

Viewpoints

Pediatric Ophthalmology & The Center for Adult Strabismus

Special Points of Interest

- Understanding the complex visual problem of accommodative esotropia
- Learn to spot signs of accommodative esotropia at an early age
- Gain knowledge of treatment options for accommodative esotropia
- PARENTS CORNER: Key elements when filling a child's glasses prescription

Understanding the Mechanism of Accommodative Esotropia

Accommodative esotropia is the most common single type of strabismus, meaning misalignment of the eyes.

Esotropia refers to eyes that are not straight because one or either eye is turned inwardly.

Accommodation is the process of focusing the eyes to see clearly. A normal reflex, the so-called near reflex, ties these two elements together. This means we humans are neurologically "wired" such that convergence (or



crossing) of the eyes occurs in a coordinated way with focusing of the eyes and constriction of the pupils. Leaving the pupil portion aside, all humans share this reflex that ties together focusing and convergence of the eyes.

Another fact of normal function (or physiology) is that when one is farsighted, the eyes must focus to see clearly. This function is automatic or involuntary. And herein lies the link of focusing (accommodation) and crossing (esotropia).

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YOU WILL NOT HEAR "I CAN'T SEE!" Signs, Symptoms and History

Accommodative esotropia is apparently not uncomfortable for the child. The condition occurs at an age when the child will not complain of any problem, although older children or adults may note double vision. Sometimes, a child will close, or "squint" one eye. Some children may have difficulty maintaining attention to tasks. In some

families, there is a strong history of eyes crossing (or misalignment), strong glasses for farsightedness, patching for decreased vision as a child, or unexplained poor vision in one eye. Such observations or history should further stimulate an early response to any concern about crossing of the eyes in a child.





Esotropic without glasses



Light reflexes centered with glasses in place

Basis for Treatment of Accommodative Esotropia

Taking this normal physiology, one can now appreciate how acquired crossing of the eyes may be effectively treated with eyeglasses. The typical onset of accommodative esotropia is in children between 2 and 5 years of age, although there can be a broad range of onset times, from infancy (about six months) to adulthood. Many parents will note that at onset, the crossing is present when viewing near objects, or when intently focusing on objects. Therefore the deviation is likely to be present

intermittently. With time and without treatment, the deviation tends to become constant, and a series of adverse (bad) consequences follows. When an eye is constantly deviated, even relatively small amounts, the brain must make an adaptation, presumably to avoid double vision. When this happens, the child's vision will likely decrease (a process called amblyopia) and this may result in irreversible loss of vision. Additionally, the child will rapidly lose the ability to use both eyes together as a team (including loss of some

depth perception and stereo vision). The deviation may be seen with increasing frequency if the child is tired or unwell. Accordingly, it is important to recognize the condition early, near its onset and prior to these complications, in order to get the maximum benefit of treatment. Stressing again, there is no advantage, only disadvantage to waiting and hoping the condition will resolve by itself and go away.



"Note the glasses are not necessarily or primarily directed at helping the child to see better; their primary purpose is to correct the crossing of the eyes".



Treatment of Accommodative Esotropia Requires Glasses

Farsightedness in children does not imply that the child cannot see, and this is part of the challenge for early diagnosis. Children have remarkable abilities to focus away their farsightedness, and thereby do not complain of inability to see. Their behavior may be remarkably normal, other than the crossing of their eyes.

Remember, it is the process of focusing that drives the eyes to cross (converge) and then to the loss of vision and depth perception. Knowing these mechanisms provides the key to treatment. If the problem is that the children must focus so much that it drives their eyes to cross, or that they are particularly

sensitive to any focusing at distance or near, then the primary treatment should be directed at decreasing or eliminating the need to focus. This is achieved with eyeglasses. Note again, the glasses are not necessarily or primarily directed at helping the child to see better; their primary purpose is to correct the crossing of the eyes. Secondly, this will likely help the development and maintenance of normal vision in both eyes.

"After age seven and in selected individuals, there may be an attempt to actively wean the child from the glasses or bifocals".

