

VISUAL IMPAIRMENT AND BLINDNESS

Vision trouble affects 22.4 million adults throughout the United States and costs about \$51.4 billion annually (National Center for Health Statistics, 2009; Prevent Blindness America (PBA), 2008). Blindness or visual impairment affects approximately 3.6 million Americans over the age of 40. Nationally, it is estimated that 2.80% of the total U.S. population over 40 years of age is affected by blindness and vision impairment. In Texas, 2.37 % of the population is blind or visually impaired. This includes approximately 55,635 individuals age 40 and older who are blind and an additional 210,636 others who are classified as visually impaired (PBA, 2008).

Visual impairment refers to the consequence of functional loss of vision such as losing the ability to perform daily living activities or function independently (American Optometric Association (AOA), 2007). Definitions of levels of visual impairments are as follows:

- **Low vision:** best-corrected visual acuity in the better-seeing eye is:
 - 20/30 to 20/60 -- mild vision loss
 - 20/70 to 20/160 -- moderate low vision
 - 20/200 to 20/400 -- severe low vision
 - 20/500 to 20/1,000 -- profound low vision (AOA, 2009).
 - Prevent Blindness America (2008) reports that *3,638,186 people in the U.S. age 40 and older are visually impaired.*
- **Legal blindness:** best-corrected visual acuity less than 20/200 in the better-seeing eye or a visual field extent of less than 20 degrees in diameter (PBA, 2008).
 - This means that what a person with normal vision can see at 200 feet, a legally blind person can see at 20 feet.

- Prevent Blindness America (2008) reports that 1,035,100 people in the U.S. age 40 and older are estimated to be blind.

A wide variety of other conditions that result in visual impairment are described in greater detail below.

Retinal diseases involve the neural tissue in the back of the eye that contains the photoreceptor cells (rods and cones). The retina converts light to electrical signals and transmits the information via the optic nerve to the brain.

- **Age-related Macular Degeneration (AMD):** Leading cause of vision loss in persons over 60 years of age with no known cure (National Eye Institute (NEI), 2009a):
 - **Dry AMD:** gradual break-down of cells in the macula (center of retina) resulting in blurring of the central vision of the affected eye
 - 90% of all AMD is dry
 - Onset is gradual
 - **Wet AMD:** abnormal blood vessels behind the retina start to grow under the macula, causing a loss of central vision.
 - Onset is rapid
 - Also known as Advanced AMD
 - A “blind spot” in the center of the eye is characteristic of AMD; the spot can grow over time but does not usually completely black out the entire vision range
 - Peripheral vision is typically maintained, but can become so severely blurred that it is impossible to distinguish details
 - *Over 2 million people in the U.S. age 50 and older have AMD (PBA, 2008)*
 - *110,852 people in Texas have AMD (PBA, 2008)*

- **Diabetic Retinopathy:** Damage to the blood vessels in the retina. There are four progressive stages (NEI, 2006b):
 - *Mild Nonproliferative Retinopathy:* microaneurysms occur
 - *Moderate Nonproliferative Retinopathy:* some blood vessels become blocked
 - *Severe Nonproliferative Retinopathy:* many more blood vessels become blocked triggering growth of new vessels
 - *Proliferative Retinopathy:* numerous newly grown blood vessels are abnormally fragile and may leak, causing severe vision loss or blindness
 - Treatment for the first three stages is unnecessary; control of diabetic issues such as blood sugar, blood pressure, and cholesterol have been shown to slow down progression of the disease
 - Proliferative retinopathy is treated with laser surgery
 - Between 40 to 45 percent of Americans diagnosed with diabetes have some stage of diabetic retinopathy
 - *Over 4.4 million people in the U.S. age 40 and older have diabetic retinopathy (PBA, 2008)*
 - *337,117 people in Texas have diabetic retinopathy (PBA, 2008)*

Corneal diseases involve the transparent tissue at the front of the eye that serves as both a protective physical barrier that shields the eye from the external environment and is the main refractive element of the eye, directing incoming light onto the lens (NEI, 2009b).

- **Refractive errors**
 - Myopia (nearsightedness) – incoming light rays focused in front of the retina
 - Hyperopia (farsightedness) – incoming light rays focused behind the retina
 - Astigmatism – light rays not focused on a single point
 - *Over 2 million individuals in Texas are myopic (PBA, 2008)*
 - *786,618 Texans are hyperopic (PBA, 2008)*
- **Corneal Dystrophies:** conditions in which one or more parts of the cornea lose their normal clarity due to a buildup of cloudy material.

There are over 20 corneal dystrophies that affect all parts of the cornea.

- **Keratoconus:** a progressive thinning of the cornea
 - Results in thin, bulging, conically shaped cornea that can cause severe visual impairment
 - Affects one in every 2,000 Americans

Glaucoma is a group of diseases that cause a gradual degeneration of cells that make up the optic nerve (NEI, 2006c).

