

# Vision Loss and Eye Disease: Descriptions and Glossary

Age-related eye diseases are the leading cause of vision impairment and blindness in the United States.

We must be aware of our personal risk of vision loss and take steps to preserve and protect our precious eyesight. Our communities must be informed so they may prepare the treatment and rehabilitation services that will be needed. Below is specific information regarding the leading causes of vision loss for Americans. Additional information can be accessed at [pbohio.org](http://pbohio.org).

## **Blindness and Visual Impairment**

The term "blindness" can have many connotations and is difficult to define. To many people, blindness refers to the complete loss of vision with no remaining perception of light. However, this ultimate form of complete blindness is rare. Far more people have a permanent loss of some, but not all, of their eyesight.

"Legal blindness" represents an artificial distinction, but it is significant in that it determines eligibility for certain disability benefits from the Federal Government. In the United States, it is typically defined as visual acuity with best correction in the better eye worse than or equal to 20/200 or a visual field extent of less than 20 degrees in diameter.

Vision impairment is defined as having 20/40 or worse vision in the better eye even with eyeglasses.

Almost everyone with blindness or vision impairment can benefit from vision rehabilitation that can help make the most of whatever vision remains. In many ways these criteria for legal blindness and vision impairment oversimplify the hardships and difficulties in daily living experienced by those living with significant vision deficits.

Blindness and vision impairment represent a significant burden to those affected by sight loss as well as to our national economy. Prevent Blindness America's 2007 study, *The Economic Impact of Vision Problems: The Toll of Major Adult Eye Disorders, Visual Impairment and Blindness on the U.S. Economy*, estimates the **annual** costs associated with adult vision problems to be \$51.4 billion in the U.S. and \$1.98 billion in Ohio.

Blindness affects more than one million Americans age 40 and older and more than 43,000 Ohioans. Over 150,000 Ohioans are visually impaired. Blacks are more frequently affected by blindness than Whites or Hispanics, while Hispanics have higher rates of vision impairment than other races. The prevalence of blindness and vision impairment increases rapidly in the later years, particularly after age 75.

## **Myopia**

Refractive errors are the most frequent eye problems in the United States. They are optical defects that result in light not being properly focused on the eye's retina.

Nearsightedness (myopia) is the most common refractive error. People with myopia see near objects clearly, while distant ones are blurred. Farsightedness (hyperopia) is also common and results in a blurring of near objects.

Other common refractive errors include astigmatism (uneven focus) and presbyopia (age-related problem with near focus). Refractive error can change throughout a lifetime.

Fortunately, eyeglasses or contact lenses can correct almost all refractive errors. It is estimated that more than 150 million Americans use corrective eyewear to compensate for their refractive error. Americans are estimated to spend over \$15 billion annually on eyewear. Refractive surgery is a popular alternative to corrective lenses, but the long-term effects are still unknown and each surgery carries some risk to overall vision and eye health.

Myopia affects more than 32 million Americans and 1.4 million Ohioans age 40 and older. Myopia affects more Whites than other races. Hyperopia is less common, affecting over 12 million older Americans.

Uncorrected or under-corrected refractive error can result in significant vision impairment.

### **Age-Related Macular Degeneration**

Age-related macular degeneration (AMD) is a condition that primarily affects the part of the retina responsible for sharp central vision. There are two forms:

**Dry AMD (non-exudative)** is the most common form of the disease. Early AMD involves the presence of drusen, fatty deposits under the light-sensing cells in the retina. Late cases of dry AMD may also involve atrophy of the supportive layer under the light sensing cells in the retina that helps keep those cells healthy. Vision loss in early dry AMD is usually moderate and only slowly progressive. Atrophy in late cases of dry AMD can result in more significant vision loss.

**Wet AMD (exudative)** is less common, but is more threatening to vision. It's called wet AMD because of the growth of tiny new blood vessels (neovascularization) under the retina that leak fluid or break open. This distorts vision and causes scar tissue to form. All cases of the wet form are considered late AMD.

The exact cause of AMD is unknown, but risk factors for the disease include age (rarely affecting those under age 50), White race and cigarette smoking. Research also suggests that long-term diets low in certain antioxidant nutrients may increase the risk of AMD. Because AMD often damages central vision, it is likely the most common cause of legal blindness and vision impairment in older Americans.

Unfortunately, there is no generally accepted treatment for dry AMD. Laser therapies to destroy leaking blood vessels can help reduce the risk of advancing vision loss in many cases of wet AMD. Research has recently shown that certain doses of zinc, vitamins A and C, and beta-carotene can help control the advance of late AMD, but appear to have no effect in preventing the disease in otherwise healthy individuals.

