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Armenian EyeCare Project



Bringing Sight to Armenian Eyes

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When should a cataract be treated?

If your eye care professional finds a cataract, you may not need cataract surgery for several years. There is a danger in delaying treatment or waiting too long to have a cataract removed.

Advanced (ripe) cataract can severely reduce vision and may be associated with the development of glaucoma. Cataracts are also easier to remove in the early stages. Better surgical techniques are available than with “ripe” cataracts and there is less risk with the procedure. By having your vision tested regularly, you and your eye care professional can discuss when you will need treatment.

How is vision restored following cataract surgery?

When the eye surgeon removes the cataract she is removing the clouded lens, which when clear focuses images on the retina. Without the powerful lens, vision is blurred until the magnification is restored. There are three ways this is accomplished.

Eye glasses. These are thick eye glass lenses that restore vision, but with a great degree of enlargement of what is seen through the lenses.

Contact lenses. Contact lenses restore vision, but must be worn daily and removed before sleep to prevent eye irritation. Vision is restored to near-normal, but contact lenses can be difficult to apply and wear, particularly for the older person.

Lens implantation. A small, clear plastic lens is implanted into the eye where the clouded lens with a cataract was removed. Vision is restored to near-normal and usually no follow-up care or additional surgeries are required. Occasionally, a clouding of the lens may occur within one to three years. This can be easily opened and removed with a rapid laser procedure.

What can you do to protect your vision?

If you are over age 60, you should have an eye examination at least once every two years. This exam should include dilating your pupils. This means drops are put into your eyes to enlarge your pupils. Although a cataract can be detected without dilated pupils, your eye care professional can see the back of your eye better using this exam. Getting a good view of the retina and optic nerve is important in detecting eye diseases such as glaucoma and macular degeneration.

Cover page photo by Lonnie Duka



Cataract



In Armenia, cataract is the leading cause of preventable blindness.

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Cataracts are a normal part of aging. About 75% or 3 out of 4 people over 65 have some form of cataracts. About 90 percent of those aged 75 and over have this condition. In Armenia, cataract is the leading cause of blindness.

What is a cataract?

A cataract is a clouding of the eye's lens that causes loss of vision.

What causes cataracts?

The lens lies behind the iris and the pupil (see diagram). It works much like a camera lens. It focuses light onto the retina at the back of the eye, where an image is recorded. The lens also adjusts the eye's focus, letting us see things clearly both up close and far away.



Aging. The lens is made of mostly water and protein. The protein is arranged in a precise way that keeps the lens clear and lets light pass through it. But as we age, some of the protein may clump together and start to cloud a small area of the lens. This is a cataract. Over time, the cataract may grow larger and cloud more of the lens, making it harder to see.

When are you most likely to have a cataract?

The term "age-related" is a little misleading. You don't have to be a senior citizen to get this type of cataract. In fact, people can have an age-related cataract in their 40s and 50s. But during middle age, most cataracts are small and do not affect vision. It is after age 60 that most cataracts steal vision.

Trauma. Eye injuries can cause a cataract to form. For example, a severe blow to the eye, which results in a ruptured globe. Or, a piece of metal from a grinding wheel or a sledge hammer, which penetrates the cornea and lens of an unprotected eye.

Iritis-Uveitis. An inflammation inside the eye-iritis or uveitis-and can cause cataract formation. This usually results after several episodes of inflammation or after a prolonged episode of untreated inflammation.

What are its symptoms?

A cataract starts out small. It has little effect on vision at first. You may notice that your vision is blurred a little, like looking through a cloudy piece of glass.

A cataract may make light from the sun or a lamp seem too bright, causing a glare. Or, you may notice when you drive at night that the oncoming headlights cause more glare than before-or are blinding and cause you to see "halos." Also, colors may not appear as bright to you as they once did.

As the cataract gets bigger and clouds more of the lens (doctors

use the term, "ripens"), you will find it harder to read and do other normal tasks. The word "cataract" means waterfall. For people with a ripe cataract, it is like trying to see through a waterfall.

How is a cataract detected?

Although you might think you have a cataract, the only way to know for sure is by having an eye examination. Should your eye care professional find one, he or she can monitor it and advise you about any future treatment.

How is a cataract treated?

It is treated with surgery. Your eye care professional will remove your clouded lens and, in most cases, replace it with a clear, plastic lens. Cataract surgery is very successful in restoring vision. In fact, it is one of the most common surgeries performed in the United States, with over 1.5 million cataract surgeries done each year.



Vision with cataract

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Laser surgery: During laser surgery, a strong beam of light is focused on the part of the eye where the fluid leaves. This makes it easier for fluid to exit the eye. Over time, the effect of laser surgery may wear off. Patients who have this form of surgery may need to continue taking glaucoma drugs to keep their pressure under control.

Surgery: Surgery can also help fluid escape from the eye and thereby reduce the pressure. However, surgery is usually reserved for patients whose pressure cannot be controlled with eye drops, pills, or laser surgery.

What can you do to protect your vision?

Studies have shown that the early detection and treatment of glaucoma, before it causes major vision loss, is the best way to control the disease. High-risk groups for the disease should make sure to have their eyes examined every two years by an eye care professional.

Intraocular pressure (IOP)

Intraocular pressure (IOP) is the pressure caused by the fluid inside the eye that helps maintain the shape of the eye. The level of pressure inside the eyes depends on:

- How much fluid is produced inside the eye.
- Whether fluid can travel normally through the eye.
- How well the fluid is removed from the eye.
- The pressure within the eyes varies during the day.

Normally, the pressure inside the eye ranges from 10 mm Hg (millimeters of mercury) to 21 mm Hg.

Possible Risk Factors

- High Myopia (near sightedness)
- Diabetes
- Hypertension
- Eye Injury or Surgery

Other Risk Factors

- History of steroid use
- Migraine headache and peripheral vasospasm
- Sleep-related breathing disorder
- Gender: Male

Cover page photo by Lonnie Duka



Glaucoma



Early detection and treatment is the best way to control Glaucoma

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What is glaucoma?

Glaucoma is a group of eye conditions in which the optic nerve is damaged. This prevents the visual message from being sent from the eye to the brain and leads to eventual blindness unless it is recognized and treated. In most cases



damage to the optic nerve results from elevated pressure within the eye that is caused by a backup of fluid in the

eye. Glaucoma can develop in one or both eyes.

Who is most likely to get glaucoma?

Anyone can get glaucoma, however, some people are at higher risk. They include:

- Everyone over age 60.
- People with a family history of glaucoma.
- People with diabetes.
- People with a history of uveitis or inflammation within the eye.
- People with a history of trauma to the eye.

What are the symptoms?

In angle-closure glaucoma the eye pressure increases suddenly. Symptoms include redness of the eye and blurred vision as well as severe pain in the brow or headache and nausea. This is a medical emergency and without treatment the eye can become blind in as few as one or two days.

Open-angle glaucoma is ten times more common and is a chronic form that slowly causes loss of vision. This is often so slow that the patient may not even realize it. At first, there are no symptoms. Vision



stays normal, and there is no pain. However, as the disease progresses, a person with glaucoma may notice his or her side vision gradually failing. Objects in front may still be seen clearly, but objects to the side may be missed, almost as if one is looking through a tube. As the disease worsens, the field of vision narrows and blindness results.

How is glaucoma detected?

Glaucoma is detected through a comprehensive eye exam. This includes visual acuity and side vision tests, measuring pressure inside the eye and examining the optic nerve.

How can glaucoma be treated?

Although glaucoma cannot be cured, it can usually be controlled. The main treatment for glaucoma aims to reduce the pressure in the eye.

