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Pediatrician survey of when the first complete eye examination should take place

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**Abstract**

Background: We hypothesize that pediatricians are more likely to refer their patients to ophthalmologists than optometrists, and that referrals are not being made at a sufficiently early age (namely, six months of age).

Methods: A survey was sent to 211 pediatricians listed with the Oregon Pediatricians Association. Reminder e-mails were sent out two weeks later to 150 pediatricians with available email addresses. Respondents remained anonymous.

Results: Of the 63 respondents (29.9% response rate), it was found that most pediatricians (52.4%) would exclusively refer a child to an ophthalmologist for an eye exam, rather than treat the child themselves or refer to an optometrist. The greatest number (41.3%) stated that a child should receive their first complete eye examination when they first experience vision problems. Only 7.9% agreed with the AOA, AAP, and AAO guidelines that after birth, children should first be examined at six months of age.

Conclusions: Among Oregon pediatricians, there is a definite preference toward referring patients to ophthalmologists rather than optometrists. Also, the respondents typically refer children for eye examinations at a later age than the AOA recommends.

**Degree Type**

Thesis

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PEDiatrician Survey of When the First Complete Eye Examination Should Take Place

By

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Angela H. Triebold

A thesis submitted to the faculty of the College of Optometry Pacific University Forest Grove, Oregon for the degree of Doctor of Optometry May 2001

Advisor:

Weon Jun, OD
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Angela H. Triebold

Weon Jun, O.D., thesis advisor
BIBLIOGRAPHY

Kimberly K. Fowble graduated from the University of Idaho with a BS in Zoology. Upon completion of her Doctorate in Optometry she plans to complete a residency in ocular disease or primary care in the Northwest. Kimberly then plans to practice in southern Idaho.

Angela H. Triebold graduated from Pacific University with a BS in Visual Science. Upon completion of her Doctorate in Optometry she plans to practice in western Washington.
Acknowledgments

We would like to thank Dr. Conley Lynch and Dr. Raquel Apodaca of the Maple Street Clinic for their contributions and guidance.
ABSTRACT

Background

We hypothesize that pediatricians are more likely to refer their patients to ophthalmologists than optometrists, and that referrals are not being made at a sufficiently early age (namely, six months of age).

Methods

A survey was sent to 211 pediatricians listed with the Oregon Pediatricians Association. Reminder e-mails were sent out two weeks later to 150 pediatricians with available e-mail addresses. Respondents remained anonymous.

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Of the 63 respondents (29.9% response rate), it was found that most pediatricians (52.4%) would exclusively refer a child to an ophthalmologist for an eye exam, rather than treat the child themselves or refer to an optometrist. The greatest number (41.3%) stated that a child should receive their first complete eye examination when they first experience vision problems. Only 7.9% agreed with the AOA, AAP, and AAO guidelines that after birth, children should first be examined at six months of age.

Conclusions

Among Oregon pediatricians, there is a definite preference toward referring patients to ophthalmologists rather than optometrists. Also, the respondents typically refer children for eye examinations at a later age than the AOA recommends.

Key Words

children, vision/eye examination, pediatrician, survey
Background

In the last several years, guidelines have been adopted by medical disciplines in an effort to standardize pediatric eye care practices.\textsuperscript{1-3} The American Optometric Association (AOA), American Academy of Pediatrics (AAP), and American Academy of Ophthalmology (AAO) all agree that after birth, a child should receive their first eye examination by six months of age.\textsuperscript{1-3} But who should be performing the eye examinations? Since the pediatrician is the child’s primary care provider, the answer is largely dependent upon the pediatrician. The pediatricians’ trade journals advise the doctors to send their referrals to ophthalmologists.\textsuperscript{4,5} Pediatricians are also encouraged to perform ocular and visual evaluations themselves.\textsuperscript{4,5} Unfortunately, studies have found that pediatricians do not consistently provide their patients with vision and eye health examinations during routine office visits.\textsuperscript{6,7} Too often, vision problems are not identified until the child’s first school vision screening.\textsuperscript{8,9} By the time a child has reached school age, it may be too late to prevent common visual problems, such as strabismus and amblyopia.\textsuperscript{6,10}

