Vision screening and eye examination are important for the detection of conditions that distort or suppress the normal visual image and, ultimately, may lead to blindness in children. Examination of the eyes can and should be performed at any age, beginning in the newborn period. Vision screening should be performed at as early an age as is practicable. Conditions that interfere with vision are of grave import because visual stimuli are critical to the development of normal vision. Decreased visual acuity often contributes to inadequate school performance. In addition, retinal abnormalities, cataract, glaucoma, retinoblastoma, eye muscle imbalance, and systemic disease with ocular manifestations may all be identified by careful examination.

Vision screening should be carried out as part of a regular plan of continuing care, beginning in the preschool years. Screening examinations may be effectively performed by paramedical personnel under appropriate medical supervision. As with other specialty areas, it is important for the pediatrician to establish contact with an area ophthalmologist in the same geographical area who is familiar with children’s eye problems. A close working relationship with such a specialist will clarify questions about procedures for eye screening as well as indications for referral.

TIMING OF EXAMINATION AND SCREENING

Children should have age-appropriate assessment for eye problems in the newborn period and at subsequent health supervision visits. Vision screening can begin as early as 3 years of age. Infants at risk for eye problems, such as retrolental fibroplasia, or those with a family history of congenital cataracts, retinoblastoma, and metabolic and genetic diseases should have an ophthalmologic examination in the nursery. All infants should be examined by 6 months of age to evaluate fixation preference, alignment, and the presence of any eye disease. By 3 to 4 years of age, children should again be medically evaluated for these problems as well as for visual acuity.

PROCEDURES FOR VISION SCREENING

Prior to objective testing, an adequate history should be obtained to elicit evidence of visual difficulties. Some of the questions that should be asked initially are as follows. “Does your child hold objects unusually close to his or her face when trying to focus?” “Do the eyes appear to cross?” “Does the child wear glasses?” Relevant family histories should also be explored.

Eye evaluation in the physician’s office generally would include the following: external inspection of the eyes, tests for visual acuity (including hyperopia), ocular muscle motility, and an ophthalmoscopic examination. The child should be comfortable and in good health at the time of the examination and, if at all possible, he or she should have some preparation for the testing situation. Particularly for younger children, parents should demonstrate the anticipated testing procedures. It is often convenient for the younger child to sit on the parent’s lap during the procedures.

Children who wear eyeglasses generally should have both corrected and uncorrected vision screening. This will determine whether or not good correction has been achieved. However, reading glasses obviously should not be worn when testing distance acuity.

BIRTH TO 2 YEARS OF AGE

An eye examination is essential in the newborn period and during the first 6 months of life. Gross visual deficiencies can be identified by history and physical examination. External examination of the eyes should be carried out and ocular motility assessed by observing the “following” ability for bright objects. Gross visual acuity can also be assessed in this manner. The pupillary light reflex is observed when an ophthalmoscopic examination is
done. An abnormal pupillary light reflex or white reflex can suggest cataracts, glaucoma, or retinoblastoma.

2 TO 5 YEARS OF AGE

Between the ages of 2 and 5 years, a variety of age-appropriate vision-screening tests may be used. Children should be evaluated by 4 years of age for visual acuity, ocular alignment, and ocular disease. The Snellen “E” chart has been widely used and well accepted. Other tests that are useful in young children are the HOTV, STYCAR, and Allen Picture Card Tests. Screening equipment such as the Titmus or Telebinocular screening instruments are also effective, easy to master by young children, require little space in a busy office, and may be used if an adequate vision lane is not available. These binocular instruments incorporate tests for visual acuity, hyperopia, and muscle balance. They significantly speed the testing procedure and are recommended. Children, before their fifth birth date, should read the 20/40 line. A two-line difference of visual acuity between eyes, even within the passing range, is an indication for referral. This difference is an important finding, and deserves careful attention because image suppression may occur when differences exist even within the normal range.

Acceptable performance for any line of characters on the Snellen chart occurs when a child can read a majority of characters. Therefore, it is not necessary that the child correctly identify every character on the line.

When using the Snellen chart for testing younger children, it is often wise to shorten the distance to 10 or 15 ft to reduce distractions. A distance-appropriate chart, however, must be used.

5 YEARS OF AGE AND OLDER

Vision screening and eye examination should be performed between 5 and 6 years of age and at intervals thereafter (at the time of health supervision visits). Additional screening for visual acuity and ocular alignment by schools and volunteer organizations should be encouraged. Children 5 years and older should read a majority of the 20/30 line. A two-line difference between eyes warrants referral.

MUSCLE IMBALANCE TESTING

Ocular muscle assessment in the preschool-aged child is of considerable importance. Both the corneal light reflex and the alternate cover test at near and far points should be carried out. The latter test is more likely to detect lesser degrees of imbalance or phorias that may have significant consequences for the child’s visual ability.

REFRACTIVE ERRORS

Refractive errors requiring the use of eye glasses exist in nearly 20% of the pediatric population prior to the attainment of full growth. The most common clinically significant refractive error is myopia (nearsightedness), usually seen in school-aged children, and correctable with eye glasses. Hyperopia (farsightedness) can cause problems in performing close work but usually does not necessitate correction in children unless it causes crossed eyes or reduced vision. Astigmatism (unequal curvature of the refractive surfaces of the eye) necessitates corrective glasses if it causes blurred vision or discomfort.

The pediatrician and someone on his staff should become expert at vision testing of young children. This is the most difficult group to test and these are the children least likely to have been tested elsewhere. Consequently, it is worthwhile to expend significant effort to make certain that testing conditions, instruments, and techniques are appropriate.
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