Medications: These may be either in the form of eye drops or pills. Some drugs are designed to reduce pressure by slowing the flow of fluid into the eye. Others help to improve fluid drainage. For most people with glaucoma, regular use of medications will control the increased fluid pressure. But, these drugs may stop working over time. Or, they may cause side effects. If a problem occurs, the eye care professional may select other drugs, change the dose, or suggest other ways to deal with the problem.

Although glaucoma cannot be cured, it can usually be controlled. The main treatment for glaucoma aims to reduce the pressure in the eye.

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What are the symptoms of diabetic retinopathy if bleeding occurs?

At first, you will see a few specks of blood, or spots, "floating" in your vision. If spots occur, see your eye care professional as soon as possible. You may need treatment before more serious bleeding occurs. Hemorrhages tend to happen more than once, often during sleep.

Bleeding can frequently reoccur and cause severely blurred vision. You need to be immediately examined by your eye care professional at the first sign of blurred vision, before more bleeding occurs.

If left untreated, proliferative retinopathy can cause severe vision loss and even blindness. Also, the earlier you receive treatment, the more likely treatment will be effective.

How are macular edema and diabetic retinopathy detected?

Macular edema and diabetic retinopathy are detected during a comprehensive eye exam that includes:

- **Visual acuity test.** This eye chart test measures how well you see at various distances.
- **Dilated eye exam.** Drops are placed in your eyes to widen, or dilate, the pupils. Your eye care professional uses a special instrument to examine your

retina and optic nerve for signs of damage and other eye problems. After the exam, your close-up vision may remain blurred for several hours.

- **Tonometry.** An instrument measures the pressure inside the eye. Numbing drops may be applied to your eye for this test.

If your eye care professional believes you need treatment for macular edema, he or she may suggest a **fluorescein angiogram**. In this test, a special dye is injected into your arm. Pictures are taken as the dye passes through the blood vessels in your retina. The test allows your eye care professional to identify any leaking blood vessels and recommend treatment.

How is diabetic retinopathy treated?

During the early stages of diabetic retinopathy, no treatment is needed, unless you have macular edema. To prevent progression of diabetic retinopathy, people with diabetes should control their levels of blood sugar, blood pressure, and blood cholesterol.

Diabetic macular edema and later stages of diabetic retinopathy are treated with laser procedures. Laser treatments often require multiple sessions to complete, but reduce the chances of fluid leakage and bursting vessels by 50 percent.

Cover page photo by Lonnie Duka



Diabetic Eye Disease



Prevention and early intervention are key to saving your sight if you have diabetes

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People with diabetes are at risk for serious eye disease—eye movement problems, cataract, glaucoma and diseases of the retina. This pamphlet focuses on **diabetic retinopathy**.

What is diabetic retinopathy?

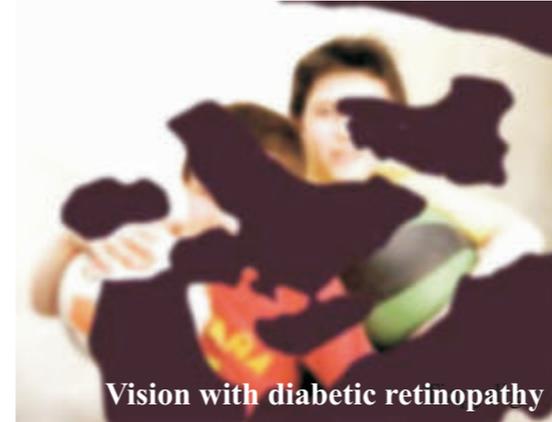
Diabetic retinopathy is a complication of diabetes and a leading cause of blindness. It occurs when diabetes damages the tiny blood vessels inside the retina, the light-sensitive tissue at the back of the eye. A healthy retina is necessary for good vision. If you have diabetic retinopathy, at first you may notice no changes to your vision. But over time, diabetic retinopathy can get worse and cause vision loss. Diabetic retinopathy usually affects both eyes.



What are the stages of diabetic retinopathy?

Diabetic retinopathy has four stages:

- **Mild Retinopathy.** At this earliest stage, microaneurysms occur. They are small areas of balloon-like swelling in the retina's tiny blood vessels.
- **Moderate Retinopathy.** As the disease progresses, some blood vessels that nourish the retina are blocked.
- **Severe Retinopathy.** Many more blood vessels are blocked, depriving several areas of the retina with their blood supply. These areas of the retina send signals to the body to grow new blood vessels for nourishment.
- **Advanced Retinopathy.** At this advanced stage, the signals sent by the retina for nourishment trigger the growth of new blood vessels. This condition is called proliferative retinopathy. These new blood vessels are abnormal and fragile. They grow along the retina and along the surface of the clear, vitreous gel that fills the inside of the eye. By themselves, these blood vessels do not cause symptoms or vision loss. However, they have thin, fragile walls. If they leak blood, severe vision loss and even blindness can result.



Who is at risk for diabetic retinopathy?

All people with diabetes—any type—are at risk. That's why everyone with diabetes should get a comprehensive dilated eye exam at least once a year. Between 40 to 45 percent of people diagnosed with diabetes have some stage of diabetic retinopathy. If you have diabetic retinopathy, your doctor can recommend treatment to help prevent its progression.

During pregnancy, diabetic retinopathy may be a problem for women with diabetes. To protect vision, **every** pregnant woman with diabetes should have a comprehensive dilated eye exam as soon as possible. Your doctor may recommend additional exams during your pregnancy.

How does diabetic retinopathy cause vision loss?

Blood vessels damaged from diabetic retinopathy can cause vision loss in two ways:

- Fragile, abnormal blood vessels can leak blood into the center of the macula, the part of the eye where sharp, straight-ahead vision occurs. The fluid makes the macula swell, blurring vision. This condition is called **macular edema**. It can occur at any stage of diabetic retinopathy, although it is more likely to occur as the disease progresses. About half of the people with proliferative retinopathy also have macular edema.
- The abnormal vessels can burst and fill the eye with blood—obscuring vision. This condition may result in blindness.

Does diabetic retinopathy have any symptoms?

Diabetic retinopathy often has no early warning signs. **Don't wait for symptoms.** Be sure to have a comprehensive dilated eye exam at least once a year.

All people with diabetes—any type—are at risk for diabetic eye disease. That's why everyone with diabetes should get a comprehensive dilated eye exam at least once a year.

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may result in eye injuries including retinal burns, cataracts, and permanent blindness. When lasers produce invisible ultraviolet or other radiation, both employees and visitors should use appropriate eye protection at all times. The selection of laser protection should depend upon the lasers in use and the operating conditions.

What to Do if There's an Accident

When wood or metal bits get into your eye, they can scratch or tear the cornea. This is very painful and could affect your vision permanently.

If this happens, call your eyecare practitioner immediately for instructions. Depending on the situation, he or she may want you to flush your eye with water or saline solution. Or it may be better to get to the hospital immediately. If you wear contact lenses, tell the doctor, who will instruct you as far as removing them or leaving them in.

How to Make Your Workplace Safe

Hazard Assessment. A hazard assessment should determine the risk of exposure to eye and face hazards, including those which may be encountered in an emergency. Conduct a thorough analysis of your workplace including inspections of work areas, shipping and receiving areas and equipment. Identify operations and areas that present eye hazards.

Emergency Area If you work with harmful chemicals, your workplace should have a sink area set up in case they get in your eyes and you need to flush them out in a hurry.

Additionally, special face shields may be worn to protect against chemical splashes. Establish first-aid procedures for eye injuries. Make eyewash stations accessible, particularly where chemicals are used. Train employees in basic first aid and identify those with more advanced first-aid training.

Personnel Vision Screening.

Uncorrected vision problems contribute to accidents. Incorporate vision screening in your hiring and regular employee physical examinations.