According to the AOA, an infant examination should include patient history, visual acuity testing, cycloplegic retinoscopy, and ocular motility and binocular vision testing. The AOA also recommends a thorough ocular health assessment including evaluation of the anterior ocular segment and adnexa, posterior ocular segment (usually indicating pupillary dilation\textsuperscript{1}), pupils, and confrontation visual fields.\textsuperscript{11} Infant examination recommended by the AAP and the AAO consists of patient history, evaluation of eyelids and orbits, external examination, motility, eye muscle balance, pupils, and red reflexes.\textsuperscript{3,4}
One major difference between testing recommended from the AOA vs. the AAP and AAO is the evaluation of the posterior ocular segment. The AOA recommends a dilated fundus exam, whereas the AAP and AAO recommend papillary red reflex screening for a child 6 months of age. While the red reflex is useful to screen for gross ocular abnormalities, such as cataracts, strabismus, and leukocoria, dilation is often necessary for detecting more subtle defects and peripheral posterior segment anomalies.  

Another difference between the AOA, AAP, and OOA for an infant eye exam is refractive testing. The AAP recommends that visual acuity testing begin at the approximate age of three years, while the AOA recommends acuity testing as well as refraction at 6 months.  

The purpose of this study is to determine when pediatricians believe a child's first complete vision / eye examination (CVE) should take place, what they believe should be included in that examination, and which eye care professional they are most often referring their patients to for vision / eye care. We also wanted to determine the pediatricians' recommendations regarding how frequently children should receive routine vision and ocular evaluations.  

We hypothesize that pediatricians are more likely to refer their patients to ophthalmologists than optometrists, and that referrals are not being made at a sufficiently early age (namely, six months of age).
Methods

We chose to survey pediatricians throughout the state of Oregon. Prior to mailing out the surveys to Oregon pediatricians, we sent out a trial questionnaire to twenty optometry students in their third-year at Pacific University College of Optometry in Forest Grove, Oregon. The students were asked to critique and make suggestions regarding the survey before returning it to us. Once the surveys were returned to us, they were reviewed by two pediatricians, Dr. Conley Lynch and Dr. Raquel Apodaca of the Maple Street Clinic in Forest Grove. Their comments and recommendations were considered in the final version of the survey.

The survey was then sent out to all 211 pediatricians listed with the Oregon Pediatricians Association from December 1999 to February 2000. A letter explaining this study was included with the questionnaire (see Appendix A). A one week response time was requested and pre-addressed, postage-paid return envelopes were provided to maintain anonymity. Also, no identifying marks were included with the survey. The surveys were sent out on February 24 of 2000. A reminder e-mail was sent out two weeks later to the 150 pediatricians for whom we had available e-mail addresses.

The sample of pediatricians work in a variety of settings, including educational institutions, hospitals, and private practices. Metropolitan, medium-size cities, small towns, and rural locations were all represented on the mailing list.
Results

Of the 211 surveys sent out, 68 responses were obtained. Of these responses, 29.9% were returned answered. Five of the questionnaires were returned by various specialists who indicated that they do not see pediatric patients for routine office visits and therefore do not generally make vision or eye health referrals. The demographic background of those pediatricians who responded is listed in Table 1. A listing of the survey questions along with responses can be found in Appendix B.

<table>
<thead>
<tr>
<th>Gender</th>
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<tr>
<td>male</td>
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<tr>
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<th>Years in practice</th>
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<tr>
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<tr>
<td>11-15</td>
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<tr>
<td>16-20</td>
<td>19.0%</td>
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<tr>
<td>&gt;20</td>
<td>36.5%</td>
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</tbody>
</table>

Table 1. Profile of survey subjects

Some of the respondents provided multiple answers on selected questions, which led to the total responses being more than 100%.
Key findings of this study are as follows: 41.3% of pediatricians in this sample hold the personal or professional belief that a child should have their initial CVE when they first begin experiencing problems with their vision (see Figure 1). Another 34.9% indicated the exam should occur when the child is 5 years old. One third indicated the age of 3 years and none of the pediatricians chose 12 months. Only 7.9% of the doctors chose 6 months of age for a child’s first CVE.

