Preparing your visually impaired child for their future

Distance Vision Devices • Education • Driving

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Lead Author
Henry Greene, OD, FAAO

Contributors and Reviewers
Cindy Bachofer, Ph.D, CLVT
Carolyn Carman, OD, FAAO
Christi Clossen, OD, FAAO
Anne Corn, Ed.D
Chuck Huss, COMS
Laura Windsor, OD, FAAO

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About the authors

**Henry A. Greene, OD, FAAO**

Upon his graduation from the Pennsylvania College of Optometry, Dr. Greene trained in Low Vision Care at the Industrial Home for the Blind (which later became the Helen Keller Center) in New York City. After moving to North Carolina, he co-founded Ocutech to develop telescopic low vision devices for the visually impaired. He joined the Department of Ophthalmology faculty at the University of North Carolina School of Medicine to run their low vision clinic where he rose to the rank of clinical professor. At Ocutech, Dr. Greene has been the principal investigator on over $1.5 million in NIH (US) and Ontario (Canada) Ministry of Health grant funding to develop telescopic low vision devices. Dr. Greene is widely published and presents lectures and courses internationally on managing the needs of the visually impaired. In 1999 he and his Ocutech colleagues received the Winston Gordon Award presented by the Canadian National Institute for the Blind. In 2008 he received the William Feinbloom Career Achievement Award from the American Academy of Optometry for his work in visual impairment.

**Cindy Bachofer, Ph.D., CLVT**

Dr. Cindy Bachofer is the low vision consultant at the Texas School for the Blind and Visually Impaired (TSBVI), Austin, TX. She completed her doctorate at Vanderbilt University in 2013. The title of her dissertation is Long-Term Use of Optical Devices by Young Adults with Low Vision. She is also a Certified Low Vision Therapist. Her teaching interests include use of optical devices, print reading strategies, and psychosocial issues for students with low vision. She previously served as a teacher of students with visual impairments and as a consultant with Project Providing Access to the Visual Environment (PAVE), from 2001-2008, at Vanderbilt University, Nashville, TN. Dr. Bachofer has also served as a literacy project leader with VISTA (Volunteers in Service to America) in Nashville and as an English instructor at both the secondary and post-secondary level in Kansas.

**Carolyn Carman, OD, FAAO**

Dr. Carolyn Carman is a graduate of the Southern College of Optometry and completed a residency in ocular pathology and low vision. She has developed low vision programs in private settings as well as in the VA Medical System and has served as Clinic Director of the low vision service at the University of Houston where she was a Clinical Professor. Dr. Carman has received the Texas Optometric Association Young Optometrist of the Year Award, the TOA Mollie Armstrong Leadership Award, and the Texas Rehabilitation Association Physician of the Year Award. She is currently Medical Director of Envision Dallas, Owner/Clinic Director of VisionMAX Specialty Vision Clinic, and serves on the Texas Medical Advisory Board for the Texas DPS.

**Christi Closson, OD, FAAO**

Dr. Closson is passionate about all aspects of low vision from working with patients, to teaching students and collaborating with colleagues. For the past 14 years she has served as the Chief of Low Vision at the Pacific University College of Optometry and the Director of the Low Vision Clinic at the Washington State School for the Blind. Community service is a large part of her professional life. She is Vice Chair of the Oregon Commission for the Blind, serves on the Board of Directors for Amigos Eye Care and started a pediatric mobile low vision clinic for Washington state. Her most treasured accomplishment has been taking two of her children on international eye care missions. Dr. Closson completed her education at the Southern California College of Optometry followed by a postgraduate residency at W.W. Hastings Indian Health Hospital in Oklahoma, in primary care and hospital-based optometry.

**Anne L. Corn, Ed.D.**

Anne Corn is professor emerita from Vanderbilt University, and currently a volunteer research professor in ophthalmology at the University of Cincinnati. Her research interests are in the use of functional low vision, the use of optical devices, and the impact of non-driving on various age groups. She is senior author of the curriculum, Finding Wheels for adolescents and young adults. Dr. Corn has published research articles on low vision driving and is herself a bioptic low vision driver for the past 31 years.

