be involved in retina diseases like macula degeneration. UV-A is the so-called "tanning rays", and some of that wavelength may also play a role in eye disorders as UV-B. Of recent concern is the thinning of a part of the Earth's atmosphere called the ozone layer. Ozone in the atmosphere limits the amount of UV reaching the Earth's surface. In places where the ozone layer is thinned, protection from UV exposure becomes a serious health concern.

UV (ultraviolet light) protection is certainly important. All ophthalmic quality lenses block all UV-B and even most UV-A rays. Adding a dark tint further increases UV-A absorption. Better quality coated lenses, most "high index" (thinner and lighter-weight materials) and all polycarbonate lenses block virtually 100% of the UV. Contrary to popular myth, dark tints do not significantly "dilate the pupil and let in more harmful UV rays." The UV is already blocked by the lens! So what about extra-added UV tints and coatings? At least for most of us, utilizing high-quality modern plastic lenses, it's not necessary. The notable exceptions are people with certain retina diseases, post ocular surgery patients, patients taking certain medications and people in certain unique conditions (laser research, arc welding, for example) which result in exposure to unusually high levels of UV may require special UV radiation protection. People residing under an atmospheric "ozone hole" may also fall into that group. (Those areas are constantly changing and are often seasonal. In the southern hemisphere, Australia, New Zealand and areas in the extreme South Pacific are effected. In the Northern Hemisphere, parts of Scandinavia, Northern Europe, Iceland, Northern Canada and even areas in the southern parts of Canada and northern USA may be effected. Efforts are underway globally to reduce the human-caused pollution that contributes to this phenomena.

People with and without the need for vision correction should use quality sunglasses---for protection from UV and for vision-system comfort. This is especially important for contact lens wearers. Most contacts do not block UV and those that do are not as protective as sunglasses. It's a good idea to use quality sunglasses so your vision clarity remains at its peak. And don't forget to try a hat with a brim or visor! That will go a long way in reducing glare and eye strain too.
Optical Considerations

Let's examine the quality of sunglass lenses. Optically, the best lenses are distortion-free and provide you with the degree of illumination reduction that enables comfortable vision without squinting in bright light. Not everyone requires the same light-blocking level to achieve visual comfort. Some of us do quite well with moderately dark lenses and others need very dark lenses to cut the glare. Light level and glare sensitively vary greatly. It has to do with the size of the pupils, the speed at which the iris reacts to changing illumination and the degree of the dark, stray light-absorbing pigments inside your eye.

Glass lenses are more durable and don't scratch as easily as plastic, but can break if dropped or struck with a hard object. Plastic lenses are lighter and are available in more colors and coatings, but are more prone to deterioration from scratches. There are some plastic materials, polycarbonate and Trivex, for example, which are ultra-impact resistant and is an excellent choice as a safety or sports lens.

Polarized lenses effectively block reflected glare, a situation which occurs primarily near water or snow or off reflective surfaces nearby, such as car windows, metallic objects, etc. Light which strikes a horizontal reflective surface is reflected back into your eyes. You then get a "double dose" of light energy, some of which falls directly on to you and some that is reflected on to you. Polarized lenses offer an interesting advantage: because they dramatically reduce or eliminate the reflected light energy which might account for the majority of the annoying glare, you can use a lighter tint to achieve the same (or better) degree of glare reduction and comfort compared to non-polarized dark lenses.

Polarized lenses are available in glass and plastics. Glass lenses are usually a laminate of two pieces of glass with a plastic polarizing sheet sandwiched in between. There’s one product that has the polarizing layer cast inside the glass and is one solid lens. This makes for a lighter product and one which doesn't de-laminate over time. Plastic lenses are lighter than their glass counterparts and are sometimes made as a single laminate and sometimes are cast as above.

Photochromic lenses (some people call them "PhotoGray" or “Transitions,” which are two popular brand name) are lenses, plastic or glass, that darken when exposed to UV light. They lighten to nearly clear when not in direct sunlight. Better photochromics darken and lighten more quickly and under more extremes of temperature. They do not perform well inside a car or truck (unless you have a sun-roof) as the windshield blocks most UV light. Some new products function better in that regard as they have a lower level of threshold UV response. Photochromic lenses are available in a number of colors, although the most common are amber-brown and gray.

All lenses are available in prescription powers as well as non-prescription for contact lens wearers and those without the need for vision correction.
The Frame

Any eyeglasses frame (those displayed for regular eyeglasses) can be made into great, custom sunglasses. Frames for sunglasses are best if they allow for good coverage of the eyes and surrounding area. Some, especially sports-oriented frames, have a wrap-around appearance. This helps prevent light energy "leaking in" from the sides and reflecting in from the rear. The wrap effect also can decrease wind noise dehydration of the exposed eye tissues for cyclists and runners.

