# Vision Screening Requirements Under 52 Early and Periodic Screening Diagnosis and Treatment (EPSDT) Programs

M. CRISTINA LESKE, MD, MPH JESSE ROSENTHAL, OD, MPH MORT SOROKA, MPA, PhD

MOST VISION PROBLEMS of children and youth meet many of the criteria for conditions that justify a screening program: they are highly prevalent, they affect well-being, they are correctable, and they may be detected by valid, reliable, and acceptable tests at a reasonable cost. For these reasons, vision screening is one of the most widely accepted screening procedures and has been incorporated in routine child health assessment activities, school health programs, and most preventive efforts.

The virtual unanimity regarding the importance of vision screening seems to disappear when individuals or professional groups recommend which specific tests should be included in a children's vision screening battery, how often they should be done, and which referral criteria should be used. In addition, the authority to set testing requirements may rest with the State, city, and very often the school district, since vision screening programs have been traditionally conducted as part of school health examinations. Therefore, vision screening standards lack uniformity, and the contents of programs vary widely. This lack of uniformity presents a serious problem to those in charge of planning and implementing vision screening activities, especially when they must decide which tests should be required by publicly funded programs.

With the advent and development of the Early and Periodic Screening Diagnosis and Treatment (EPSDT) program, there is now a nationwide framework for administering periodic health assessments of children— including vision screening. There have been no studies of the vision screening component of this federally mandated and financially supported program.

### **EPSDT Background**

EPSDT was originally added to the Medicaid program by Congress in 1967, and final regulations were implemented in 1973. It was designed to emphasize the importance of preventive services by requiring the States to screen, diagnose, and treat Medicaid-eligible children and youth under age 21 for disabling conditions. Since EPSDT is included under Medicaid, each State has the administrative responsibility for the program, as well as a cost-sharing obligation.

The EPSDT program is the first major attempt to evolve a Federal health policy that mandates preventive health services for needy children. However, from its enactment to the present, it has been the focus of much controversy. Child advocate and social welfare groups have complained about initial delays, subsequent ambiguities, and inadequacies in Federal regulations. The laxity of most States in complying with EPSDT implementation and the failure of the Federal Government to apply sanctions have also been major sources of criti-

Dr. Leske is with the Department of Community and Preventive Medicine, School of Medicine, State University of New York, Stony Brook, N.Y. 11794. Dr. Rosenthal and Dr. Soroka are with the State College of Optometry, State University of New York. This paper is adapted from one presented at the annual meeting of the American Public Health Association, New York, November 1979. Tearsheet requests to Dr. Leske.

cism. The problematic course of EPSDT has been described previously (1-3).

In its current form, EPSDT represents a vast improvement from the early Medicaid years. The Federal regulations mandate the provision of a minimum set of assessment requirements by all the States, including health and developmental history, evaluation of growth and development, evaluation of nutritional and immunization status, and hearing and vision testing. All children with positive findings must be referred for treatment, but EPSDT allows States to limit the scope of services to those provided by the State Medicaid program. However, treatment for visual and hearing problems (including eyeglasses and hearing aids) and restorative dental care must be provided under EPSDT (3).

State compliance with EPSDT regulations is improving, partly as a result of the Medicaid Management Information System that facilitates Federal monitoring of the program. The cost for the implementation and operation of this computerized management and claims processing system is heavily underwritten by the Federal Government, and about one-half of the States have adopted it. Hence, two major stumbling blocks in the path of a successful child health screening program that is nationally sponsored are being resolved. The health conditions for which screening is to be conducted have been determined and federally mandated, and operational compliance, including outreach and followup, is improving.

A remaining and major unresolved area is the establishment of Federal guidelines for standardized testing and criteria for referral. Although vision screening and referral are required, there are no regulations regarding the vision tests that should be administered and what represents a screening failure requiring referral. For these reasons, several questions can be raised. Are specific vision screening tests required under the State EPSDT programs? If so, which tests are being required? How similar are they to one another? Are these required tests appropriate to detect the most prevalent vision problems of children?

