Title	**Screening and Treatment of Retinopathy of Prematurity**
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Related guidelines/policies:	Developmental Care – Positioning and Handling Sucrose use for Procedural Pain

1.0 Background

The provision of screening and treatment of Retinopathy of Prematurity in the West Midlands was investigated in 2004 by the West Midlands Neonatal Forum. The steering group made up of Ophthalmologists and Neonatologists subsequently produced a 'Good Practice Guide' in 2005[1]

In December 2007 an evidence based guideline covering the Screening and Treatment of Retinopathy was jointly published by The Royal College of Paediatrics and Child Health, The Royal College of Ophthalmologists and The British Association of Perinatal Medicine[2].

What follows is a summary of the parts of those documents that are relevant to staff working in Neonatal Units, it does not include guidance for Ophthalmologists.

2.0 Retinopathy of Prematurity

Retinopathy of Prematurity (ROP) is one of the few causes of childhood visual disability which is largely preventable. Many extremely preterm babies will develop some degree of ROP although in the majority this never progresses beyond mild disease which resolves spontaneously without treatment. A small proportion develop potentially severe ROP which can be detected through retinal screening. If untreated, severe disease can result in visual impairment and consequently all babies at risk should be screened[2].

3.0 Screening

3.1 Screening Criteria

The joint guideline[2] outlines a group of babies who ***must*** be screened, these are all babies less than 31 weeks gestational age (up to 30^{+6}) or less than 1251g birthweight.

However they feel it is good practice to screen a slightly larger group to ensure capture of all infants who may be at risk. All Screening Ophthalmologists working within the network have undertaken to screen this larger group.

Therefore, all babies less than 32 weeks gestational age (up to 31^{+6}) *or* less than 1501g birth weight should be screened.

3.2 Timing of First Screening Examination
The guidance on timing of first screen now depends upon the baby's gestation.

	Timing of First ROP Screen	
Gestational Age (weeks)	**Postnatal weeks**	**Postmenstrual age**
22	**8**	**30**
23	**7**	**30**
24	**6**	**30**
25	**5**	**30**
26	**4**	**30**
27	**4**	**31**
28	**4**	**32**
29	**4**	**33**
30	**4**	**34**
31	**4**	**35**

If possible, all babies <32 weeks gestational age should have their first ROP screening examination prior to discharge, however discharge should not be delayed in order to achieve this.

Babies >32 weeks gestational age but with birthweight <1501 grams
the first ROP screening examination should be undertaken between 4 to 5 weeks (i.e. 28-35 days) postnatal age.

There may be clinical or organisational circumstances which prevent screening examinations being performed when scheduled. The decision to postpone screening should be made by a Consultant, and the reasons for doing so should be clearly stated in the baby's medical record. The examination should be rescheduled within one week of the intended examination**.**

3.2 Timing of Subsequent Examinations
This will be decided upon by the Screening Ophthalmologist depending upon their findings.

3.3 The Screening Examination
Screening can be stressful for both babies and parents. Both will require adequate preparation.

Parents of babies due for screening should be informed about the procedure and be given suitable written information before screening is started.

Babies will require Mydriatic eye drops (Cyclopentolate 0.5% and Phenylephrine 2.5%) prior to screening. These dilate the pupil and enable adequate views of the retina.
One to two drops of both mydriatics in each eye 1 hour prior to screening is recommended.

The examination can be painful, especially if an eyelid speculum is used. Topical anaesthetic eye-drops should be considered in this situation.

ROP examinations can have short-term effects on blood pressure, heart rate and respiratory function in the premature baby. The examinations should be kept as short as possible and precautions taken to ensure emergency situations can be dealt with promptly and effectively

Comfort care techniques, such as administration of Sucrose, nesting, swaddling and/or the use of a pacifier should be employed during the examination to reduce stress for the baby.

Ophthalmological Notes should be made after each examination. These should document the extent of the changes and include a recommendation for the timing of the next examination. They should be kept within the baby's medical record.

