

Esotropia

One common form of strabismus, or misaligned eyes, is called esotropia. Esotropia, or “crossed” eyes, occurs when the eyes turn inward. Esotropia can be both **congenital**, when it occurs in infants, and **accommodative**, which is more likely to develop after two years of age.

Young children with **congenital esotropia** cannot use their eyes together. In most cases, early surgery can align the eyes.

With **accommodative esotropia**, when the child focuses the eyes to see clearly, the eyes turn inward. This “crossing” may occur when focusing at a distance, at close range, or both. Eyeglasses reduce the focusing effort and often straighten the eyes. Sometimes bifocals are needed for close work. If significant crossing of the eyes persists with glasses, surgery may be required.

The main sign of esotropia is an eye that is not straight. Sometimes children will squint one eye in bright sunlight or tilt their head in order to use their eyes together.

Amblyopia, or “lazy eye,” is closely related to esotropia. Children learn to suppress the double vision associated with esotropia so effectively that the deviating eye gradually loses vision. It may be necessary to patch the good eye and have the child wear eyeglasses before treating the esotropia.

Esotropia is often treated by surgically adjusting the tension on the eye muscles under general anesthesia. The goal of surgery is to get the eyes close enough to perfectly straight so that it is hard to see any residual deviation. Surgery usually improves the condition, and though the results are rarely perfect, they are usually better in young children.

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Leukocoria

Leukocoria is a condition in which the eye's normally black pupil appears white, especially under bright light.

It is common to see "red eye" in photographs that were taken using flash photography. When the flash of a camera or another bright light produces the appearance of a white pupil, this is a sign of a serious underlying problem with the eye, and an ophthalmologist (Eye M.D.) should be consulted immediately. Primary care physicians often notice this sign when conducting a regular well-baby examination, and parents are frequently the first to notice it when looking at photographs of their children.

Leukocoria is a sign of many diseases and conditions of infancy and childhood, including:

- congenital cataract;
- persistent hyperplastic primary vitreous (PHPV);
- retinoblastoma;
- retinopathy of prematurity; and
- toxocariasis.

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Strabismus

Strabismus refers to misaligned eyes. **Esotropia** (“crossed” eyes) occurs when the eyes turn inward. **Exotropia** (“wall-eye”) occurs when the eyes turn outward. When one eye is higher than the other, it is called **hypertropia** (for the higher eye) or **hypotropia** (for the lower eye). Strabismus can be subtle or obvious, and can occur occasionally or constantly. It can affect one eye or shift between the eyes.

Strabismus usually begins in infancy or childhood. Some toddlers have **accommodative esotropia**. Their eyes cross because they need glasses for farsightedness. But most cases of strabismus do not have a well-understood cause. It seems to develop because the eye muscles are uncoordinated and do not move the eyes together. **Acquired strabismus** can occasionally occur because of a problem in the brain, an injury to the eye socket, or thyroid eye disease.

When young children develop strabismus, they typically have mild symptoms. They may hold their heads to one side if they can use their eyes together in that position. Or, they may close or cover one eye when it deviates, especially at first. Adults, on the other hand, have more symptoms when they develop strabismus. They have double vision (see a second image) and may lose depth perception. At all ages, strabismus is disturbing. Studies show school children with significant strabismus have self-image problems.

Amblyopia (“lazy eye”) is closely related to strabismus. Children learn to suppress double vision so effectively that the deviating eye gradually loses vision. It may be necessary to patch the good eye and wear glasses before treating the strabismus. Amblyopia does not occur when alternate eyes deviate, and adults do not develop amblyopia.

Strabismus is often treated by surgically adjusting the tension on the eye muscles. The goal of surgery is to get the eyes close enough to perfectly straight that it is hard to see any residual deviation. Surgery usually improves the conditions though the results are rarely perfect. Results are usually better in young children. Surgery can be done with local anesthesia in some adults, but requires general anesthesia in children, usually as an outpatient. Prisms and Botox injections of the eye muscles are alternatives to surgery in some cases. Eye exercises are rarely effective.

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Intraocular Lenses for Children

For years, children who have undergone cataract surgery to correct congenital cataract have been fitted with eyeglasses or contact lenses to correct their vision after surgery. These methods have worked well, but their success relies on parents making sure that their children wear their eyeglasses and contact lenses on a regular basis as prescribed. This is essential to preventing additional eye problems like amblyopia, which can cause poor vision and vision loss.

Today, there is another option to correct children's vision after cataract surgery. The use of **intraocular lenses (IOLs)** has become more common in children in recent years and has a distinct advantage over other forms of vision correction: IOLs provide continuous vision correction, preventing the vision problems that can develop if a child does not wear the prescribed glasses and lenses.

The use of IOLs in children is still somewhat controversial, especially in children under 1 or 2 years of age. There is little data available to evaluate the long-term safety of IOLs implanted at a young age. Children can have an especially increased inflammatory response to the implants, which can often be controlled with steroid medications. However, in some cases, a fibrous membrane can develop, which will require further surgery to remove. Unlike glasses or contact lenses, the IOL prescription cannot be changed without surgery to replace the implants. This makes choosing the correct prescription especially important, which can be difficult in young children. In addition, a child's eye may not be able to accommodate an IOL designed for an adult, so fit can be a problem. Finally, because IOLs do not correct astigmatism, and because the child's eye will grow, which changes the refractive error (prescription), children with IOLs often need to wear eyeglasses in order to achieve good vision.