**Chuck Huss, COMS**

Mr. Huss received his Master of Arts degree in Orientation and Mobility from Western Michigan University in 1976. He has worked as an Academy-certified Orientation and Mobility Specialist (COMS) in the States of Ohio and West Virginia for the past 45 years, serving clients or students, K through geriatrics. Mr. Huss is nationally known for his work and experience in formalized bioptic driver training and assessment. He served as one of the driver rehabilitation specialists within the West Virginia Pilot Low Vision Driving Study (’85–’88), its continuum of related services (‘89–’98) and its full-time West Virginia Bioptic Driving Program (‘09–’22). Prior to his retirement (1/04/22), his employer for the past thirty nine (39) years has been the West Virginia Division of Rehabilitation Services (WVDRS).

**Laura Windsor, OD, FAAO**

Dr. Laura Windsor is a partner of the Eye Associates Group, LLC/Low Vision Centers of Indiana. She joined her father, Richard Windsor, O.D., F.A.A.O., R. Lewis Scott, O.D., F.A.A.O. and Craig Ford, O.D., F.A.A.O. in practice after graduating from the Indiana University School of Optometry in 2001. Dr. Windsor’s practice is diverse and provides primary care and low vision rehabilitation for infants to seniors. She also provides neuro-ocular care to patients who have suffered a stroke and head injuries and for children and adults with special needs. She receives referrals for low vision and brain injury patients from across the United States and from around the world at the Low Vision Center of Indianapolis.
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Dear Parent

You may have been told your child has a visual impairment, or has low vision, or that your child is “legally blind.” You may have also been told that “there’s nothing more that can be done” or a statement similar to that. What the doctor most likely means is that there is nothing more that can be done medically or surgically to improve your child’s sight.

These terms do not mean that your child is without sight. Nor do they describe how well your child is able to use the vision that they do have (which is called their Functional Vision). They do mean that your child does not see as well as a normally-sighted child. They may have to sit much closer to the television, or must hold printed material very close to their eyes, or that they may not pay attention to things that are beyond the distance that they can use visual information.

A diagnosis of a condition that results in a visual impairment has both legal and educational implications, potentially making your child eligible to receive special educational services from your child’s school system. And, your child’s visual impairment doesn’t mean that you are on your own! A range of professionals including Optometrists and Ophthalmologists who specialize in low vision care, teachers of children with visual impairments (TVI), Certified Low Vision Therapists (CLVT), and certified orientation and mobility specialist (COMS) are available to help your child’s use of their vision with low vision devices, instruction and training.

If you are reading this you are probably motivated to help your child maximize the use of their vision. You may also wonder whether your child might someday be able to drive.

The goal of this paper is to introduce you to ways you can help your child enhance their distance vision which can impact their future opportunities as well as their quality of life.

What is meant by “Functional Vision”? 

Visual acuity is measured using a number fraction—the top number is the distance in feet from the eyechart. The bottom number is the distance at which a person with normal eyesight can read the same line. For example, if a person has 20/200 vision, they are able to read at 20 feet what a ‘normally sighted’ individual can read at 200 feet away.
Dear Parent (continued)

One person’s 20/200 vision is not necessarily the same as another person’s 20/200 vision. It’s all a matter of what the individual can do using that level of vision. The ability to read text, find what one is looking for, walk without bumping into obstacles, and recognize friends and family at a distance, can all vary between individuals with the same visual acuity when measured on the eye chart.

Functional vision refers to how well your child can use their vision. While there are no tests to specify the level of ‘functional vision’-- it’s ‘functional vision’ that describes how well your child can use their sight to help them see in their world.

Is driving in my child’s future?

In 47 states in the US and in a growing number of countries, individuals whose best-corrected visual acuity (with glasses or contacts if helpful) is 20/200 (6/60 metric) or better (and with adequate visual field size) may be eligible to drive with a restricted driver’s license when using a low vision device called a bioptic telescope (bioptics).

Bioptics are eyeglasses that include a miniature telescope attached toward the top of an eyeglass frame. The position of the telescope above the user’s normal line of sight allows them to look either through their regular eyeglass lenses (called the carrier lenses) or into the telescope with just a slight downward tilt of the head. The driver will use their normal vision through the carrier lenses most of the time and will only look through the telescope briefly to see signs, signals, traffic and other critical information at a much further distance than their normal vision would provide. With training and practice bioptics become easy, convenient and natural to use. And, they’re not only helpful for driving but for many other seeing needs as well. More on this later.

