

# Retinopathy of prematurity (ROP)

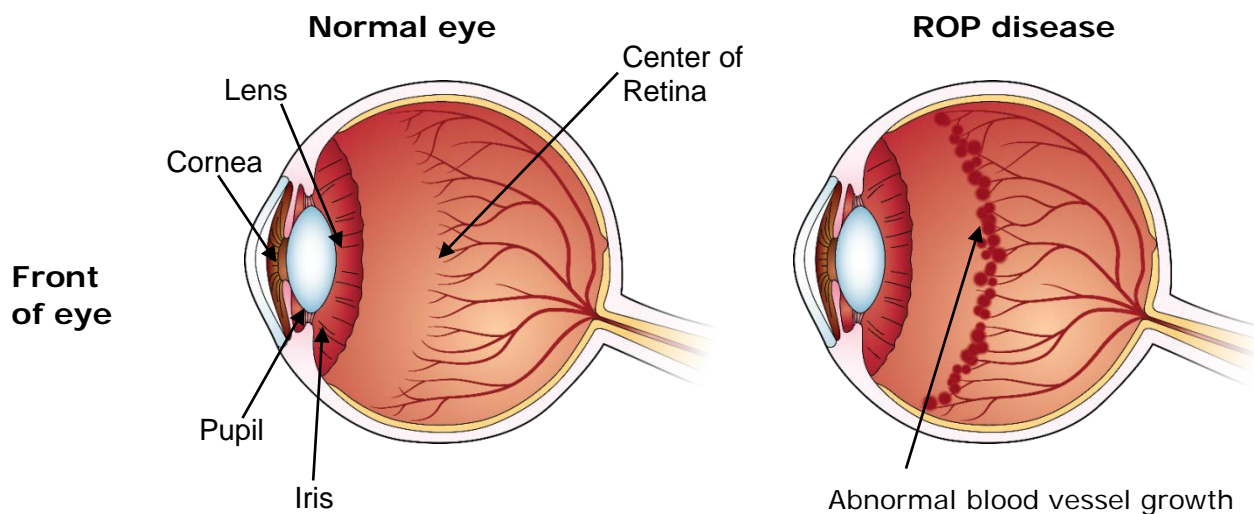
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## What is retinopathy of prematurity?

Retinopathy is an eye disease. Retinopathy of prematurity (ROP) describes the type of eye disease that some premature babies may get. ROP affects the retina, the back surface of the eye that is responsible for vision. When light strikes the retina a picture is made.

The blood vessels in the retina help feed the eye with oxygen. The eyes develop rapidly during the last 12 weeks of pregnancy. In premature babies, the blood vessels are not fully grown. These blood vessels grow outwards, from the centre of the retina. As the blood vessels grow toward the outer edge of the retina, they can grow normally or abnormally.

Abnormal growth causes a ridge of blood vessels between the areas of the retina with and without blood vessels. This abnormal growth of blood vessels is called retinopathy of prematurity or ROP.



## **What causes ROP?**

The exact cause of ROP is not known. Only premature babies whose eyes are not fully developed can get ROP. Changes in the oxygen level of the blood and other factors may contribute to the abnormal growth of blood vessels.

## **How can ROP affect babies?**

Most premature babies will have normal vision. However, retinopathy can affect the vision of some preterm babies. Babies with ROP may need glasses.

If the eye disease becomes severe, partial or complete loss of vision can occur. This may be due to scarring of the blood vessels in the retina. The scarring may cause the retina to pull away from the inner wall of the eye. This is called detachment. When the retina is detached it cannot send a clear picture to the brain and causes vision loss.

The risk of blindness is extremely low for babies born after 30 weeks gestation and those with birth weights greater than 1250 grams. The risk is higher for extremely small, premature babies. About 1 in 20 babies weighing less than 1000 grams may have severe vision problems.

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## How can you tell if my baby has eye disease?

The ophthalmologist (eye specialist) will examine your baby's eyes to check for eye disease. This doctor has special training and experience in examining the eyes of premature babies.

Before the examination, your baby's nurse will put drops in your baby's eyes. The drops make the pupil of the eye larger.

The ophthalmologist uses an instrument to hold the eyelids apart so that he or she can look into the eye and see the retina. Your baby is given eye drops that prevent pain, but he or she may feel uncomfortable during the examination. Sucking a little sugar (sucrose) water can make your baby feel more comfortable.

The ophthalmologist may look directly into your baby's eyes, or may use a special camera called the 'RetCam'. The RetCam takes digital pictures of your baby's eyes, which become part of your baby's health record. This takes about 10 minutes (5 minutes longer than a regular eye exam).

