

Living with GLAUCOMA



2

5

М

Е

Э

3

6

5

Ш

Е

М

x

Э

Ш

Э

x

TABLE OF CONTENTS

Introduction	1
An Overview of Glaucoma	3
Types of Glaucoma	4
Who Develops Glaucoma?	5
What is Your Risk for Glaucoma?	6
Symptoms and Diagnosis	7
Treatments for Glaucoma	10
An Overview of Medications	10
Surgical Options	11
Making the Most of Life with Glaucoma	13
Low Vision Rehabilitation	13
Low Vision Aids	13
Measuring Eye Pressure	14
Adjusting to Everyday Life	14
Dare to Ask for Help	16
Resource List	17
Glossary	30
Glaucoma Publications	34

INTRODUCTION

Most people have heard of **glaucoma** and know that it affects the eye, but fewer of us know more about this treatable, but incurable disease. Glaucoma is the leading cause of vision loss in the U.S., affecting approximately three million people. Experts estimate that half of those affected by glaucoma may not know they have it because there are normally no symptoms during the early stages of the disease. Worldwide, glaucoma affects close to 67 million people.

Glaucoma is called “the sneak thief of sight,” because it often has no symptoms until permanent visual damage has occurred. Although it can be treated, currently there is no cure. Vision lost to glaucoma cannot be regained, and untreated glaucoma leads to blindness.

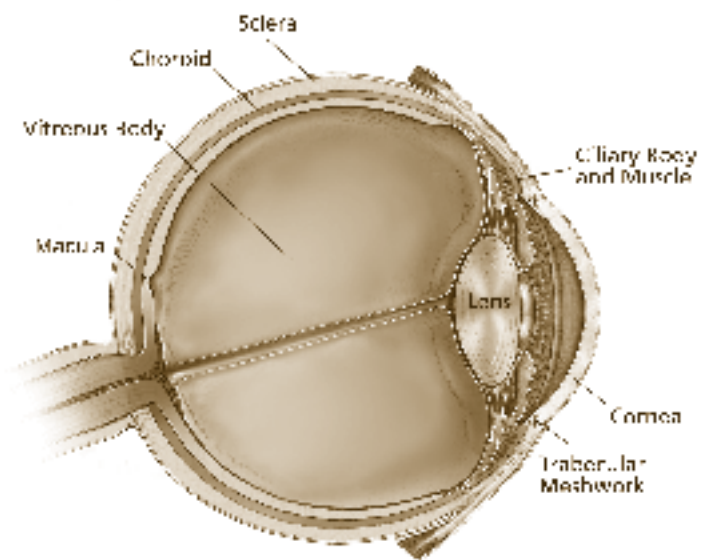


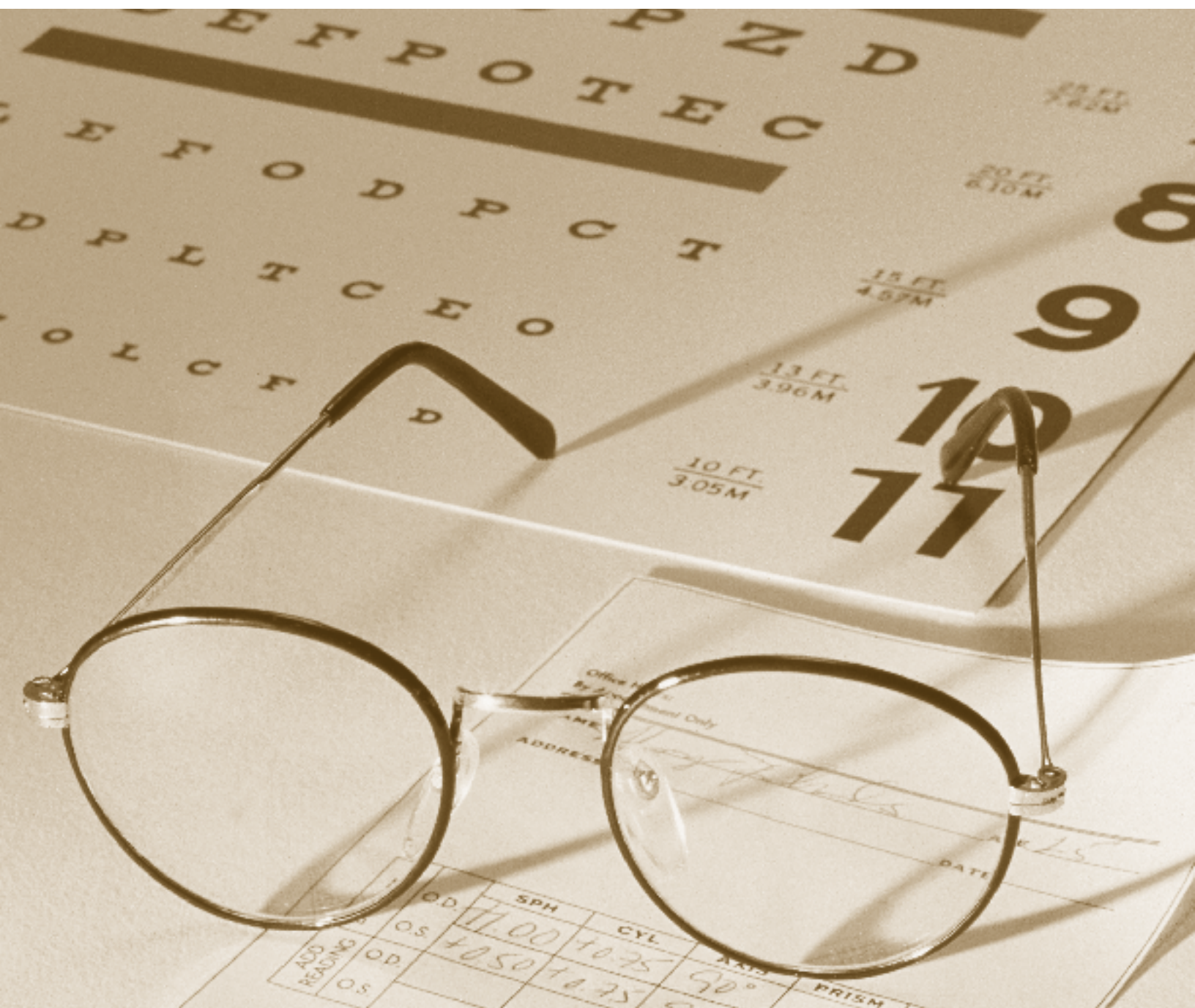
Illustration by Bob Morreale

This booklet provides some basic information about glaucoma, as well as current treatment options and suggestions on making your life (or the life of a loved one) easier. At the end of this booklet, there is a *Glossary* that defines terms and a *Resource List* with excellent sources of help for those with low vision.