A bioptic is for more than just driving.

Obviously, we cannot promise that your child will someday drive, but maximizing their distance vision can be extremely helpful in many other ways. Distance vision is an important ‘social’ sense-- it allows us to make eye contact, read body language, and helps us to feel connected to the world around us. Seeing at a distance can also contribute to your child’s academic, social and emotional development.
What you need to know and what you should do now.

1. Never accept that there’s nothing more that can be done to help your child use their vision!

2. You have to be an advocate for your child.

3. Find a low vision specialist—an optometrist or ophthalmologist who prescribes low vision devices for individuals with visual impairments.

4. Introduce your child to low vision devices early and make them fun to use.

5. Let your child use their vision as much as they can. Not using their vision will not protect or preserve it! Try not to over-help your child by doing tasks for them that they could do themselves, even if it takes them longer.

6. Share activities that support the use of their vision, such as cooking and riding bicycles, with the goal of promoting your child’s age-appropriate skills and independence.

7. If your child qualifies for special education services, meet with your child’s educational team to create an Individualized Education Plan (IEP) to develop appropriate learning goals, technology, and classroom accommodations. Be sure to look for goals for the use of your child’s functional vision.

8. If your child is in high school and meets your jurisdiction’s requirements for driving with a visual impairment, request ‘pre-driver readiness’ training from the orientation and mobility specialist (O&M or COMS).

9. If your child qualifies for a 504 Plan you can request special education services including orientation and mobility as well as low vision devices.

10. Once your child is old enough, and especially if driving is a possibility, have them sit in the front passenger seat and engage them in reading signs, seeing traffic signals and watching the motorists around them.
Part 1: About monocular telescopes

How will a monocular telescope help my child to better use their vision?

When looking through a telescope the image appears larger. Your child may say that everything looks closer, which is true, but the benefit is that it will allow them to see further away. For instance, if your child can only recognize your face when you are no further than 4 feet away, a 4-power telescope will let them see you as far as 16 feet away! If the telescope is focusable, as most are, it will also help them see more clearly for closer (mid-range) activities (for example computer screens, table top activities, and reading music on a music stand) rather than having to bring things very close to their face in order to see them.

What they might be missing without using a monocular telescope

Without seeing well at a distance, children may not pay attention to what’s going on around them. They won’t see and be able to ‘read’ the body language of their friends and classmates which can make healthy social interaction more challenging. With their monocular they will learn to look across the room to see their teachers’ and classmates’ faces, their smiles, yawns or eye-rolling, or the whiteboard in school, the menu on the wall at a restaurant, the pins at the end of a bowling alley, sport scores on TV, or the animals at the zoo. Children sitting in the back of the car not paying attention to what’s happening on the road, or who are led through a store rather than being encouraged to find products on their own, may not develop the visual skills they’ll need to become as independent as possible.
When should your child begin to use a monocular telescope?

Provide your child with low vision devices early and make using them fun. By age 3 a child with low vision is usually capable of learning to use and benefit from a monocular telescope. Don’t pressure your child to do something they’d rather not do. Not all children will be eager to use a telescope, perhaps especially in public, as they may have been made fun of or feel embarrassed. But it’s important for them to know that they exist and how they can help them see much more.

Your child may become more motivated to use a telescope or bioptic if it may make them eligible to drive. Oftentimes, older children will say that they wish they had a telescope earlier in their lives as they would have been so helpful in the classroom and in social settings.

Acquiring a monocular telescope—find a low vision specialist.

Low vision specialists are optometrists or ophthalmologists who specialize in helping individuals with vision impairments maximize their ability to use their vision. They perform special testing and prescribe a range of low vision devices best suited to support the individual’s specific visual goals. You will want to stay connected with a low vision specialist as your child matures as their needs and goals will likely increase and more sophisticated low vision devices may become appropriate.

