

# Low Vision Drivers: The Ophthalmologist's Role and Responsibility

**D**ecades ago, acquiring or retaining a driver's license would have been a significant challenge or improbability for individuals with mild to moderate vision loss. Today, thanks to expanded vision standards for driving in licensing jurisdictions across the United States, many candidates with low vision can now qualify and apply for (at least restrictive) driving privileges.

The decision to commence—or continue—driving must be made based on a discussion between the individual, an ophthalmologist, a driver rehabilitation specialist or driving instructor, and the state licensing authority. “Although it may be tempting to tell some patients that they cannot drive, this decision must be considered carefully because driving privileges should not be withheld without clear justification,” said John D. Shepherd MD, at the University of Nebraska Medical Center in Omaha.

Ophthalmologists have multiple responsibilities to low vision patients who are seeking licensure, including assessment, education, and referrals—and, in some cases, discussion about the use of a bioptic lens system.

## The Bioptic Lens System

**Why a bioptic lens?** In order to safely operate a vehicle, drivers must be able to identify cues within their visual field, accurately assess this information, and



**BIOPTIC LENS.** A binocular-mounted dual-lens system is used for visual assistance in driving. The driver is using the telescopic unit for short-term vertical spotting to resolve distant detail, color, or movement of objects or forms in her dynamic driving environment.

take appropriate action. Many individuals with mild to moderate visual acuity (VA) loss are capable of recognizing these cues; however, due to reduced central VA, identifying or interpreting them may be a challenge. “With the aid of a bioptic lens and specialized driver training, many of these individuals can learn to drive safely,” said driver rehabilitation specialist Charles P. Huss COMS, who estimated that there are approximately 8,000 to 10,000 persons in the United States who are currently licensed bioptic drivers.

**How the lens works.** A bioptic lens is a dual-optic lens system consisting of

a small telescopic unit mounted onto a pair of eyeglasses (carrier lens), slightly above an individual's natural sightline (Fig. 1). The driver looks through the carrier lens about 95% of the total driving time. The telescope is used intermittently and for brief fractions of a second for glimpsing detail, color, or activity in the field of view and for spotting road signs, traffic lights, pedestrians, or motor vehicles that are 20 feet distant or farther. Viewing through the telescope is only undertaken when the car is on straight sections of a roadway and when other cars are at a safe distance.

Using the telescopic lens is not as easy as putting on a pair of glasses and shifting the car into drive, however. Viewing through the miniature magnifying unit, even though briefly,

---

BY LESLIE BURLING-PHILLIPS, INTERVIEWING RHONDA DALYAI, MA, TVI, CDI, CHARLES P. HUSS, COMS, CYNTHIA OWSLEY, PHD, MSPH, AND JOHN D. SHEPHERD, MD.

can present 2 problems to new users, according to Dr. Shepherd: It can cause a pericentral scotoma, and it causes apparent motion. The latter, he said, “is exacerbated by a moving vehicle and can be quite disturbing to a novice user. It is therefore imperative to train individuals in both stationary and moving environments to ensure that they can benefit from the bioptic lens for driving.”

**Using the lens.** The driver training requirements for bioptic lenses vary, but most states require extensive training and a rigorous assessment upon completion. For example, West Virginia’s program is a 6-week course that involves 90 hours of training evenly divided between classroom instruction, passenger-in-car related instruction, and on-road driving instruction. Prior to graduation, students must pass a standardized 40-mile, 80-minute on-road driving assessment on a variety of roadways and under several conditions (e.g. bright sun, overcast, rain, light to heavy traffic).

Rhonda Dalyai, MA, TVI, CDI, a West Virginia driving instructor to those with low vision, said, “We help clients with a wide variety of visual issues and diagnoses. Based on their needs, we try to accommodate and assist them with what will work best for them in the dynamic driving environment.”

The research shows that, once trained and licensed, bioptic drivers find the device helpful;<sup>1</sup> they have personal insight about any driving deficiencies they may have;<sup>2</sup> and they are no more likely than their nonbioptic counterparts to receive a traffic offence or be involved in collisions.<sup>3,4</sup> (Mr. Huss suggests finding a driver rehabilitation specialist at [www.aded.net](http://www.aded.net).)

**Know your state’s visual requirements for driving.** “As many as 23 states now license people down to, and including, the 20/200 level, which is a dramatic shift in what was thought feasible 50 years ago,” said Mr. Huss, who is based in West Virginia. While many states offer some type of bioptic driving licensure, Connecticut and Utah do not allow it in any form.

Among the states that do permit the device, the laws vary widely. For exam-

ple, key differences include the minimum level of VA allowed; the degree of horizontal visual field required; the maximum amount of telescopic magnification permitted; whether or not night driving and interstate driving are permitted; and the type and extent of adaptive driver’s training that is needed. “Ophthalmologists should know the visual requirements for licensing in their state and be able to educate their patients about bioptic driving when relevant. The requirements can be found online at your state’s licensing bureau,” said Cynthia Owsley, PhD, MSPH, at the University of Alabama at Birmingham.