3.4 Termination of Screening

Screening can be stopped when a baby is no longer at risk of sight threatening ROP. The Screening Ophthalmologist will decide when it is safe to stop screening each individual baby.

4.0 Treatment

Timely treatment for ROP is effective at preventing severe vision impairment. Recent evidence shows some benefit from treating at slightly earlier stages of disease than was previously thought.

4.1 Preparations for Treatment

The Screening Ophthalmologist will decide when treatment is required. This should be organised within 48-72 hours of discovery on screening. Babies with more aggressive disease should be treated with more urgency - within 48 hours of diagnosis.

Laser treatment must only be undertaken by trained staff in an appropriate setting, within a unit that is used to providing neonatal intensive care. The area used should be 'Laser Safe'[3] and have all the equipment required for provision of Neonatal intensive care.

Within the SWMNN the following Ophthalmologists treat ROP at the following centres…

Miss Lucy Butler	-	Birmingham Women's, City, Worcester
Miss Tina Kipioti	-	Heartlands
Mr John Barry	-	Birmingham Children's

4.2 The Procedure

The Treating Ophthalmologist should speak to the parents and gain informed consent prior to starting the procedure.

Drugs for local eye management should be given as advised by the Ophthalmologist. *Cyclopentolate 0.5% and Phenylephrine 2.5%, one to two drops 30 minutes and one hour prior to start of treatment is usually effective*.

Adequate analgesia and sedation must be given for the procedure, as well as Atropine to reduce the reflex bradycardia induced by handling the eyeball. Each unit should draw up a written guideline for this according to their local experience and their Ophthalmologist's preferences.

Regimen currently used with the Network include :

General Anaesthesia
Sedation with Midazolam and Morphine and Ventilation
Sedation and Paralysis with Ventilation
Sedation with Ketamine +/- Morphine and Ventilation

Babies should be monitored during and after their treatment. In addition to their Neonatal Nurse, an experienced clinician (Middle grade, Staff grade, ANNP or Consultant) should stay close to the cot-side during treatment. A Consultant Paediatrician should also be available.

4.2 Post Operative Care

The Ophthalmologist will guide the post-operative care, which usually involves regular eyedrops. The baby should be re-examined 5-7 days after the procedure, and then on a weekly basis.

If a second treatment is required, this would usually be performed 10-14 days after the initial procedure.

5.0 Follow up

Babies who are discharged from hospital before being discharged from ROP screening must be recalled as an outpatient The appointment date should be given to parents before discharge, and the importance of attendance should be explained.

All babies who develop Grade 3 ROP, which resolves spontaneously and those treated for ROP should remain under Ophthalmology follow-up until at least 5 years of age.

6.0 Organisation of services

Effective services for ROP screening and treatment must be embedded in a robust organisational structure, with individual responsibilities identified.

Units should have written protocols outlining local procedures for screening and treatment of ROP.

A record of all babies who require review and the arrangements for their follow-up must be kept.

If babies are transferred either before ROP screening is initiated or when it has been started but not completed, it is the responsibility of the Consultant Paediatrician to ensure that the Neonatal team in the receiving unit is aware of the need to start or continue ROP screening. Screening status and the need and arrangements for further screening must be recorded in all transfer letters

7.0 Supporting information/References

1 West Midlands Neonatal Forum ROP good practice Guideline

2 UK Retinopathy of Prematurity Guideline – 2008. RCPCH, RCOphth, BAPM

3 Health and Safety information about Laser use

8.0 Related patient information

RCPCH / RCOphth ROP Parent Information Leaflet

ROPARD website

RNIB website – ROP web-pages

9 Audit

The Ophthalmologists will undertake regular audit of their work within this area.

Suggested topics for Neonatal Staff include…

- Adequacy of Parent information
- Completeness of screening programme
- Timing of first screen
- Screening before discharge for babies <32 weeks
- Outpatient follow-up of babies discharged before screening ends
- Adequacy of transfer information

It would be interesting to perform Network wide audits comparing frequency of ROP requiring treatment in the different units across the network.