Telescope powers are usually prescribed to provide approximately 20/40 visual acuity when looking through the device. Studies have shown that with 20/40 visual acuity individuals can see and do most all visually guided activities. In all 50 states people with normal 20/40 visual acuity are eligible to receive unrestricted driver’s licenses. As telescope powers increase, their field of view narrows and image motion increases. This can make finding what the user is looking for and stabilizing the image more challenging. So, using a higher power telescope than necessary is not usually beneficial and may be counter-productive.

Monocular telescopes are not very expensive and are certainly less costly than most conventional eyeglasses. While you can purchase a monocular telescope on your own, having a low vision specialist prescribe one will help ensure that your child receives the appropriate power and design that is best suited for their individual level of vision. Also, if the school has arranged for the low vision evaluation the cost of the telescope as well as any other suggested low vision devices may also be covered.
Part 2: Encouraging your child to use a monocular telescope

It’s important to provide lots of fun opportunities for your child to use their monocular to enable them to explore their world. The more they use it the more they will develop confidence in their seeing skills.

1. As a parent purchase a monocular for yourself and use it along with your child and especially on family outings. The more your child sees others using telescopes, the more normal and acceptable it will seem to them.

2. Demonstrate the monocular to the teacher, classmates and your child’s friends. Let them look through it themselves to see how ‘cool’ it is to use.

3. Engage your child’s teachers in exploring the ways they can support your child’s monocular use in the classroom and around school. Make certain that using the monocular (as well as any other low vision devices) is included in your child’s IEP or 504 plan.

4. If your teenager has sufficient vision to potentially drive, encourage them to sit in the front passenger seat to point out to the driver what they see during the drive. Let them describe traffic signs and signals, pedestrians, curves in the road and other vehicles. This will help them develop the ‘road sense’ they’ll need when they learn to drive.

5. Community and social media groups can be helpful in getting children connected with others like themselves with visual impairments.

6. Be prepared to counsel your child if someone makes fun of them.

7. Be patient and loving!

continued
8. Here are some resources that can help your younger child adjust to using a monocular:

- **Tomas and the Case of the Mysterious Missing Dog** (video, from the Texas School for the Blind and Visually Impaired)

- **Monocular Mac PDF** by Anne Corn, Ed.D

If your child receives instruction from a teacher for students with vision impairments (TVI), they will provide training to help your child learn to use their telescope. A certified orientation and mobility specialist (COMS), who may also be employed by the school, can help your child develop a wide range of indoor and outdoor visual skills they will find helpful as they grow up.

Many children will learn to use their monocular with minimal support while others might need instruction and practice. If your child is hesitant to use their monocular, especially in public, you may want to help them explore their feelings about their situation.

If a TVI or COMS is unavailable, we present some suggestions on how you can start helping your child learn to use the monocular on your own.
Part 3: 
Learning to use the monocular telescope

1. **Show them the parts of the telescope.**
   Monoculars often come with a rubber ‘eye cup’ which is the side of the monocular that will be held closest to the eye. The soft eye cup is intended to minimize scratching of eyeglass lenses. The focusing ring (or barrel) is usually located toward the front of the monocular at the opposite side from the eye cup. The front lens of the telescope is called the ‘objective lens,’ and the rear lens is called the ‘eye lens’ which is the lens held closest to the eye.

2. **Choosing the eye to use the monocular.**
   Most children will automatically look through the monocular with their dominant eye; others may need help to determine which eye to use. Whichever eye seems most natural for your child is the eye they should use.

3. **Holding the monocular.** The monocular can be held with one or both hands, but usually when focusing the device both hands will be needed especially at first. Eventually they may be able to learn to hold and focus it with just one hand.

4. **Make certain your child’s first experience is positive.** Begin by positioning a target about 8-10 feet directly in front of them and make certain the telescope is in focus for that distance before handing it to your child to look through it. Make certain that when your child handles the telescope it is level and aligned with their eye. Don’t let your child continue to struggle if their first attempt is unsuccessful. Move the target closer, refocus, and let them try again.

5. **Keeping the monocular steady.** Resting the monocular on their eyeglasses (if used) or resting a finger on the cheek can help to stabilize the telescope. If it wobbles too much it will be hard for them to see what they want to look at. If they have difficulty stabilizing the telescope you might consider using a lower power telescope at the beginning because it won’t produce as much image movement.