Over two million Americans and 92,500 Ohioans age 50 and older have late AMD. The disease advances more significantly for Whites after age 75. In Blacks, the disease is more prevalent in women until about age 75.

## **Cataract**

Cataract is a clouding of the eye's naturally clear lens. Most cataracts appear with advancing age. The exact cause of cataract is unclear, but it may be the result of a lifetime of exposure to ultraviolet radiation contained in sunlight, or may be related to other lifestyle factors such as cigarette smoking, diet, and alcohol consumption. Cataract can also occur at any age as a result of other causes such as eye injury, exposure to toxic substances or radiation, or as a result of other diseases such as diabetes.

In the United States, cataract is sometimes considered a conquered disease because treatment is widely available. However, cataract still accounts for a significant amount of vision impairment in the U.S., particularly in older people who may have difficulty accessing appropriate eye care due to cost, availability, or other barriers.

Treatment of cataract involves removal of the clouded natural lens. The lens is usually replaced with an artificial intraocular lens (IOL) implant. Cataract removal is one of the most commonly performed surgical procedures with more than a million such surgeries performed each year.

Surgery is not truly a cure for cataract, however, and its success in controlling vision loss comes with a price. It is estimated that the direct annual medical costs for outpatient, inpatient and prescription drug services related to the treatment of cataract total \$6.8 billion.

Ongoing research into the normal healthy functioning of the eye's lens may help us better understand the causes of cataract and how it might be prevented.

Cataract affects over 22 million Americans and 945,000 Ohioans age 40 and older. By age 80, more than half of all Americans have cataract. Cataract is slightly more common in women than in men and affects Whites somewhat more frequently than other races, particularly with increasing age.

## **Diabetic Retinopathy**

Diabetic retinopathy is a common complication of diabetes. It affects the tiny blood vessels of the retina. Retinal blood vessels can break down, leak, or become blocked— affecting and impairing vision over time. In some people with diabetic retinopathy, serious damage to the eye can occur when abnormal new blood vessels grow on the surface of the retina.

In general, the longer someone has diabetes, the greater the risk of developing diabetic retinopathy. Eventually, almost everyone with juvenile-onset diabetes will develop some signs of diabetic retinopathy. Those who acquire diabetes later in life are also at risk of diabetic retinopathy, although they are somewhat less likely to develop advanced diabetic retinopathy.

Diabetes also increases the risk of other eye diseases such as cataract and glaucoma. Because of its dangers to good vision, people with diabetes are urged to seek annual dilated eye exams.

Research suggests that the risk of diabetic retinopathy can be reduced through careful control of blood sugar. People with diabetes are also encouraged to control their blood pressure.

Laser treatment, called photocoagulation, has been shown to reduce the risk of sight loss in advanced cases of diabetic retinopathy. Focal photocoagulation can be used to destroy leaking blood vessels. Scatter photocoagulation, where large numbers of spots are destroyed by a laser, is used to control the growth of abnormal blood vessels. In some cases vitrectomy, a surgical procedure to remove clouded fluid and gel from inside the eye can help.

Diabetic retinopathy affects over nearly 4.5 million Americans and over 171,000 Ohioans age 40 and older. After age 40, Hispanics are most commonly affected by the disease.

## **Glaucoma**

Glaucoma is a disease that causes a gradual degeneration of cells that make up the optic nerve, which carries visual information from the eye to the brain. As the nerve cells die, vision is slowly lost, usually beginning in the periphery. Often, the loss of vision is unnoticeable until a significant amount of nerve damage has occurred. For this reason, it is estimated that half of all people with glaucoma are unaware of their disease.

The exact cause of primary open-angle glaucoma, the most common form of the disease, is uncertain. Other forms of glaucoma (such as angle-closure, secondary and congenital glaucoma) occur in relation to specific physical causes.

Elevated fluid pressure within the eye (intraocular pressure) seems related in some way to all cases of glaucoma. The majority of cases exhibit intraocular pressure outside the normal limits at some time. However, even patients with normal pressure seem to benefit from treatment aimed at lowering pressure.

Most cases of glaucoma can be controlled and vision loss slowed or halted by treatment. Medications, laser treatments and surgery can be used to lower intraocular pressure. However, any vision lost to glaucoma cannot be restored.

Unfortunately, glaucoma cannot be prevented. Factors that increase the risk of glaucoma include age, race, diabetes, eye trauma, and long-term use of steroid medications.

Glaucoma is traditionally defined by a triad of signs, including the presence of at least two of the following: elevated intraocular pressure, optic disc cupping, and visual field loss.

Glaucoma affects almost 2.3 million Americans and nearly 94,000 Ohioans age 40 and older. Glaucoma is more common in Blacks and Hispanics and with increasing age.