If your child requires cataract surgery, discuss all the options with your ophthalmologist (Eye M.D.) in order to make the best decision for your child.

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Tearing in Children

Although it can be caused by wind, smoke, or pollen, an excess of tears in children is often caused by **congenital nasolacrimal duct obstruction**, a condition in which a baby's tear duct is blocked instead of draining normally through the duct into the nose. The condition can be recognized by tears that build up on the surface of the eye and overflow onto the eyelashes, eyelids, and down the cheek. Because the tears are not draining normally, babies will sometimes get infections, which can cause red, swollen eyelids and yellowish-green discharge.

Congenital nasolacrimal duct obstruction is usually caused by the failure of a thin tissue at the end of the tear duct to open properly when the child is born. It can also be caused by a lack of openings to the duct system at the eyelids, by infections, and by abnormal growth of the nasal bone, which pinches off the tear duct. Some infants may have excessive tearing due to narrow tear ducts rather than an obstruction. In this case, the tearing may be intermittent, occurring when the infant has a cold or during especially windy or cold weather. Finally, congenital glaucoma can cause tearing in children. This serious condition is often accompanied by other signs, including an enlarged eye, a cloudy cornea, and light sensitivity.

Most babies born with blocked tear ducts do not need treatment. More than 90% of blocked tear ducts clear by themselves before the child turns 1 year old. If treatment is necessary, the first course of action is usually tear duct massage, along with topical antibiotics to treat infection. The tear sac is located between the inside corner of the eye and the side of the nose. The purpose of massage is to put pressure on the tear sac for a few seconds to pop open the membrane at the end of the tear duct. This is most easily done by putting your hands on each side of the baby's head and using your index fingers to press on the tear sac. This should be done several times a day, such as at after feedings or diaper changes.

In certain circumstances, tear duct probing, balloon tear duct dilation, or tear duct probing with tube placement may be necessary. Should your infant need treatment to remove a tear duct obstruction, ask your ophthalmologist (Eye M.D.) to discuss appropriate treatment options with you.

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Eye Examination for Children

Children are examined for any rare congenital problems at birth and at each well-child examination by the primary care physician, who will check for problems that may not be apparent to the parent or child but that could have serious consequences for the child's vision. When the child is old enough, the primary care physician will perform a more formal vision screening examination. If the parent or the child's doctor has any concerns, or if there is a family history of strabismus, amblyopia, or other eye conditions, the child should be referred to an ophthalmologist (Eye M.D.) for evaluation.

Conditions that the primary care physician will screen for include:

- strabismus (misaligned eyes);
- amblyopia ("lazy eye");
- ptosis (drooping of the upper eyelid); and
- decreased vision.

If the child is referred to an ophthalmologist, he or she will conduct a physical examination of the eyes, using eye chart tests, pictures, or letters to test the child's ability to see form and detail of objects, and to assess for any refractive error (nearsightedness, farsightedness, and astigmatism).

Vision problems in children can be serious, but if caught in time and treated early, the child's good vision can be protected.

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Eyeglasses for Infants and Children

Prescriptions for eyeglasses can be measured in even the youngest and most uncooperative children by using a special instrument called a **retinoscope** to analyze the light reflected through the pupil from the back of the eye.

Most lenses for children's eyeglasses are made of polycarbonate lens material, which is stronger and lighter than glass. It is a good idea to request a scratch-resistant coating on children's lenses. Children can be rough with glasses, and plastic lenses scratch easily.

Color tints or tints that respond to changes in light can be incorporated into eyeglass lenses. For children, the tint should not be so dark that the child has trouble seeing indoors.

Frames come in all shapes and sizes. Choose one that fits comfortably but securely. There are devices that keep eyeglasses securely in place, a good idea for active children and young children with flat nasal bridges. Cable temples, which wrap around the back of the ears, are good for toddlers. Infants may require a strap across the top and back of the head instead of earpieces. Flexible hinges hold the eyeglasses in position, allow the glasses to "grow" with the child, and prevent the side arms from breakage.

Often children do not like wearing their eyeglasses although the prescription is correct. Distraction, positive reinforcement, and incentives can help children develop the habit of wearing their glasses. If all else fails, your ophthalmologist can prescribe an eyedrop that blurs vision when the glasses are not in place. This often helps overcome the child's initial resistance to wearing glasses.

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Exotropia

One common form of strabismus, or misaligned eyes, is called exotropia. Exotropia, or “walleye,” occurs when the eyes turn outward. This occurs most often when a child is focusing on distant objects.

The main sign of exotropia is an eye that is not straight. The exotropia may occur only from time to time, especially when the child is daydreaming, tired, or sick. Parents often notice that the child squints one eye in bright sunlight.

Amblyopia, or “lazy eye,” may develop with exotropia, although it is less common than with esotropia (“crossed” eyes), as the deviation is usually intermittent. Children learn to suppress the double vision associated with exotropia so effectively that the deviating eye gradually loses vision. It may be necessary to patch the good eye and have the child wear eyeglasses before treating the exotropia. Prisms and eye exercises may also help control the outward turning in some children.

Exotropia is often treated by surgically adjusting the tension on the eye muscles under general anesthesia. The goal of surgery is to get the eyes close enough to perfectly straight so that it is hard to see any residual deviation. Surgery is usually quite successful, since most children with the condition have binocular vision.

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