Glaucoma is commonly used as though referring to one disease. In actuality, it is a group of eye disorders that leads to damage of the optic nerve (the bundle of nerve fibers that carries information from the eye to

the brain), which can then lead to vision loss, and ultimately blindness.

In this booklet, glaucoma will be used as a general term except where specified otherwise.



An Overview of GLAUCOMA

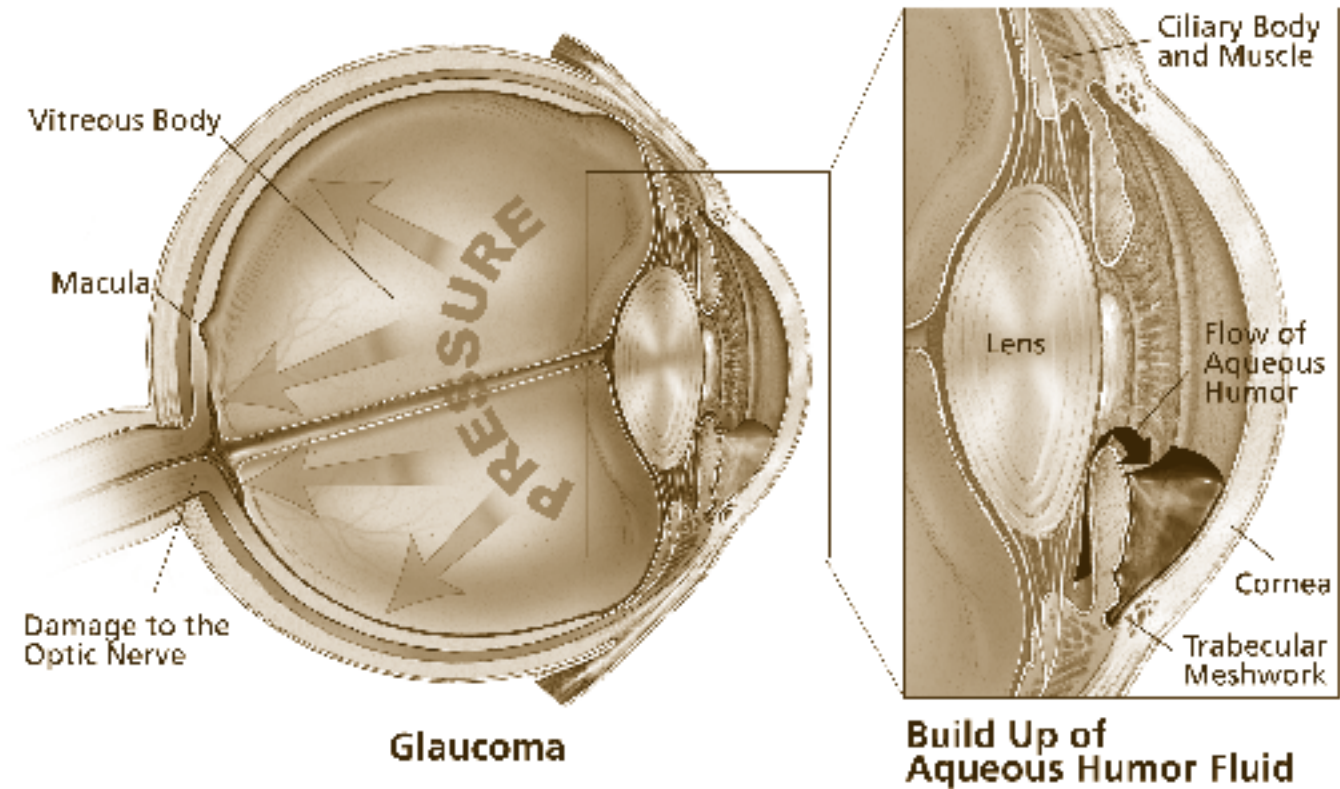


Illustration by Bob Morreale

To understand how eye pressure impacts the development of glaucoma, it is important to understand how the eye works. Basically, the eye constantly makes a fluid, called the *aqueous humor*, which helps maintain normal eye pressure and provides nutrients to the *cornea* and the *lens*. The aqueous humor circulates inside the front of the eye (*anterior chamber*), and drains through a spongy tissue called the *trabecular meshwork*. Normally, there is a balance between the amount of fluid made and the amount that leaves the eye. If this balance is not

achieved, then intraocular pressure (or IOP) builds up inside the eye. This damages the *optic nerve*, and glaucoma may develop.

Types of Glaucoma

There are many different types of glaucoma. The most common by far is *open-angle glaucoma*. The majority of the remaining cases are *closed-angle glaucoma*, which can be chronic or acute.

Open-angle glaucoma has no symptoms at first. It is a progressive disease characterized by optic nerve damage. High eye pressure is the most significant recognized risk factor for the development and progression of the disease. The pressure in the eye builds up gradually leading to damage to the optic nerve, loss of side (peripheral) vision, and without treatment, total blindness.

Closed-angle glaucoma comes in two forms: *acute or chronic*. *Acute closed-angle glaucoma* is a medical emergency that must be treated immediately or blindness can result in one or two days. In acute closed-angle glaucoma the normal flow of aqueous humor between the iris and the lens suddenly becomes blocked.

Symptoms may include severe pain, nausea, vomiting, and blurred vision. The patient may also see colored halos around lights. *Chronic closed-angle glaucoma* progresses slowly and can produce damage without symptoms, similar to open-angle glaucoma.

Glaucoma can sometimes occur when fluid pressure inside the eye is normal, a condition called *normal-tension glaucoma*. The causes of optic nerve damage under normal pressure are not well understood, but may be due to an unusually fragile optic nerve or decreased blood flow to the optic nerve.

Other Types of Glaucoma

- **Congenital glaucoma** – occurs in infants, who are born with defects that prevent the normal drainage of the aqueous humor.
- **Secondary glaucoma** – can be open- or closed-angle, and results from some other eye disorder or medical problem, such as inflammation, a tumor, or trauma. Forms of secondary glaucoma include:
 - **Pigmentary glaucoma** – a form of the disease in which pigment

granules from the iris flake off into the aqueous humor and clog the trabecular meshwork.