Published reports regarding EPSDT do not provide an answer to these questions. However, the available data indicate a wide variation in vision screening findings among the programs. In 1978, 7.6 percent of the individuals screened under EPSDT nationwide were found to have a vision abnormality. This percentage varied from State to State, ranging from 0.1 to 34 percent of the children and youth tested (4). Recent data from individual State programs substantiate the variability in referral rates for vision problems (5,6). Some of these differences might be explained by the characteristics of each State in terms of population composition and other variables that could influence the local prevalence of vision problems. It is more likely, however, that the variation in referral rates for vision is explained by variation in the characteristics of the EPSDT program itself, specifically with regard to differences in vision screening requirements and referral criteria. Since such information had not been collected, the study reported here was undertaken in 1979 to determine the vision screening requirements in the EPSDT State programs.

The study objectives were as follows:

• Study the vision screening requirements under EPSDT nationwide by determining (a) whether all programs had specific vision screening requirements, (b) which specific tests were required, (c) whether referral criteria were mandated by the program, (d) age at which tests were performed, and (e) frequency of testing.

• Compare the requirements of the State programs.

• Determine whether variations in vision screening requirements were associated with characteristics of the States or the EPSDT programs.

• Determine whether the tests being required were appropriate to identify the most prevalent eye and vision problems of children and youth.

These objectives were attained by (a) conducting a national survey of EPSDT vision screening requirements and (b) an extensive evaluation of the available data on prevalence of vision problems in children and youth. We present the findings only from the survey of requirements; a detailed evaluation of the prevalence data will be reported later.

## Methods

For the national survey of EPSDT vision screening requirements, questionnaires were mailed to 49 States, the District of Columbia, Puerto Rico, and the Virgin Islands, all of which have programs. The questionnaire requested information on (a) the specific tests required for each program, (b) the presence or absence of regulatory referral criteria mandated for each test, (c) the ages at which testing was done, and (d) the frequency of testing.

Descriptive data on each State and its Medicaid program were obtained from published sources. Variables of interest were:

• demographic and socioeconomic—population (total and under age 21), median income, educational level, percentage of minority population, urbanization, and unemployment (7);

• health manpower—ratio of physicians, ophthalmologists, and optometrists to the State population (8,9);

health and welfare expenditures—average hospital costs and expenditures for welfare programs (7); and
characteristics of the Medicaid program—costs, coverage for eye services, percentage of population covered, and percentage of persons referred for vision problems (4).

A data base was formed from the questionnaire replies and the preceding variables. Frequency distributions and cross-tabulations were generated, and differences between groups were tested for statistical significance by the Student's t, Mann-Whitney, and chisquare tests.

# **Results**

Of the 52 questionnaires sent, 28 replies were received after the first mailing, 12 after the second, 10 after the third, and 2 after the fourth—a return rate of 100 percent. In addition to returning the questionnaire or letter, or both, 27 program respondents enclosed a copy of their requirements, thus permitting a validation of the answers to the questionnaire. No discrepancies were found. The information on requirements was obtained from the respondents' questionnaires or enclosures, or both, for 47 of the programs. The remaining five respondents sent letters stating their programs' vision screening requirements (two) or lack of requirements (three).

Specific vision screening requirements. The District of Columbia, Puerto Rico, and the Virgin Islands had specific vision screening requirements, but 9 of the 49 States with programs, or almost one-fifth, had no requirements. In these nine States, the tests to be performed were left to the discretion of the individual providers. Three of the nine States without requirements were located in the New England area, two in the West North Central, two in the Mountain, and one each in the East North Central and West South Central areas. The States without requirements had small, predominantly white populations but were similar to the States with requirements regarding the other variables studied. A comparison of the States with and without requirements did not reveal any statistically significant differences at the 5 percent level. In interpreting the lack of statistical significance of this and other comparisons, one should consider the small size of the groups being compared.

Tests required. The number and types of tests required by the programs are shown in table 1. The following summary of the absolute frequency of specific test requirements in the programs was derived from that table.

