

## JOINT POLICY STATEMENT

September 2006

### Screening Examination of Premature Infants for Retinopathy of Prematurity

A Joint Statement by the American Academy of Pediatrics, the American Association of Pediatric Ophthalmology and Strabismus and the American Academy of Ophthalmology

**ABSTRACT.** *This statement revises a previous statement on screening of premature infants for retinopathy of prematurity published in 2001.*

### INTRODUCTION

Retinopathy of prematurity (ROP) is a disorder of the developing retina of low birth weight preterm infants potentially leading to blindness in a small but significant percentage of those infants. The Multicenter Trial of Cryotherapy for Retinopathy of Prematurity demonstrated the efficacy of peripheral retinal cryotherapy in reducing unfavorable outcomes. The study's 10-year follow-up report<sup>2</sup> confirmed these lasting benefits: unfavorable structural outcomes were reduced from 48% to 27%, and unfavorable visual outcomes (ie, best corrected visual acuity worse than 20/200) were reduced from 62% to 44%. Subsequently, laser photocoagulation has been used for peripheral retinal ablation with at least equal success.<sup>3-6</sup> Most recently, the Early Treatment for Retinopathy of Prematurity Randomized Trial confirmed the efficacy of treatment for severe ROP and redefined the indications for treatment.<sup>7</sup> Because of the sequential nature of ROP progression and the proven benefits of timely treatment in reducing the risk of visual loss, effective care now requires that at-risk infants receive carefully timed retinal examinations by an ophthalmologist experienced in the examination of preterm infants for ROP and that all pediatricians caring for these at-risk preterm infants be aware of this timing.

This statement outlines the principles on which a program to detect ROP in infants at risk might be based. The goal of an effective screening program must be to identify the relatively few preterm infants who require treatment for ROP from among the much larger number of at-risk infants while minimizing the number of stressful examinations required for these sick infants. Any screening program designed to implement an evolving standard of care has inherent defects, such as overreferral or underreferral, and cannot, by its very nature, duplicate the precision and rigor of a scientifically based clinical trial. With that in mind and on the basis of information published thus far, the sponsoring organizations of this statement suggest the following guidelines for the

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United States. It is important to recognize that other world locations could have very different screening parameters.<sup>8</sup>

### RECOMMENDATIONS

1. Infants with birth weight of less than 1500 g or gestational age of 30 weeks or less, as defined by the attending neonatologist, as well as selected infants with birth weight between 1500 and 2000 g or gestational age greater than 30 weeks with an unstable clinical course, including those requiring cardiorespiratory support, who are believed by their attending pediatrician or neonatologist to be at high risk, should have retinal screening examinations performed after pupillary dilation using binocular indirect ophthalmoscopy to detect ROP. One examination is sufficient only if it unequivocally shows the retina to be fully vascularized in each eye. Effort should be made to minimize the discomfort and systemic effect of this examination by pretreatment of the eyes with a topical anesthetic agent, such as proparacaine; consideration may also be given to the use of pacifiers, oral sucrose, etc.
2. Retinal examinations in preterm infants should be performed by an ophthalmologist with sufficient knowledge and experience to enable accurate identification of the location and sequential retinal changes of ROP. The “International Classification of Retinopathy of Prematurity”<sup>9</sup> should be used to classify, diagram, and record these retinal findings at the time of examination.
3. The initiation of acute-phase ROP screening should be based on the infant’s age. The onset of serious ROP correlates better with postmenstrual age (gestational age at birth plus chronologic age) than with postnatal age.<sup>10</sup> That is, the youngest infants at birth take the longest time to develop serious ROP. This knowledge has been used previously in conducting a screening schedule.<sup>11-12</sup> Table 1 was developed from an evidence-based analysis of the Multicenter Trial of Cryotherapy for Retinopathy of Prematurity natural history data and confirmed by the Light Reduction in ROP Study conducted a decade later.<sup>13</sup> It represents a suggested schedule for timing of the initial eye examinations based on postmenstrual age and chronologic (postnatal) age to detect ROP before it becomes severe enough to result in retinal detachment while minimizing the number of potentially traumatic examinations.<sup>14</sup> Table 1 provides a schedule for detecting ROP potentially damaging to the retina with 99% confidence.
4. Follow-up examinations should be recommended by the examining ophthalmologist on the basis of retinal findings classified according to the international classification.<sup>9</sup> The following schedule is suggested:
  - 1-Week or Less Follow-up
    - Stage 1 or 2 ROP – zone I
    - Stage 3 ROP – zone II
  - 1- to 2-Week Follow-up
    - Immature vascularization – zone I – no ROP
    - Stage 2 ROP – zone II
    - Regressing ROP – zone I

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### 2-Week Follow-up

- Stage 1 ROP – zone II
- Regressing ROP – zone II

### 2- to 3-Week Follow-up

- Immature vascularization – zone II – no ROP
- Stage 1 or 2 ROP – zone III
- Regressing ROP – zone III

The presence of plus disease in zones I or II suggests that peripheral ablation, rather than observation, is appropriate.<sup>14</sup>

5. Practitioners involved in the ophthalmologic care of preterm infants should be aware that the retinal findings requiring strong consideration of ablative treatment have recently been revised according to the Early Treatment for Retinopathy of Prematurity Randomized Trial study.<sup>7</sup> The finding of threshold ROP, as defined in the Multicenter Trial of Cryotherapy for Retinopathy of Prematurity, may no longer be the preferred time of intervention.