Optimal Visual Acuity May Require Other Treatments

Additional treatment is based on particular circumstances. If vision is decreased in one eye, patching (or occlusion) of the preferred or better-seeing eye is generally performed. Patching is continued until the vision is equal or nearly so in each eye. Alternative means of penalizing the vision in the preferred eye include eye drops that dilate the pupil, such as Atropine. If the eyes should be straightened for distance viewing and continue to cross for near,

bifocals may be indicated. If used, bifocals are generally placed high in the lens, so that the "line" is at the bottom edge of the pupil. Sometimes the crossing is only partially corrected with glasses, or only temporarily so. In these instances eye muscle surgery may be required. In summary, treatment is directed at getting the eyes aligned (straight) for both distance and near viewing, and at improving the sight in each eye with appropriate

optical correction (eyeglasses) and patching if necessary. When these goals are achieved, the ongoing objective is to keep things this way. This will require regular visits to your eye doctor. At the beginning and in order to stabilize the condition, frequent visits (every few weeks to months) may be required. Once stable, visits may be as infrequent as once a year.



Performing near activities while patched may be beneficial in treating amblyopia.

- Holmes JM, Pediatric Eye Disease Investigator Group, JAAPOS April 2005 • Volume 9 • Number 2 • p129 to p136

The Natural History of Accommodative Esotropia

Provided the child or patient responds as anticipated, families often have questions about the future. While the course of accommodative esotropia can vary significantly, general expectations can be given. The first thing to remember is that glasses do not change the eyes, they simply may correct the alignment and associated vision problems. Therefore, the glasses are generally required for several years. Farsightedness will start at a certain level, from moderate to high in degree, and

gradually tend to increase until about age seven, where it levels. Thereafter, it will likely decrease as the child grows rapidly. This will require changes in the lenses from time to time (generally annually). After age seven and in selected individuals, there may be an attempt to actively wean the child from the glasses or bifocals. In general, many (more than half) of children with this problem will outgrow the need for their glasses. Weaning from or growing out of the glasses typically does not occur until

age ten or later, and yet may not ever be possible or successful. For some, those without bifocals, contact lenses are a useful alternative to glasses. In the early teenage years, some affected persons who are very dependent on their glasses to correct the crossing, usually with bifocals, may be candidates for eye muscle surgery to diminish their dependence on or eliminate the use of glasses or bifocals.

Children with [high] hyperopia have an increased risk of amblyopia and strabismus that further threatens their future visual function.

-Klimesk D, JAAPOS August 2004 • Volume 8 • Number 4 • p310 to p313

Accommodative Esotropia Responds Well to Early Diagnosis and Treatment

In summary, accommodative esotropia is a common form of strabismus that tends to respond well to early diagnosis and treatment. The mechanism of crossing is neurologically complex and sometimes multifactor, meaning that the condition

may be only partially amenable to treatment with eyeglasses alone. The bottom line is that delays in diagnosis or failure to treat all aspects of the problem, including visual, will likely limit the effectiveness of the outcome. Circumstances may

vary, so consult with an eye doctor about care.



"Consult an eye doctor about care".



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Parents Corner

FINDING AND FITTING YOUR CHILD'S NEW GLASSES! *William Franz, ABOM*

- > Shop for glasses when the pupils are not dilated.
- > A Board certified optician has had training to fit glasses properly.
- > Inquire about warranties on children's frames and lenses.
- > If a frame looks too big, it is! Search for a frame that fits now.
- > For toddlers, metal frames with adjustable silicone nose pads are appropriate. Cable temples, silicone covers, or straps will keep glasses seated at the top of the bridge of the nose.
- > As the child matures the nose is able to support plastic or metal frames.
- > The eyes should be centered in the frame with enough space vertically so that the child does not look over or under the glasses.
- > Bifocals should be placed at the lower border of the undilated pupil. It is usually best to have a visible line in the bifocal lens.
- > It may take up to two weeks to adjust to the new glasses. Encouragement and positive family support further the likelihood your child will like wearing their glasses.

Premature infants should be fit with plastic frames called "stubbies." These are fitted with a soft cloth strap around the head.

Increase concern should be given with straps on infants. They can be pulled down around the neck with the possibility of choking.