

# Night Vision & Driving

Many of your patients will find driving at night far more challenging than in daylight. The elderly particularly will often volunteer the information that they have trouble seeing where they are going, and that the dazzle from oncoming headlights is annoying or even debilitating.

## Daytime vision and vision at night

Daytime (photopic) vision relies primarily on the cone photoreceptors of the retina - these are most concentrated in the fovea centralis, the very centre of the retina and responsible for the sharpest vision.

Vision in pitch darkness (scotopic vision) depends mostly on the rod photoreceptors which prevail away from the central retinal region - rods are not colour sensitive in the main.

Night driving in most circumstances involves mesopic vision - in terms of retinal function, midway between photopic and scotopic. In fact, in well lit and brighter urban road settings, the visual conditions are almost photopic.

It is the variability of lighting conditions encountered at night which presents the most challenges. This is especially so for the elderly, many of whom have cataract to one degree or another, and who also may have compromised retinal function.

Obviously, the more a driver can see, the better will be their decision making, and thus their safety.

The distribution of road lighting and reflectorised road markings is often patchy and in many circumstances, virtually non-existent. Therefore the night driver is often "on their own".

## Helpful advice you can give

Windscreens should be kept clean on the outside; washers should be filled with the appropriate detergent and wiper blades renewed regularly. The film that builds up on the inside of the windscreen should also be cleaned off.

Headlamps should also be washed often, and the appropriate products

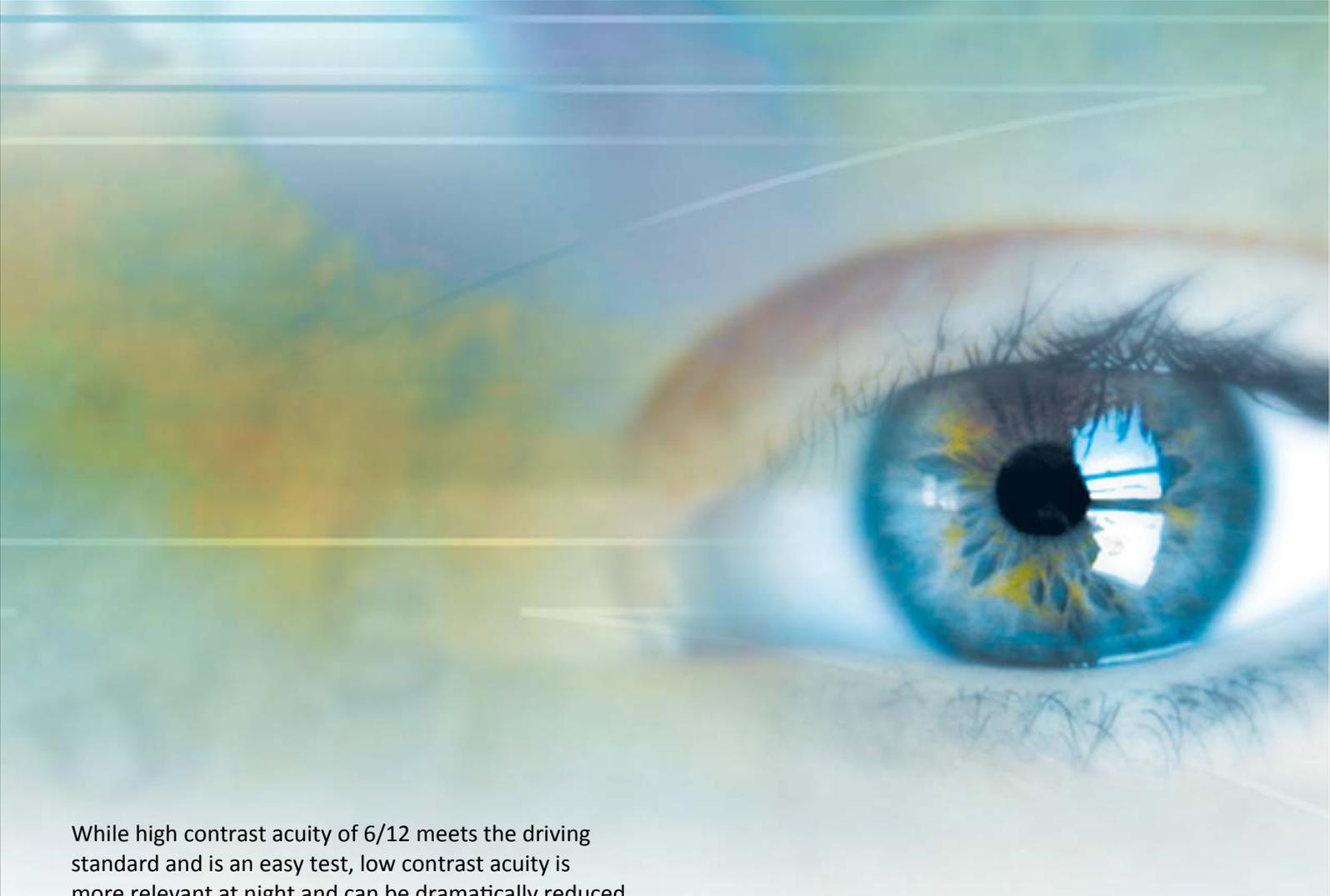
used to remove the yellowing commonly seen on polycarbonate headlight covers.