Require Compliance. For maximum protection against eye injury, establish a 100 percent mandatory program that requires eye protection throughout your workplace. Provide the means for maintenance and require each worker to be responsible for her own eyewear.

Train and Educate. Conduct ongoing educational programs to reinforce the need for protective eyewear. Include eye safety in your regular programs and new employee orientation. Regularly review and revise accident prevention strategies. Aim for the elimination of all accidents and injuries.

Cover page photo by Mkhitar Khachatryan



Workplace Eye Safety



The proper eye protection will lessen the severity or prevent 90% of accidental eye injuries at work.

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Why is eye safety at work important?

Eye injuries in the workplace are very common. Each day hundreds of people will injure their eyes at work and about 20% of these injuries will cause temporary or permanent vision loss. Experts believe that the right eye protection could have lessened the severity or even prevented 90% of accidental eye injuries at work.

What causes eye injuries at work?

The most common causes for eye injuries are:

- Flying objects (bits of metal, glass)
- Tools
- Particles
- Chemicals
- Harmful radiation

How to avoid an eye injury.

There are three things you can do to help prevent an eye injury at work.

- Do an eye hazard assessment and know the eye safety dangers.
- Eliminate hazards before you start work with special protections like machine guards or work screens.
- Wear proper eye protection for the eyes and face designed to prevent or lessen the severity of injuries to workers.



What eye protection should you wear?

The type of safety eye protection you should wear depends on the hazards in your workplace and your specific job. Often this will require a primary and a secondary protective device.

Impact Hazards

The majority of impact injuries result from flying or falling objects, or sparks striking the eye. Most of these objects are smaller than a pin head and can cause serious injury such as punctures, abrasions, and contusions.

While working in an area where the worker is exposed to flying or falling objects wear safety

spectacles with side shields or goggles as primary protection. Secondary protective devices such as face shields are required during severe exposure to impact hazards.

Heat Hazards

Heat injuries may occur to the eye and face when workers are exposed to high temperatures, splashes of molten metal, or hot sparks. Burns to eye and face tissue are the main concern when working with heat hazards.

To protect your eyes from heat when workplace operations involve pouring, casting, hot dipping, furnace operations, and other similar activities requires goggles or safety spectacles with special-purpose lenses and side shields. Many heat hazards also require the use of a face shield in addition to safety spectacles or goggles.

Chemical Hazards

A large percentage of eye injuries are caused by direct contact with chemicals. Serious and irreversible damage can occur when chemical substances contact the eyes in the form of splash, mists, vapors, or fumes. When working with or around chemicals, it is important to know the location of **emergency eyewash stations** and how to access them with

restricted vision. When fitted and worn correctly, goggles protect your eyes from hazardous chemicals. A face shield may also be required in areas where workers are exposed to more severe chemical hazards.

Dust Hazards

Dust is present in the workplace during operations such as woodworking and buffing. Working in a dusty environment can cause eye injuries and presents additional hazards to contact lens wearers. Either eyecup or cover-type safety goggles should be worn when dust is present. Safety goggles are the only effective type of eye protection from nuisance dust because they create a protective seal around the eyes.

Optical Radiation Hazards

Laser work and similar operations create intense concentrations of heat, ultraviolet, infrared, and reflected light radiation. A laser beam, of sufficient power, can produce intensities greater than those experienced when looking directly at the sun. Unprotected laser exposure

Each day hundreds of people will injure their eyes at work and about 20% of these injuries will cause temporary or permanent vision loss.

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How is Hyperopia Treated?

Farsightedness can be corrected with glasses or contact lenses to change the way light rays bend into the eyes. You may need to wear your glasses or contacts all the time, or only when reading, working on a computer, or doing other close-up work.

Astigmatism

A normal cornea is round, with even curves from side to side and top to bottom, shaped like a baseball. With astigmatism, the cornea is shaped more like the back of a spoon and blurs and distorts both distant and near objects.

How common is Astigmatism?

Astigmatism is the most common vision problem people experience and may accompany nearsightedness or farsightedness. Two-thirds of people with myopia also have astigmatism.

What Causes Astigmatism?

Astigmatism is usually caused by an irregularly shaped cornea, but may be the result of an irregularly shaped lens, located behind the cornea. Either kind of astigmatism can usually be corrected with eyeglasses, contact lenses or refractive surgery.

Most often astigmatism is hereditary and many people are born with an oblong cornea. However, it may also result from an eye injury, from certain types of eye surgery, or from **keratoconus**, a disease that causes a gradual thinning of the cornea.

Symptoms and Signs of Astigmatism

Mild astigmatism may cause your vision to be slightly blurred or it may not be noticeable at all. However, uncorrected astigmatism can cause headaches or eyestrain, and distort or blur your vision at all distances.

Adults and children can have astigmatism. Approximately 25 percent or more of children may have astigmatism but are unaware because they won't complain of the blurred vision. Because it can affect a child's ability to see well in school and during sports, it is important to have their eyes examined regularly to detect astigmatism early.



Myopia, Hyperopia,
Astigmatism

Vision Disorders



Approximately 1
our of 5 people
in Armenia have
refractive errors
that affect their
ability to see
properly

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Refractive Errors

Vision disorders-called refractive errors- are the most common of all vision problems. They affect the cornea and the way we see.

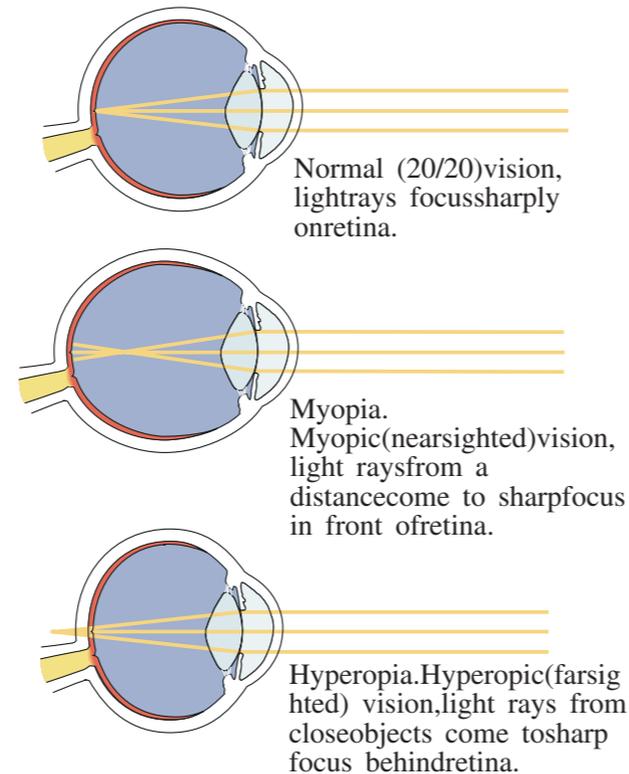
Our eyes are very like the way a camera takes a photographs-the refractive process. The cornea and lens in your eye act as the camera lens and the retina is similar to the film. The image that your retina "sees" goes to your brain, which tells you what the image is.

The cornea bends, or refracts, light on the retina enabling us to see. When the curve of the cornea is irregularly shaped, the cornea bends light imperfectly on the retina. This is what causes a refractive error and affects your vision-myopia, hyperopia and astigmatism.

Myopia or Nearsightedness

When the cornea is curved too much, or if the eye is too long, objects in the distance are blurry. This is called myopia, or nearsightedness-you can see near, but not faraway.

Nearsightedness, or myopia, is a vision problem experienced by up to about one-third of the population. They have difficulty reading



highway signs and seeing objects at a distance, but can see for up-close tasks such as reading or sewing.