- **Pseudoexfoliation syndrome** – a form in which a white material appears to flake off the lens of the eye and block eye fluid flow. It is very common in some populations around the world.
- **Neovascular glaucoma** – abnormal blood vessels block the fluid drainage channels of the eye, resulting in increased eye pressure. Some factors that cause the abnormal blood vessel growth include: diabetes, blocked arteries in the neck causing insufficient blood supply to the head, and blocked blood vessels in the back of the eye (retina).

Who Develops Glaucoma?

Glaucoma can occur in anyone at any age. However, certain factors may put some people more at risk for developing this condition. Among the highest risk factors:

- **Race** – Glaucoma is a leading cause of permanent blindness among African Americans and Hispanics.
- **Genetics** – Glaucoma tends to occur repeatedly in families. Genetics may also explain why certain races are more predisposed to various forms of glaucoma.
- **Age** – The prevalence of glaucoma increases with age, especially in people over 60 years old. Between the ages of 45 and 64, glaucoma is fifteen times more likely to cause blindness in African Americans than in Caucasians. In Hispanics age 65 and older, the risk of developing glaucoma rises rapidly.

What is Your Risk for Glaucoma?

The following are risk factors for the three most common forms:

Risk Factors for Open-angle Glaucoma

Strong Risk Factors

- High eye pressure
- Family history of glaucoma
- Age 40 and older for African Americans

- Age 60 and older for the general population, especially Mexican Americans
- Thin cornea
- Suspicious optic nerve appearance with increased cupping (size of cup, the space at the center of optic nerve, is larger than normal)

Potential Risk Factors

- High myopia (very severe nearsightedness)
- Diabetes
- Eye surgery or injury
- High blood pressure
- Use of corticosteroids (for example, eye drops, pills, inhalers and creams)

Risk Factors for Closed-angle Glaucoma

- Age
- Family members with glaucoma
- Poor short distance vision (farsightedness)
- Eye injury or eye surgery
- East Asian and Inuit ethnicity

Risk Factors for Normal-tension Glaucoma

- Cardiovascular disease
- Family members with glaucoma
- Low eye pressure
- Japanese ethnicity

Symptoms and DIAGNOSIS

Glaucoma normally develops gradually, with no real symptoms to warn of its presence. The first noticeable sign of optic nerve damage is usually the loss of side (peripheral) vision. This is the case for open-angle, normal-tension and chronic closed-angle glaucoma. Note that acute closed-angle glaucoma does exhibit symptoms including pain, nausea and blurred vision, and needs to be treated immediately.

Because most forms of glaucoma develop slowly and silently, those at high risk should make sure to get their eyes examined on a regular basis, preferably every 1-2 years or as directed by a doctor. Medicare covers annual screening for certain people at high risk for glaucoma. Some organizations may also be able to help offset the cost of eye exams (check the Resource List at the back of this booklet).

If you are at high risk, a doctor will often perform several exams, collecting comparative readings at different times of the day. Since eye pressure can vary from day to day and even hour to hour, these comparative read-

ings are much more likely to present an accurate picture of overall eye pressure. However, if the cornea is thin, this pressure reading can be artificially low. Lasik (the surgical procedure intended to reduce a person's dependence on glasses) causes the cornea to become thinner than normal. Inform your doctor if you have had this procedure.

During an eye examination, the doctor will determine:

1. Normal pressure reading for the eye

Eye pressure readings are now generally considered “normal” if they fall within 12 to 22 mm Hg, with an average of 15 to 16 mm Hg (mm Hg is an abbreviation for millimeters of mercury and is a standard measurement of pressure).

A cautionary note regarding “normal” pressure readings:

- Remember that patients with normal-tension glaucoma can show normal pressure readings and still have glaucoma.
- There are some indications that these “normal” ranges may have to be adjusted when testing African Americans. It appears that African Americans have thinner corneas than Caucasians and so may show “abnormal” readings at lower pressure levels.

2. Visual field

The doctor will test the area that can be seen when looking straight

ahead (central vision) and to the side (peripheral vision).

3. Visual acuity

Your doctor needs to know how well you see, with and without corrective lenses, at various distances. This is also known as the “20/20 test.”

Tests Used to Make a Diagnosis

The methods used to examine the eye and obtain an accurate diagnosis of glaucoma include:

- **Pupil dilation** in which special drops temporarily enlarge the pupil so that the eye doctor can better view the inside of the eye.

After pupil dilation, for a short time, you may be sensitive to light and experience difficulty driving. Consider bringing sunglasses, or have a friend drive you to your appointment.

- **Tonometry** measures the pressure inside the eye. Examples of tonometers include:

The *air puff or noncontact tonometer* emits a puff of air. Eye pressure

- is measured by the eye's resistance to the air. The *applanation tonometer* touches the eye's surface after the eye has been numbed, and measures the amount of pressure necessary to flatten the cornea. The *electronic indentation method* measures pressure by directly contacting anesthetized eyes with a digital pen-like instrument.
- **Visual field testing** measures the entire area that can be seen when the eye is looking forward. This documents central and/or peripheral vision. This test measures the dimmest light that can be seen at each spot tested. The patient responds to the appearance of light by pressing a button every time a flash of light is perceived.
 - **Visual acuity** measures how well you see at various distances. While seated 20 feet away from an eye chart, the patient is asked to read standardized visual charts with each eye. The test is performed with and without corrective lenses.
 - **Pachymetry** involves using an ultrasonic wave instrument to help determine the thickness of the cornea. This test can help the doctor better evaluate your eye pressure readings.
 - **Ophthalmoscopy** allows the eye doctor to examine the interior of the eye by looking through the pupil with a special instrument. It is helpful in detecting damage to the optic nerve due to glaucoma.
 - **Gonioscopy** allows the doctor to view the front part of the eye (anterior chamber) to determine if the iris is closer to the back of the cornea than usual. This test can help diagnose closed-angle glaucoma.
 - **Optic nerve imaging** helps the eye doctor document how the optic nerve changes over time. Stereo optic nerve photographs, scanning laser polarimetry (GDx), confocal scanning laser ophthalmoscopy (Heidelberg Retinal Tomograph or HRT), and optical coherence tomography (OCT) are examples of optic nerve imaging techniques. All four imaging techniques are painless and non-invasive. The patient's eye doctor will determine which method(s) to use.

