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Your Child's Eyes

Guidelines for Parents

The American Academy of Pediatrics has developed this brochure to emphasize the importance of regular eye examinations in infancy and childhood. This pamphlet describes the normal function and development of an infant's eye and vision. It gives an overview of warning signs and other problems that should be evaluated by your pediatrician or ophthalmologist.

Regular eye exams at proper age intervals are the key to maintaining your child's healthy vision. The earlier the visual problems are detected, the better the outcome.

Visual development

At birth, babies have not yet attained normal adult vision-but they can see. Newborns can make out large shapes and faces but are unable to distinguish fine details. Faces have strong visual appeal. Because the visual system is immature, your baby probably cannot distinguish between pastel colors or subtle variations in shading, but can see bright, strong colors in contrasting patterns of light and dark.

Your baby's visual development is very dramatic during the first year of life. Vision usually develops rapidly so that by the age of 3 to 4 months, most infants can see small objects. Some babies can distinguish between various colors (especially red and green) by this time.

You baby can focus clearly on close and distant objects and can distinguish a real human face from one that is drawn.

By 4 months, the baby's eyes should be well aligned (work together) to give the perception of depth or binocular vision. By 12 months, a child's vision reaches normal adult levels. Vision does not develop exactly on the same schedule in all infants, but the overall pattern of development is the same. Because visual development is so rapid during the first year, early detection of visual problems is critical so that permanent visual impairment does not occur.

Warning Signs That May Indicate A Problem (Infants up to 1 year of age)

If your baby can not make steady eye contact by 2 or 3 months of age, or seems unable to see, you should consult your pediatrician. A constant crossing of the eyes or one eye that turns out is usually abnormal; however, most babies do occasionally cross their eyes during their first 6 months of life.

Babies older than 3 months of age can usually follow or "track" an object with their eyes as it moves across their field of vision. You can test this by holding a colored object, like a toy or a ball, in front of your baby until he or she can see it. Then, slowly move the object and watch as your baby's eyes follow. Be careful to avoid clues aided by voices or other sounds.

Warning Signs For Your Preschool Child

The presence of any of the following requires immediate consultation with your pediatrician or ophthalmologist.

If the eyes become misaligned (strabismus), the child should be evaluated immediately. This may be a situation that is easily corrected with glasses or it may represent a more serious eye disorder.

The presence of a white pupil suggests a number of eye disorders ranging from a cataract to a tumor of the eye. Immediate evaluation is indicated.

The sudden development of pain and redness in one eye or both eyes can represent a number of different conditions ranging from simple pink eye to blinding eye problems. If this occurs, a simple visit to your pediatrician will generally result in the correct diagnosis and proper treatment.

Warning signs at any age

No matter how old your child is, if you spot any one of the following, consult your pediatrician:

- Your child's eyes flutter quickly from side-to-side or up-and-down (nystagmus).
- The eyes are always watery.
- The eyes are always sensitive to light.
- Any change in the eyes from their usual appearance.
- You see white, grayish-white, or yellow colored material in the pupil.
- There is redness in either eye that does not go away in several days.
- There is continued pus or crust in either eye.
- The eyes look crossed, turn out, or don't focus together (strabismus).
- Your child often rubs the eye(s).
- Your child often squints.
- Your child often tilts (or turns) his or her head.
- The eyelid(s) appears to droop.
- The eye(s) appears to bulge.

Vision screening information

Vision screening is a very important factor in identifying vision-threatening conditions. The American Academy of Ophthalmology and the American Academy of Pediatrics recommend that children be screened in four stages:

1. In the newborn nursery: Pediatricians should examine all infants prior to their discharge from the nursery to check for infections and structural defects, cataracts, or glaucoma. All children with multiple medical problems or with a history of prematurity and/or oxygen exposure should be examined by an ophthalmologist.

2. By the age of 6 months: Pediatricians should screen infants at the time of their well baby visits to check for alignment (eyes working together).

3. At the age of 3 to 4 years: All children should be examined by a pediatrician. At this age, the visual acuity is checked and the eyes are examined for any other abnormality that may cause a problem with the child's educational development. Any abnormality requires referral to an ophthalmologist.

4. At the age of 5 years and older: Pediatricians should screen children annually if this is not provided by school personnel or volunteer organizations. Visual acuity is tested as well as evaluation of other ocular functions.

Specific problems that require further evaluation

Falsely Misaligned Eyes (pseudostrabismus) Sometimes infants appear to have crossed eyes, yet the eyes are truly straight. The cause for pseudostrabismus is presence of a wide nasal bridge or extra folds of skin between the nose and the inside of the eye that make the child have a cross-eyed appearance. Most children outgrow this problem, but you should contact your doctor for an examination. Your pediatrician can tell whether a child has misaligned eyes or just pseudostrabismus, but in some instances, a visit to an ophthalmologist is necessary for further tests.