Symptoms and Signs of Myopia

Nearsighted people often have headaches or eyestrain, and might squint or feel fatigued when driving or playing sports. If you experience these symptoms while wearing your glasses or contact lenses, you may need a comprehensive eye examination as well as a new prescription.

What Causes Myopia?

Myopia occurs when the eyeball is slightly longer than usual from front to back. This causes light rays to focus at a point in front of the retina, rather than directly on its surface. Nearsightedness runs in families and usually appears in childhood. This vision problem may stabilize at a certain point, although sometimes it worsens with age.

Myopia Treatment

Nearsightedness may be corrected with glasses, contact lenses or refractive surgery. Depending on your vision problem, you may need to wear your glasses or contact lenses all the time, or only when you need distance vision, like driving, seeing a chalkboard or watching a movie.

Refractive surgery can reduce or even eliminate your need for glasses or contacts. The most common refractive surgical procedures involve lasers.

Hyperopia or Farsightedness

Hyperopia is a common vision problem, affecting about one-fourth of the population. People with hyperopia

see far. They see distant objects very well, but have difficulty seeing objects that are near.

Symptoms and Signs of Hyperopia

Farsighted people sometimes have headaches or eyestrain, and may squint or feel fatigued when performing close work. If you get these symptoms while wearing your glasses or contact lenses, you may need a new prescription.

What Causes Hyperopia?

Hyperopia results from an eye that is too short. This vision problem occurs when light rays entering the eye focus behind the retina, rather than directly on it. The eyeball of a farsighted person is shorter than normal. Many children are born with hyperopia, and some of them "outgrow" it as the eyeball lengthens with normal growth.

Sometimes people confuse hyperopia with **presbyopia**, which also is a difficulty in seeing up close, but has a different cause and is age-related, usually after 40.

Nearsightedness, or myopia, and farsightedness or hyperopia, are common vision problems, which if diagnosed properly are easily corrected with glasses or contact lenses.

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Treatment

Early treatment can prevent vision loss. In some cases, if an eye disease is not treated your child could lose her sight.

Common Childhood Eye Diseases

Refractive Errors

- **Myopia- Nearsightedness.** Your child can't see objects at a distance.
- **Hyperopia- Farsightedness.** visual disorder in which your child can't see up close.
- **Astigmatism.** If your child has astigmatism, it means that his or her eye is shaped more like a football, rather than a baseball. Astigmatism is very common and causes blurry vision.

Treatment

Glasses are the most common correction for children, but contact lenses are also an option.

Conjunctivitis or "Pink Eye"

- **Cause:** Bacterial, viral, or fungal infection of the membrane lining the eyelids.
- **Contagious:** Yes, usually
- **Signs and Symptoms:** Redness, itchiness, light sensitivity, and a discharge that crusts.
- **Treatment:** Your doctor may recommend ointments, eyedrops or oral antibiotics with warm compresses for bacterial forms. Some viral forms often resolve on their own.

Allergies

- **Cause:** Inflammation due to allergies.
- **Signs and Symptoms:** Red, itching, watery eyes. No discharge.
- **Treatment:** Use cool compresses to soothe the eyes and antiallergenic eyedrops, over the counter or by prescription. Avoid the allergen.

Stye

- **Cause:** Eyelid gland becomes clogged. Children often get sties by rubbing their eyes with dirty hands.
- **Signs and Symptoms:** Bump on eyelid with occasional discharge. Pain indicates infection.
- **Treatment:** Apply warm compresses; use antibiotic drops or ointment if stye is infected.

Blocked Tear Duct

- **Cause:** Inflammation that occurs when tear ducts are blocked because of infection, injury, or narrowness of duct.
- **Signs and Symptoms:** Watery eyes; inside corner is red, swollen and painful.
- **Treatment:** Open duct with warm compresses; massage the affected area at the nose; use antibiotic drops if infected. See doctor.

Scratched Cornea

- **Cause:** Scratch in the membrane covering the eye, caused by a foreign object. May lead to an infection.
- **Signs and Symptoms** Light sensitivity, tearing, and pain.
- **Treatment:** Apply antibiotic ointment frequently until healing is complete along with warm compresses four times a day.



Common Childhood Eye Problems



More than 90 percent of children's eye problems are correctable if treatment is started early.

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Eyes and vision rank among the health issues of most concern to parents. While serious eye disease is uncommon in children, it is estimated that one in 20 preschool children and one in four school-age children has a vision problem that needs correcting and could cause permanent vision loss if left untreated.



Uncorrected vision problems are a serious problem for parents and children. Parents need to be aware because children may not realize something is wrong with their vision

Catch Visual Problems Early!

More than 90 percent of vision development and eye health problems are treatable and can be more easily corrected if treatment is



started early. Be observant in detecting the early warning signs in your children.

Eye Examinations: When, How Often?

Vision screening is aimed at detecting eye disorders in children that can be treated when they are young. In addition to normal pediatric checkups, children without symptoms and who are at low risk for eye problems should have their eyes screened by:

- six months of age
- age three
- start of school

Risk-free children should continue to have their eyes examined every two years throughout school. If there are risk factors more frequent eye exams are necessary. They include:

- prematurity
- developmental delays
- turned or crossed eyes
- family history of eye disease

- history of eye injury
- other physical illness or disease

Signs and Symptoms of Eye Disease

If a child has one of the problems listed below, he or she should have an examination by an eye doctor as soon as possible. No infant or child is too young to have an eye exam.

You see the following signs:

- a white pupil
- a lump, swelling or drooping of the eyelid
- tearing, discharge or redness of the eyes
- one pupil-the black center of the eye-is larger than the other
- the cornea-clear outside layer of the eye-is large in one or both eyes

You observe the following behavior:

- one eye looks or turn in or out
- the eyes seem to jiggle or rotate
- turns or tilts head to look at things
- head tilted to one side or one shoulder higher
- squinting or closing of one eye
- excessive blinking, squinting and/or watering
- poor hand-eye coordination or

- motor skills
- eyes don't "track" or follow objects
- problems moving in space, frequently bumps into things or drops things

While reading or doing close work your child:

- holds the book or object unusually close
- closes one eye or covers eye with hand
- tilts head toward object, favoring one eye
- frequently loses place and fatigues easily
- uses finger to read
- rubs eyes during or after reading

Your child frequently complains of:

- only able to read for short periods of time
- headaches or eyestrain
- nausea or dizziness
- motion sickness
- double vision

While serious eye disease is uncommon in children, it is estimated that one in 20 preschool children and one in four school-age children has a vision problem that needs correcting and could cause permanent vision loss if left untreated.

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Six to Twelve Months

From six to 12 months, your child may be crawling and walking. By the sixth month, babies acquire fairly accurate eye movement control and by eight to 12 months they are judging distances well. Their eye/hand/body coordination enables them to grasp and throw objects fairly accurately. Perception skills such as visual memory and visual discrimination help babies make sense of their exciting new world. The integration of their vision and fine motor coordination allows babies to manipulate smaller objects, and many begin feeding themselves with finger foods. Once children start walking, they learn to use their eyes to direct and coordinate their bodies' large muscle groups to guide their whole body movements.

Toddlers and Preschoolers

Children's vision continues to develop throughout their preschool years. As toddlers, it is important for them to continue development of eye/hand/body coordination, eye teaming, and depth perception. Stacking building blocks, rolling a ball back and forth, coloring, drawing, cutting, or assembling lock-together toys all help improve these

important skills. Reading to young children is also important as they develop strong visualization skills "picturing" the story in their minds.

First Signs of Eye and Vision Problems

It's important to watch your child closely and be aware of her vision development. If you suspect it is not developing normally seek out the help of an eye professional. Things to look for include if your child's eyes are grossly turned in or out; if they don't move normally before age three months; if the eye is crossed far into the nasal area; if one eye moves while the other remains still; or if one eye appears radically different from the other.

