

AS VISION DIMS

Current perspectives on managing glaucoma patients with low vision rehabilitation.

BY KARA HANSON, OD, FAAO



A recent study found that patients are most concerned about the effect glaucoma has on their ability to perform activities of daily living and the future of their visual function.¹ As emphasized in the American Academy of Ophthalmology's recently produced short video, "There Is Something Else You Can Do" (<https://www.aao.org/low-vision-and-vision-rehab>), a referral for low vision rehabilitation (LVR) is considered the standard of care, and it is essential for eye care providers to understand the impact vision loss has on their patients' lives.

The low vision specialist (LVS) serves as the point person to coordinate the rehabilitative process using a multidisciplinary approach. The LVR team works together to educate patients about ways they can meet their specific goals. Tools include optical and nonoptical strategies. Some are simple and easy; others are more high-tech or require significant training. Smartphones and new technologies have increased the options available to people with low vision, allowing them to enhance their visual function but also to take advantage of their other senses, like hearing.

THE FUNCTIONAL IMPACT OF GLAUCOMA

Glaucoma can cause central, paracentral, and peripheral visual field (VF) defects, decreased dark adaptation, reduced contrast sensitivity, and problems with glare.² Looking closely at the pattern of VF loss can help clinicians predict potential problem areas in patients' visual function. For example, a person with inferior VF loss will likely have difficulty with mobility, find it hard to see steps or curbs, and trip over objects. In contrast, someone with superior VF loss may have difficulty locating overhead signage, fail to notice traffic signals, and bump his or her head on an open cabinet door. Patients with central VF loss often have lower quality-of-life (QOL) scores than those with peripheral VF loss.³ This is understandable because the former's detail vision is compromised, making it difficult for them to read, see faces, and perform visually demanding tasks. VF results showing bilateral inferior loss or central loss in a patient's better-seeing eye should trigger eye care providers to question if he or she is having difficulty performing activities of daily living and prompt a subsequent LVR referral to improve his or her QOL.

Interestingly, research has found a stronger association with QOL scores for a 10-2 versus a 24-2 testing strategy. The likely reason is that the 24-2 grid pattern tends to miss subtle damage to the central field, because stimuli are presented at 6° intervals, whereas 10-2 test stimuli are separated by 2°.⁴ Occasionally, patients may complain about their visual function more than would be expected based on their 24-2 VF results. In such cases, testing macular function may reveal why their QOL is reduced and can prompt an earlier referral for LVR.

GOAL-ORIENTED REHABILITATION

Overview

Although conventional magnifiers and telescopes are still commonly used, electronic devices have become ubiquitous, and software modifications have made them accessible to the blind and visually impaired. Compared with conventional magnifiers or telescopes, high-tech digital magnification devices offer greater versatility, but they can have steep learning curves. Patients can become overwhelmed trying to decide on their own which tools will work for them. An LVR team will evaluate device options and discuss the pros, cons, and limitations of each with patients so that they can make an educated decision about which tools and strategies will best meet their needs.

Smartphones and E-readers

An electronic tablet can allow patients with mild to moderate low vision to read books, newspapers, and other materials successfully. Backlit devices provide better

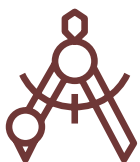


(Courtesy of David Lewerenz, OD.)

Figure 1. eSight's adjustable camera can be tilted up to allow for walking while wearing the device.



4 TOOLS FOR SEVERE VISION LOSS



OrCam MyEye (OrCam Technologies)

A discreet camera with a speaker mounted to the temple of a spectacle frame helps the wearer read, identify products, and recognize faces.
www.orcam.com



Aira

This company's platform works on wearable devices that pair with a smartphone to stream audio, video, and GPS coordinates to a trained assistant, who relays information to the user to help him or her navigate, read, etc., for an annual fee.
<https://aira.io>



Be My Eyes (Be My Eyes)

This free smartphone app creates a live audio-video connection between the user and a sighted volunteer who will provide assistance.
bemyeyes.com



TapTapSee (CamFind)

The user double taps the smartphone's screen to photograph an object, and this free app provides verbal identification.
taptapseeapp.com

contrast and have variable font sizes, and they do not require ambient or task lighting. If glare is an issue, most devices have a "night reading" option that displays white print on a black background so that the screen emits less light.

Accessibility features can be customized to maximize ease of use. People with more severe vision impairment can use the voice-over and text-to-speech features that are built into many of the devices as well as numerous apps to help them access print material. Patients often prefer a tablet to a conventional computer, because they can hold a tablet closer without compromising ergonomics. Reading glasses prescribed for their habitual working distance will

maximize the screen's clarity. Larger tablets offer more potential for magnification and a larger field of view.

For short-term reading, patients can use their smartphones' magnifier—an accessibility feature. Apple devices' magnifier allows users to photograph a document such as a menu, enlarge it, and scan it with their fingers on the screen. They can use contrast modes similar to those of closed-circuit televisions (CCTVs) to enhance contrast and control glare. Although smartphone or tablet magnifiers make reading materials more accessible, CCTVs that are specifically designed for low vision patients typically provide higher resolution and a better refresh rate, making them easier to use as low vision devices.



(Courtesy of OrCam Technologies.)



Figure 2. When the wearer points a finger, it triggers the OrCam to read or identify the object of regard.

Multiuse Devices

During the past few years, manufacturers have brought to market several high-tech devices with head-born digital magnification that can be used for distance, intermediate, and near tasks. Examples include eSight (Figure 1; esighteyewear.com), NuEyes (<https://nueyes.com>), and Enhanced Vision (Jordy; bit.ly/2mmQETt). Like conventional CCTVs, these units provide variable magnification and enhanced contrast modes, but they are more versatile and portable. Compared with bioptic telescopes, the digital magnifiers provide a relatively larger field of view, but image quality tends to be better with the optical magnification found in bioptic telescopes. Digital magnifiers offer multiple features and versatility, but they come with a steeper learning curve and cost more than traditional bioptic or monocular telescopes.

Options for Severe Vision Loss

People with little to no functional vision can benefit from several devices and apps that help them to access print, recognize faces, and navigate their surroundings (Figure 2). These devices enhance users' function and independence, but they are not a substitute for working with a certified orientation and mobility specialist to gain safe, proficient mobility skills. (See *4 Tools for Severe Vision Loss*.)

CONCLUSION

As with anything, there are advantages, disadvantages, and limitations to all low vision devices. Based on patients' goals, an LVS will guide them through appropriate device options so that they can make educated decisions on the ones in which they will invest. The LVR team will also train patients on how to use devices and strategies to improve their overall QOL and independence. An early referral for LVR can help patients adapt and adjust to their vision loss throughout the course of their lives. ■

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