**Inform viable candidates about bioptic driving.** Bioptic driving can be prescribed for a range of diseases and conditions, but most suitable candidates have mild to moderate central vision loss with a VA of 20/50 to 20/200 and a stable ocular condition. Additional factors that make an individual a good candidate for the bioptic system include:

- Full or relatively full visual fields (VFs)
- Acuity that can be improved with a 4X telescope or less (varies by state)
- Not light sensitive
- Good contrast sensitivity
- Good glare recovery skills
- Good color vision
- Normal head, neck, and eye movement
- Normal bilateral hearing
- Average or above-average intelligence
- Free of visual attention deficits (i.e., reduced speed of visual processing, reduced ability to divide attention, and reduced selective attention)
- Highly motivated, dedicated, goal oriented
- Able to accept objective criticism
- Emotionally stable
- Prior driving experience, or a realistic grasp on the concept of driving and its responsibilities
- Has participated in sports or recreational activities that require forward scanning (i.e., looking ahead to where your body will be in the next few seconds), lateral head and eye scanning, and object avoidance.

### When a Lens May Not Work

Not all low vision patients will qualify for a bioptic lens, and ophthalmol-

ogists must assess and guide these patients as well.

### Identify patients who do not meet the visual requirements for driving.

When you recognize that a patient may not qualify for state licensure, “discuss the legality of driving and issues that may compromise safety for driving, which will make a difference in terms of whether an individual should be licensed or not. All recommendations should be documented in the medical record,” said Dr. Shepherd.

**Recognize the distinction between legal and safe.** Even if an individual passes the tests needed to drive, this does not necessarily mean that they are safe to drive. Much more is involved than maintaining the legal VA and VF. Driving also requires the sensory ability to perceive changes in a rapidly changing environment, the mental ability to judge this information in a timely fashion and to make appropriate decisions, and the motor ability to execute those decisions. All are important factors when assessing who is safe to drive. While someone might meet the visual requirements, a prolonged reaction time or impaired motor ability (e.g., arthritis) could make it inadvisable to issue a driver’s license because it could potentially be unsafe.

**Look for red flags.** Some patients may meet the visual requirements for driving, but they may have other visual problems or physical or cognitive impairments that could affect their driving. According to Mr. Huss, ophthalmologists should be alert to the warning signs and recommend driving cessation or refer the patient for further evaluation if there is evidence of slow reaction rates, cognitive decline, significant VA or VF loss, contrast sensitivity loss, reduced glare recovery, or poor night vision, or if driving tasks are becoming challenging.

Dr. Shepherd noted that it is important to remember that the final responsibility of issuing a driver’s license rests with the state driver licensing authority. If there is any question about a patient’s ability, he said, “it is the prerogative of the ophthalmologist to appeal to the licensing authority for a behind-the-wheel evaluation for the patient.”

**Suggest alternative transportation.**

It is important to remain sensitive when discussing driving cessation with a patient. Suggesting alternative transportation should be part of the discussion with those who do not qualify for a driver's license. For example: getting rides with family and friends, taxi services, Uber or Lyft, shuttle buses, and public transportation are all common choices. "Local agencies on aging and rehabilitation are usually great resources for transportation options that exist in a community. Encourage the visually impaired individual and their family members to tap these resources as well," said Dr. Owsley.

"If a patient comes to me with the expectation that a bioptic lens will help them to drive and they are not a good candidate, I have found that putting the costs into perspective helps. In addition to the costs of the bioptic telescope and driver's training, there are the costs of owning and operating a motor vehicle, including auto insurance, car maintenance and repairs, licensing and title, and gasoline. In reality, the amount of money saved can provide a lot of alternative transportation," said Dr. Shepherd.

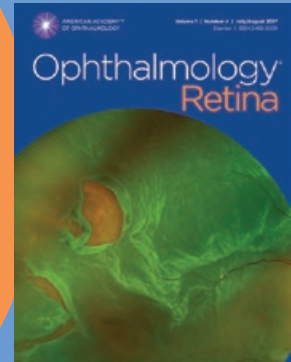
1 Bowers AR et al. *Invest Ophthalmol Vis Sci.* 2005;46(1):66-74.  
2 Owsley C et al. *Invest Ophthalmol Vis Sci.* 2014; 55:330-336.  
3 Wood JM et al. *Invest Ophthalmol Vis Sci.* 2013; 54:3790-3797.  
4 Vincent C et al. *Assistive Technology.* 2012;24(3): 184-195.

**Ms. Dalyai** is a certified teacher of the visually impaired and certified driving instructor at the West Virginia Division of Rehabilitation Services, Nitro, W.V. *Relevant financial disclosures: None.*  
**Mr. Huss** is a driver rehabilitation specialist at the West Virginia Division of Rehabilitation, Nitro, W.V. *Relevant financial disclosures: None.*  
**Dr. Owsley** is professor and vice chair for research administration in the department of ophthalmology at the University of Alabama at Birmingham. *Relevant financial disclosures: None.*  
**Dr. Shepherd** is director of the Weigel Williamson Center for Visual Rehabilitation and assistant professor of ophthalmology at the University of Nebraska Medical Center in Omaha. *Relevant financial disclosures: None.*



AMERICAN ACADEMY  
OF OPHTHALMOLOGY®

High-quality  
research from the  
world's leading  
ophthalmic journal



The Academy's newest scientific publication, ***Ophthalmology***® ***Retina***, focuses on advances in medical drug treatment, surgery and technology for retina-related diseases and conditions.

Subscribe at [aao.org/store](http://aao.org/store).

Protecting Sight. Empowering Lives.®