Catching **strabismus** early is important, because a visual condition called **amblyopia** may result if strabismus is left untreated. If your child doesn't see well out of one eye due to strabismus, the eyes aren't working as a team to see.



Infant Eye Development



It's important to watch your child's vision development closely and seek the help of an eye professional if you suspect a problem.

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Prenatal Care

Before your child is born, it's very important for you to have regular prenatal care and to eat a nutritionally balanced diet and practice good hygiene for her eyes to properly develop.

Mothers-to-be should make sure they have received all of their immunizations **prior** to becoming pregnant—mumps, measles and rubella. One of the major causes of childhood blindness is mothers who have German Measles during pregnancy.

Newborns

Your baby's eyes will be checked immediately at birth when the doctor administers eye drops to prevent an infection. If your baby is premature, make sure her eyes were thoroughly checked at the hospital before you brought her home. If not, make an appointment to see an eye care professional.



Your baby's vision begins to develop at birth and continues throughout her first year of life. Born with an underdeveloped visual system, she can see patterns of light and dark and shades of gray and can only focus eight to twelve inches. She learns to focus by looking at faces and then gradually moving out to objects of interest brought near her. When infants begin to follow moving objects with their eyes, tracking and eye teaming skills develop as they begin to learn to coordinate their eye movements. Soon they begin to reach for objects—the beginning of eye/hand coordination.

As your baby grows, more complex skills, such as visual perception, develop to meet her growing need to understand and interpret her world. By four months of age, your baby can see full color

The First Three Months

Babies usually see movement before anything else. Full-term babies should be able to see their mother's facial expression within a week of birth. Color vision is not yet fully developed at this time. Depth perception will also mature during the first year of life, as long as both of the child's eyes are working as a team. Eye muscle coordination in a newborn, as well as a small child, is also very immature. Babies often exhibit eyes turned in, turned out or not working as a team, called **strabismus**. This happens when the muscles of one side of the eye pull more than the muscles on the other side. If this problem doesn't resolve itself by the age of three or four months, consult your pediatrician or eye care professional.

Four to Six Months

As babies learn to push themselves up, roll over and sit, eye/body coordination develops as well as their eye/hand coordination. They are able to reach and grasp at objects freely or direct a bottle into the mouth. By the fourth or fifth month, babies' brains have finished

learning how to fuse the pictures coming in from both their right and left eyes into a single image for full binocularity, or "two-eyed" vision with strong depth perception.

As babies learn to aim accurately when reaching for objects their spatial and dimensional awareness continue to improve. Between four and six months, your baby should start to reach or bat at the mobile or toys you hold in front of her as her vision, depth perception and understanding grows. Many toys can help your child develop vision and have fun at the same time. Ask your pediatrician about developmental toys. As your baby learns to look quickly and accurately between near and far distances she refines her eye teaming and focusing skills. By the time she reaches six months her normal visual acuities has usually developed to 20/20.

Before your child is born, it's very important for mothers-to-be to have regular prenatal check-ups, to eat a balanced diet and to practice good hygiene for their baby's development.

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What causes amblyopia?

Any condition that affects normal visual development or use of either eye during the critical period (birth to 6 years of age) may cause amblyopia. The most common causes of amblyopia are **strabismus**-an imbalance in the positioning of the two eyes, and when one eye is more nearsighted, farsighted, or astigmatic than the other eye-**refractive imbalance**. When one eye sees clearly and the other sees a blur, the good eye ignores the eye with a blur. If this is not fully corrected in early childhood the child is susceptible to amblyopia.

Diagnosis of Amblyopia

Because amblyopia usually occurs in only one eye, many children are unaware of their condition and they either can't or don't know how to tell their parents. If parents don't take their infants and toddlers for a comprehensive vision examination, many children will go undiagnosed until a later age-often when they begin school. To diagnose amblyopia, doctors use a special eye chart.

How is amblyopia treated in children?

Amblyopia treatment is most effective when done early in the child's life, usually before age 6. Treatment involves making the child use the eye with the reduced vision (weaker eye) and is usually simple, employing glasses, drops, exercises and/or patching.

Patching. To make the child use the weaker eye, a patch can be put over the stronger eye. Patching stimulates vision in the weaker eye and helps the part of the brain that manages vision develop

more completely.

Atropine. Sometimes, a drop of a drug called atropine is placed in the stronger eye once a day to temporarily blur the vision so that the child will prefer to use the eye with amblyopia. Treatment with atropine stimulates vision in the weaker eye.

Why is early treatment important?

The vision pathways in the brain must become strong early, when children are very young. The first few years of life are the most important for eyesight. After a child is 8 to 10, the brain's vision system is complete and it doesn't develop anymore. If the amblyopia hasn't been treated by this age, the child could have poor vision for life and it won't be possible to treat it with glasses or patching.

With early detection, accurate diagnosis and proper treatment, the prognosis with amblyopia is excellent. Treatment before age 6 years of age, and especially before 2 years of age, gives the best results.

Nystagmus

Nystagmus is defined as an involuntary movement of the eyes. Most frequently it is composed of a mixture of slow and fast movements of the eyes that are repetitive. The direct cause of nystagmus is instability in the motor system controlling the eyes. The cause is often unknown. There is no known cure for nystagmus; however, certain types of nystagmus show spontaneous improvement in childhood (up to age 10). Treatment may include having the child sit in the front row at school, special eye glasses with prisms or surgery if warranted.

Cover page photo by Zaven Khachikian



Eye Movement Disorders



About four to five percent of children have some form of Eye Movement Disorder—a group of conditions that affect the way one eye or both eyes together move

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Eye Movement Disorders are a group of conditions that affect the way one eye or both eyes together move. Most of us are fortunate because our eyes started to work as a team very early in infancy and have continued to work together ever since. We are able to focus each eye on whatever we look at, regardless of the direction, and our brain combines the picture or image from each eye into the mental picture we actually see in three dimensions.

About **four to five** percent of children have some form of Eye Movement Disorder. For a number of reasons their eyes do not move properly or work together as a team. It is important that these conditions be diagnosed and treated as early as possible when the eye is still developing.



Signs and Symptoms of Eye Movement Disorders

- Eyes that look misaligned
- Eyes that do not appear to move together
- Frequent blinking or squinting, especially in bright sunlight
- Eyes that have jerky movements up and down or back and forth
- Tilting head to look at things
- Faulty depth perception
- Double vision

Strabismus

What is Strabismus?

Strabismus is a visual condition in which the eyes point in different directions and are out of alignment. One eye may be straight and the other turned in, out, up or down. It may be constant or come and go. There are three basic kinds of strabismus:

- **Esotropia.** When either one or both eyes turn inward toward the

nose, esotropia is the most common form of strabismus.

- **Exotropia.** The second most common kind of strabismus, exotropia is when one or both eyes turn out. It usually begins at age two or three.
- **Hypertropia.** The least common type of strabismus, hypertropia is when one eye is higher than the other and the child often tilts her head to avoid double vision

Causes of Strabismus:

Though we know the brain controls the eye muscles that control the eye movement, and that the muscles in both eyes must be coordinated for the eyes to move together, we don't know the exact cause of strabismus.

How common is Strabismus?

It is estimated that 4 percent of children have some form of Strabismus. Males and females are affected equally and it may run in families.

Symptoms of Strabismus:

Children may sometimes squint one eye in the sunlight or tilt their head to use both eyes together.

Diagnosis of Strabismus:

The child with strabismus rarely complains. In most cases, it is the appearance of the eye that first catches the parent's attention. A child should be examined by an ophthalmologist whenever the eyes appear not to be working together.

How is Strabismus Treated

After a thorough eye exam your doctor can recommend the best treatment, which may involve patching, eyeglasses, surgery or a combination of these therapies.

