

Review: Retinopathy of Prematurity

What is ROP?

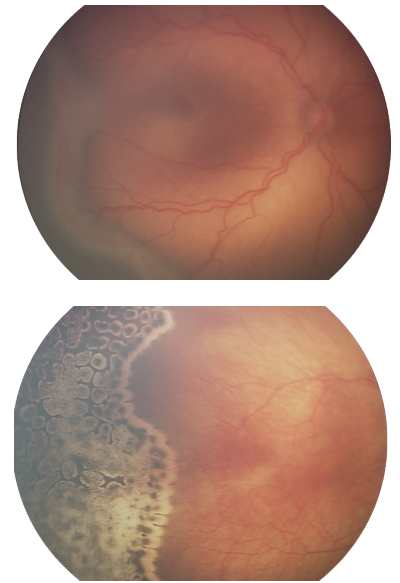
Retinopathy of prematurity is a disease process that affects babies born prematurely. The retinal vessels, that supply oxygen and nutrients to the eye, stop developing normally. Abnormal and weak vessels begin to grow as the retina signals that it needs oxygen and nutrients. Those weak vessels can leak and cause scarring of the retina and potentially cause the retina to detach.¹

What causes ROP?

Doctors do not know for certain what causes ROP. Blood vessels in the eye normally finish developing in the last few weeks before birth. Premature infants, however, leave the protective uterus before blood vessels of the eye have had a chance to fully develop. The infants are then exposed to elements, such as medication, high levels of oxygen, and light and temperature changes. These factors may interfere with the normal development of blood vessels in the eye and cause ROP.¹

How is ROP treated?

Early stages of ROP do not require any treatment. If ROP advances, laser treatment or injections into the eye can be used to slow or reverse the abnormal blood vessels.¹

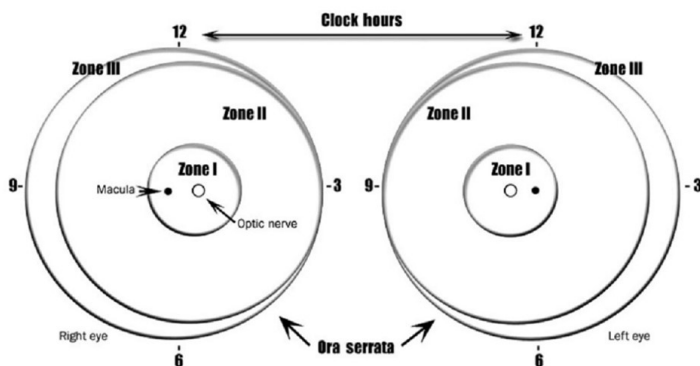


Who should be screened for ROP?

According to the American Academy of Pediatrics:¹

- All infants with a birth weight of ≤ 1500 g
- Gestational age of 30 weeks or less (as defined by the attending neonatologist)
- Selected infants with a birth weight between 1500 and 2000 g or a gestational age of >30 weeks who are believed by their attending pediatrician or neonatologist to be at risk for ROP (such as infants with hypotension requiring inotropic support, infants who received oxygen supplementation for more than a few days, or infants who received oxygen without saturation monitoring) should be screened for ROP.

*Please note due diligence must be taken to always reference the most recent guidelines available.



How is ROP Classified?

Retinopathy of prematurity is classified in both a zone (location) and a stage (severity).²

The Zones in ROP explain the location and the extent of the disease. ROP affecting areas within Zone 1 may affect vital visual structures and is often treated and monitored closely.²

The Stages in ROP explain what findings are noted in each Zone. The stage of the disease often will determine the treatment plan depending on what zone is being affected.

1. Fierson, Walter M. "Screening Examination of Premature Infants for Retinopathy of Prematurity." *Pediatrics*, vol. 142, no. 6, 2018, doi:10.1542/peds.2018-3061.

