



Comprehensive Vision Examination of Preschool Children

Undiagnosed Vision Problems: The Hidden Epidemic

Vision disorders are a common pediatric health problem in Canada and the United States.^{1,2,3} (Appendix 1) It is estimated that nearly 25% of school-age children have vision problems.⁴⁻⁶ Despite the economic, social and health care advances that have occurred in our society, many preschool and school-age children are not receiving adequate professional eye and vision care.

The earlier a vision problem is diagnosed and treated, the less negative impact it will have on a child's development.^{7,8} Undetected and untreated vision problems can interfere with a child's ability to learn in school and to participate fully in sports and other childhood activities. Visual impairment in children is associated with developmental delays and the need for special education, vocational and social services, often beyond childhood into adulthood.⁹

It has been estimated that only 14% of children under 6 years of age receive professional eye care.¹ Early detection and treatment of eye and vision problems need to be a major public health goal. An important component of this continuum of care is for all children to receive a professional vision examination before entering school.

Limitations of Vision Screening

Vision screening programs are intended to identify those children who have eye or vision problems that threaten their sight or that impair their ability to develop and learn normally. However, vision screenings are a limited procedure and cannot be used to diagnose an eye or vision problem. A vision screening "failure" only indicates a need for further evaluation and care.¹⁰ Vision screenings are only able to detect a small percentage of those children needing professional vision care.

An eye and vision screening conducted as part of a preschool or school physical cannot substitute for a professional vision examination. Vision evaluations provided by pediatricians or other primary care practitioners generally only include a screening of visual acuity and gross ocular alignment.¹¹

Vision screening programs provided in public or private schools have been used to try to identify children with vision problems who previously have not had access to an eye and vision examination. However, these vision screening programs vary significantly and often fail to provide the desired result. Although both laws and guidelines exist for the screening of preschool children, only about 21% are screened for vision problems.¹²

Current vision screening methods cannot be relied upon to effectively identify preschool children in need of vision care. Vision screening may actually serve as an unnecessary barrier to the early diagnosis of vision problems in many children. These programs can create a false sense of security for those children who "pass" the screening, but who actually have a vision problem, and may result in over-referral for those later found not to have an eye or vision problem.¹³ Many eye and vision



problems that can impact a child's ability to see and learn can be missed during a screening. Just as a blood pressure screening cannot be considered an adequate assessment of a person's overall health status, a limited vision screening cannot be expected to adequately assess overall eye health and visual abilities.

Need for Vision Examinations

Clearly the prevalence of vision disorders present in pre-school age children and the limitations of vision screening programs support the need for and importance of early detection through a comprehensive eye and vision examination by an optometrist or an ophthalmologist. A vision examination is much more extensive than a vision screening or limited pre-school physical. An age-appropriate eye and vision examination of a pre-school child would generally include the following:¹⁴

- Patient and family history
- Visual acuity measurement
- Assessment of refractive status
- Evaluation of ocular motility, binocular vision and accommodative function
- Ocular health examination
- When appropriate, supplemental testing of visual perceptual development may be provided

Comprehensive vision examinations can only be conducted by eye care professionals with the specialized training needed to make a definitive diagnosis and prescribe treatment. Often specialized equipment and procedures, which are not available as part of a vision screening program, are needed to adequately evaluate a child's eyes and vision status.

Conclusion

Vision screening programs and preschool physical examinations are not a substitute for a professional eye examination. Countless children are at risk from undiagnosed eye and vision disorders. The only way to prevent years of needless suffering and failure for these children is by early diagnosis through a comprehensive vision examination. Reliance on limited, non-diagnostic, non-validated screenings does not effectively meet the vision needs of our children. Any undetected vision problem may result in the reduction of the efficiency of the visual system. This may further result in the inability of children to achieve their full potential. Therefore, all children should receive a comprehensive eye and vision examination assessing and treating any deficiencies in ocular health, visual acuity, refractive status, oculomotility, and binocular vision prior to entering school.



References

1. Poe GS. Eye care visits and use of eyeglasses or contact lenses. United States 1979 and 1980. Vital and health statistics, Series 10, No. 145, DDHS Publication (PHS) 84-1573, Hyattsville, MD, February 1984.
2. Robert, J. Refraction status and motility defects of persons 4-74 years, United States 1971-72. Vital and health statistics. Series 11, No. 206. DHEW Publication (PHS) 78-1654, Hyattsville, MD, August 1978.
3. Scheiman M, Gallaway M, Coulter R, et al. Prevalence of vision and ocular disorders in a clinical pediatric population. *Optom Vis Sci* 1992; 69 (suppl):108
4. Roberts, J. Eye examination findings among children, United States. Vital and health statistics, Series 11, No. 115, DHEW Publication (HSM) 72-1057, Rockville, MD, June 1972.
5. Roberts J. Eye examination findings among youths ages 12-17 years, United States. Vital and health statistics, Series 11, No. 155, DHEW Publication (HRA) 76-1637, Rockville, MD 1975.
6. Peters HB. Vision care of children in a comprehensive health program. *J Am Optom Assoc* 1966; 37(12):1113-18
7. Gottfried A, Gilman G. Visual skills and intellectual development: a relationship in young children. *J Am Optom Assoc* 1985; 56 (7): 550-5.
8. Woodruff ME. The visually "at risk" child. *J Am Optom Assoc* 1973; 44 (2):130-4.
9. Report of the Task Force on Vision Impairment and Its Rehabilitation. Washington, DC: National Eye Institute, 1998.
10. Schmidt, P. Screening for Vision Problems of Young Children. In: *Eye Care for Infants and Young Children*, Moore, B. Boston: Butterworth-Heinemann, 1997.
11. American Academy of Ophthalmology. Policy Statement: Vision screening for infants and children. San Francisco: 1996
12. U.S. Department of Health and Human Services. Head Start- A Child Development Program. Washington, DC: Publication No. 8131092(OHDS), 1981.
13. Ehrlich MI, Reinecke RD, Simons K. Preschool Vision Screening for amblyopia and strabismus. Programs, methods, guidelines, 1983. *Survey of Ophth* 1983; 28(3):145-63.
14. American Optometric Association. Optometric Clinical Practice Guideline: Pediatric Eye and Vision Examination. St. Louis, 1994.

APPENDIX 1

Vision Disorders in a Clinical Population of Children Ages 6 Months to 18 Years

Disorder Prevalence

Hyperopia	24.8%
Astigmatism	22.5%
Myopia	18.2%
Non-strabismic binocular disorders	14.3%
Strabismus	12.1%
Amblyopia	7.1%
Accommodative disorders	5.5%
Retinal abnormalities	1.8%