Any spectacles used for driving should be free of any tinting and they should be kept clean. Some lens coatings can fail. The early stages of lens failure may not be evident to the wearer and yet vision may be compromised, especially in glare (oncoming headlights) conditions. If you see any crazing, haze, or filming on a patient's lenses that does not clean away, it might be a good idea to advise them to have the lenses checked by an optometrist.

Elderly drivers should have regular professional eye examinations; this particularly relates to those known to have cataract, as often their refraction alters significantly over relatively short periods. Many drivers seem to think that just because they meet the required 6/12 vision standard either with, or without, spectacles, that they are fine. Often however, the demands of driving in poor light or darkness require a better standard of vision than this.

*Think especially of patients with cataract, as often their refraction alters significantly over relatively short periods.*





While high contrast acuity of 6/12 meets the driving standard and is an easy test, low contrast acuity is more relevant at night and can be dramatically reduced by cataract even though high contrast acuity is within normal limits. Drivers with cataract should be counselled about these effects to help them better understand the need to be extra vigilant when driving at night. And for your patients with more advanced cataract, you should consider encouraging them to avoid night driving altogether .

Debilitating glare from oncoming headlights is a serious danger. This is especially so when the oncoming driver fails to dip their lights. Some drivers are also troubled by the blue/white brightness of contemporary HID xenon headlamps. Drivers need to be counselled to slow, to keep their eyes directed to the left of the road whilst at the same time maintaining an awareness of the relative position of the oncoming vehicle.

Drivers should be encouraged to think of the performance of their own headlights. Whilst safety (NCAP ratings) and fuel economy feature strongly in vehicle purchasing decisions, the fact is that headlight performance is also a variable that should be considered. Contemporary published 'road tests' aren't much help in this regard; some vehicles have headlights that, although meeting WOF standards, are mediocre.

Often, it is possible to retro-install bulbs with improved light output for the same power consumption; any reputable auto electrician can offer the appropriate advice. And of course headlights should be aimed as high as is legal to ensure maximum illumination of the road ahead, especially when on dipped beam.

Finally, drivers should be encouraged to use high beam at every appropriate opportunity when traveling in darkness. Unfortunate accidents where a motorist hits a darkly clad pedestrian or an animal in their path, or even a deep pothole, might well be avoided with more appropriate headlight settings.

If required, more detailed advice is available from a local optometrist or through the offices of the New Zealand Association of Optometrists.

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