

French recommendations for the screening of retinopathy of prematurity

*Written by Amandine BARJOL, Anne-Laure LUX, Sophie SOUDEE, Florence METGE and Georges CAPUTO, validated by the French Retinopathy of Prematurity Study Group (**GEFROP**) and the French Association of Strabology and Pediatric Ophthalmology (**AFSOP**)*

Retinopathy of Prematurity (ROP)

Retinopathy of Prematurity (ROP) is related to the retinal vascular immaturity in preterm infants and changes in oxygen pressure surrounding the birth and neonatal resuscitation. The postnatal development of the retinal vasculature should be monitored because some of these infants will develop a potentially vision-threatening retinopathy in the absence of adapted treatment.

The normal vasculature develops centrifugally, from the optic disc to the periphery.

ROP is described according to 5 stages and 3 zones. (Table 1 and Figure 1)

Table 1. International classification of ROP

Stage 1	Demarcation line
Stage 2	Ridge
Stage 3	Extraretinal proliferation/neovascularization
Stage 4	Partial retinal detachment
	A: macula not involved
	B: macula involved
Stage 5	Total retinal detachment
Preplus disease	Increased vascular tortuosity
Plus disease	Dilation and vascular tortuosity involving at least two quadrants

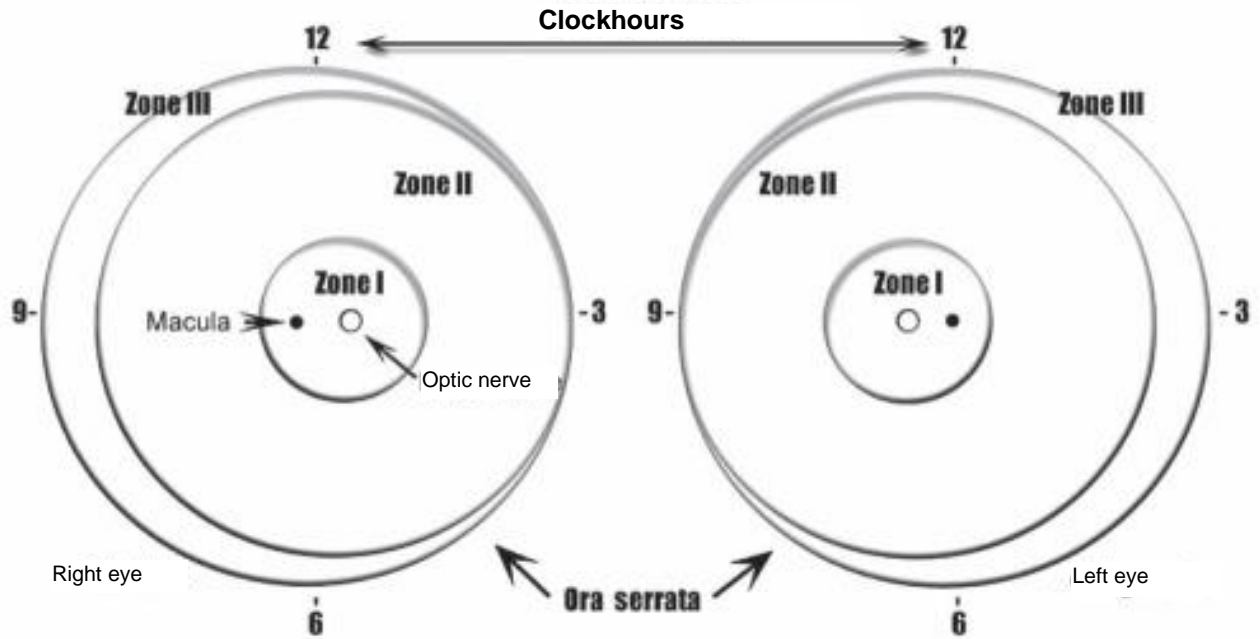


Figure 1: Three zones of ROP development

Who should be screened?