![At what age should the first complete vision / eye examination take place?](image)

Figure 1. Responses of when a child should receive their first complete vision / eye examination.
When asked the question about which tests to include in the first CVE, the majority of pediatricians chose all tests except color vision and ocular pressure (see Figure 2). The tests chosen for the initial examination were ocular alignment (84.1%), pupillary testing (84.1%), external ocular health (82.5%), and ocular motility (81.0%). Other preferred tests were refractive error (77.8%) and internal ocular health (76.0%).

Figure 2. Pediatrician responses of which tests to include in the first vision / eye exam.
33.3% of the surveyed pediatricians recommend to their patients that they wait until visual problems arise before seeking a complete vision and eye health exam (see Figure 3). 27.0% of pediatricians recommend eye examinations at the age of 5 years, 20.6% at the age of 3 years, and 7.9% at the age of 4 years. Only 1.6% of the doctors chose to recommend a child’s first CVE at 6 months. 1.6% of pediatricians also recommended 12 months for a child’s initial CVE, while another 1.6% chose 2 years of age. The remaining 1.6% of doctors chose 10-13 years of age.

![Figure 3. Recommendations from pediatricians to their patients regarding the first vision / eye examination.](image)

**Figure 3.** Recommendations from pediatricians to their patients regarding the first vision / eye examination.
A 52.4% pediatrician majority indicated they would exclusively refer their patients to an ophthalmologist for their patient's first CVE. Another 22.2% of pediatricians would refer to either an ophthalmologist or optometrist, while only 12.7% of the pediatricians would refer to an optometrist (see Figure 4). In addition, 12.7% of respondents would perform the eye evaluation themselves.

Figure 4. Referral choices made by pediatricians for a child's first complete vision / eye exam.
The majority of sampled pediatricians, to include 54.0%, indicated that patients should return to the eye care professional only if they continue to experience problems with their vision. However, 31.7% of responding doctors felt a child should receive an eye exam every 2 years. Another 20.6% of pediatricians felt an exam every year is indicated. 15.9% of the sample chose every 3-4 years and only 1.6% said they did not know how often a child should receive an eye examination. One respondent chose to say that an eye exam should take place whenever recommended by a consultant.

Figure 5. Pediatrician responses to how often a child should receive a vision / eye exam.
Discussion

The data presented here suggests that pediatricians may not advise parents to bring their children in to receive eye care within the recommended guidelines set forth by the AOA, AAP, and the AAO.\(^1-3\) Only 7.9% of pediatricians responded in accordance to the AOA guidelines which state that the first CVE should take place at six months of age. However, several respondents were confused as to whether we were asking about eye exams performed by eye care professionals or the eye screening exams they perform at well-baby checks and health exams.

77.8% of the pediatricians sampled agreed that refractive error testing was appropriate for a child’s first CVE. The AOA recommends refractive testing for a 6 month old child while the AAP does not.\(^1-3\) However, due to the format of the survey, we cannot conclude as to what age they feel this test is appropriate, only that it should be included with the first CVE.

Refraction on a 6 month old is an important part of the exam in detecting refractive risks for amblyopia. Results warranting close observation and/or care are oblique astigmatism, myopia, large anisometropia, and high hyperopia. Due to an infant’s short attention span and poor fixation, the AOA advises using cycloplegic refraction, near retinoscopy, and/or photorefractive screening.\(^{11}\)

Of the tests listed in the survey, only two tests did not receive a majority of positive responses. These were ocular pressure and color vision. However, neither of these tests is recommended as a primary care test in an eye examination for a six-month-old child.\(^1\) Infantile glaucoma is usually detected through signs such as enlarged cornea,
photophobia, corneal scarring, and excessive tearing. Intraocular pressure is not as vital in the detection of infantile glaucoma as it is in the treatment and management of glaucoma.\textsuperscript{13} One in twelve boys and one in 200 girls have a color deficiency. However, color vision testing is not performed until the child reaches an appropriate age of cognitive development, usually 3 years of age, when color discrimination can be tested.\textsuperscript{14}