Misaligned Eyes (strabismus) With strabismus, the eyes are not aligned. Strabismus is quite common and occurs in about 4% of children. One eye may gaze straight ahead while the other eye turns inward, upward, downward, or outward. When an eye turns inward, the child has "crossed" eyes (esotropia). T'here are two common causes for esotropia. Some children are born with crossed eyes (or develop it shortly after birth), and in this situation, the muscles are too tight. Treatment for this most commonly involves surgery on the eye muscles, generally performed prior to the age of 2.

T'he second most common cause for esotropia is excessive farsightedness. This problem can be present at birth, but most commonly occurs between the age of 2 and 6 years. This type of esotropia is corrected with glasses.

When an eye turns outward, the child has exotropia. Exotropia may be present from birth, but most commonly is seen in children 2 to 7 years of age. Generally the eyes turn out on rare occasions at first but with time more frequent outward turning of the eyes is noted. Children with exotropia occasionally squint one eye when exposed to bright sunlight. T he treatment for large amounts of exotropia is usually eye muscle surgery.

Children with misaligned eyes will generally turn off the vision in the turned eye so that they are not plagued with double vision. Children with strabismus should have a careful examination by an ophthalmologist because untreated strabismus may lead to a lazy eye (amblyopia) or loss of depth perception. Rarely, strabismus may indicate a more serious condition, such as cataract or eye tumor (retinoblastoma).

Lazy Eye (amblyopia) Lazy eye is reduced vision from lack of use in an otherwise normal eye. I t usually happens only in one eye. Any condition that prevents a clear image can interfere with the development of vision and result in amblyopia.

Amblyopia is common, affecting about 2% of children. Some causes of amblyopia include strabismus, droopy eyelids (ptosis), cataracts, or refractive errors. Because early treatment offers the best results, your pediatrician will refer you to an ophthalmologist.

Cataract (cloudy lens) A cataract is a clouding of the eye's normally clear lens. The lens is located behind the pupil and helps focus images on to the back of the eye (retina).

Cataracts may be present at birth or may appear later in life. Injury may also cause this condition. Early detection and treatment are crucial in infants and children so that normal visual development can occur. For this reason, most cataracts should be surgically removed soon after they are discovered. It should be noted that cataracts in infants and children are uncommon and not related to cataracts that occur in adults.

Glaucoma (elevated eye pressure) Glaucoma is a condition in which the pressure inside the eye is too high. If left untreated, glaucoma will eventually lead to total blindness. Warning symptoms are extreme sensitivity to light, tearing, and persistent pain. Signs include an enlarged eye, cloudy cornea, and lid spasm. If any of these are present, your pediatrician will refer you to an ophthalmologist immediately. Glaucoma in childhood usually requires surgery to prevent blindness.

Tearing The tear duct system, which allows the tears to drain from the eyes into the nose, usually opens in the first few months of life. In some infants, however, the system remains blocked, resulting in the eyes overflowing with tears and collecting mucus. Tearing may result from other ocular conditions, the most serious of which is glaucoma (see above). If your child suffers from continued tearing or watering from the eyes, please consult your pediatrician. Gentle massage of the tear duct can occasionally assist in relieving the blockage. If massage and observation are unsuccessful, a tear duct probe may be required.

Ptosis (droopy eyelids) Ptosis refers to a situation in which the eyelids are not as open as they should be. This situation is caused by a weakness of a muscle that opens the upper eyelid. When ptosis is mild, it is just a cosmetic problem. However, ptosis can interfere with vision if it is severe enough to block the vision in the eye. In infancy, it is important that ptosis be eliminated so that vision will develop normally. Correction of ptosis usually requires surgery on the eyelid(s).

Blepharitis (swollen eyelids) Blepharitis refers to an inflammation in the oily glands of the eyelid. This usually results in swollen eyelids and excessive crusting of the eyelashes, most evident in the morning. Tenderness of the eyelids and a foreign body sensation in the eye may occur as well. Blepharitis can be treated with warm compresses and eyelid scrubs using baby shampoo. If an infection is present, antibiotics may be necessary. If any of these findings are present, please consult your pediatrician.

"Pink Eye" (conjunctivitis) Pink eye appears as a reddening of the white part of the eye. It is usually associated with excessive tearing, a discharge, and a foreign body sensation in the eyes. Conjunctivitis has many causes and can occur at any age. In infants and children, pink eye is usually caused by a viral or bacterial infection. In older children, it may also be caused by allergy. Depending on the cause of conjunctivitis, eye drops or ointment may be indicated. If your child has conjunctivitis, regular hand washing will help prevent the spread of the infection to other family members. If conjunctivitis occurs, call your pediatrician's office.