Treatments for GLAUCOMA

The first line of treatment for most cases of glaucoma, except emergency situations, is medication, usually eye drops and rarely, pills. Researchers are continuously working to develop new medications that improve eye pressure with greater convenience and as few side effects as possible. If medications aren't effective, the next option is surgery. As with medication, new surgical advances and ideas are evolving.

An Overview of Medications

All glaucoma drugs work to reduce intraocular pressure by increasing the outflow of eye fluid (aqueous humor), decreasing its production or some combination of the two. Eye drops are frequently prescribed because they tend to have fewer side effects. The most common treatments include:

- Prostaglandins
- Miotics
- Alpha agonists

- Adrenergic agonists
- Beta blockers
- Carbonic anhydrase inhibitors

Discuss all drug options and their side effects thoroughly with your eye doctor. Make sure that he or she is aware of any medical conditions you have, as well as any medications you are taking. The eye doctor will determine the best treatment for you, based on your unique situation. Also ensure that your regular doctor knows you are using eye drops as they are medications.

To be effective, glaucoma medications must be used consistently and exactly as prescribed by your doctor. If you have difficulty remembering to use your eye drops, consider setting an alarm on your clock or cell phone as a reminder.

Surgical Options

For the most part, surgery is an option to be explored after medications have failed. However, in some cases medication or surgery can be equally effective in treating open-angle glaucoma. For some patients, surgery may be the best first choice, and for others, a combination of medication and surgery is most successful. Therefore, discuss all your options, especially in relation to your other health issues, carefully with an eye doctor.

Two exceptions to the “medication first” rule are patients (infants) with congenital glaucoma who almost always require surgery, and cases of acute closed-angle glaucoma, which always require immediate surgical treatment.

There are two types of surgery used to treat glaucoma, laser and conventional filtration, with laser procedures being the most common. Regardless

of which form of surgery is chosen, the ultimate goal is to relieve intraocular pressure by providing a way for fluid to drain from the eye.

Laser Surgery

Laser procedures are most frequently used to treat glaucoma. There are several eye laser surgeries:

- **Trabeculoplasty** is often used to treat open-angle glaucoma. In argon laser trabeculoplasty (ALT), a high-energy laser is aimed at the trabecular meshwork (canals through which eye fluid drains) to open clogged areas. These openings allow fluid to bypass drainage canals and flow out of the eye. In selective laser trabeculoplasty (SLT) a low-energy laser treats specific cells in the trabecular meshwork. Because it affects only certain cells without causing collateral tissue damage, SLT can potentially be repeated.
- **Laser Peripheral Iridotomy** is frequently used to treat closed-angle glaucoma. A laser creates a small hole in the iris to allow fluid to drain from the eye.
- **Cyclophotocoagulation** is a procedure most often used to treat more

aggressive or advanced forms of glaucoma. The laser is directed towards the eye fluid-producing ciliary body through the sclera (white part of the eye) or endoscopically. This helps to decrease the production of eye fluid (aqueous humor).

The potential side effects of laser surgery include temporary eye irritation and blurred vision. There is a small risk of cataracts.

Conventional Filtration Surgery

Conventional filtration surgery involves cutting into the sclera (white part of the eye). The surgeon then removes a tiny piece of the eye's trabecular meshwork (canals through which eye fluid drains). This procedure, called a *trabeculectomy*, creates a new pathway for the fluid to drain from the eye.

Most patients are able to discontinue glaucoma medications after a trabeculectomy. However, some people will still need to use medication, or the procedure may need to be repeated. Potential near-term side effects of trabeculectomies include blurred vision, bleeding in the eye and infection. Longer term effects may include

worsened cataracts and the sensation of a foreign body in the eye.

For patients who do not respond to trabeculectomy or are not candidates for this procedure, a *glaucoma drainage implant* may be placed in the eye. A tiny tube is inserted into the anterior chamber of the eye (the region of the eye between the cornea and the lens), which facilitates fluid drainage.

Peripheral Iridectomy is performed on closed-angle glaucoma patients. A small section of peripheral iris is removed, which allows fluid to drain more easily from the eye.

Making the Most of LIFE WITH GLAUCOMA

Dealing with loss of vision is not easy, but low vision rehabilitation and aids can greatly help glaucoma patients and their families.

Low Vision Rehabilitation

If you are diagnosed with glaucoma and experience vision loss, your doctor may recommend that you visit a low vision therapist. These professionals will evaluate your situation, taking into account your home, lifestyle, daily tasks and hobbies. They can design individualized programs, and they may suggest low vision aids, as well as instruct in their use. If you consult a low vision therapist, to get the most from your plan, be specific about activities that are important to you, and other sources of pleasure.

Medicare and Medicaid coverage policies for low vision rehabilitation training and devices are changing, so check with local low vision rehabili-

tation centers to find out whether any program costs are covered. Some centers may offer free training, or other organizations may help to defray costs. To find out more about state-funded services, contact your Area Agency on Aging. For more information, see the Resource List at the back of this booklet.

Low Vision Aids

Many low vision aids can be purchased through companies, and many print and audio materials can be purchased or sometimes borrowed at little or no cost through organizations. Some examples of these aids and materials are listed below, but many more are available. The Resource List includes contact information for such companies and other helpful organizations.

Some low vision aids:

- **Reverse telescopes** – These can be useful for people with tunnel vision. They allow all the light entering the eye to focus within the “tunnel” so people gain a better sense of their indoor surroundings.
- **Magnifiers** – For those with multiple eye problems, magnifiers can be beneficial. However, most glaucoma patients do not need magnifiers.
- **Devices with large letters/numbers** – Many devices with extremely large letters or numbers, such as clocks, watches, telephones and remote controls are commercially available for those with low vision.
- **Large print items** – Books, newspapers, magazines, cards, puzzles, labels and many other items that require reading are available in large print.
- **Computer and internet enhancements** – Large type keyboards, bigger type sizes, larger monitors, screen magnifiers and audio aids such as screen reading software are all available. Many websites on the internet have adjustable print size and differing contrast options.

- **Audio devices** – Talking books, watches, calculators and appliances can help with simple tasks such as reading, making appointments, paying bills and preparing meals.

