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Photos and other materials available in downloadable, camera-ready format on the NEI Website at <http://www.nei.nih.gov/vip>.

## Trained Screeners Can Identify Preschoolers With Vision Disorders

Specially trained nurses and lay people performed effectively when using certain vision screening tests to identify preschoolers with vision disorders, according to a National Institutes of Health-funded research study of more than 1,400 children.

In comparisons using selected vision screening tests, trained nurses and lay people were able to correctly identify up to 68 percent of children with at least one of the most prevalent vision disorders of childhood: amblyopia (lazy eye), strabismus (eye misalignment), refractive errors (poor vision that can be corrected with glasses or contact lenses) or poor vision not associated with any obvious disorder. These results demonstrate that trained lay people and nurses can achieve similar results when using specific tests to screen preschool children for vision disorders.

The purpose of the Vision In Preschoolers Study (VIP Study) is to identify whether vision-screening tests can accurately identify preschool-aged children who would benefit from a comprehensive vision examination. Study personnel evaluated selected children enrolled in Head Start centers in Berkeley, CA; Boston, MA; Columbus, OH; Philadelphia, PA; and Tahlequah, OK. The VIP Study was funded by the National Eye Institute (NEI), part of the National Institutes of Health. Results from the second phase of this study are published in the August 2005 issue of the journal *Investigative Ophthalmology and Visual Science*. An earlier phase of the VIP Study found that four commonly used

vision screening tests were more effective than seven other commercially available tests in recognizing vision problems in preschool-aged children.

During the first phase of the study, published in the April 2004 issue of the journal *Ophthalmology*, licensed optometrists and ophthalmologists compared 11 commercially available screening tests for diagnosing eye disorders in children. They tested 2,588 children in a mobile van specially designed with four vision screening rooms. They also gave each child a full eye examination using established diagnostic examination procedures and tests.

The 11 tests varied widely in performance when they were administered by the eye care professionals. The best tests detected two-thirds of children having at least one of the targeted vision disorders and nearly 90 percent of children with the most important conditions. Three tests that assessed refractive error (e.g., nearsightedness, farsightedness, or astigmatism) and one test that evaluated visual acuity were more accurate than others in detecting children with vision problems. These tests included two hand-held autorefractors used to measure refractive error; retinoscopy, which uses light reflected off the back of the eye and hand-held lenses to measure refractive error; and a visual acuity test in which children stand 10 feet away from a chart displaying symbols and name each symbol as the screener points to it.

“We are excited to have identified the best-performing tools for vision screening of preschool children, and to have found that trained lay screeners and nurses can use those tools effectively,” said Paul A. Sieving, M.D., Ph.D., director of the NEI. “As early detection of childhood eye disease increases the likelihood of successful treatment, these results have important implications for the visual health of children.”

For the second phase of the study, nurses and lay screeners administered four vision screening tests to 1,452 children at their Head Start centers. They screened all children who had failed a basic Head Start vision screening and a random sample of those children who passed the screening.

The screening tests included three of the tests that performed best in the first phase of the study: two hand-held automated refractors to measure refractive error and a test of visual acuity in which children name or match symbols at a set distance. The screeners also administered a test for depth perception in which the children point to a three-dimensional image. All children screened also received a standardized, comprehensive eye examination by a licensed eye care professional in a specially equipped vision van at the child’s Head Start Center.

The results demonstrated that trained nurses and lay screeners achieved similar accuracy rates administering the two automated refractors. Nurses correctly identified up to 68 percent of children with vision disorders while lay screeners correctly identified up to 62 percent of these children. Using these hand-held

instruments, nurses and lay screeners correctly identified more than 80 percent of children with conditions considered most severe.

Using charts displaying several symbols at one time at a distance of 10 feet, nurses and lay screeners were not able to correctly identify as many children with vision disorders. However, when lay screeners administered a simpler version of the symbols visual acuity test at a distance of five feet, they correctly identified 61 percent of children with vision problems. Nurses and lay screeners identified about the same percentage of children with vision problems (45 percent versus 40 percent) using the test of depth perception.

The researchers estimate that, nationwide, two to five percent of children ages three to five have amblyopia, three to four percent have strabismus, and 10-15 percent have significant refractive error.

"It is estimated that up to 15 percent of preschool children between the ages of three and five have an eye or vision condition that, if not corrected, can result in reduced vision," said Paulette P. Schmidt, O.D., M.S., chairperson of the VIP Study and a professor of optometry and vision science at The Ohio State University College of Optometry. "Unfortunately, many parents are unaware that their child has an eye problem because vision problems do not hurt and children do not know how well they should see."

"Accurate and efficient identification of preschool children with vision disorders has a significant impact on visual outcome," Schmidt said. "Parents should question which eye problems are being screened for, the accuracy of the tests, and how often serious eye conditions are missed by these tests," she said. "If results from a vision screening test indicate that a child should have a follow-up examination, parents should ask about next steps. Parents also should be aware that vision screening programs do not substitute for a comprehensive eye examination by a licensed eye care professional. However, vision screening may be a valuable way to detect children who would benefit most from an eye examination."

Planning is now underway for a third phase of the VIP Study. A list of study centers is attached.

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***The National Eye Institute is part of the National Institutes of Health (NIH) and is the Federal government's lead agency for vision research that leads to sight-saving treatments and plays a key role in reducing visual impairment and blindness. The NIH is an agency of the U.S. Department of Health and Human Services.***

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