



# Retinopathy of prematurity (ROP)

**This information sheet from Great Ormond Street Hospital (GOSH) explains the causes, symptoms and treatment of retinopathy of prematurity and where to get help.**

**In the womb, the retina (the light sensitive surface at the back of the eye that converts images into nerve signals that the brain understands) develops slowly and the retinal blood vessels often only complete growing by the end of gestation.**

**If a child is born prematurely these blood vessels can grow abnormally causing damage to the retina and of course vision. This is called retinopathy of prematurity.**

**Retinopathy of prematurity (ROP) affects around 20 per cent of babies who are born prematurely. It mainly occurs in babies who are born before week 32 of pregnancy or weigh less than 1500g when they are born.**

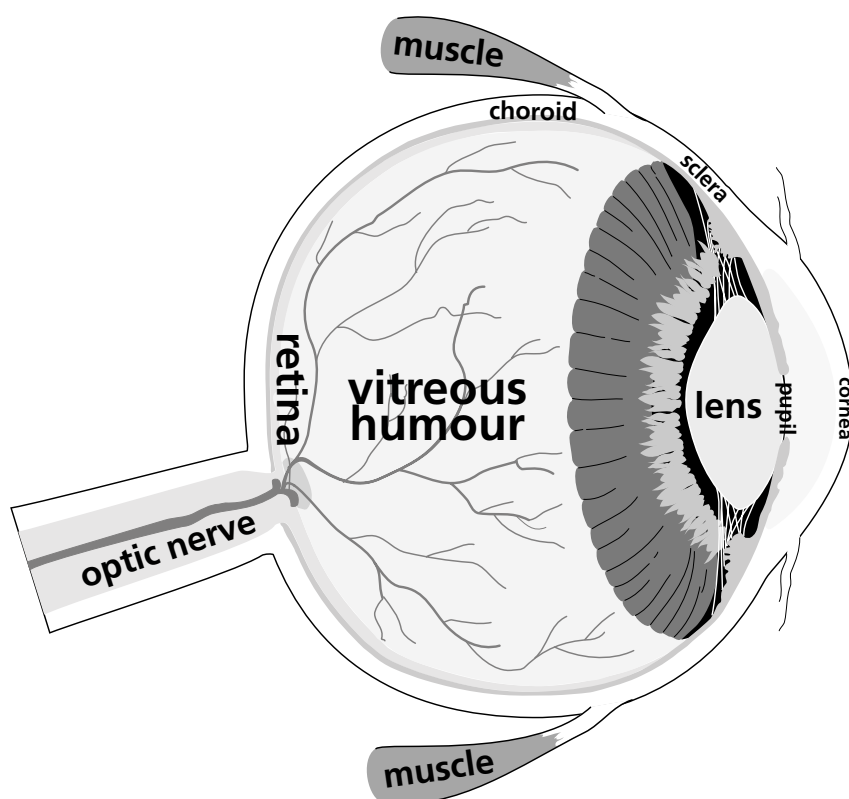
## What causes retinopathy of prematurity?

ROP occurs when a baby is born too early to have reached an important milestone in the development of their eyes. It is not passed on from parents to children.

To function properly, the retina needs a constant supply of blood to provide oxygen. The blood vessels that supply this blood usually develop between weeks 16 and 36 of pregnancy.

If a baby is born early, and the development of these blood vessels is incomplete, there will be areas on the retina that do not receive enough oxygen. This triggers the production of chemicals to produce new blood vessels.

These new blood vessels are fragile and can leak blood causing scarring. This pulls the retina out of position, affecting the baby's ability to see properly.





The major reasons for babies developing ROP are being born prematurely and of low birthweight. In the past too much oxygen was found to be harmful to the production of healthy blood vessels and this is the reason that oxygen levels in the blood are monitored in all premature babies.

Premature babies are often given oxygen when they are born, particularly if their lungs are not yet fully formed. The amount of oxygen they receive will be monitored carefully to reduce the risk of abnormal blood vessels forming behind the retina and affecting the baby's eyesight.

## **What are the signs and symptoms of retinopathy of prematurity?**

There are no outward signs and symptoms but all premature babies born before week 32 of pregnancy or weighing less than 1.5kg are screened by an ophthalmologist (eye specialist) on a weekly or two-weekly basis.

## **How is retinopathy of prematurity normally diagnosed?**

ROP is only usually apparent 32 weeks after conception so babies born before this stage of pregnancy are given weekly or two-weekly screenings to check for any abnormal developments.

Before the examination, drops will be put in the baby's eyes to dilate the pupil. They will then use a head-mounted ophthalmoscope (a tool that allows them

to see inside the eye) to examine the baby's retinas. They may also use an indenter (a tiny rod) to press on the eyeball and get a better look. Sometimes a special camera (called a RetCam™) is used to take pictures of the retinas.

The test can be uncomfortable for the baby so the ophthalmologist will try to be as quick as possible. They may also give the baby a drop of sugar water on a dummy to relieve their discomfort.

The ophthalmologist will be able to see how much of the eye is affected and how severe any damage might be.

There are five stages of retinopathy of prematurity:

- **Stage 0** – No ROP
- **Stage 1** – Avascular zone (where blood vessels are yet to reach) – demarcated by a line dividing the avascular zone from normal vascular zone.
- **Stage 2** – Ridge (thick) divides avascular zone from vascularised retina
- **Stage 3** – Vascularisation of ridge and vessels growing into cavity of eye
- **Stage 4** – Subtotal detachment of retina starting from ridge
- **Stage 5** – When the retina has become completely detached from the back of the eye
- In addition, the ophthalmologist may describe pre-plus or plus disease where there is vascular congestion and dilatation.



## How is retinopathy of prematurity normally treated?

Most babies have mild ROP. If the baby has a mild form of retinopathy, they will not need any treatment as their condition will resolve itself and the retinopathy will not affect their vision as they grow older.

However, at its most severe, retinopathy of prematurity can cause total blindness.

There are various procedures that can:

- Help prevent the development of retinopathy. For example, destroying the areas of the retina that do not have blood vessels. This removes the need for the body to produce any more blood vessels.
- Help treat the results of retinopathy. For example, re-attaching the retina after it has been pulled out of position.
- More recently the use of ANTI-VEGF (a growth factor thought to promote ROP) has been advocated but this is controversial.

In all cases, the complicated nature of these procedures means they carry some risk of vision loss and intraocular haemorrhage (bleeding inside the eye).

## What happens next?

Babies who have had severe retinopathy of prematurity will need regular appointments with an ophthalmologist until they are at least five years old.

Only a very small percentage will experience impaired (or loss of) vision as they grow older, although they may be more at risk of developing other eye conditions such as a squint or the need for glasses later in life.

## More information

At GOSH, talk to our **Eye Clinic Liaison Officer** who can provide practical information, advice and support on all aspects on visual impairment. You can telephone her on 020 7405 9200 extension 0345, email her at [paula.thomas@gosh.nhs.uk](mailto:paula.thomas@gosh.nhs.uk) or visit her at your next clinic appointment.

Contact the **Royal National Institute of Blind People (RNIB)** – the national organisation for people affected by visual impairment. Visit their website or call their helpline on 0303 123 9999.

### Notes

Compiled by the Ophthalmology Department  
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