- Infants born <31 weeks of amenorrhea regardless of birth weight
- AND
- Infants weighing <1,251 grams at birth
 - Infants weighing 1,250-2,000 grams if risk factors:
 - Prolonged oxygenotherapy
 - Sepsis
 - Prolonged use of inotropic agents

When should the screening be carried out?

- Infants born <27 weeks of amenorrhea: Initial screening at 31 weeks of PMA
- Infants born ≥27 weeks of amenorrhea: Initial screening at 4 weeks of corrected age (CA)

Screening schedule table

Birth term Weeks of amenorrhea (WA)	1 st Fundus Examination Corrected age Post menstrual weeks (PM)
<27 WA	31
27	31

28	32
29	33
30	34

How should the screening be carried out?

1. Pupil dilation in each eye with
 - Neosynephrine 2.5%: 1 drop 30 minutes before examination
 - Mydriaticum 0.5%: 1 drop 25 minutes before examination and a second drop 20 minutes before examination.
2. Use of a lid speculum:
3. Fundus examination

Two fundus visualization techniques are possible:

- Headset indirect ophthalmoscopy with 28-30 diopter lens, performed by a trained ophthalmologist.
- Retinal imaging with wide-field camera. Images should be read by an expert ophthalmologist.

Quality criteria:

- Visualization of the posterior pole: search for venous dilation and/or arterial tortuosity of vessels emerging from the optic disc (four quadrants)
- Visualization of the retinal periphery, if possible up to the ora serrata in the nasal, temporal, upper and lower quadrants.

Pain relief

Topical anesthetics (oxybuprocaine) should be administered and a sweet sucking used, associated with the child swaddling to minimize discomfort and stress related to the examination. The child should be held by a team member while the examiner carries out the examination.

Follow-up examinations

The ophthalmologist sets the date of the next fundus examination.

- Follow-up of one week or less:
 - Stage 1 or 2 ROP in zone I
 - Stage 3 ROP in zone II

- Follow-up of 1-2 weeks:
 - Immature vasculature (stage 0) in zone I
 - Stage 2 ROP in zone II
 - Regressive ROP in zone I

- Follow-up of 2 weeks:
 - Stage 1 ROP in zone II
 - Regressive ROP in zone II

- Follow-up of 2-3 weeks:
 - Stage 1 or 2 ROP in zone III
 - Regressive ROP in zone III

Treatment

Laser photocoagulation is the gold standard.

It is indicated in high-risk prethreshold ROP (type 1):

Prethreshold type 1 ROP
Zone I: any stage 3 or plus disease
Zone II: stage 2 or 3 WITH plus disease

It is performed under general anesthesia in the operating room. The entire avascular retina from the ridge to the ora serrata should be treated.

Anti-VEGF injection is currently under evaluation. It should be discussed on a case-by-case basis. It is indicated in the aggressive posterior forms of zone I, and more generally when the avascular zone is still important such as in stages 3 zone I. In any case, a close and prolonged monitoring is essential because of the frequency of recurrences. Indeed, an additional laser treatment is often required. The injected dose should be adjusted: 0.675 mg or 0.337 mg per eye.

Duration of ROP screening

The fundus monitoring should be maintained until complete vascularization or regression of retinopathy in moderate forms (stages 1-2 zones II-III).
 If treated, the fundus should be reexamined until laser pigmentation and regression of the plus disease/ridge flattening.

After anti-VEGF injection, the fundus should be monitored until complete vascularization. An angiogram is recommended. In case of non-vascularization, additional laser treatment will be carried out.

Long-term follow-up

Any preterm infant is at increased risk of refractive, oculomotor or neurovisual disorders. A systematic ophthalmological assessment, including orthoptic assessment, cycloplegia and fundus examination is recommended around the age of 1, 3 and 5 years.

Responsibilities concerning ROP screening

- Any neonatology department admitting high-risk preterm infants should organize the screening of such patients
- If infants are transferred from one unit to another, arrangements should be made to ensure a suitable ophthalmological monitoring. Results of ROP screening should be accurately transferred to the receiving unit.

The planning of the return to home should include provisions for any indicated ophthalmological examination and monitoring. Parents should understand the importance of such examinations.