Measuring Eye Pressure

Portable tonometers allow people to check eye pressure at home. Correct use of these tonometers requires training, but they can be helpful for those who have difficulty visiting a doctor for multiple readings that may be needed for an accurate diagnosis. The patient (or family member) can take readings at various times of the day, per a doctor’s instructions, and then bring the results to the doctor for the final reading. Check with your doctor about the practicality and affordability of portable tonometers.

Adjusting to Everyday Life

With some adjustments, people with low vision can live independently in their own homes, continue to carry out daily activities and take pleasure in hobbies. Over time, you will likely come up with individual, innovative solutions to reflect your needs, help you function better in the

home and increase your enjoyment of life. Seek help through friends, family and volunteer groups to implement these adaptations.

Consider the following suggestions and add some of your own:

- Improve lighting by using overhead lights, task lights, and extra lighting in hallways and on stairs; use night lights.
- Control glare; amber or yellow lenses can help even when inside. Use blinds and curtains in windows when necessary.
- Install handrails on stairs; consider marking the edges of steps with bright tape or painting steps with contrasting colors.
- Install grab bars in the bathroom; put contrasting tape around the edges of the tub and sink; use non-skid, brightly colored mats and bathmats.
- Consider removing doors and replacing them with bright curtains, or paint them contrasting colors. Ensure that thresholds are flush with the floor.

- Eliminate anything you might trip over. Ensure that area rugs are skid-proof and properly tacked down, and that there are no worn or broken floor tiles.



- Keep “travel areas” clear. Arrange furniture so that it does not impede movement.
- Organize household items in the kitchen, bedroom and bathroom by always putting them in the same place, especially frequently used items, such as keys, shoes, coats, glasses, pots and pans. Develop a system for grouping clothes and arranging food.
- Use large stickers on the thermostat, stove and other appliances (many utility companies will come to your home and put these on at no charge); mark key positions with raised labels.
- Place brightly colored or black tape around thermostats, light switches and electrical outlets to find them more easily.
- Use bright, contrasting colors for towels, rugs, placemats, tableware, etc., and put bright or light-colored towels or blankets on furniture so they are easier to see.
- Set alarms to alert you when to take any prescribed medications. Keep a list of your medications in a prominent place in the home; carry a list in your wallet or purse.
- Program frequently used and emergency numbers into your telephone.

Dare to Ask for Help

Coping with vision loss and learning to “see differently” takes strong and steady motivation. It helps to think of these changes as challenges to overcome, not all at once, but as they arise. Of course, initial feelings of frustration, depression and isolation are understandable, but over time with perseverance, you will achieve as much independence as possible and be able to live life fully.

Don’t be afraid to ask for help, and be clear about your wants and needs with family, friends and professionals. Consider joining a support group of people facing similar issues. There are a growing number of sources for help for those with low vision. A good place to begin looking for these is the Resource List at the end of this publication. By reading this booklet and using the valuable information it contains, you have already started on the path to success.

Low Vision RESOURCE LIST

National Glaucoma Research, a program of the American Health Assistance Foundation

Resource for the latest research news, prevention strategies, treatment and adjustment to low vision.

**22512 Gateway Center Dr.
Clarksburg, MD 20871
Phone: (301) 948-3244
Toll-free: 1-800-437-2423
www.ahaf.org**

The following organizations are not affiliated with the American Health Assistance Foundation (AHAF), and AHAF does not endorse any programs offered by these organizations.

Eye Care Professional Organizations

American Academy of Ophthalmology

Search for ophthalmologists and eye specialists by state and locality. Also links to www.geteyesmart.com which includes information on eye health and other eye-related topics.

www.aao.org

American Optometric Association

Provides contact information for state optometry associations which can in turn help locate an optometrist.

**243 N. Lindbergh Blvd.
St. Louis, MO 63141
Phone: (314) 991-4100
Toll-free: 1-800-365-2219
www.aoa.org**

Financial Aid

BenefitsCheckUp[®], National Council on Aging

Provides information on federal and state programs that offer assistance in paying for prescription drugs, utility bills, healthcare and other needs of older Americans.

www.benefitscheckup.org

Hill Burton Program

The program ended in 1997, but about 300 hospitals and healthcare facilities are still obligated to provide free or reduced-cost care. The website has a directory of participating healthcare facilities.

Health Resources and Services Administration
5600 Fishers Ln.
Rockville, MD 20857
Phone: (301) 443-5656
Toll-free: 1-800-638-0742 or
1-800-492-0329 in Maryland
www.hrsa.gov/hillburton

Knights Templar Eye Foundation

Provides financial assistance to those unable to pay for eye surgery but who are not eligible for assistance from social or government agencies. A letter of denial from a social or government agency is required to qualify.

1000 East State Pkwy., Suite I
Schaumburg, IL 60173-4592
Phone: (847) 490-3838
Fax: (847) 490-3777
www.knightstemplar.org

Lions Clubs International

Provides financial assistance to those who need eye care. Check the phone book for local Lions Clubs.

300 W. 22nd St.
Oakbrook, IL 60523-8842
www.lionsclubs.org

The Medicine Program.com

Coordinates with physicians to assist those who do not have insurance coverage for outpatient prescription medications and do not qualify for governmental programs.

P.O. Box 1089
Poplar Bluff, MO 63902-1089
Phone: (866) 694-3893
www.themedicineprogram.com

New Eyes for the Needy

Helps provide eyeglasses for the poor worldwide. Applicants must provide written proof that they have no other source of assistance.

549 Millburn Ave.
Short Hills, NJ 07078
Phone: (973) 376-4903
Fax: (973) 376-3807
www.neweyesfortheneedy.org

Partnership for Prescription Assistance

Helps qualifying patients who lack prescription coverage get the medicines they need through appropriate public or private programs.

950 F St. NW, Suite 300
Washington, DC 20004
Toll-free: 1-888-4PPA-NOW
(477-2669)
www.pparx.org

RxAssist

Offers information on patient assistance programs sponsored by pharmaceutical companies that provide free medications to those who cannot afford them.

Phone: (401) 729-3284
www.rxassist.org

Seniors EyeCare Program

Sponsored by the American Academy of Ophthalmology Foundation and the Knights Templar Eye Foundation, the Seniors EyeCare program supports the Diabetes EyeCare Program and Age-Related Macular Degeneration EyeCare Program, which provide free and low-cost eye exams and surgical care for U.S. citizens 65 and older who have not had access to an ophthalmologist in three or more years.