Discrepancies exist in the data between when a pediatrician believe the first exam should take place and what they are actually recommending to their patients. For instance, 41.3\% of pediatricians felt a child’s first CVE should be when they experience problems, but only 33.3\% of the pediatricians actually recommend this to their patients. Also, 7.9\% of doctors felt the first CVE should take place at 6 months of age, but only 1.6\% recommend this to their patients. This may be due to the lack of specificity in the structure of the survey, but the reason behind this discrepancy is unknown. This is an area in which further study is warranted.

Optometrists appear to be underutilized by the pediatrician community when considering vision / eye care referrals. Ophthalmologists were utilized more than twice as often as optometrists for vision / eye referrals by pediatricians. Only 12.7\% of the sample would refer to an optometrist, while 52.4\% would refer to an ophthalmologist. However, 22.2\% reported they would refer to either an optometrist or an ophthalmologist. Still, these numbers are disappointing since optometrists have been well trained to take care of the pediatric population’s vision / eye care needs. Some of the most common visual anomalies in children are refractive errors, non-strabismic binocular disorders, strabismus, amblyopia, and accommodative disorders, all of which are well within the optometrists scope of care.\textsuperscript{15}
Another discrepancy is the difference between what the AOA guidelines recommend regarding how often a child should receive a CVE and how the sample pediatricians responded.\textsuperscript{1-3} The AOA recommends eye exams by 6 months of age, at 3 years, before first grade and every 2 years thereafter.\textsuperscript{1} In addition to these, the AAO recommends an eye exam at birth.\textsuperscript{5} The majority of pediatricians from this survey reported that a child should continue eye care only if experiencing problems, however 31.7\% of the pediatricians responded in agreement with guidelines that a child should receive a CVE every two years.

Continued eye examinations in young children are important because the visual system is still maturing. In addition, children can be poor responders or unable to voice the problems they are having. Some of the more common childhood signs and symptoms of visual problems include an eye turn, red eyes, headaches, rubbing or closing an eye, frequent blinking, and squinting.\textsuperscript{13,14,16} Also, some patients will not display any signs or symptoms indicative of a vision problem.

Conclusion

The results presented here show that there are some significant discrepancies between the guidelines set forth by the AOA, AAP, and AAO regarding pediatric eye care and what is actually occurring in Oregon pediatric practices. Among Oregon pediatricians, there tends to be an inclination toward referring patients to ophthalmologists rather than to optometrists.

Other research has shown that physicians are less likely to refer out to an optometrist than an ophthalmologist.\textsuperscript{17,18} An Illinois study\textsuperscript{17} found that their surveyed
physicians knew little about the scope of optometry, outside of the ability to prescribe spectacles, contact lenses, and vision therapy. Although a North Carolina study\textsuperscript{18} found that physicians were aware of the optometrist's scope of practice, both studies reported that the surveyed physicians were unlikely to refer a patient to an optometrist.\textsuperscript{17,18} Since the role of family medical practitioners (including pediatricians) and optometrists are both as primary care providers, it is unfortunate that there is such a lack of interaction between these two disciplines. There appears to be a preference in the medical community to send patients to ophthalmologists (traditionally in the role of secondary eye care providers) for primary eye care.

Limitations of our survey include the limited region the sample is from and the structure of the questions asked. Oregon pediatricians may not be representative of all pediatricians in the United States. In addition, more specificity was needed in the structuring of the questions in the survey. Some pediatricians were confused on the first question as to whether we were asking about well-baby eye screenings or eye exams performed by eye care professionals. Also, when asking which tests to perform for a child's first CVE, we should have specified which tests are appropriate for a 6 month old infant.