Amblyopia

What is amblyopia?

Amblyopia is caused when the brain favors one eye and refuses to use the other. If for any reason the visual stimuli from each eye are different, the brain responds by suppressing one eye. The suppressed eye may look normal, but it is not being used normally. The brain favors the stronger eye and vision does not develop in the weaker eye. This condition is also sometimes called *lazy eye*.

How common is amblyopia?

Amblyopia is the most common cause of visual impairment in childhood. The condition affects approximately 2 to 3 percent of children under six. Unless it is successfully treated in early childhood, amblyopia will persist into adulthood and is the most common cause of one-eye or monocular visual impairment among children and young and middle-aged adults.

With early detection, accurate diagnosis and proper treatment, the prognosis with amblyopia is excellent. Treatment before age 6 years of age, and especially before 2 years of age, gives the best results.



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When To Call The Doctor

- Any time the eye is injured immediately if the injury is serious.
- Any time chemicals get in the eye.
- Any time the cornea is scratched.
- Any time redness, swelling or pain will not go away.
- Any time there is decreased vision.

Foreign body

- If tiny specks of dust, sand or fuzz get in the eye it can cause pain and redness.
- Sometimes blinking will help clear the eye.
- Do not remove the object if it is resting on the cornea.
- Do not rub the eye.
- Wash your hands before touching the eye.
- Look for the object. Have the person look up and down and side to side.
- If you can't see it, gently pull down on the lower lid and then up on the upper lid to try to find it.
- If you find it, keep the eye open while you gently flush it out with water.
- If the object does not come out, cover they eye with a clean cloth and see a doctor.
- If the object comes out but the person has cloudy vision, or if pain or redness do not go away, go to the doctor.

Object stuck in the eye

- Do not put any pressure on the eye.

- DO NOT remove any object that is stuck in the eye.
- Place a paper cup over the eye and tape it in place.
- Go to the doctor

Chemical Burns

- Many household products and sprays can cause eye injuries. The eye should be immediately irrigated with water.
- Turn the person's head so the eye is facing down and to the side.
- Flush eye from bridge of nose to outer edge of eye with running water for at least 15 minutes.
- Keep the eye open. This may be painful.
- After the eyes are rinsed, take out contact lenses.
- Have the eye doctor examine the eye.

Blows to the eye/Black eye

- A black eye is usually caused by a direct blow to the face, such as in a sports injury, an accident or a fight.
- Gently cover the eye with a cool washcloth or ice wrapped in a towel.
- Do not press on it.
- If the eye is bleeding, see a doctor right away.
- If the skin is deeply cut, stitches may be needed.
- If there is double vision, the eye looks smaller or if there is facial deformity see a doctor.



Eye Safety: Preventing Blindness from Eye Injuries



The leading cause of blindness in children is eye injury and three out of four of children's eye injuries happen when no adult is present.

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Most eye injuries can be avoided by using proper eye protection. By being aware of potential hazards and following safety precautions, you may save your sight or the sight of a loved one.

How to Prevent Eye Injuries

In the home

- Wear protective eyewear or glasses when working with chemicals to protect your eyes from splashes. Never mix cleaning agents and always wash your hands after use.

- Keep all household chemicals and paints locked up away from children.
- Do not use bungee or elastic cords. They may snap into your eye and blind you.
- Champagne corks or the

tops of some carbonated beverages can fly into the eye and blind you. Point them in a safe direction.



Especially for Children.

The leading cause of blindness in children is eye injury and three out of four of children's eye injuries happen when no adult is present.

- Avoid toys with sharp or rigid points, shafts, spikes, rods and dangerous edges.
- Do not let children of any age use projectile-firing toys with out adult supervision.
- Pad or cushion sharp corners and edges of furnishing and home fixtures.
- Install cabinet and drawer locks in kitchens and bathrooms.
- Do not let children play in areas where cats and dogs go to the bathroom.
- Do not let children play with sticks

In the car

- Know the proper procedures for handling batteries and jump-starting cars. “Dead” batteries can explode and splash you with acid. When jump starting a car, the last connection is the black cable to the good battery or car body to prevent the bad battery from exploding.
- Use infant and child safety seats, safety belts and shoulder harnesses. Keep children in the back away from air bags.

In the workshop

- Wear safety glasses when grinding or pounding to protect against flying particles.
- Never look directly at a solar eclipse or a welders' torch.
- Extinguish cigarettes or matches before working around flammable materials or opening the hood of the car.

Around the yard

- Wear safety glasses or goggles especially when chopping wood or using power trimmers on bushes and trees.
- Inspect and remove rocks and twigs from lawns before mowing.
- Keep children and others out of the area where you are mowing.

When playing sports

- Observe all safety rules when you play.
- Children and adults should use sports-specific eyewear to avoid sports-related accidents. Wear safety glasses along with protective helmets or face protectors, when appropriate.

First Aid for Eye Injuries

General Rules for Treating Eye Injuries

- Call the doctor any time the eye is injured.
- Wash your hands before touching the eye.
- Do not press on an injured eye or rub it.
- Do not use dry cotton swabs or sharp tools around the eye, e.g., tweezers.
- Keep the injured area clean and covered.

Most eye injuries can be avoided by using proper eye protection. By being aware of potential hazards and following safety precautions, you may save your sight or the sight of a loved one.

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How is dry AMD treated?

Treatment can delay and possibly prevent AMD from progressing to the advanced stage, in which vision loss occurs. Studies have found that taking a specific high-dose formulation of antioxidants vitamin C and E, beta carotene and zinc significantly reduces the risk of advanced AMD and its associated vision loss.

How is wet AMD treated?

Wet AMD is treated with lasers, which destroy fragile and leaky blood vessels. Treatment may slow the rate of vision decline or stop further loss of vision, but there is no cure.

If you have dry AMD

If you have dry AMD, you should have a comprehensive dilated eye exam at least once a year. Because dry AMD can turn into wet AMD at any time, you should get an Amsler grid from your eye care professional. Use the grid every day to evaluate your vision for signs of wet AMD. This quick test works best for people who still have good central vision. Check each eye separately. Cover one eye and look at the grid. Then cover your other eye and look at the grid. If you detect any changes in the appearance of this grid or in your everyday vision while reading the newspaper or watching television, get a comprehensive dilated eye exam.

If you have wet AMD

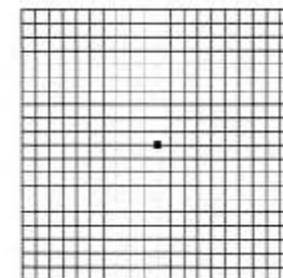
If you have wet AMD and your doctor advises treatment, do not wait. After laser treatment you will need frequent eye exams to detect any recurrence of leaking blood vessels. Studies show that people who smoke have a greater risk of recurrence than

Can my lifestyle make a difference?

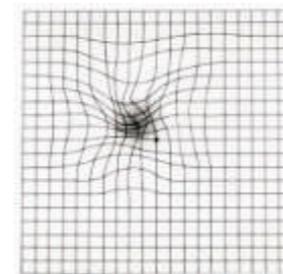
Yes, follow these advices to reduce your risk of developing AMD.

- Eat a healthy diet high in green leafy vegetables and fish.
- Don't smoke.
- Maintain normal blood pressure.
- Watch your weight.
- Exercise.