The pictures are saved on a CD. The ophthalmologist can review them to watch for any changes in your baby's eyes. If a second opinion is needed, the ophthalmologist may send the pictures of your baby's eyes to another ophthalmologist by confidential e-mail.

We take great care to protect the privacy of your baby's health information.

## When are my baby's eyes checked?

The first time your baby's eyes will be checked is usually 4 weeks after birth, but not before 31 weeks corrected age. Before 31 weeks, a baby's eyes are too hazy to check the growth of the blood vessels at the back of the eye.

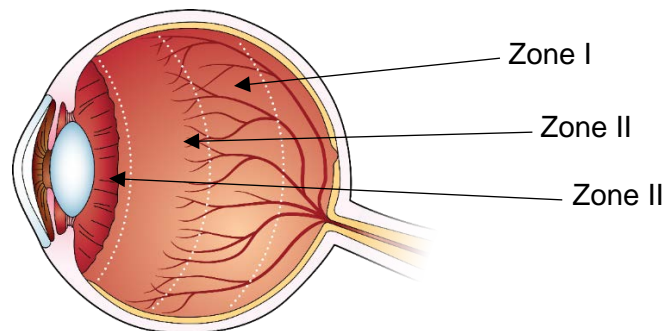
The ophthalmologist will decide how often your baby's eyes need to be rechecked:

- **If your baby does not have eye disease**, he or she will have several eye exams until the blood vessels in the retina have finished developing.
- **If your baby has ROP**, regular eye exams are done to assess whether the disease is getting worse (progressing) or getting better (regressing). Progressive eye disease may need treatment.

## How serious is my baby's ROP?

The eye doctor will divide ROP into five stages, ROP ranges from mild (stage 1) to severe (stages 4 and 5). The eye doctor will also look at the development of blood vessels in the retina and how far away from the retina they grow. The retinal blood vessels start growing in Zone 1 which is closest to the retina, and gradually grow outward until reaching Zone 3. Therefore, if your baby has developed abnormal blood vessel growth in Zone 1, this is more severe than abnormal blood vessel in Zone 3.

The diagram below outlines Zone I, II and III and where they are located on the eyeball.