Further research is indicated to discern why pediatricians elect to refer to ophthalmologists rather than optometrist. Is this preference for ophthalmology related to the reason for the referral? Are pediatricians fully aware of the scope of practice for optometrists in their states? Another area for further research is the discrepancy between when a pediatrician believes a child should receive their first eye exam and what pediatricians recommend to their patients. Is it because they included their own vision
Are pediatric eye screenings adequate in comparison to optometric and ophthalmologic vision/eye exams?

As optometrists we must find ways to better communicate with pediatricians. We are well trained in detection, diagnoses, and management of pediatric vision/eye disorders and can provide a great service to the pediatric population. In our own communities we need to become familiar with pediatricians in our area, be active in school screenings, and participate in studies to provide better care to our pediatric patients.
References

Dear Doctor:  

February 16, 2000  

We are optometry students working in conjunction with pediatrician Dr. Raquel Apodaca and family physician Dr. Conley Lynch, to conduct a thesis survey. We are interested in determining public awareness regarding when the first vision and eye examination should take place. Our survey will be distributed to parents in western Washington County school districts, as well as pediatricians throughout the state of Oregon.  

It would be greatly appreciated if you could take a moment and complete the survey. Please return it in the envelope provided within one week. Your responses will be kept completely confidential and anonymous.  

Thank you for your cooperation. We look forward to receiving your responses.  

Sincerely,  

Kimberly Sabo, Intern  
Angela Triebold, Intern  

Survey to Pediatricians  

Gender: ___M ___F  

Years in practice: _________  

City/State: _____________  

Ages of children you examine: ____________  

1. At what age should the first complete vision / eye examination take place?  
   a) 6 months  
   b) 12 months  
   c) 3 years  
   d) 5 years  
   e) when first experiencing problems with vision  

2. Which of the following tests should be included in the first complete vision / eye exam? (check all that apply)  
   a) internal ocular health  
   b) external ocular health  
   c) refractive error  
   d) ocular pressure  
   e) ocular alignment  
   f) ocular motility  
   g) color test  
   h) pupils  
   i) stereo acuity  

3. When do you recommend that your patient receive his first complete vision / eye examination?  
   ____________________________  

4. To whom would you refer for a child’s first complete vision / eye exam?  
   a) Self  
   b) Ophthalmologist  
   c) Optometrist  
   d) Other: ___________________  

5. How often should a child receive a complete vision / eye examination?  
   a) Every 6 months  
   b) Every year  
   c) Every 2 years  
   d) Every 3-4 years  
   e) If having problems  
   f) Other: ________________
APPENDIX B

I. **At what age should the first complete vision / eye examination take place?**
   - 6 months: 7.9%
   - 12 months: --
   - 3 years: 33.3%
   - 5 years: 34.9%
   - When first experiencing problems with vision: 41.3%
   - Birth (written in by respondent): 1.6%

II. **Which of the following items should be included in the first vision exam?**
    (check all that apply)
    - Internal eye health: 76.2%
    - External eye health: 82.5%
    - Refractive error: 77.8%
    - Ocular pressure: 33.3%
    - Ocular alignment: 84.1%
    - Ocular motility: 81.0%
    - Color test: 47.6%
    - Pupils: 84.1%
    - Stereo acuity: 58.7%

III. **When do you recommend that your patient receive his first complete vision / eye examination?**
    - 6 months: 1.6%
    - 12 months: 1.6%
    - 2 years: 1.6%
    - 3 years: 20.6%
    - 4 years: 7.9%
    - 5 years: 27.0%
    - 10-13 years: 1.6%
    - When first experiencing problems with vision: 33.3%

IV. **To whom would you refer for a child’s first complete vision / eye exam?**
    - Self: 12.7%
    - Ophthalmologist only: 52.4%
    - Optometrist only: 12.7%
    - Ophthalmologist or optometrist: 22.2%

V. **How often should a child receive a complete vision / eye examination?**
   - Every 6 months: --
   - Every year: 20.6%
   - Every 2 years: 31.7%
   - Every 3-4 years: 15.9%
   - If having problems: 54.0%
   - With consultant’s recommendation (written in by respondent): 1.6%
   - Don’t know: 1.6%