Toll-free: 1-800-222-EYES (3937)
www.eyecareamerica.org

SEE International

Serves disadvantaged patients who are not eligible for any social service programs such as Medicare or Medicaid. Contact SEE for information on qualification requirements.

**7200 Hollister Ave., Unit A
Goleta, CA 93117
Phone: (805) 963-3303
Toll-free: 1-800-208-6733
Fax: (805) 965-3564
www.seeintl.org**

Social Security Administration

Provides some financial assistance to those who are legally blind or who have vision problems that prevent them from employment.

**Toll-free: 1-800-772-1213
www.ssa.gov**

Vision USA

Managed by the American Optometric Association and its affiliated state agencies, this national nonprofit charity provides free basic eye health and vision care services to individuals who have no other means of obtaining care.

**Toll-free: 1-800-766-4466
www.aoa.org/visionusa.xml**

Federal Government Resources

Eldercare Locator

Website of the U.S. Department of Health and Human Services provides resource information for older adults in any U.S. community; referrals to state and local area agencies on aging and community-based organizations that serve many elder care needs; English and Spanish speaking information specialists.

**www.eldercare.gov
1-800-677-1116**

GovBenefits.gov

A partnership of federal agencies that provides access to government assistance programs.

**www.govbenefits.gov
1-800-FED-INFO
(1-800-333-4636)**

Medicaid

Program funded by federal and state governments to assist those who do not have the resources to pay for healthcare. Check the phone book or online by state.

Medicare

Federal program that pays for certain healthcare expenses. Call 24/7 for assistance; English and Spanish-speaking customer service.

www.medicare.gov
1-800-633-4227

National Eye Institute, National Institutes of Health

Supports eye disease and vision research; develops public and professional education programs to help prevent blindness, reduce visual impairment, and increase awareness of low vision services and devices.

2020 Vision Place
Bethesda, MD 20892-2510
Phone: (301) 496-5248
www.nei.nih.gov

National Institute on Aging, National Institutes of Health

Conducts and supports biomedical, social and behavioral research and public education to promote healthy aging. Website database has information on over 250 national organizations that help older people.

Building 31, Room 5C27
31 Center Dr. MSC 2292
Bethesda, MD 20892
Phone: (301) 496-1752; TTY
1-800-222-4225
www.nia.nih.gov
www.nihseniorhealth.gov
(general information)

[www.nia.nih.gov/
HealthInformation/
ResourceDirectory.htm](http://www.nia.nih.gov/HealthInformation/ResourceDirectory.htm)
(database)

State and Local Resources

Healthcare Professionals

Healthcare providers (physicians, nurses, etc.) are the first source of information for those facing health issues.

State and Area Agencies on Aging

Each state and territory in the U.S. has an Agency on Aging office located in its capital city, as well as local offices. Check the phone book or online by state and area. They provide information on nutrition and support services, elder rights programs, long-term care, ombudsman programs, legal services, outreach and elder abuse prevention.

State Departments of Health and Social Services

Each state in the U.S. has these departments, as well as local offices. They can provide information on support and respite services, facilities, financial assistance, and regulations and licensing. Check the phone book or online by state and locality.

Low Vision Aid Resources

ABLEDATA

Provides information on assistive technology and rehabilitation equipment from domestic and international sources.

**8630 Fenton St., Suite 930
Silver Spring, MD 20910
Toll-free: 1-800-227-0216
www.abledata.com**

Ai Squared

Develops computer access software for the visually impaired.

**P.O. Box 669
Manchester Center, VT 05255
Phone: (802) 362-3612
Toll-free: 1-800-859-0270
www.aisquared.com**

Beyond Sight

Offers a wide variety of items for the visually impaired, including computers, talking clocks, kitchen items, magnifying glasses and closed circuit TVs.

**5650 South Windermere St.
Littleton, CO 80120
Phone: (303) 795-6455
www.beyondsight.com**

Bossert Specialties, Inc.

Offers magnifiers and other low vision aids.

5130 N. 19th Ave., Suite 7
Phoenix, AZ 85015
Phone: (602) 956-6637
Toll-free: 1-800-776-5885
www.wemagnify.com

11800 31st Court North
St. Petersburg, FL 33716-1805
Phone: (727) 803-8000
Toll-free: 1- 877-775-9474
www.low-vision-help.com

The Braille Institute of America

Offers an online low vision products catalog called Vistas.

Toll-free: 1-800-BRAILLE
(272-4553)
www.brailleinstitute.org

Enhanced Vision Systems

Offers a full line of vision tools and magnifiers.

5882 Machine Dr.
Huntington Beach, CA 92649
Phone: (714) 374-1829
Toll-free: 1-888-811-3161
www.enhancedvision.com

Freedom Scientific

Provides assistive and adaptive low vision technology including portable and desktop video magnifiers, and magnification and screen reading software.

G. W. Micro

Offers software and hardware solutions for the blind and visually impaired.

725 Airport N. Office Park
Fort Wayne, IN 46825
Phone: (260) 489-3671
www.gwmicro.com

HumanWare

Designs and manufactures technology solutions for the visually impaired including the SmartView™ video magnifier.

175 Mason Cir.
Concord, CA 94520
Phone: (925) 680-7100
Toll-free: 1-800-722-3393
www.pulsedata.com

Independent Living Aids, Inc.

Offers a catalog of low vision products.

**P.O. Box 9022
Hicksville, NY 11802
Phone: (516) 937-1848
Toll-free: 1-800-537-2118
www.independentliving.com**

Innoventions, Inc.

Created and offers the Magni-Cam™ electronic magnifier.

**9593 Corsair Dr.
Conifer, CO 80433-9317
Phone: (303) 797-6554
Toll-free: 1-800-854-6554
www.magnicam.com**

J. Bliss Imaging Systems

Offers computer programs and applications for the visually impaired.

**P.O. Box 7382
Menlo Park, CA 94026
Phone: (650) 327-5477
Toll-free: 1-888-452-5477
(or 888-4JBLISS)
www.jbliss.com**

LS&S

Offers a catalog of both low vision and hearing impaired products.

**P.O. Box 673
Northbrook, IL 60065
Toll-free: 1-800-468-4789
www.lssgroup.com**

Maxi Aids

Offers a catalog of low vision devices.