Tests required	Programs	
	Number	Percent
None	9	17
Distance vision	43	83
Near vision	10	19
Ocular muscle-fusion	33	63
Color vision	13	25
Hyperopia	7	13
Funduscopy	5	10

Distance vision. All programs with specific requirements mandated distance visual acuity testing; in nine programs, it was the only test required. Testing with and without eyeglasses was required by 18 programs, eyeglasses only by 8 programs, without eyeglasses by Table 1. Number and types of vision screening tests required by 52 Early and Periodic Screening Diagnosis and Treatment programs, 1979

		Programs	
Number and types of tests required	Number	Percent	
None	9	17	
Distance vision only 2 tests	9	17	
Distance vision and ocular muscle-fusion	13	25	
Distance vision, ocular muscle-fusion, and near vision	4 2 2 2 1	21	
Distance vision, ocular muscle-fusion, near vision, and color vision Distance vision, ocular muscle-fusion, color vision, and hyperopia	4) 3}	13	
Distance vision, ocular muscle-fusion, color vision, near vision, and hyperopia Distance vision, ocular muscle-fusion, color vision, near vision, and funduscopy Distance vision, ocular muscle-fusion, color vision, funduscopy, and hyperopia	1 1 1	6	
Total	52	99	

1 program, and 15 programs did not specify if eyeglasses were worn during the test.

Near vision. Testing for near vision acuity was required by 10 programs—2 tested with eyeglasses, 6 with and without eyeglasses, and 2 did not specify how testing was done. Near vision testing was required only by those programs having three or more requirements.

Ocular muscle-fusion. Tests to detect ocular muscle imbalance or fusion problems, or both, were required by 33 of the 43 programs with requirements; they were the second most frequently required tests. The major objective of these tests was detection of strabismus, whereas screening for phoria and fusion problems (stereopsis testing) was less commonly required, as shown in the following table.

Test	Number of programs
Strabismus only	. 13
Strabismus-phoria	. 10
Strabismus-phoria-stereopsis	. 4
Strabismus-phoria-stereopsis-other	. 2
Stereopsis only	. 2
Phoria only	. 1
Not specified	. 1

In sum, 29 programs required strabismus testing; 17, phoria; 8, stereopsis; and 2, other.

Other tests. Color vision testing was mandated by one-fourth of the programs; hyperopia testing and funduscopy were the most infrequent requirements. According to Federal guidelines, inspection of the eyes is a required component of EPSDT; thus, it is assumed that all programs mandated eye inspections.

Referral criteria. Although specific tests were required by 43 programs, fewer than two-thirds of them set referral criteria for the tests (table 2). All but one program with referral criteria for distance vision testing had referral criteria for the other tests as well. The programs with and without referral standards were similar with regard to most State characteristics. An interesting difference emerged, however, in the comparison of the percentages of children referred for vision problems in both groups: States with referral criteria had a higher percentage of referrals for vision than those without criteria. Although the mean and the median percentages of vision referrals for States with criteria were 9.9 and 9.7 respectively, the corresponding values for States without referral criteria were 5.6 and 3.0. These differences were statistically significant at the 5 percent level.

Table 2.	Regulatory r	referral cr	iteria for	required \	ision/
screening	in Early and	Periodic	Screening	Diagnosis	and
Treatment programs, 1979					

Test	Number of programs			
	Yes	No	Not specified	Total
Distance visual acuity	28	10	5	43
Near visual acuity	5	1	4	10
Ocular muscle-fusion	21	6	6	33

Age at testing. There were wide variations in the ages at which testing was required to begin (table 3). Most programs required that distance visual acuity testing begin at age 3. Ocular muscle-fusion tests were required to begin during the first year of life by most programs with this requirement, but one-third did not require testing until age 3 or older. An even greater variability existed with regard to the age at initial testing for near visual acuity. In contrast, the schedule for testing was quite uniform—most programs required yearly testing for children under age 6, every 2 or 3 years for children 6 to 11 years old, and every 3 years for children 12 or older (data not shown).

## Discussion

The results of the survey have quantified the wide variation in vision screening requirements among State EPSDT programs. The variability of requirements regarding specific tests, combination of tests, and age at initial testing is noteworthy. Although distance vision and ocular muscle-fusion tests were most commonly required, only a few States had identical vision screening requirements.

