

# Falls and Vision Loss

Prepared by Bernard A. Steinman, M.S.

Although people may fall at any time during their lives, falling is of greater concern to older people because of age-associated changes in the body that make them more likely to experience a serious injury as a result of a fall. Aging is associated with some forms of vision loss that further compound the risk of falling and being injured. People with visual impairments are more than twice as likely to fall as people without visual impairments. In addition to risk factors that are experienced by the aged in general, older people with visual impairments have a unique set of factors that place them at greater risk of falling.

Age Related Vision Loss—Aging is often accompanied by normal changes in the eyes that can increase the risk of falls. In contrast, some age-related vision losses are associated with diseases that are not a normal part of aging, but are more likely to affect older adults. The most common pathological eye conditions include cataracts, age-related macular degeneration, diabetic retinopathy, and glaucoma.



**Normal Vision**—Normal vision is clear and undistorted. However, some normal age-related changes in the eye occur after the age of 40 that make it difficult to change the focus of the eye between near and far objects. Normal age-related changes in the eye are called presbyopia.



Cataracts often develop slowly and occur when the normally clear lens becomes cloudy. Cataracts often result in blurred vision, sensitivity to bright lights and glare, and difficulty seeing at night.



Age-Related Macular Degeneration, or AMD, is a degeneration of part of the retina that perceives fine details. Persons with AMD experience a progressive decrease and/or distortion of vision in the central part of their visual field and may be forced to utilize their peripheral vision to move around.



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Diabetic retinopathy is a secondary condition of persons with diabetes. It affects the blood vessels that provide nourishment to the retina. Blood vessels in the retina may become malformed and weakened resulting in vision that is splotchy and inconsistent. Diabetic retinopathy may become progressively worse and eventually lead to blindness, if diabetes is not controlled.



Glaucoma (open angle) occurs when ducts that regulate fluid in the eye become blocked, resulting in pressure on the optic nerve. Primary open angle glaucoma is gradual and cumulative. Symptoms may include halo effects around bright lights, decreased peripheral vision, and changes in contrast sensitivity.

## Visual Impairment as a Risk Factor for Falls

The heightened risk of falls that is associated with aging may be discussed with respect to intrinsic and extrinsic factors. Intrinsic factors are characteristics of the individual that increase the likelihood of falling, such as visual or health conditions. Extrinsic factors are environmental, and include things such as poor lighting or slippery surfaces. Older individuals with visual impairments have a unique set of intrinsic and extrinsic factors that increase their risk of falling.

## Vision-Related Intrinsic Factors

- Reduced contrast sensitivity— Older adults who have visual impairments may have difficulty seeing edges that mark important changes in surfaces. Reduced contrast sensitivity can make curbs nearly invisible, and may make some clutter or obstacles very difficult to detect.
- Reduced depth perception— Older people who have poor vision in one eye may have more difficulty judging distances. Reduced depth perception may make the world seem 2-dimensional, resulting in greater difficulty judging one's distance from hazardous obstacles.
- Reduced visual field— Whereas some eye diseases such as Glaucoma may result in poorer peripheral vision, other eye diseases like Diabetic Retinopathy or Age-related Macular Degeneration (AMD) may cause blind spots (scotomas) in the central field, or throughout the visual field. Of course, objects that are not seen cannot be avoided, so reduced visual fields are a common cause of falls, especially when coupled with environmental hazards.



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- Poor visual acuity— Cataracts and other age-associated eye diseases may reduce the clarity and detail of a visual image. Similarly, natural age-related changes to the eyes (presbyopia), including the increased difficulty of focusing the eye's lens on objects, can reduce the ability to discern fine details in the environment.
- Increased sensitivity to glare— Age-related changes in the eye make older people more sensitive to glare. Bright indoor lighting, and sunlight, may make it difficult for older people to see, and to avoid objects that are in their paths.

## Vision-Related Environmental Factors

- Pavement cracks/misalignments— Older adults with vision impairments may not see cracks in sidewalks and pavement that could cause them to trip.
- Steps/stairs— Due to problems with depth perception and balance, steps and narrow stairs may be especially hazardous to some older people with visual impairments.
- Low contrast obstacles/clutter— Objects that blend into the background are more likely to cause trips and stumbles among visually impaired elders.
- Low contrast edges— In some cases, changes in lighting on the edge of a surface may indicate a step downward/upward. When vision loss reduces the ability to detect edge contrasts, the risk of falling increases.
- Inappropriate glasses/multifocal glasses— Older adults who have outdated prescriptions or glasses with multifocal lenses are at increased risk for falling.

## General Effects of Visual Impairment

As a result of risk factors associated with visual impairments among the elderly, the incidence of falling may increase because visually impaired elders...

- May fail to see environmental hazards (e.g., curbs, overhead obstacles, clutter, pets)



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- May experience more difficulty maintaining balance
- May over-correct or have trouble taking corrective action after a stumble
- May exercise less, and consequently lose strength and balance
- May venture outdoors less often resulting in reduced absorption of Vitamin D, which is important for the maintenance of healthy bones.

## Making Life Safer for Older Adults with Visual Impairments

- Fortunately, many of the factors that place visually impaired older adults at risk for falling can be addressed through modifications to individual behavior and to the home environment.
- Proper maintenance of diseases that affect the eyes (e.g. glaucoma, and diabetes) can help to preserve residual vision. Similarly, removal of cataracts has been shown to reduce the likelihood of falling. Regular checkups, by older people in general, can help to detect vision problems early.
- Regular adherence to approved exercise programs (low adherence may result in greater likelihood of falling). Even modest exercise has been shown to improve muscle tone and balance among elderly participants.
- Home safety assessment and modifications
  - Fix cracks in pavement and sidewalks.
  - Mark abrupt edges (e.g., steps and stairs) with bright high-contrast tape, so that they are visible.
  - Adjust lighting so that it is sufficient to see, but not too bright, such that it causes glare.
  - Remove or repair uneven surfaces (for example, those caused by protruding tree roots).
  - Keep walkways clear of clutter.
  - Put bells on pet collars.