**42 Executive Blvd.
Farmingdale, NY 11735
Toll-free: 1-800-522-6294
www.maxiaids.com**

MONS International, Inc.

Offers products for the visually impaired, including Braille watches, talking calculators, 4-track recorders, kitchen aids, writing guides, computer software and accessories, greeting cards and talking scales.

**6595 Roswell Rd., NE #224
Atlanta, GA 30328
Phone: (770) 551-8455
Toll-free: 1-800-541-7903
www.magnifiers.com**

Ocutech, Inc.

Offers various types of magnifier attachments to enhance the vision of the partially sighted; produces the VES AutoFocus telescope.

**109 Conner Dr., #2105
Chapel Hill, NC 27514
Phone: (919) 967-6460
Toll-free: 1-800-326-6460
www.ocutech.com**

OVAC

Offers a complete line of closed circuit TV products for the visually impaired.

**67-555 E. Palm Canyon
Bldg. C-103
Cathedral City, CA 92234
Toll-free: 1-800-325-4488
www.ovac.com**

Telesensory

Offers products for video magnification and speech output.

**650 Vaqueros Ave., Suite F
Sunnyvale, CA 94085
Toll-free: 1-800-804-8004
www.telesensory.com**

Vision Cue

Offers Braille, low vision and speech products from a variety of manufacturers.

**4858-A SW Scholls Ferry Rd.
Portland, OR 97225
Toll-free: 1-888-318-2582
www.visioncue.com**

Low Vision Organizations

Low Vision Rehabilitation Centers

Ophthalmologists or local hospitals can help locate low vision rehabilitation centers. These centers evaluate and train those with low vision, and offer devices and services.

American Council of the Blind

Provides a wide variety of services to visually impaired persons with an emphasis on employment opportunities.

**1155 15th St., NW, Suite 1004
Washington, DC 20005
Phone: (202) 467-5081
Toll-free: 1-800-424-8666
www.acb.org**



Association for Education & Rehabilitation of the Blind and Visually Impaired

An association of those engaged in the education, guidance, vocational rehabilitation or occupational placement of the blind and partially-sighted. The organization conducts certification programs, maintains job exchange services and works with local, state, and national governments on legislation affecting services to the blind and visually impaired.

**1703 N. Beauregard St.,
Suite 440
Alexandria, VA 22311
Phone: (703) 671-4500
Toll-free: 1-877-492-2708
www.aerbvi.org**

Columbia Lighthouse for the Blind

Offers programs that enable the blind or visually impaired to remain independent; including early intervention services, training and consultation in assistive technology, career placement services, comprehensive low vision care and rehabilitation services.

1120 20th St., NW
Suite 750 South
Washington, DC 20036
Phone: (202) 454-6400
Fax: (202) 454-6401
Toll-free: 1-877-324-5252
www.clb.org

International Association of Audio Information Services

Website includes directory of radio reading services in the U.S., Canada and several other countries.

www.iaais.org

Lighthouse International

Provides education and vision rehabilitation services, and supports research and advocacy.

111 East 59th St.
New York, NY 10022-1202
Phone: (212) 821-9200
Toll-free: 1-800-829-0500
www.lighthouse.org

National Association for Visually Handicapped

Serves as a clearinghouse for information about services available to the partially sighted from public and private sources. Conducts self-help groups and provides information on large print books and educational tools, publishes a quarterly newsletter and maintains a large print loan library for the visually impaired.

22 W. 21st St., Sixth Floor
New York, NY 10010
Phone: (212) 889-3141
www.navh.org

NFB-NEWSLINE®

Developed and operated by the National Federation of the Blind, offers free nationwide telephone newspaper service for the blind and visually impaired.

1800 Johnson St.
Baltimore, MD 21230
Phone: (410) 659-9315
Toll-free: 1-866-504-7300
www.nfb.org/nfb/newspapers_by_phone.asp

The Seeing Eye

Matches specially bred and trained dog guides with blind people in the U.S. and Canada.

P.O. Box 375
Morristown, NJ 07963
Phone: (973) 539-4425
Fax: (973) 539-0922
www.seeingeye.org

Print and Audio Materials for the Visually Impaired

American Printing House for the Blind

Provides special media, tools and materials for the blind and visually impaired.

1839 Frankfort Ave.
Louisville, KY 40206
Phone: (502) 895-2405
Toll-free: 1-800-223-1839
www.aph.org

Associated Services for the Blind

Offers Braille, tape and large-print materials for the blind and visually impaired.

919 Walnut St.
Philadelphia, PA 19107
Phone: (215) 627-0600
Fax: (215) 922-0692
www.asb.org

Books on Tape, Inc.

Produces, rents and sells unabridged audio books on cassettes, CDs and MP3-CDs.

C/O Random House
400 Hahn Rd.
Westminster, MD 21157
Toll-free: 1-800-521-7925
www.booksontape.com

Choice Magazine Listening

Provides free audio tapes of current magazine articles to those who are blind, visually impaired or unable to read because of other physical limitations.

85 Channel Dr.
Port Washington, NY 11050
Phone: (516) 883-8280
Fax: (516) 944-6849
www.choicemagazinelistening.org

National Library Service for the Blind and Physically Handicapped

The Library of Congress provides free Braille and recorded materials; loans record and cassette players to eligible borrowers through a network of cooperating libraries. Books and magazines in recorded form (talking books) or in Braille are delivered and returned by postage-free mail.

**1291 Taylor St. NW
Washington, DC 20011
Phone: (202) 707-5100
Toll-free: 1-800-424-8567
www.loc.gov/nls/**

Recording for the Blind & Dyslexic

Provides free, recorded educational books for those with visual, perceptual or other physical disability. The master library contains over 90,000 titles.

**20 Roszel Rd.
Princeton, NJ 08540
Toll-free: 1-866-732-3585
www.rfbd.org**

Clinical Trials

National Institute on Aging, National Institutes of Health

Provides information on government-sponsored human trials and recruitment, with locations, purpose, eligibility requirements and phone contacts.

**[www.nia.nih.gov/
HealthInformation/ClinicalTrials.
htm](http://www.nia.nih.gov/HealthInformation/ClinicalTrials.htm)
www.clinicaltrials.gov/**

CenterWatchSM Clinical Trials Listing ServiceTM

Provides information about clinical research, including listings of active industry and government-sponsored clinical trials, research on new drug therapies and drugs recently approved by the Food and Drug Administration.

www.centerwatch.com

GLOSSARY

Acute closed-angle glaucoma: A sudden blockage of the normal flow of eye fluid (aqueous humor). Symptoms may include severe pain, nausea, vomiting, blurred vision and seeing a rainbow halo around lights. Acute closed-angle glaucoma is a medical emergency and must be treated immediately or blindness could result in one or two days.

