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# ELDER CARE

## A Resource for Interprofessional Providers

### Aids for Patients with Low Vision

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The National Eye Institute reported in 2004 that more than 3 million adults in the US had blindness or low vision, and most of these people were over 65. By 2020, that number is expected to have increased to 5.5 million (Table 1). As noted in a prior issue of Elder Care, age-related macular degeneration (AMD) is the most frequent cause of irreversible blindness among older adults in the US. It affects 30% of people over 75, with 1 in 14 having serious visual impairment.

**Table 1. Eye Disease Prevalence and Projections**

*Number of Adults >40 Years in US	2004 Estimates* (in millions)	2020 Projections* (in millions)
Age-Related AMD	1.8	2.9
Glaucoma	2.2	3.3
Diabetic Retinopathy	4.1	7.2
Cataract	20.5	30.1

Source: National Eye Institute  
[www.nei.nih.gov/news/pressreleases/041204.asp](http://www.nei.nih.gov/news/pressreleases/041204.asp)

This provider fact sheet will review several of the most commonly used devices for individuals with visual impairment that cannot be successfully managed with medical or surgical therapies (summary in Table 2).

#### Hand-Held Magnifiers

A hand-held magnifier is the most basic vision aid. Typical devices have a 3" round or 2"x4" rectangular lens, and magnify objects up to 5x, though some go up to 20x (Figure 1). Many models are illuminated to facilitate use in low-light. Hand-held magnifiers are used to assist with reading and viewing pictures. Their advantages are low cost (\$10-30) and portability. The main disadvantage is that they require use of the hands, and so often work poorly when patients have tremor. Also, their narrow field of view requires movement of the device across text during reading, thus reducing reading speed.

#### TIPS FOR RECOMMENDING LOW-VISION AIDS

- Recommend low-cost magnifiers or high-powered spectacles if they are adequate visual aids.
- Avoid hand-held devices for patients who have tremor.
- Consider spectacle-mounted magnifiers when patients need both near and distant vision aid.
- Check to see if your state commission for the blind will pay for patient's vision aids.

**Figure 1.**  
**Hand-Held Magnifier**

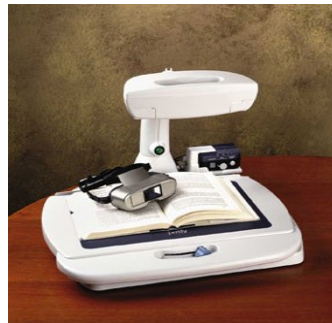
Source: National Eye Institute, NIH  
Ref#: PSA25



[www.nei.nih.gov/photo/keyword.asp?conditions=Low+Vision+Devices&match=all](http://www.nei.nih.gov/photo/keyword.asp?conditions=Low+Vision+Devices&match=all)

#### Stand Magnifiers

Stand magnifiers are magnifying lenses mounted on a stand that typically sits on a desk top. As with hand-held magnifiers, they can be illuminated. Their main advantage over hand-held magnifiers is that they free the hands and often can be used by people with tremor. Some sit over



**Figure 2.**  
**Stand Magnifier**

Source: NASA Scientific and Technical Information: Improving Vision.

[www.sti.nasa.gov/tto/spinoff2003/hm\\_7.html](http://www.sti.nasa.gov/tto/spinoff2003/hm_7.html)

text on four legs and have large view areas; others are mounted on fixed or goose-neck stands. Cost varies from around \$15 for simple models to as high as \$200 for more sophisticated models (Figure 2).

#### High-Powered Spectacles

High-powered spectacles are inexpensive eyeglasses with high-magnification lenses. They do not require the use of hands. Their disadvantage is the need to hold objects close to the eyes, which interferes with illumination for reading. They are relatively inexpensive; prices start at about \$20.

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## Spectacle-Mounted Magnifiers

Spectacle-mounted magnifiers are small protruding lenses that are mounted on eyeglass frames (Figure 3). The magnifiers can be “microscopes” for close-up vision or “telescopes” for more distant vision, and patients may switch between the two. In microscope mode, patients must hold objects much closer to the eye than normal, which some people find difficult and can interfere with adequate illumination of reading material. Telescope mode is designed for more distant viewing activities like watching television, painting, reading music, and looking at a computer monitor. With both modes, the field of vision is narrow.

Spectacle-mounted magnifiers require prescription by an eye-care professional. They are also somewhat expensive, with least-costly models starting at about \$100. Many patients need instruction on how to use these devices correctly.



**Figure 3.**  
**Spectacle-Mounted Magnifier**

Source: US Department of Veterans Affairs. Optometry. Low Vision. Rehabilitations.

[http://www.va.gov/OPTOMETRY/Low\\_Vision\\_Rehabilitation.asp](http://www.va.gov/OPTOMETRY/Low_Vision_Rehabilitation.asp)

## Electronic Magnification Units

Commonly called closed circuit television (CCTV), these devices use video cameras to view objects and project a magnified image of the object on a computer monitor (Figure 4). The camera can be hand held and scanned across text, or it can be mounted in a device similar to the document readers/cameras that are used in lecture halls, enabling an entire page to be viewed at once. High levels of magnification (up to 60x) can be achieved, and the size of print can be increased or decreased with a zoom control. Lower-cost units with a hand-held scanner start at about \$200, while more expensive units can cost as much as \$2000.

**Insurance Coverage** Unfortunately, most medical insurance plans do not provide coverage for low-vision aids. In many states, the commission for the blind provides devices at no cost to appropriate patients.



**Figure 4.**  
**Electronic Magnification Unit**

<http://www.nei.nih.gov/lowvision/content/mike.asp>

**Table 2. Advantages and Disadvantages of Various Low Vision Aids**

Device	Advantages	Disadvantages
Hand-held magnifiers	Inexpensive; can be illuminated	Must hold at precise focal length from reading material; slow reading; difficult with tremor
Stand magnifiers	Inexpensive; can be illuminated; No hands necessary	Must set device at precise focal length from reading material; not easily portable
High-powered spectacles	Inexpensive; no hands necessary	Objects must be close to eye, which interferes will illumination
Spectacle-mounted magnifiers	Have both “microscope” and “telescope” lenses, so can be used for both near and far vision; no hands necessary	Expensive; objects must be held close to the eyes in microscope mode; narrow field of vision; training required
Electronic magnification units (closed-circuit TV)	Permit high-resolution images at a customized high-magnification level; both portable and desktop models	Expensive

## References and Resources

Low Vision Aids. Macular Degeneration Partnership. [http://www.amd.org/site/PageServer?pagename=Low\\_Vision\\_Aids](http://www.amd.org/site/PageServer?pagename=Low_Vision_Aids)  
 Rosenberg EA, Sperazza LA. The Visually Impaired Patient. *Am Fam Physician*. 2008; 77:1431-8. <http://www.aafp.org/afp/20080515/1431.html>  
 Virgili G, Acosta R. Reading aids for adults with low vision. *Cochrane Database Syst Rev*. 2006 Oct 18; (4):CD003303.  
 What You Should Know About Low Vision. Patient education brochure from the National Eye Institute.

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