Better quality frames use superior quality materials which hold their adjustment better, retain color and style and generally last much longer than less expensive frames.

Many name-brand sunglasses do indeed have excellent optics. If you are thinking about buying a tremendously discounted "name brand", make sure they are first quality product, not imported copies or manufacturing rejects. If the price seems to good to be true, it probably is, but not always. You can determine (to a reasonable degree) the quality of optics in any non-powered lens by holding the frame at arm's distance, perfectly level (not turned or tilted) and view horizontal and vertical objects (door frames, window sills) as you move the lenses slowly side to side and up and down. The image should not shift and lines should not bend or distort in any way. It is certainly possible to find an inexpensive sunglass with good optics if you know what to look for. The type and construction of the lens material also plays a role in how well the optics will be maintained over time. Thinner lenses and lenses made of certain plastics tend to warp when exposed to heat. Leaving your sunglasses on the dashboard of your car will likely ruin the optical quality of the lenses, even if they were excellent quality lenses to begin with.

The Tint/ Color of the Lens

Tint is another issue: Gray lenses provide a normal color presentation. Other colors can change the way the world appears. Gray-green lens, for example is a very well tolerated tint, but does somewhat enhance blues and greens and diminish reds and yellows. Some people like reddish or yellowish tints. Others like to view the world through rose colored glasses! Purists, artists and photographers, however, desire neutral-density lenses which only reduce illumination with absolutely no shift in color perception. There is some evidence that blocking or reducing certain colors reduces your sensitivity to those colors when using your eyes under normal conditions. This is indeed true in the short term.

“Blue blockers” certainly distort color perception as they are designed to skew the spectrum away from the shorter blue/violet end. They allegedly improve vision perception (not necessarily acuity) by reducing the blue wavelengths which sometimes cause light scatter and haze. They are also sold as devices which "protect the eyes from damaging radiation". There is no clinical evidence to support these assumptions for people with normal, healthy eyes. There are, however, a couple of instances where they may indeed help: people with yellowed crystalline lenses from cataracts and patients with certain retinal diseases may indeed benefit from reducing some of the short blue-violet wavelengths nearest the UV range. Lenses can be tinted to selectively filter the appropriate wavelength of light to enhance vision perception for these individuals. Glasses marketed as "blue blockers" do not conform to any specific guidelines.
Review of tints:

Gray/smoke: Most common type of colored lens. Reduces total illumination reaching the eye without changing the apparent color of viewed objects.

Amber/browns: Produces a warmer view and may increase contrast perception on hazy days as it reduces blue wavelengths. May help people with certain types of cataracts. Highlights contrast differentials in green colors and can enhance acuity on the golf course.

Yellow: Can improve contrast without reducing apparent illumination. Similar to amber, it blocks blue wavelengths as above. Good for overcast days and a popular choice for mountainbikers, skiers and practice shooting.

Rose: May improve contrast due to short blue wavelength blocking as above. Many people find this a soothing tint and that it reduces glare-related eyestrain.

Blue: This tint has been used by tennis players for enhancing apparent brightness while increasing the relative contrast of whites and yellows, including balls, court markings and top-of-net tape.

Mirror coatings: Can further reduce light transmission and reduce glare. Provides identity-blocking effect as your eyes cannot be seen.

Sunglasses for Children

Children also benefit from sunglasses. Their eyes and vision system are a growing and developing system, like the rest of their bodies. Protecting their eyes from unnecessary strain and squinting in sunlight makes good health sense and increases the best-odds of allowing their vision system to meet its best future potential. Using a hat with a brim or sun visor is especially important for children, especially those who don't like to wear sunglasses. Polycarbonate lenses are ideally suited for children's sunglasses. This material offers an extra bonus of impact resistance and safety along with full UV protection at no additional cost.

About Price

Price is not always an indication of quality, but, in general, good optics do cost more. And it's definitely worth it, if seeing clearly and comfortably is important to you! Some specialty lenses, like polarized and photochromics add some additional cost. The quality of the frame is also an issue. Better quality frames hold the adjustment and fit better and last much longer than lower quality materials. Sometimes, you do get what you pay for, but in some cases, you're just paying for a brand name or this season's latest fad. It is important to consider the comfort and health of your eyes when considering the purchase of sunglasses. Fashion and fun are important, too. Sunglasses give you the opportunity to combine health and fashion, so treat yourself to the very best. You deserve it!