Adrenergic agents: A class of drugs used to treat glaucoma that help to lower eye pressure by reducing the production of fluid and increasing the amount of fluid drainage.

Alpha agonists: A class of drugs used to treat glaucoma that reduce aqueous humor production and increase the eye's fluid outflow.

Anterior chamber: The region of the eye between the cornea and the lens that contains aqueous humor.

Aqueous humor: Watery fluid that nourishes the anterior chamber of the eye, the region between the cornea and the lens. For pressure within the eye to be considered normal, the aqueous humor must enter the eye at the same rate that it exits.

Beta-blockers: A class of drugs used to treat glaucoma that work to lower the intraocular pressure by decreasing the rate at which fluid flows into the eye.

Carbonic anhydrase inhibitors: A class of drugs used to treat glaucoma that reduces fluid flow into the eye.

Central vision: Sharp, clear, “straight ahead” vision that is used to read or drive.

Choroid: The layer of the eye between the sclera and the retina, which consists of blood vessels. The choroid provides nourishment and oxygen to the retina.

Ciliary body: Part of the eye that produces the aqueous humor.

Closed-angle glaucoma: This form of glaucoma occurs when the angle between the iris and the cornea is narrow, impeding the flow of aqueous humor. This causes the eye pressure to increase.

Congenital glaucoma: Glaucoma that occurs in babies who are born with defects that prevent the normal drainage of the aqueous humor. Symptoms include tearing, blinking and light sensitivity. This condition requires immediate attention and usually surgery.

Cornea: The outer, transparent structure that covers the iris, pupil and anterior chamber.

Farsightedness: Ability to see distant objects more clearly than close ones.

Glaucoma: A group of eye diseases that lead to damage of the optic nerve (the bundle of nerve fibers that carries information from the eye to the brain), which can then lead to vision loss and the possibility of blindness. Optic nerve damage usually occurs in the presence of high intraocular pressure; however, it can occur with normal or even below-normal eye pressure.

Gonioscope: An instrument that allows the doctor to view the front part of the eye (anterior chamber). It is used to determine if the iris is closer to the back of the cornea than usual. This test can help diagnose closed-angle glaucoma.

Halo vision: The perception of a colored halo around a light source.

Intraocular pressure: The fluid pressure inside the eye.

Iris: The colored ring of tissue behind the cornea that regulates the amount of light entering the eye by adjusting the size of the pupil.

Laser therapy: This form of glaucoma treatment uses a narrow single-wavelength beam of light that can help fluid drain from the eye or decrease the amount of fluid produced.

Lens: The transparent structure suspended behind the iris that helps to focus light on the retina.

Macula: The central area of the eye's retina that processes sharp, clear, "straight ahead" vision. The paper-thin macula has light-sensitive cells that send visual signals to the brain.

Miotics: A class of drugs used to treat glaucoma that helps increase the rate of fluid drainage from the eye.

Nearsightedness: Ability to see close objects more clearly than distant ones.

Open-angle glaucoma: A progressive disease characterized by optic nerve damage. High eye pressure is the most significant recognized risk factor for the development and progression of the disease. The pressure in the eye builds up gradually. At some point, side vision (peripheral vision) is lost and without treatment, total blindness will occur. In this form of the disease, the angle between the iris and the cornea is not narrowed or blocked.

Ophthalmologist: A doctor who specializes in diagnosing and treating diseases and defects of the eye and related structures.

Ophthalmoscope: An instrument used to examine the interior of the eye through the pupil. It is useful for detecting glaucomatous damage to the optic nerve.

Optic nerve: The nerve that carries visual signals from the eye to the brain. Pressure elevated because of glaucoma can damage the optic nerve head and cause blindness.

Optometrist: A person trained to diagnose near and farsightedness and to prescribe corrective lenses. In some states, optometrists can diagnose and treat eye diseases.

Peripheral vision: Vision at the outer periphery of the field of vision.

Prostaglandin analogs: A class of drugs used to treat glaucoma that reduce pressure in the eye by increasing the outward flow of fluid from the eye.

Retina: Light-sensitive part of the eye. Light is focused on photoreceptors in the retina by the cornea and lens.

Sclera: The tough white outer layer that protects the entire eyeball.

Tonometer: A device used to measure the fluid pressure inside the eye.

Trabecular meshwork: Mesh-like structure forming a network of canals leading to the channel between the cornea and sclera, the main route through which aqueous humor exits the eye.

Vitreous humor: The clear, jelly-like substance that fills the eye from the lens on back to the retina. The vitreous humor helps maintain the eye's shape, and provides a clear path for light to reach the retina.

Glaucoma PUBLICATIONS

Living with Glaucoma

This 34-page booklet discusses the types of glaucoma, treatments, visual rehabilitation, low vision aids, and adjusting the home. A comprehensive resource list is also included. *Free*

Low Vision Resource List

An extensive list of organizations to assist the visually impaired. *Free*

National Glaucoma Research Report

This quarterly newsletter published by AHAF's National Glaucoma Research (NGR) program provides easily understood updates on research currently being funded by NGR, and other timely information about glaucoma. *Free*

Safety and the Older Driver

This 28-page booklet discusses medical conditions that can affect driving, safety driving tips and strategies, a self test for drivers, how to evaluate and discuss unsafe driving practices, and options for maintaining independence once a decision is made to stop driving. *Free*

The Essential Facts on Glaucoma

This 11-page brochure discusses the primary forms of glaucoma, risk factors, treatment options, and strategies to meet the challenges of everyday living. *Free*

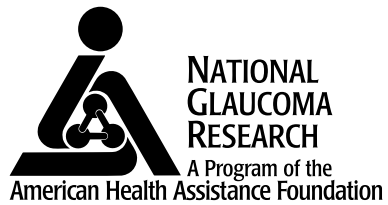


E W 3

5 3 M W O A

2 5 M E 3 X O

2 6 5 W E M O



22512 Gateway Center Drive
Clarksburg, MD 20871

(301) 948-3244
1-800-437-2423
fax (301) 258-9454

www.ahaf.org