6. **Children who wear glasses** may prefer to use the telescope without their glasses as the eyepiece will be closer to their eye which can provide a wider field of view through the telescope. If they are using their glasses, the rubber eye cup can be rolled back to allow the telescope to be held closer to the eyeglass lenses which will also widen the field of view.
7. **Focusing the telescope.** At the beginning, your child may not know when they have the telescope in the best focus. They should rotate the focusing ring slowly while looking at a target that’s large enough to be easily located. Once the image appears clear to them have them confirm that they have the best focus by focusing back and forth a little (like tuning-in an old-fashion radio) to confirm that they have the best focus. If your child wears eyeglasses, have them first practice focusing while wearing their eyeglasses. That way you will be able to look through their telescope at the same target and at the same distance (using your own glasses if you need them) to confirm that their focus is correct.

8. **Finding what you want to look at.** Children will usually be able to find what they want to look at with their regular vision so that aiming the monocular at it should be easy. If they miss the target they can look for another nearby target that they can use as a reference. For instance, by first locating the pole of a street sign by scanning right and left, they can then follow the pole upward to find and then read the sign.

9. **Provide many opportunities to use the monocular.**
   Here are some suggestions:
   a. Reading street signs and house numbers
   b. Reading menus at fast-food restaurants
   c. Watching sports and reading the scores on TV
   d. Attending school assemblies and other programs and presentations
   e. Attending sporting events, watching the action and reading the scoreboards
   f. Reading aisle and shelf signs in the grocery store
   g. Watching wildlife (birds or squirrels, etc.) or sights at amusement parks, zoos, and fairs
   h. Create games at home such as "I Spy" to locate toys or other items "hidden" around the room.
   i. Tape pictures and signs on a wall and have them locate, read or describe them.
   j. Tracking moving targets such as other students on the playground, kites, traffic or maybe even bubbles.

10. **Practice copying text seen at a distance** while looking through the telescope. This skill will be helpful in the classroom. The more that they can see, remember, and write down at one time, the more efficient they will become using their telescope.

11. **Taking care of their monocular.** Some children enjoy decorating their monoculars and this should be encouraged as they will ‘take ownership’ of their device. Some children will want to use a neck strap which will make using their monocular more convenient; others will keep it in their pocket, purse or backpack. Let them select a strap they would like to use, not necessarily the black one that usually comes with the device. Don’t get upset if the telescope gets broken—it means they’re using it, and of course, things happen!

12. **Encourage your child to talk about their feelings** (both positive and negative) about using a monocular and how and when their telescope might be helpful to them. They shouldn’t be waiting to be told when it should be used.
Part 4: About bioptic telescopes

When is it time for a bioptic?

If your child is using their monocular a lot, a bioptic will make a telescope much more convenient to use.

The advantage of a telescope mounted on eyeglasses is that they’re always available and convenient to use. You do not have to stop what you’re doing, pick up a monocular telescope, aim it, and focus it. This can not only be inconvenient but there are times when one or both hands need to be free to do other things like typing, using a computer, copying notes from the board in school, playing music, and of course when driving. So, in the same way that bifocal eyeglasses let an individual see at both distance and at near without having to change their glasses, a bioptic allows the user to look through their telescope without stopping what they are doing.

A bioptic will be required if driving is ultimately in their future. Some kids may prefer to use a bioptic right from the beginning rather than a handheld monocular.

Once you are ready to consider a bioptic, it’s time to visit a low vision specialist who’s experienced in prescribing bioptics. They can also be a resource for accessing driver training as well as being available to support your child’s ongoing vision needs.

Learn more about bioptic telescopes. Download the Ocutech Guide to Bioptic Telescopes.
Opinions about driving with a bioptic telescope.

Some professionals, even eye doctors, may believe that people with low vision shouldn’t drive. Much of this apprehension comes from a lack of familiarity with low vision care and specifically how bioptics are used while driving. However, in the U.S. today, there are thousands of individuals with visual impairments that are licensed to drive using bioptic telescopes. And, they are driving safely. Regulations for driving with a visual impairment and with using a bioptic vary from state to state so it’s important to know what your state’s vision requirements are.

