Lions Clubs International Foundation Core Four Photoscreening: Results From 17 Programs and 400,000 Preschool Children

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Introduction: Photoscreening programs for preschool vision screening have been promoted by Lions Clubs International Foundation (LCIF) via their 17 Core Four grant project awards since 1999. Results from 15 Core Four grant programs in the United States and one in Taiwan are presented here. ***Methods:*** Photoscreening was modeled after the Tennessee program and instituted statewide in each area. Programs were given latitude with respect to screening instrument and referral criteria, but a partnering academic institution and medical director were expected. Preschool children were screened by volunteers; referred children were examined by community optometrists and ophthalmologists who returned results to each program's coordinating center. Outcome data included number of children screened, referral rate, follow-up rate, and positive predictive value, which was generally determined using AAPOS-defined vision screening criteria. ***Results:*** All but one program used the MTI photoscreener (it chose not to participate); photoscreening referral criteria were standard for 13 programs. Through December 2004, more than 400,000 preschool children had been screened. The referral rate for programs using the MTI photoscreener averaged 5.2% (range, 3.7–12.6%). The predictive value of a positive photoscreen was 80%. Overall, 54% of referred children received follow-up examinations. Follow-up rate was the largest variable: 4 programs, screening nearly 250,000 children, had follow-up rates 70% or greater; 10 programs had follow-up data from fewer than 40% of referred children. ***Conclusions:*** Volunteer-led photoscreening programs can be instituted in other locations, including overseas, with high levels of effectiveness. Limitations include the possibility of poor success and variable attention to follow-up. (J AAPOS 2006;10:44-48)

Amblyopia is being recognized as a significant visual problem in the developed world.[1-3] The series of prospective randomized studies from the Pediatric Eye Disease Investigator Group has increased the awareness of this problem,[4-8] and focused a spotlight on preschool vision screening to detect amblyopia. Although traditional vision screening has been time-honored, it is poorly validated. The recent Vision in Preschoolers (VIP) study found that most subjective tests of acuity and stereopsis did not perform well even when administered by eye care professionals who have a specific interest in preschool vision screening.[9]

Approximately 8 years ago, the Lions Clubs of Tennessee established a photoscreening program that used lay volunteers to screen preschool children. The Tennessee program attempted to remedy previously recognized deficiencies in photoscreening with respect to high over-referral rates, variable interpretation, and low positive predictive values. Details regarding this program have been previously published.[10-13] The photoscreening program in the state of Tennessee has become well recognized for its role in screening children, increasing visibility of Lions Clubs in the state of Tennessee, and recruiting new members to Lions Clubs.

The Lions Clubs International Foundation observed the success of the Tennessee program and began to incorporate photoscreening into its Core Four sight preservation programs, allowing Lions Clubs in various states to

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apply for matching funds up to $200,000, to establish photoscreening programs in their states. Currently, 17 Lions Club International Foundation (LCIF) grants have been awarded, totaling nearly 2.5 million U.S. dollars befpre matching. The combined program has screened more than 400,000 preschool children worldwide, making it the largest not-for-profit photoscreening program for amblyopia detection worldwide. The purpose of this report is to describe the preliminary outcomes of the program, especially the variability in outcomes across the sites. Institutional review board authorization to report data was obtained from Vanderbilt University.

METHODS

A rigorous process was required of Core 4 Sight Preservation Program applicants, often including a site visit to the Tennessee program. Grant guidelines required a narrative explanation of Lions infrastructure, program policies, and procedures for administration and training, follow-up and referral systems, funds to cover costs of treatment of children without insurance while also verifying state-match for the grant request at a 3:1 ratio (LCIF:local dollars). Grants were available for 3 years, not to exceed $200,000 in LCIF support. Upon receipt of the grant, the program leaders (paid full-time coordinator, Lions volunteer coordinator, and medical advisor) were trained to begin program administration in a 2-day seminar by an LCIF Technical Advisor (usually T.J.). The training taught the new program to train their own volunteers to conduct screening, establish a statewide referral network, conduct follow-up with parents and referral doctors, and collect outcome measures. It was expected that outcome measures would provide results enabling the program to be funded via local means after the 3-year LCIF grant period.

LCIF program standards evolved after initial programs (Iowa, Missouri, New Jersey, and Tennessee) received funds, because it became clear to LCIF leadership that some programs were having difficulty with implementation. Although in the beginning a partnership with a medical advisor was only recommended, it later was highly encouraged. Additionally, preapplication site visits to the Tennessee program did not become a requirement until after Iowa, MO, and Tennessee received funds. The most recent requirement was a strong recommendation to budget funds for a follow-up coordinator (Indiana, Kentucky, Maryland, Michigan, and New York all included follow-up funds).

Individual programs were given the latitude to choose the screening instrument, although at the time of the first grants, the MTI photoscreener (Riviera Beach, FL) was preferred. Programs also could define the referral criteria, although the published Tennessee criteria[10,11] were preferred. All were encouraged to have centralized interpretation of photoscreening photographs. The Microsoft Access First Glimpse™ database was made available to keep track of results. Programs were asked to provide outcome measures of the numbers of children screened, number referred, the unreadable and untestable rates, follow-up rate, and the positive predictive value. Examination failure criteria were suggested based upon the Tennessee Lion's Outreach Program experience,[10] and the AAPOS standards for detection of amblyogenic factors in children,[14] but were allowed to vary. Programs were expected to partner with an academic institution, to oversee quality control of the screening, and to provide credibility to the program. However, programs were to be encouraged to be housed out of the individual Lions Clubs, rather than the academic institution. All programs sought to target preschool children in defined populations, such as Mother's Day Out programs, daycares, and preschools. Referred children were to be seen locally with examination results collected at the coordinating center. Data were collected for each program from its inception through December 31, 2004.

RESULTS

The first LCIF core four grants were awarded in 1999, up to $200,000 per grant. Currently 17 grants have been awarded. All but one program uses the MTI photoscreener; the single program using another instrument asked not to have its results incorporated in this manuscript since their program used a different instrument with different referral criteria and outcome measures. Partnering institutions included academic ophthalmology (7), local private practices (2), a community hospital, a private foundation, a University not having an academic ophthalmology department, and a state health department (Table 1). Three programs did not identify a partnering institution. Programs were overseen by pediatric ophthalmologists (8), general ophthalmologists (3), optometrists (2), nonvision science PhDs (2), or by another professional (1).

Most programs used the referral criteria for the MTI photoscreener that have been published and validated in the Tennessee program.[10,11] These criteria make a decision to refer based upon the size of the crescent with modification for the size of the pupil. Only one of the programs (Missouri) used the manufacturers' referral criteria (Table 1).

The interpretation was conducted centrally in all programs (rather than in the field) but interpretation personnel varied. Interpretation personnel included technicians or orthoptists (3), ophthalmologists (2), optometrists (2), medical students (1), and program coordinators (Table 1). Four programs used the fee-based Vanderbilt Ophthalmic Imaging Center on a regular basis. Several other programs used the VOIC early on, and eventually moved interpretation in house. Interpreting personnel evaluated each picture and determined pass or refer based upon the referral criteria (see above).

Overall results from the 16 grant recipients sharing their information are shown in Table 2. The Maryland