Corneal Abrasion (scratched cornea) A corneal abrasion refers to a scratch of the front clear surface of the eye (cornea). These abrasions are very painful and usually associated with light sensitivity and tearing. Treatment consists of antibiotics to prevent infection and a patch to allow for the healing of the scrape. Your pediatrician may monitor this although more serious injuries often need follow up by an ophthalmologist.

Nearsightedness (myopia) Children who are "nearsighted" see objects that are close to them clearly, but objects that are far away are unclear. Nearsightedness is very rare in infants and toddlers, but becomes more common in school-age children. Eyeglasses will

help clear the vision but will not "cure" the problem. Despite using glasses, nearsightedness will generally increase in amount until the mid-teenage years so that periodic follow-up examinations by an ophthalmologist are indicated.

Farsightedness (hyperopia) A small degree of farsightedness is normal in infants and children. It does not interfere with vision and requires no correction. It is only when the farsightedness becomes excessive, or causes the eyes to cross, that glasses are required.

Astigmatism Astigmatism is the result of an eye that has an irregular corneal shape. Astigmatism may result in blurred vision. Children with astigmatism may need glasses if the amount of astigmatism is large.

Learning Disabilities Learning disabilities are quite common in childhood years and have many causes. The eyes are often suspected but are almost never the cause of learning problems. Your pediatrician may refer you for an evaluation by an educational specialist to pinpoint the exact cause.

When should your child's eyes be checked?

Pediatricians check the eyes shortly after birth as part of the newborn examination. Your baby's eyes also will be examined later during health supervision visits. The doctor looks for eye disease and checks to see if the eyes are functioning properly. Children with a family history of serious vision problems are more likely to have eye problems.

Fortunately, most babies have normal, healthy eyes. When problems occur, early detection and treatment make it more likely that the child's vision will develop normally. If your pediatrician detects problems, he or she may refer your child to an ophthalmologist for further evaluation and care.

Glossary

- **Amblyopia** - reduced vision in an otherwise normal eye; causes include strabismus, droopy eyelids, cataract, and refractive errors.
- **Astigmatism** - an irregular or uneven corneal curvature that causes distortion or blurring of vision for objects at any distance.
- **Blepharitis** - swelling of the eyelids caused by an inflammation of the oily glands of the eyelids.
- **Cataract** - clouding of the normally clear lens within the eye that may cause reduced vision.
- **Choroid** - pigmented vascular layer between the retina and sclera.
- **Ciliary Body** - the structure that focuses the lens and produces the fluid inside the front of the eye.
- **Conjunctiva** - a thin, transparent tissue with tiny blood vessels covering the white portion of the eye or sclera; when an eye is irritated, the vessels in the conjunctiva can swell and cause the eye to appear bloodshot or pink.
- **Conjunctivitis** - redness of the conjunctiva; usually associated with excessive tearing, discharge, and foreign body sensation in the eye.
- **Cornea** - crystal-clear membrane which is in front of the colored part (iris) of the eye.
- **Corneal Abrasion** - a scratch of the front surface of the eye that may cause pain, light sensitivity, and tearing.
- **Esotropia** - inward crossing of the eyes.
- **Exotropia** - outward turning or misalignment of the eyes.
- **Glaucoma** - elevation of the pressure within the eye that may cause damage to the optic nerve and loss of vision.

- **Hyperopia** - the medical term for farsightedness; the eyeball is usually shorter than normal, which may make it difficult for the child to focus on objects that are nearby.
- **Iris** - the colored part of the eye that opens and closes the pupil, regulating the amount of light entering the eye.
- **Learning Disabilities** - a number of conditions that include dyslexia, problems understanding math, spelling difficulties, and reading disabilities; not caused by the eyes but by the brain's inability to quickly interpret images seen by the eyes.
- **Lens** - the powerful focusing portion of the eye that acts like the lens in a camera.
- **Myopia** - the medical term for nearsightedness; the eyeball is usually longer than normal, which may make it difficult for the child to clearly see objects far away.
- **Optic Nerve** - a bundle of nerve fibers that is similar to a telephone cable that is made up of many wires; the optic nerve carries the many nerves of sight from the retina to the brain.
- **Pseudostrabismus** (false strabismus) - the false appearance of eyes crossing caused by widening of the nasal bridge and extra folds of skin between the nose and the eye.
- **Ptosis** - droopiness of the lid or lids, usually present from birth, which is related to a weakness in the muscle that raises the eyelid.
- **Pupil** - black-appearing circle in the center of the iris; changes in size control the amount of light that reaches the retina.
- **Retina** - back portion of the eye that registers visual images for transmission to the brain.
- **Sclera** - the white portion of the eye, a thick outer coating of the eye.
- **Strabismus** - a condition in which the eyes are not aligned; one eye will appear straight while the other eye turns inward, outward, upward, or downward.
- **Vitreous** - the clear jelly that fills the back of the eye behind the lens.