- Elevated pressure inside the eye is frequently, but not always, present
- Vision loss is gradual and usually unnoticed until significant, irreversible nerve damage occurs
- Peripheral and side vision is lost first, creating a “tunnel effect” where patients only see what is central in their vision. Gradually, this central vision also begins to deteriorate until little or no vision remains.
- Can be treated with medication and/or surgery to slow the progression of the disease
- Leading cause of blindness among African Americans
- *2.3 million people in the U.S. age 40 and older have glaucoma (PBA, 2008)*
- *145,790 people in Texas have glaucoma (PBA, 2008)*

Cataract is a clouding of the eye’s naturally clear lens that interferes with vision (NEI, 2006a).

- Result of build-up of proteins in the lens
- Occur mostly in older persons
- Fuzzy or blurred vision is sometimes the first symptom
- Outpatient surgery is the only option for mild to severe cataract, and is usually performed by replacing the cataract affected lens with an artificial lens
- *Over 22 million people in the U.S. age 40 and older have cataract (PBA, 2008)*
- *1,354,576 people in Texas have cataract (PBA, 2008)*
- Medical costs and prescription drug services total \$6.8 billion a year for cataract treatment (PBA, 2008)

Vision Is a Continuum

A person with low vision has severely reduced visual acuity or a significantly obstructed field of vision - or both - that cannot be corrected by glasses, medicine or surgery (Santa Rosa Low Vision Clinic, n.d.). Persons with visual impairments face a variety of challenges on a day-to-day basis. These difficulties often lead persons with visual impairments to suffer from loneliness, isolation, and depression. Even simple tasks such as preparing food may become extremely difficult.

The elderly are at the highest risk for developing visual impairments, and suffer the most from the effects of vision loss because of an inability to adapt to a world of non-vision. In 2006, 78 million baby boomers turned 60, jumpstarting a two-decade period of growth in America's 65 and older population. By 2030, 57.8 million baby boomers are projected to be between the ages 66 and 84 (U.S. Census, 2006).

Early and frequent screening of older adults is imperative to minimize the impact of vision problems. The National Institute on Aging states that most vision problems among seniors can be treated or avoided if treated before the problem becomes too severe (2006).

Low Vision Rehabilitation

Special low vision exams may be necessary to assess a patient's level of usable vision. Provided by low vision specialists, these exams are conducted using specialized charts (versus the standard eye chart) as well as tests to measure contrast sensitivity, size, and location of blurry or distorted areas in the visual field, and other functions such as how well someone can see faces, street signs, newspaper print, stove dials, etc. (Low Vision Gateway, n.d.b).

The goal of a low vision exam is to help maximize the use of remaining vision. Low vision doctors prescribe prescription eyewear, filters, microscopic - telescopic eyewear, magnifiers, adaptive equipment, closed circuit television systems, independent living devices, and provide training and counsel for patients (Santa Rosa Low Vision Clinic, n.d.).

The Lighthouse International website provides a comprehensive on-line directory of low vision services and resources. Currently, the site lists 8 low vision centers within a 50 mile range of San Antonio proper (Lighthouse International, 2009).

While low vision exams are not currently covered under most vision insurance policies, the U.S. Federal government's Centers for Medicare and Medicaid Services has authorized a demonstration project in six geographic areas to study the impact of Medicare coverage for vision rehabilitation services. The study, to be completed in 2011, will generate data to determine if visual rehabilitation, including services taking place in both community settings and a person's home, should be covered for all Medicare recipients (U.S. Department of Health & Human Services, 2007).

Accessible Media

It is important, especially for seniors, to access resources to help alleviate feelings of isolation. Certain adaptations, such as learning to read Braille, are very difficult to attain. There are a limited number of services available to address this growing need:

- **U.S. Library of Congress National Library Service for the Blind and Physically Handicapped (NLS):** any U.S. citizen who is unable to read or use standard print materials as a result of a temporary or permanent visual or physical limitation may receive service. Playback equipment, books, magazines, and catalogs are sent directly to the subscriber by U.S. Postal Services as "*Free Matter for the Blind*" and are returned the same way. There is no cost to the individual for this service (NLS, 2007).
- **National Federation of the Blind** offers a free newspaper reading service (U.S. newspapers only) where qualified individuals call a toll-free number and can hear articles from over 290 newspapers, including five Spanish language papers, read over the phone (National Federation of the Blind, 2009).
- **Canadian Institute for the Blind** provides an online digital audio library that allows subscribers to listen to books online or download to computer. This is a free service for those who qualify (Canadian Institute for the Blind, 2009).
- **Owl Radio** in San Antonio provides daily radio broadcasts of newspapers, magazines and other information. Programming is transmitted to special radio receivers provided to qualified applicants over subcarriers provided by Texas Public Radio (Low Vision Resource Center, 2008).

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