Treatment may also be initiated for the following retinal findings:

- Zone I ROP – any stage with plus disease
- Zone I ROP – stage 3 – no plus disease
- Zone II – stage 2 or 3 with plus disease

Plus disease is defined as a degree of dilation and tortuosity of the posterior retinal blood vessels as defined by a standard photograph.<sup>1,9</sup> Special care must be used in determining the zone of disease. The number of clock hours of disease may no longer be the determining factor in recommending ablative treatment. Treatment should generally be accomplished, when possible, within 72 hours of determination of treatable disease to minimize the risk of retinal detachment.

6. Conclusion of acute screening examinations should be based on age and retinal ophthalmoscopic findings.<sup>14</sup> These findings include:
  - Zone III retinal vascularization attained without previous zone I or II ROP. If there is examiner doubt about the zone or if the postmenstrual age is less than 35 weeks, confirmatory examinations may be warranted.
  - Full retinal vascularization.
  - Postmenstrual age of 45 weeks and no prethreshold disease (defined as stage 3 ROP in zone II, any ROP in zone I) or worse ROP is present.
  - Regression of ROP.<sup>15</sup> Care must be taken to be sure there is no abnormal vascular tissue present capable of reactivation and progression.
7. Communication with the parents by members of the staff is very important. Parents should be aware of ROP examinations and should be informed if their child has ROP, with subsequent updates on ROP progression. The possible consequences of serious ROP should be discussed when there is significant risk of poor visual outcome. Documentation of such conversations with parents in the nurse or physician notes is highly recommended.
8. Responsibility for examination and follow-up of infants at risk of ROP must be carefully defined by each neonatal intensive care unit. Unit-specific criteria with respect to birth weight and gestational age for examination for ROP should be established for each neonatal intensive care unit by consultation and agreement

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between neonatology and ophthalmology services. These criteria should be recorded and should automatically trigger ophthalmologic examinations. If hospital discharge or transfer to another neonatal unit or hospital is contemplated before retinal maturation into zone III has taken place, or if the infant has been treated by ablation for ROP and is not yet fully healed, the availability of appropriate follow-up ophthalmologic examination must be ensured, and specific arrangement for that examination must be made before such discharge or transfer occurs. The transferring primary physician, after communication with the examining ophthalmologist, should have the responsibility of communicating what eye examinations are needed and their required timing to the infant's new primary physician. The new primary physician should ascertain the current ocular examination status of the infant from the record and through communication with the transferring physician so that any necessary examinations by an ophthalmologist with regular experience and knowledge of the examination of preterm infants for ROP can be arranged promptly at the receiving facility or on an outpatient basis if discharge is contemplated before the need for continued examination has ceased, as outlined in recommendation 6. If responsibility for arranging follow-up ophthalmologic care after discharge is delegated to the parents, they should be made to understand the potential for severe visual loss, including blindness; that there is a critical time window to be met if treatment is to be successful; and that timely follow-up examination is essential to successful treatment. This information should preferably be communicated both orally and in writing. If such arrangements for communication and follow-up after transfer or discharge cannot be made, the infant should not be transferred or discharged until appropriate follow-up examination can be arranged by the unit discharging the infant.

Pediatricians and other practitioners caring for infants who have had ROP, whether requiring treatment or not, should be aware that these infants may be at risk of other seemingly unrelated visual disorders, like strabismus, amblyopia, cataract, etc. Ophthalmologic follow-up for these potential problems after discharge from the neonatal intensive care unit is indicated.

This statement replaces the previous statement on ROP from the American Academy of Pediatrics, American Association for Pediatric Ophthalmology and Strabismus, and American Academy of Ophthalmology<sup>16</sup>; are evolving; and may be modified as additional ROP risk factors, treatments, and long-term outcomes are known.

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**Table 1. Timing of First Eye Examination Based on Gestational Age at Birth\***

Gestational Age at Birth (wk)	Age at Initial Examination (wk)	
	Postmenstrual	Chronologic
22†	31	9
23†	31	8
24	31	7
25	31	6
26	31	5
27	31	4
28	32	4
29	33	4
30	34	4
31‡	35	4
32‡	36	4

\* The table provides a schedule for detecting prethreshold ROP with 99% confidence; usually well before any required treatment.

† This guideline should be considered tentative rather than evidence based for infants with gestational age of 22 to 23 weeks because of the small number of survivors in these gestational age categories.

‡ If necessary.

**Approved by:**

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