Amsler Grid



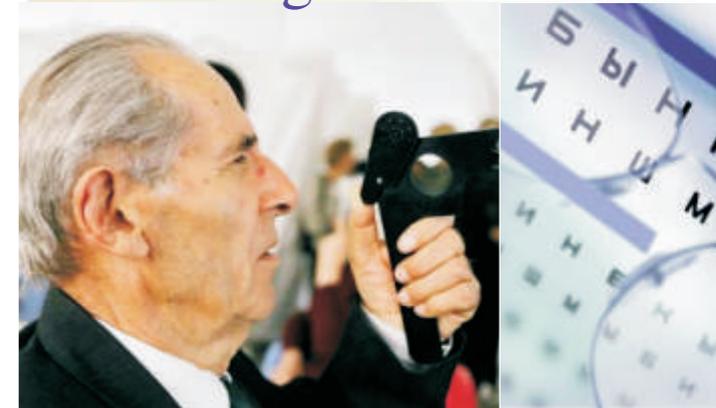
Normal vision



Vision with age related macular degeneration



Age-Related Macular Degeneration



A healthy lifestyle can play a role in reducing your risk of developing AMD

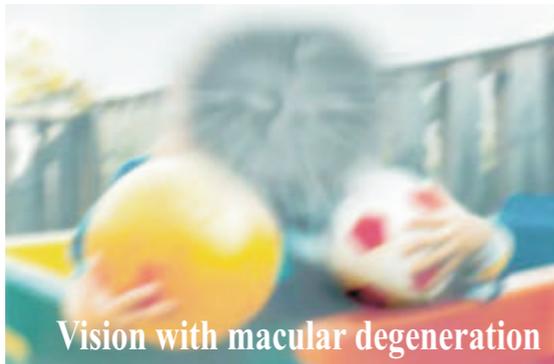
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What is age-related macular degeneration?

Age-related macular degeneration (AMD) is a disease that blurs the sharp, central vision you need for "straight-ahead" activities such as reading, sewing, and driving. AMD affects the macula, the part of the eye that allows you to see fine detail but preserves the peripheral vision. AMD causes no pain. In some cases, AMD advances so slowly that people notice little change in their vision. In others, the disease progresses faster and may lead to a loss of vision in both eyes.

Where is the macula?

The macula is located in the center of the **retina**, the light-sensitive tissue at the back of the eye. The retina instantly converts light, or an image, into electrical impulses. The retina then sends these impulses, or nerve signals, to the brain. The macula allows us to appreciate detail and perform tasks that require sharp vision such as reading.



Vision with macular degeneration



Are there different forms of AMD?

AMD occurs in two forms: wet and dry.

Wet AMD occurs when abnormal blood vessels behind the retina start to grow under the macula. These new blood vessels tend to be very fragile and often leak blood and fluid. The blood and fluid raise the macula from its normal place at the back of the eye. Damage to the macula occurs rapidly. With wet AMD, loss of central vision is severe and can occur quickly. An early warning symptom of wet AMD is that straight lines appear wavy.

Dry AMD occurs when the light-sensitive cells in the macula slowly break down, gradually blurring central vision in the affected eye. As dry AMD gets worse, you may see a blurred spot in the center of your vision. Over time, central vision in the affected eye can be lost gradually. With dry AMD you may have difficulty recognizing faces or may need more light for reading and other

tasks. Dry AMD generally affects both eyes, but vision can be lost in one eye while the other eye seems unaffected.

If you have vision loss from dry AMD in one eye only, you may not notice any changes in your overall vision. With the other eye seeing clearly, you still can drive, read, and see fine details. You may notice changes in your vision only if AMD affects both eyes.

Which is more common--the dry form or the wet form?

The dry form is much more common. More than 85 percent of all people with intermediate and advanced AMD combined have the dry form. Almost all vision loss comes from advanced AMD, the wet form leads to significantly more vision loss than the dry form.

Can the dry form turn into the wet form?

Yes. All people who have the wet form had the dry form first. The dry form can advance and cause vision loss without turning into the wet form. The dry form also can suddenly turn into the wet form, even during early stage AMD. There is no way to tell if or when the dry form will turn into the wet form.

Who is at risk for AMD?

AMD can occur during middle age. The risk increases with aging. Other risk factors include:

- Smoking.
- Obesity. Research studies suggest a link between obesity and the progression of AMD to advanced AMD.
- Race. Caucasians are much more likely to lose vision from AMD.
- Family history. People with a family history of AMD are at higher risk of getting the disease.
- Gender. Women appear to be at a greater risk than men.

How is AMD detected?

AMD is detected during a comprehensive eye exam that includes: **Visual acuity test** and **Dilated eye exam**.

Other test for AMD is **Amsler grid**.

What is Amsler grid?

During an eye exam, you may be asked to look at an Amsler grid. The pattern of the grid resembles a checkerboard.

You cover one eye and stare at a black dot in the center of the grid. While staring at the dot if the straight lines in the pattern appear wavy or you notice that some of the lines are missing, these may be signs of AMD.

Age-related macular degeneration (AMD) is a disease that blurs the sharp, central vision you need for "straight-ahead" activities such as reading, sewing, and driving.

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What to do if your eyes don't see as well as they should?

Lots of people have problems with their eyes. You can miss a lot of things if you can't see well. Sometimes you don't even know you have a problem because you don't know everyone else sees things differently.

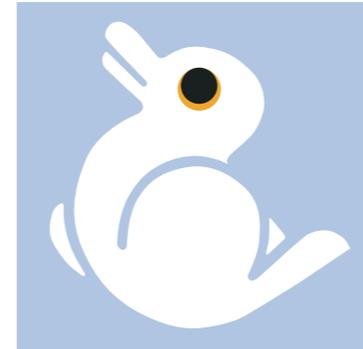
If you are worried you have a problem with your eyes, tell your mom or dad or a teacher. Here are some things that might mean you are not seeing as well:

- You can't see the board.
- Writing looks blurry.
- Your eyes hurt or feel tired.
- You get headaches.
- You keep losing your place when reading or copying.
- You need your book close up to your eyes to be able to read it.
- When you look up from your work everything looks blurred or misty.

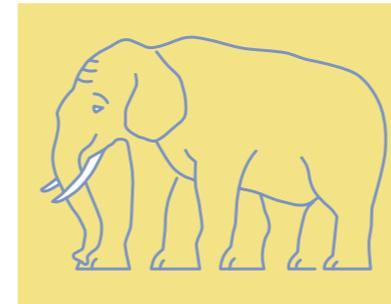
Optical Illusions

The word **Optical** means "related to the science of vision." An **illusion** is something that tricks the senses.

Optical illusions teach us about how the eye and brain work together to create vision. In our everyday three-dimensional (3-D) world, our brain gets clues about depth, shading, lighting, and position to help us interpret what our eyes see. But when we look at two-dimensional (2-D) images that lack some of these clues, the brain can be fooled.



Is this a picture of a rabbit or a duck?



How many legs does the elephant have?

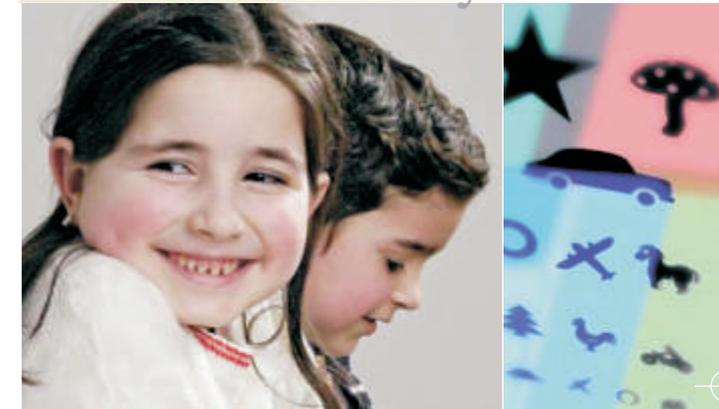


Is this a picture of a vase? Or two faces looking at each other? Do you see both?

