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C O M M E N T S

## INCORPORATING AN AUTOMATED VISION SCREENING DEVICE INTO A PRESCHOOL SCREENING PROGRAM

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### Review

Vision problems are one of the most common conditions of childhood; however, few children receive complete eye examinations by pediatric vision specialists at recommended intervals.

The National Eye Institute reports that vision problems are associated with developmental delays. The earlier a vision problem is diagnosed and corrected, the less negative impact it will have on a child's development (American Optometric Association).

A joint policy statement, issued by the American Academy of Pediatrics (AAP), the American Association of Certified Orthoptists, the American Association for Pediatric Ophthalmology and Strabismus, and the American Academy of Ophthalmology, in 2003, recommended the following:

1. Eye assessment at all routine health visits.
2. Visual acuity measurement for children 3 years and older.

3. Referral to pediatric eye care specialists those children with ocular or visual abnormalities.

The American Optometric Association goes even further by recommending routine comprehensive eye examinations at the following ages: 6 months, 3 years, 6 years, and every two years after the age of six.

In the year 2000, the State of Kentucky required that every child have a complete eye examination before entering public school or public supported preschools/programs. This policy resulted in almost 14% of the children being prescribed glasses (11 % age 3 and 20% ages 6+).

FDLRS/South with the assistance of the University of Miami's Mailman Center for Child Development has been trying to identify hearing, vision, speech, and learning problems in the local preschool population

(children ages 3 to 5). The following is a description of how a new vision screening device was incorporated into the screening process.

### Vision Screening

The Florida Diagnostic and Learning Resources System(FDLRS)/South with the assistance of the University of Miami's Mailman Center for Child Development have been conducting preschool screenings since 1980. These screenings have been done on site at the various preschools and day care centers in Miami-Dade County and also at FDLRS/South with the children referred for an evaluation.

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*FDLRS/South Associate Center  
Staff Member Performing a Vision Screening*

# VISION SCREENING DEVICE CONTINUED ...

By Sam Corrado, Ed.D.

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A team made up of education professionals and technicians screens the hearing, vision, speech, and development (learning) of the children between the ages of 3 and 5 at the local preschools and day care centers. At FDLRS/South the vision screenings have been conducted by members of the diagnostic staff.

In previous years, the vision screening was conducted using a House-Apple-Umbrella Symbol Chart. This eye chart method of screening is time consuming and is dependent on the child's behavior (i.e. cooperation, attention, activity level etc.) for reliable and valid results. Eye chart testing of preschoolers has problems with specificity (false positives) and sensitivity (false negatives) according to the Orinda Longitudinal Study of Myopia. The Orinda Study was done between 1991 and 1996 and reported a rate of 21% false negatives.

This past year (7-03 to 6-04) the Welch Allyn SureSight Vision Screener, a portable autorefractor, was used for the vision screenings. The SureSight Screener gets to the root of the eye's optics problem (refraction) rather than its manifestation (visual acuity). The SureSight screener does not measure visual acuity but automatically screens for near- and farsightedness (myopia/hyperopia), astigmatism (asymmetrical focus), and anisometropia (unequal power between the eyes) which could lead to lazy eye

(amblyopia). This autorefractor addresses the problems associated with the eye chart acuity screenings in that it does not require a response from the child. Minimal child interaction is required and the test takes about five seconds to screen each eye. A study conducted by the National Eye Institute (NEI) points out the SureSight Vision Screener as one of the best performing instruments out of a total of eleven instruments studied.

Table 1 describes how many vision referrals were made during the past two years using the Eye Chart and how many referrals were made this past year using the SureSight Vision Screener.

Table 1

	01/02	02/03	03/04
Vision Referrals	98	85	196
Children Screened	2057	2121	2289

In the new fiscal year 2001-2002 FDLRS South screened a total of 2,057 children with 98 children being recommended for a complete eye examination. In 2002-2003 there were 85 children recommended for an eye examination out of 2,289 total children screened. This past year, while using the SureSight Vision Screener, there were 196 eye examination referrals out of a total of 2,121 children screened. This is a significant increase in the amount of referrals made

when using the Welch Allyn SureSight Vision Screener as compared to the use of the Eye Chart during the previous two years.

## Procedure and Results

A follow-up procedure was used to gather data on the reliability of the SureSight Screener. This procedure involved the preschools reporting results of eye examinations for the children that failed the vision screening at their school. Data for the children screened at FDLRS/South was obtained directly from the eye examination report provided by the vision professional who conducted the evaluation.

Table 2 describes the results for this follow-up procedure. Data for 90 children has been collected (n = 90) to this point. Fail is defined as a child who had some type of vision intervention that included surgery, glasses, or a vision concern (refractive error) that needed to be followed-up in the future. Sixty-eight children required some type of vision intervention (Fail 68). Forty-seven children needed glasses. Pass is defined as a child that did not have a vision problem (False Positive). A Hit Rate of 76 % was calculated.

Table 2

	Fail	Pass
n = 90	68	22

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The refractive errors that the forty-seven children had that needed glasses are listed below:

- 19 Astigmatism
- 2 Astigmatism + Hyperopia
- 3 Astigmatism + Myopia
- 3 Astigmatism + Anisometropia
- 2 Astigmatism + Myopia +  
Anisometropia
- 7 Hyperopia
- 5 Myopia
- 1 Myopia + Anisometropia
- 1 Myopia + Astigmatism +  
Anisometropia
- 4 Anisometropia

## Conclusion

The Welch Allyn SureSight Vision Screener is a positive addition to a preschool screening program.

The number of referrals increased by approximately 100% and the Hit Rate for true positives was 76%. This automated vision screener is also very useful for handicapped children with developmental delays who can not respond to the typical eye chart screening. No response is required from the child and measures of near- and farsightedness, astigmatism, and difference between the powers of both eyes are obtained in a matter of seconds.

*The entire CHRIS newsletter  
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seen on [www.chris.miami.edu](http://www.chris.miami.edu).*