2. "The International Classification of Retinopathy of Prematurity Revisited." *Archives of Ophthalmology*, vol. 123, no. 7, Jan. 2005, p. 991., doi:10.1001/archophth.123.7.991

Review: Anatomy of the Eye

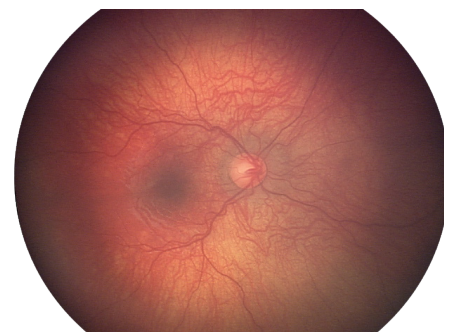
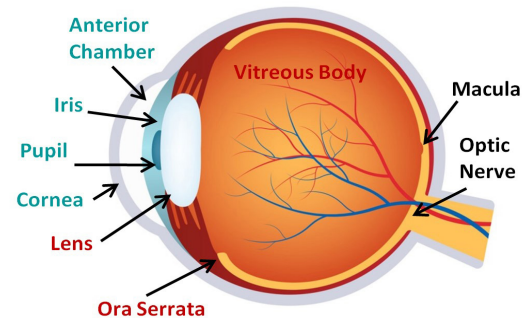
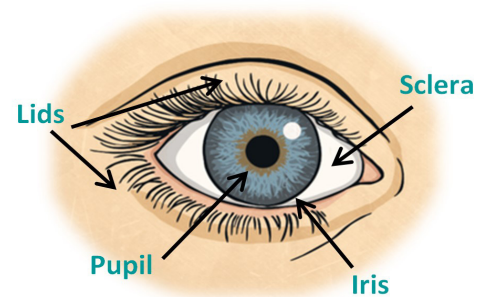
The front portion of the eye is often referred to as the anterior portion. Important anterior structures to note are the **lids**, **cornea**, **sclera**, **iris**, **pupil**, and **anterior chamber**. The upper and lower **lids**¹ are folds of skin which cover and protect the eye when closed.

When thinking about how the eye process images we will explain how light enters the eye and is processed into signals to the brain. Light first enters the **cornea**¹, the clear front window of the eye that transmits and focuses light. The **anterior chamber**³ is the space in the eye that is behind the cornea and in front of the iris. It is filled with a fluid that constantly provides nutrients to the eye. The **iris**¹, known as the colored part of the eye, is a sphincter muscle. The **pupil**¹ is the dark aperture in the iris. These structures together determine how much light is let into the eye. The **sclera**² is the white outer layer of the eyeball.

As we move into the posterior, or back, structures of the eye we continue to see how light is transferred and focused. The **lens**¹ is the transparent structure inside the eye that helps focus light. That light will then travel through a clear, jelly-like, substance that fills the middle of the eye called the **vitreous body**¹.

The **ora serrata**⁴ is the serrated junction between the retina and the ciliary body. It is the most anterior edge of the retina.

The most posterior portion of the eye houses vital structures that allow light to be processed by the brain into visual images. The **retina**¹ is the nerve layer that lines the back of the eye, senses light and creates impulses that go through the optic nerve to the brain. The **optic nerve**¹ connects the eye to the brain. Impulses formed by the retina are dispatched through the optic nerve to the brain, which interprets them as images. The **macula**¹ is a small area in the retina that contains special light-sensitive cells and allows us to see fine details clearly.⁵ The **arcades**⁶ are the blood vessels that form the anatomical structure in the eye that takes the form of an arch. The arcades and optic nerve serve as landmarks that can help physicians determine what eye and where in the eye an image is taken.



1. Jr., William C. Shiel. "Definition of Eye." MedicineNet, MedicineNet, 27 Dec. 2018, www.medicinenet.com/script/main/art.asp?articlekey=7021.

2. Dahl, Andrew A. "Scleritis Treatment, Symptoms, Causes & Risk Factors." MedicineNet, MedicineNet, 11 May 2018, www.medicinenet.com/scleritis/article.htm#what_is_the_sclera.

3. Jr., William C. Shiel. "Definition of Anterior Chamber." MedicineNet, MedicineNet, 27 Dec. 2018, www.medicinenet.com/script/main/art.asp?articlekey=10586.

4. "Ora Serrata." The Free Dictionary, Farlex, <https://encyclopedia.thefreedictionary.com/Ora+serrata>.

5. "What Are the Differences between Rods and Cones?" WebMD, WebMD, www.webmd.com/eye-health/qa/what-are-the-differences-between-rods-and-cones.

6. Labib, Bisant A. "Read the Retinal Vasculature Like a Pro." Review of Optometry, 15 Feb. 2017, www.reviewofoptometry.com/article/read-the-retinal-vasculature-like-a-pro.

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