Cover page photo by Zaven Khachikian



Kids: About the eye



85% of all your
experience is through
your eyes.

the armenian eyecare project

Think of the eye as a camera. The front part of the eye has the magnification and the back part has the film

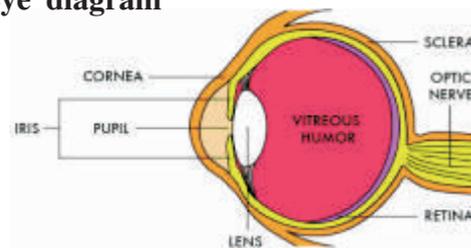
Cornea. Your eye works very much like a camera. Light enters the eye, first passing through the outer clear layer of the eye, called the cornea.

Pupil. Through the cornea, the light next passes through the pupil that is a passage way to the back of the eye. The pupil gets bigger to allow more light in (when there's very little light) and smaller to allow less light in (when there's a lot of light).

Iris. How does the pupil know to get bigger or smaller? That's the job of the iris. The iris is the colored part of your eye, and it controls the pupil's size.

Lens. Once the light passes through the iris, it next hits the lens. The lens puts the light rays into focus and sends it to the retina. But before it hits the retina, it has to pass through the vitreous humora colorless mass of jelly-like material behind the lens. The light passes through this material, traveling to the retina.

Eye diagram



Retina. The retina is the innermost layer of the eye. Think of the eye as a camera. The retina is the film which captures the image. The image on the retina appears upside-down, backwards, and 2-dimensional. But we see things right-side-up and 3-dimensional. Something else happens before the journey is over...this light-information is sent to the brain.

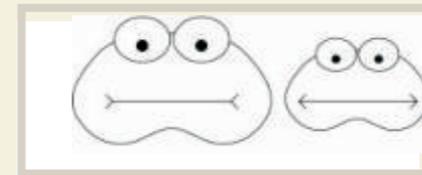
The retina contains light-sensitive cells called rods and cones. These cells connect to the brain.

The optic nerve. This nerve is the brain's messenger, sending the image to a place in the back of the brain called the occipital lobe. Here the 2-dimensional image becomes 3-D.

Protecting Your Eyes

Did you know that 9 out of 10 eye injuries can be prevented with proper care? Eye injuries usually happen at home and school and often during sports and hobby activities. Make sure you practice prevention!

Fool Your Eyes



Which frog has a bigger mouth?
Are you sure?
Measure to find out.

How Are Your Eyes Protected?

- Your eyes lie in bony sockets that protect them from getting hit.
- Eyebrows help keep light from getting in your eyes.
- Eyelids close to keep things from getting in your eyes.
- Eyelashes keep things from getting in your eyes.

Protecting the eyes of your friends and family

Injuries happen easily so be careful. Wouldn't it be awful if someone's eyes were hurt and it was your fault? Make sure you don't hurt anyone else's eyes.

- **Never** throw sand, dirt or small things at others.
- **Never** run with pointy things like pencils or scissors in your hands.
- **Never** fire anything at others like darts or paper planes.
- **Never** spray insect repellent or use any other spray near others.

How Can You Protect Your Eyes?

Because your eyes are so precious you really need to take special care of them.

- In sports wear protective eyewear.
- Turn on lights when it's going dark.
- Wear sunglasses and hats on bright days. Don't look directly at the sun.
- Tell your parent if your eyes are sore.
- Tell your teacher if you can't see the blackboard or your book clearly.
- Wear glasses if you need them.
- Don't wear other people's glasses.
- Don't rub your eye if you get something in it.
- Use correct drops/medication for your eyes if you need to and do not use ones that someone else has used.
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- Do you know that 9 out of 10 eye injuries can be prevented? Practice prevention!

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Armenian EyeCare Project



Bringing Sight to Armenian Eyes

Acknowledgements
United States National Eye Institute
American Academy of Ophthalmology

Endorsed by
Ministry of Health of
Republic of Armenia
and RA Chief Ophthalmologist



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What to do if your eyes don't see as well as they should?

Lots of people have problems with their eyes. Sometimes you don't even know you have a problem because you don't know everyone else sees things differently. If you think you may have a problem with your eyes, tell your mom or dad or a teacher. Here are some things that might mean you are not seeing properly

- You can't see the board.
- Writing looks blurry.
- Your eyes hurt or feel tired.
- You get headaches.
- You lose your place when reading.
- You need your book close to your eyes to read.
- When you look up from your work everything looks blurred or misty.

First Aid Tips

If something gets into your eye, such as sand or dust, do not rub your eye. Wash your eye with water to get the object out. If your eye gets hit by a ball or a fist, put cold cloths on your eye for 15 minutes. This will make the swelling go down and reduce pain. You should also go to the doctor.

If an object, such as a stick or a pencil, gets stuck on your eye, do not pull it out. Put a loose bandage on your eye and go to the doctor immediately.

If a chemical like cleaning fluid splashes in your eyes, wash out your eyes with water for at least 15 minutes. See a doctor immediately.

The eyes you've got will be yours forever - treat them right and they'll never be out of sight!

Optic Illusions

The word **Optical** means "related to the science of vision." An **illusion** is something that tricks the senses.

Optical illusions teach us about how the eye and brain work together to create vision. In our everyday three-dimensional (3-D) world, our brain gets clues about depth, shading, lighting, and position to help us interpret what our eyes see. But when we look at two-dimensional (2-D) images that lack some of these clues, the brain can be fooled.

YELLOW BLUE ORANGE
BLACK RED GREEN
PURPLE YELLOW RED
ORANGE GREEN BLACK
BLUE RED PURPLE
GREEN BLUE ORANGE

Look at the chart and say the color of the word.
Not the word itself. Why is it so difficult? Because the right side of your brain is trying to say the color and the left side of your brain is trying to say the word.



Is this a picture of a young woman or an old man?



Teens: About the eye



Your eyes do some great things for you so take special steps to protect them

the armenian eyecare project

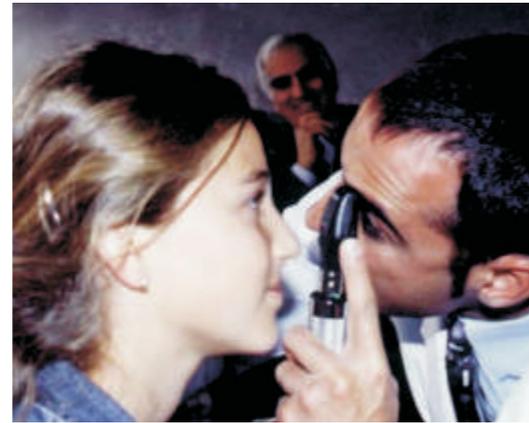
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3-D Vision

How does your brain turn a 2-dimensional image into a 3-dimensional image? Each eyes several inches apart carries this light information to the brain from two slightly different angles. When the brain receives both of these 2-dimensional images, it combines them

together into one 3-dimensional image, allowing you to see the world in 3D!

Crying What makes tears?

Your eyes have their own system to wash away things that can hurt or irritate them. Above the outer corner of each eye are **lacrimal glands**, which make tears. Every time you blink your eye, a tiny bit of tear fluid comes out of your upper eyelid. It helps to wash away germs, dust, or particles that don't belong in your eye. It also keeps your eye from drying out.

Sometimes your eyes will make more tear fluid than normal to protect themselves. This may have happened to you if you've been poked in the eye, if you've been in a **dusty or smoking** area, or if you've been near someone who's cutting onions. And how about the last time you felt sad, scared, or upset? Your eyes got a message from your brain to cry, and the lacrimal glands made tears.

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How Your Eyes Are Protected?

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Eyelashes grow along the outside of the eyelids; they also keep things from getting in your eyes.

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- Don't wear other people's glasses.



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