Vision Concerns in Preschool-Aged Children

Vision disorders are common in early childhood. The goals of screening in this age group are to detect amblyopia and conditions that can lead to amblyopia such as refractive error and strabismus.

*Refractive error*, such as farsightedness, astigmatism, and nearsightedness, occurs when light entering the eye is not precisely focused on the retina, causing blurred vision. Refractive error is the most common vision problem in early childhood, affecting approximately 15-20% of children aged 3-5 years. Refractive error can lead to the development of amblyopia. This is especially likely when the refractive error is unequal between the two eyes, which occurs in about 3.6% of children.

*Strabismus* is an eye misalignment or inability to direct the two eyes in the same direction simultaneously which occurs in approximately 4% of children. Strabismus can also lead to the development of amblyopia.

*Amblyopia* is reduced vision in an eye that has not received enough stimulation during early childhood. This prevents the eye from properly developing the visual pathways in the brain. Amblyopia occurs in approximately 2-5% of children and can result in permanent vision loss if not treated early. In fact, according to the United States Preventive Services Task Force, amblyopia is the leading cause of visual impairment in children in the US.

Benefits of Early Formal Screening, Detection, and Treatment

Early vision screening in the medical home can lead to the detection of amblyopia, strabismus, and significant refractive error, allowing for treatment to begin sooner, thus improving treatment outcomes. According to the AAP, if all children receive vision screening at well-child visits in their medical home, permanent visual loss due to amblyopia will decrease significantly.

For example, treatment outcomes for amblyopia, a major preventable cause of lifelong vision loss, are improved if treatment is started by age four. Therefore, universal screening for amblyopia starting at age three is an important step toward the elimination of amblyopia because screening can identify children at risk during this critical treatment window.

Without formal screening, parents and pediatricians alike may have difficulty recognizing vision concerns among preschool-aged children. Children at this age do not know if they are seeing normally, so they generally do not complain about poor vision. In addition, some parents do have concerns about their child’s development, but may not always attribute these to vision problems. Early formal screening can rule out eye problems in children whom parents suspect are developmentally delayed. Correcting vision problems early may also enhance readiness for school and result in improved learning.
Bright Futures Recommendations

Bright Futures recommends that all children have formal vision screening with a valid, age-appropriate tool as part of their health supervision visit annually from three through six years of age.

Primary care providers should:

• **Prepare parents** by explaining the purpose of the screening and remind them that this is not a vision exam, but rather a process of identifying potential concerns. Discourage assumption of a “problem” by explaining that this screening is performed for all children in this age range whether or not there are existing vision concerns.

• **Assess for parent or child concern** and ask for parent observations. Risk assessment must be adapted to the developmental status of the child.

• **Perform vision screening tests.** This should include tests of distance visual acuity and tests of ocular alignment and stereovision.
  
  − Recommended tools for visual acuity measurement for children ages 3–5 years include the HOTV chart and the Lea chart (heart, house, circle, and square). Some children may be able to use the Snellen Chart. Refer if less than 20/40 in either eye or a 2-line or more difference between each eye even if in passing range.
  
  − Recommended tools for ocular alignment and stereovision measurement include the cover/uncover and cross cover tests, and the random dot E stereotest. Refer if there is any eye movement on the cover/uncover or cross-cover test or if there are less than 4 of 6 correct on random dot E stereotest.
  
  − Test each eye individually. Make sure that the other eye is completely occluded.
  
  − Consider testing in a quiet room and not in a heavily trafficked hallway to minimize distractions
  
  − Incorporate parents into the screening process by having them help the child maintain the correct distance during the test and encourage the child’s participation and concentration during testing.

• **Refer** all children with an abnormal screening result to a pediatric ophthalmologist or an eye care specialist appropriately trained to treat pediatric patients.
  
  – Refer children at high risk regardless of screening results. Factors that would put a child at high risk include prematurity, low birth weight, fetal alcohol syndrome, and children with special health care needs who may be difficult to screen such as children with cerebral palsy or Down syndrome.
  
  – Some children who have vision problems will appear to be uncooperative during testing. When in doubt, refer. Depending on the situation, you may wish to have the child come back and rescreen in one month, but if you have any doubts about the family returning to be rescreened or if you suspect that the child’s lack of cooperation is due to vision issues, make the referral.

• **Communicate the results** to the family, adapting to the needs of the family by sensitively using translators when appropriate, and avoiding overly technical and overly discouraging language. Encourage families to follow through on referrals by explaining the benefits of early detection and stressing the need for further evaluation by a trained eye care specialist. Keep communication lines open between the medical home, the specialist’s office, and the family to improve care coordination.

• **Document vision screening in the medical record** and list the quantitative result of the screening as well as any referrals made. Use CPT code 99173 for screening tests of visual acuity, quantitative, bilateral. Medicaid reimburses for this code at $7.45. Most health plans also provide benefit coverage for vision screening; however, payment may be bundled with the health supervision visit.

The Illinois Chapter’s Early Childhood Development Initiatives team is currently offering training and information about the Bright Futures recommendations for vision screening among preschool-aged children. Visit [www.illinoisaap.org/project/bright-futures/](http://www.illinoisaap.org/project/bright-futures/) for resources and trainings opportunities, or contact Rachel Sacks at rsacks@illinoisaap.com or 312/733–1026, ext 218 to learn more.

CORRECTION: “In the winter 2011 issue of the Illinois Pediatrician, the article referencing the Medical Home Chapter Champions Program on Asthma campaign contained photographs of children using asthma medication. We hope you noticed that two of the pictures revealed the improper use of asthma inhalers (or “metered dose inhalers”) in children.

Dr. Aaron Donnell wants to use this as a teaching point that what was missing was a valved holding chamber, or “spacer” device, which should always be used with children when administering inhaled asthma medicines. The use of these devices has two objectives: to promote delivery of the medication to the lung, and to reduce the deposition of medicine in the oropharynx, which should reduce systemic bioavailability of the medications and their potential side effects. We hope this correction encourages the universal use of valved holding chambers in children and allows us to clean our photo databases of antiquated practices.”