Another important finding of the study is that not all the States define referral criteria for vision tests. An association was found between presence of referral criteria and percentage of children referred for vision treatment. This finding suggests that the variations in referrals are influenced by the characteristics of each program, most notably by the referral criteria used.

Nine States had no vision screening requirements, and nine others required distance visual acuity testing only. In contrast, other States had very comprehensive requirements and included many kinds of tests in their vision screening battery. These differences in requirements were not related to variables such as demographic

Table 3. Age at initial vision screening in 52 Early and Periodic Screening Diagnosis and Treatment programs, 1979

Age	Number of programs			
	Distance vision	Near vision	Ocular muscle-tusion	
Under 1	. 0	0	15	
1	. 0	1	2	
2	. 2	1	1	
3	. 30	3	5	
4	. 6	0	1	
5	. 2	2	1	
6 and over	. 1	3	2	
Not specified	. 2	0	6	
Total	. 43	10	33	

and socioeconomic factors, health manpower, health and welfare expenditures, or the characteristics of the Medicaid program that were included in the study.

The requirement of only distance visual acuity testing by nine programs raises some doubts regarding the effectiveness of their screening activities, especially since five of these programs did not have referral criteria for the test. Potentially serious vision problems of childhood (such as strabismus) may not affect the results of distance visual acuity tests, and therefore their use as the sole screening procedure may be criticized (10). Organizations such as the American Academy of Pediatrics and the American Optometric Association have recommended a minimum set of vision tests for EPSDT that includes more than distance vision screening (11,12). The specific recommendations of these organizations reflect their differences in approach to childhood vision problems, but both organizations suggest that EPSDT should include evaluation of visual acuities, muscle imbalance, inspection, hyperopia, depth perception, and color discrimination tests. Despite these recommendations, however, it is clear that no uniformity exists.

If major vision disorders are to be found and corrected under EPSDT, an increase in the scope of requirements under many of the State programs is apparently needed. The tests to be required must be based on the prevalence of vision abnormalities and their impact on those who have them. The common vision disorders, such as refractive errors, are easily corrected. Others, such as those associated with amblyopia, are less common and more difficult to treat but may cause loss of vision if not corrected in time. Although color blindness is not correctable, few would dispute that it is important for affected children and their parents to be aware of this condition. Since color discrimination problems affect 7 percent of males and less than 1 percent of females (13,14), the yield of testing would be greatly increased by requiring color vision testing of boys only.

The results of this study highlight the need for setting national standards for vision screening tests, with specific criteria for referral appropriate to age. To make a meaningful impact, such standards should be adopted by all the EPSDT programs. It would be useful if national standards for vision screening programs and referral were incorporated whenever future legislation regarding children is considered.

The current system of reporting abnormalities observed during vision screening merits some comments. The programs now report the percentages of screenees with vision conditions; as stated previously, these percentages vary widely. For example, 7 States reported 1 percent or less of screenees with vision problems, but 5 others referred between 22 and 34 percent for vision conditions. These results are difficult to interpret without information such as the ages of the examinees, the reasons for referral, or the scope of each program. Evaluation of the vision screening component of each program is not possible without some changes in the current reporting system.

The objective of the EPSDT program is to provide preventive health services to those children and youth who most need such services. The early detection of vision problems is an important part of this program. However, an essential prerequisite for an effective vision screening program is not being met, namely, the existence of adequate standards for testing and referral in all the State EPSDT programs. We recommend that all programs formulate and adopt such standards.

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A 1979 survey of vision screening requirements in 52 Early and Periodic Screening Diagnosis and Treatment (EPSDT) programs revealed that 17 percent of the programs had no requirements, and 17 percent required only distance visual acuity testing. An additional 25 percent required distance vision and ocular musclefusion tests only, and the remaining programs required various combinations of three or more tests. Fewer than two-thirds of the programs with requirements had referral criteria for the tests. The ages at which initial testing was required also varied among the programs. The differences in requirements were not related to the demographic, socioeconomic, and other variables analyzed in this study. Programs with specific referral criteria, however, had a higher percentage of referrals for vision screening than those without such criteria.

Because of the variability in vision screening standards and referral criteria observed among the programs, the authors conclude that national standards are needed.