How bioptics are used for driving:

Studies show that experienced bioptic drivers look through their regular eyeglass lenses (called carrier lenses) almost all of time. They only look through the telescope for brief 1-2 second periods (similar to how the mirrors in the car are used) to see signs, signals, obstacles, pedestrians, and traffic that may not be adequately visible when looking through their regular eyeglass lenses.

Watch this video for a presentation on how bioptics are used for driving:
Part 5: Introducing your child to driving

Once it’s determined that your child’s level of vision will make them eligible to drive, orientation and mobility specialists and parents should provide “pre-driver readiness skills.” This can help them become familiar with the road skills they’ll use once they start formal driver training.

It’s time to get the professionals involved.
Even parents of normally-sighted children can worry about teaching their kids to drive. So, finding a specialist to help is desirable and recommended. These professionals include:

- certified orientation and mobility specialist (COMS),
- certified low vision therapist (CLVT),
- certified driving instructor (CDI),
- certified driver rehabilitation specialist (CDRS)
- occupational therapist with special certification in Low Vision (OTR/L, SCLV)

Here is an overview of what your child will be taught as part of a driver-readiness program:

- Independent travel in familiar and unfamiliar areas
- Learning to use maps and GPS
- The ability to create and use travel routes
- Learning to cross roads with traffic
- Using optical devices to find and read signage and signals
- Use of optical devices to judge distances and traffic crossing times

Advanced pre-driver readiness skill training

Once your child has become a confident pedestrian, it’s time to introduce them to what’s happening on the road. This starts with your child sitting in the front passenger seat, while you are driving.

Specifically, your child will be taught to develop:

1. Distance viewing skills
   a. where to be looking while driving
   b. how to scan the roadways to be aware of traffic
   c. how to maintain lane position and safe following distances

2. Critical object, road and traffic condition awareness
   a. situations that warrant changes in speed and/or lane position
   b. the presence of restricted lines of sight
   c. other vehicles and obstacles on the road
   d. traffic signs and signals

3. When and how to use a bioptic when driving
   a. On road spotting skills
   b. On road scanning skills
   c. The appropriate use of the bioptic while driving
Additional resources and information
We do hope that this information has been helpful and reassuring as you raise and support your visually impaired child. Here are some additional resources you may find beneficial.

**Tomas and the Case of the Mysterious Missing Dog** (video, pdf)  
https://www.tsbvi.edu/publications/6025-tomasFeatured

**Monocular Mac by Anne Corn, Ed.D**  
https://www.dropbox.com/s/vo0mefhhemfk/MONOCULAR%20MAC%20-%20Anne%20%20Corn%20%202021.pdf?dl=0

**How to use a monocular**  
https://www.wikihow.com/Use-a-Monocular

**Fun, low budget ways to teach kids to use monoculars:**  
https://library.tsbvi.edu/Play/16470

**Low Vision Driving with Bioptics: An Overview - Chuck Huss and Anne Corn**  
https://www.dropbox.com/s/f18on7xtmgeyk/jVIB_BiopticDriving_Huss%26Corn.pdf?dl=0

**Bioptic telescope use in naturalistic surroundings**  
https://www.dropbox.com/s/4kzn7h32rrxhu01/Bioptics_Driving_PeliLab.pdf?dl=0

**Learning to use your bioptic for driving**  

**Bioptic driving: General Information**  

**Visually Impaired Drivers Who Use Bioptic Telescopes: Self-Assessed Driving Skills and Agreement With On-Road Driving Evaluation**  
https://iovs.arvojournals.org/article.aspx?articleid=2128329

**Bioptic Telescopes Meet the Needs of Drivers with Moderate Visual Acuity Loss**  
https://iovs.arvojournals.org/article.aspx?articleid=2163347

**Evaluation of Safety of Visually Impaired Bioptic Drivers**  
https://www.dropbox.com/s/87dann3ygyt100/Bioptics_Safe-Driving-TVST.pdf?dl=0

**Step-by-Step Guide to Reinforcing Pre-Driver Readiness Skills with Novice Bioptic Driving Candidates, Chuck Huss, COMS, Driver Rehabilitation Specialist,**  

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