

A PARENTS' GUIDE TO THEIR PREMATURE BABY'S EYES

WHAT IS ROP?

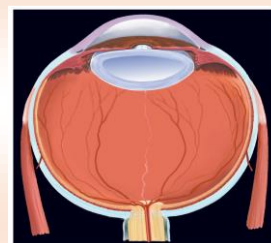
Retinopathy of Prematurity (ROP) is a potentially blinding disease, which in the United States affects several thousand premature infants each year. It was unknown prior to 1942 because premature infants did not survive long enough to show the effects of ROP. With improvements in the medical care of the smallest premature infants, the rate and severity of ROP have increased.

The diagnosis of ROP is made by an ophthalmologist who examines the inside of the eye. Premature infants qualify for eye examinations based on their birth weight. Although a high percentage of examined babies will show some degree of ROP, most will not require treatment. Nevertheless, premature babies require lifelong follow-up by an ophthalmologist because of their increased risk for eye misalignment, amblyopia, and the need for glasses to develop normal vision.



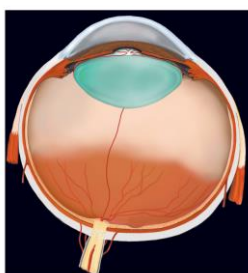
HOW THE EYE WORKS

The eye functions much like a camera. The front of the eye contains the structures which focus the image and regulate the amount of light that enters the eye, similar to the lens and shutter of a camera. The inside of the eye is filled with a gel-like substance called vitreous. In the back of the eye is the retina, which functions like the film in a camera. Without film, a camera cannot take a picture and without the retina, the eye cannot see. A normal full-term infant has a nearly fully formed retina. Blood vessels which provide nutrition to the retina grow from the back of the eye to the front, with this process completed just after birth.



Full-term eye, retina fully developed.

THE PREMATURE EYE



When a baby is born prematurely, the retina is only partially formed. The blood vessels have grown into the retina at the very back of the eye, but not into the rest of the retina. The amount of undeveloped retina is proportionally to the severity of prematurity. The closer that a premature baby is to full-term, the more normally developed is the retina. The greater the prematurity, the greater is the amount of undeveloped retina.

Premature eye with developed retina (blood vessels on orange-colored surface) and undeveloped retina (no blood vessels in peach-colored peripheral retina).

ZONES OF INVOLVEMENT Two factors influence vision loss from ROP: the amount of retina that is undeveloped at the time of birth and the severity of the disease. The retina is divided into Zones 1, 2, and 3, and the severity of ROP is graded as Stage 1, 2, 3, 4 or 5.

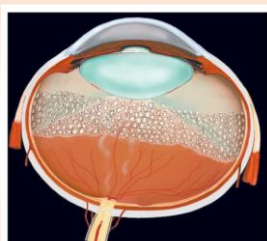
These diagrams show the zones of the premature retina. As the premature blood vessels grow from the back to the front of the eye, the amount of premature retina decreases. At full-term, the blood vessels extend to nearly the entire retina.



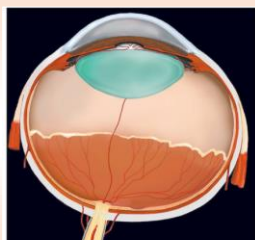
ROP STAGES & TREATMENT



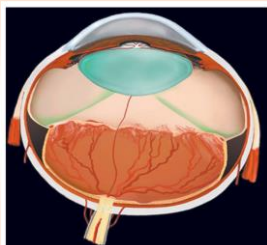
The first stage of ROP occurs when the blood vessels stop growing and form a line that separates normal from pre-mature retina.



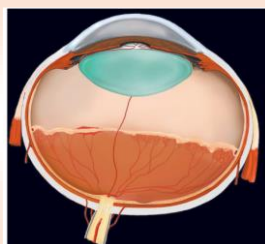
In favorable cases, treatment results in disappearance of the abnormal vessels with potentially good vision.



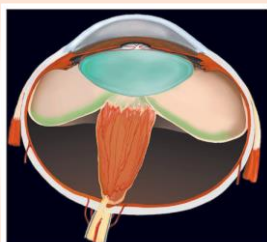
In the second stage, the line takes on substance and presents as an elevated ridge of tissue.



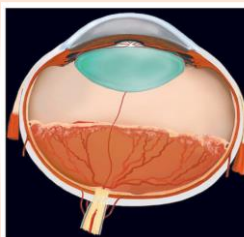
In some cases, the ROP continues to progress and the retina detaches. A partial detachment is Stage 4A. If the center of vision is involved, it is 4B.



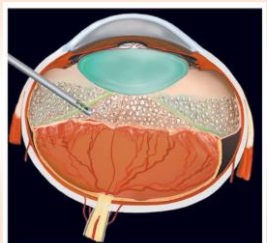
As the ROP advances, fragile new abnormal blood vessels grow toward the center of the eye (Stage 3). At this point, the eye is still capable of repairing itself.



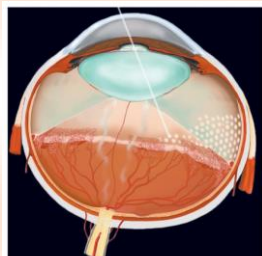
Left untreated, the retina can become totally detached, Stage 5. These eyes have very poor visual outcomes.



As Stage 3 advances, the normal vessels dilate, indicating that the ROP may not go away on its own. This is known as "plus disease."



Removal of the vitreous tissue that fills the eye can relieve the traction which pulls the retina away from the wall of the eye.



If enough retina has Stage 2 or 3 ROP in the presence of "plus disease," then treatment is indicated. In general, laser using light energy (as shown in the drawing) is the treatment of choice. Alternative treatments include drugs such as Lucentis (ranibizumab) or Avastin (bevacizumab), or cryotherapy (freezing).

If the retina detaches, removal of the vitreous (vitrectomy) and lens may be needed. Rarely, a band of silicone may be placed around the eye (a scleral buckling operation).

OVERVIEW

More than 80% of premature babies who weigh less than 1000 grams (2.2 lbs.) will develop ROP. Most will resolve without treatment. Those who require treatment must receive it in a timely manner to obtain the best possible outcome. This may occur after discharge from the hospital. For this reason, it is critical that premature babies be examined according to the schedule that will be communicated to you at discharge. There is risk of retinal detachment from the active form of ROP until about 10 weeks after the baby's due date (50 weeks after conception).

Vision is a highly complex act which requires the functioning of the visual pathways in the brain. Even with timely screening and proper treatment, other factors may lead to less than normal vision in premature infants. Modern treatment has reduced the devastating effects of ROP on the eye, yet worldwide, it remains the leading cause of pediatric retinal blindness. With or without ROP, there can be profound vision loss due to amblyopia (lazy eye), eye misalignment, or the need for glasses. Therefore, every premature infant deserves the lifelong attention of an ophthalmologist.

For more information, visit our website at: www.pediatricrff.org