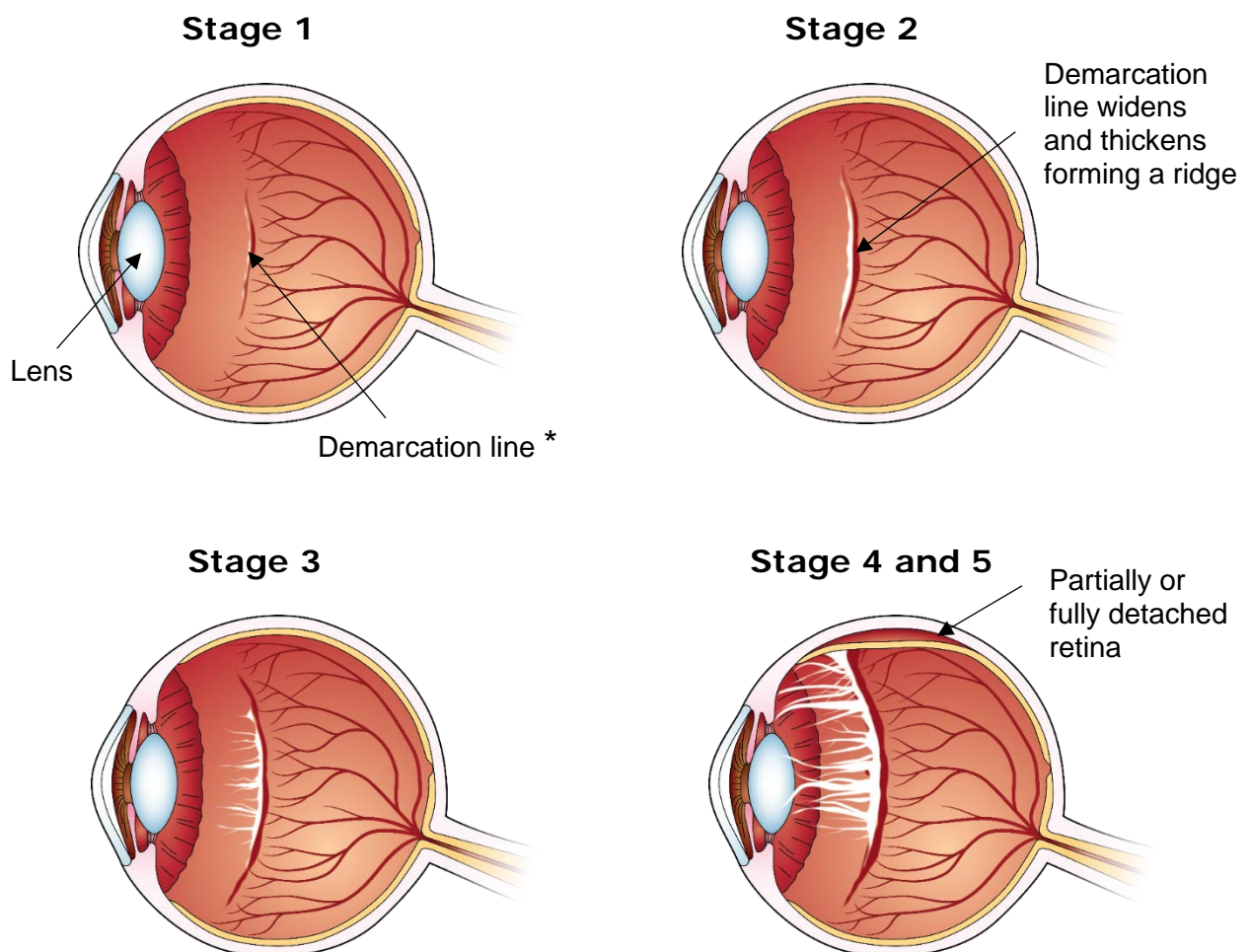
## Stages of retinopathy of prematurity

**Stage 1** – mildly abnormal blood vessel growth

**Stage 2** – moderately abnormal blood vessel growth

**Stage 3** – severely abnormal blood vessel growth

**Stages 4 and 5** – severely abnormal blood vessel growth that has caused part of the retina to pull out of place (partially detached retina) or the entire retina to pull out of place (detached retina)



\* Demarcation line – is a thin but definite structure that separates the part of the retina that has blood vessel growth from the part of the retina that does not have blood vessel growth. There is abnormal branching of the blood vessels that lead up to the demarcation line. When an eye doctor examines an infant for ROP, the demarcation line looks like a line that is flat and white.

## **If my baby has ROP, what can be done to prevent loss of vision?**

Your baby will have regular eye examinations to check the extent of the disease and determine if treatment is needed:

- If your baby's eye disease gets better, your baby will need fewer eye examinations.
- If your baby's eye disease gets worse, your baby will need more frequent eye examinations.

## **Use eye injections when needed**

If your baby's eye disease is getting worse, the ophthalmologist may consider treatment with bevacizumab (Avastin®).

Avastin works by blocking the growth of abnormal blood vessels. This gives normal blood vessels a chance to grow again.

Avastin is given by injection, using a very thin needle:

- Before the injection, your baby will be given pain medication and anesthetic drops to numb his or her eyes.
- After the injection, your baby will be given antibiotic eye drops to prevent infection. The health care team will watch your baby's eyes closely for any signs of infection (redness, discharge or swelling) and continue treatment with antibiotics if needed.

To see how well Avastin is working, the ophthalmologist will recheck your baby's eyes the next day and do eye exams each week.

If Avastin is not effective, your baby may need to have laser treatments.

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## Use laser therapy when needed

If your baby's chances of blindness are more than 50%, laser therapy may be done. Laser therapy is an eye treatment that uses a bright red light that shines through the eye tissue. This treatment can prevent further abnormal growth of the blood vessels. If further abnormal growth were to continue, the retina could detach from the back of the eye.

The ophthalmologist decides if this therapy needs to be done, and when it is to be done. This therapy is most helpful at a certain time in the development of the eyes' blood vessels.

Before treatment, the ophthalmologist will discuss with you the possible complications of this procedure.

## Who will check my baby's eyes after we leave the Neonatal Unit?

Your baby may continue to need eye examinations after leaving the Neonatal Unit. If your baby needs follow-up eye examinations, you will have appointments made with an ophthalmologist in your community.

If your community does not have an ophthalmologist who is familiar with premature babies' eyes, other arrangements will be made. After you go home, you may need to bring your baby to the McMaster Children's Hospital for eye care.

Please be sure to check that the nurse or doctor at the hospital has made an appointment for your baby's next eye examination.

**As eye disease may get better or worse rapidly, it is very important to keep all scheduled eye appointments.**

Ask your baby's nurse if you would like to watch a videotape with more information about ROP.

If you have any questions about ROP or your baby's eyes, please talk with your baby's nurse or doctor.

