

## ***The Treatment of Strabismus in the Four to Ten Year Old Child***

**Nathan Flax, M.S., O.D.**

**ABSTRACT:** Approximately 6% of children have strabismus, a condition where the eyes are not straight and do not work together. The condition is described and the problems created are discussed, including its effect on appearance and performance. Treatments available to correct strabismus and their success rates are presented. Most children can be treated effectively to restore normal appearance and binocular function.

Most people use their two eyes together as a team. They keep both eyes straight and aimed where they are looking. A substantial number of children are unable to do this. They have a condition known as strabismus (also called tropia, heterotropia, squint, manifest deviation, and in the vernacular "crossed" or "wall" eye). The prevalence of strabismus in the four to ten age range is generally reported between 4% and 8%. A British study of four thousand children reported obvious strabismus in 4% (Graham 1974). Eight percent of 1110 consecutive clinical cases in an ophthalmological practice were found to have strabismus (Fletcher 1966). The National Center for Health Statistics found strabismus to be the most common visual abnormality in children ages 6-17 with an incidence of 6.7% (Roberts 1972). Other studies have generally found similar rates between 4% and 8% (Frendsen 1966).

When these children look at something, one eye points where they want to look and the other aims elsewhere. The deviating or turned eye may point inward or outward and sometimes above or below their sighting eye. When the turned eye aims toward the nose the condition

---

Dr. Flax is a Founder, National Academy of Practice in Optometry, Professor Emeritus, State College of Optometry, State University of New York, a Diplomate in Binocular Vision and Perception, American Academy of Optometry, Fellow, College of Optometrists in Vision Development, and in private practice, Garden City, New York. Address communications to the author at 585 Stewart Avenue, Garden City, NY 11530.

is called esotropia or convergent strabismus. When the turned eye aims outward, the condition is labeled exotropia or divergent strabismus. There may also be a vertical turn, often accompanying a lateral deviation. Strabismus is generally classified by the direction of turn and the eye which deviates, resulting in compound labels such as "right hyper esotropia" to describe a patient whose right eye turns in and upward while the left eye aims straight ahead.

Strabismus is also classified by a number of other factors. One is the magnitude of the turn, given in angular units. Another is the presence or absence of a specific ocular muscle weakness. Strabismic deviations are commonly the result of faulty innervation or coordination of the ocular muscles rather than actual paralysis of a muscle. Yet another has to do with the time course of the deviation. Those whose eyes always turn are called constant, while others may demonstrate the deviation only intermittently. Still another classification depends upon whether it is always the same eye which turns, known as unilateral, or if there is alternation with either eye turning at different times or under different circumstances. Age of onset and presumed etiology are also utilized in classification of strabismus (von Noorden 1990, Griffin 1976).

Regardless of the specific type of strabismus, there are two major factors which must be considered in understanding the impact of the condition on the developing child. Strabismus is an anomaly of the motor system which controls eye position and eye movements. This creates both a cosmetic problem and also a perceptual problem because the eyes do not work together as a team. Depending upon the magnitude or angle of the eye turn and the child's facial configuration, the appearance of a child with strabismus can sometimes be disfiguring. The cosmetic aspect of strabismus is often the most obvious; but it is the lack of proper sensory integration of the eyes which is generally more functionally disabling. Even when the turn or deviation is small in magnitude with little impact on appearance, visual function is seriously compromised.

The information seen with each eye normally is integrated into a single percept which permits fine depth discrimination. This process is known as binocular fusion. The strabismic child cannot achieve this fusion because each eye is aimed at a different place and receives a different image. The brain cannot combine these different pictures. This may result in conditions known as "confusion" and "diplopia". The object that the turned eye is aimed at appears to be superimposed on the thing actually being looked at. Two different things seem to be