

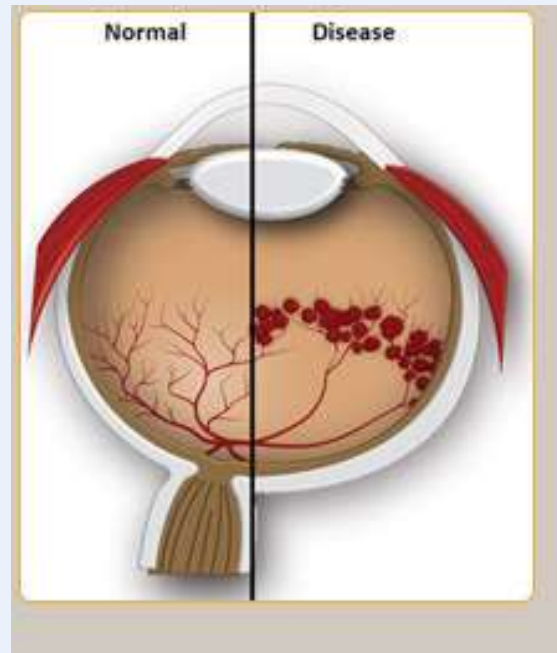
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Screening for Retinopathy of Prematurity

Dr. A. van der Byl
Dec 2014

What is ROP?

- ▶ Disorder of the developing retina of preterm infants
 - ▶ Affects immature vasculature
 - ▶ May lead to neovascularization
 - ▶ Progress to retinal detachment
 - ▶ Blindness



Stevie Wonder
1950: 6 weeks prematurely

Scope of the problem

- ▶ South Africa : ‘Third epidemic of ROP’
 - ▶ More premature babies survive due to improved care
BUT
 - ▶ Infants with higher birth weights are at risk due to
LACK OF
 - ▶ Equipment to administer blended oxygen
 - ▶ Equipment to monitor oxygen (O₂) saturation
 - ▶ Skills, inadequate staffing
 - ▶ Resources to screen
- ▶ +/- 16 000 babies at risk each year
 - ▶ Few studies, but +/- 4 to 7% of VLBW had stage 3 or worse
 - ▶ In schools for the blind: 10.6% was due to ROP



ROP in the South African Context

Guideline for the prevention, screening and treatment of retinopathy of prematurity (ROP)

L Visser, R Singh, M Young, H Lewis, N McKerrow (ROP Working Group, South Africa)

S Afr Med J 2013;103(2):116-125.



SA ROP Screening Guidelines:

WHO should be screened?

- ▶ Born before 32 weeks' gestation
 - ▶ Birthweight less than 1 500 g
 - ▶ Preterm weighing 1 500 to 2 000 g with risk factors:
 - ▶ Family history
 - ▶ Cardiac arrest
 - ▶ Multiple blood transfusions (>2)
 - ▶ Exchange transfusion
 - ▶ Severe HIE (asphyxia)
 - ▶ Suboptimal oxygen monitoring
(?unable to provide blended oxygen/air mixture)
-



SA ROP Screening Guidelines: **WHEN?**

- ▶ 4 – 6 weeks chronological age **OR**
31 – 33 weeks post-conceptual age
(which ever comes later)
- ▶ Before 37 weeks post-conceptual age

*If born at <28 weeks gestational age, screen at 6 weeks after birth,
If born at >28 weeks, screen at 4 weeks



SA ROP Screening Guidelines: **WHERE & BY WHOM?**

- ▶ As inpatient or outpatient
- ▶ By Ophthalmologist

- ▶ Adequate monitoring for apnoea
- ▶ Basic resuscitation equipment
- ▶ Support for Ophthalmologist & patient



SA ROP Screening Guidelines:

PREPARATION?

- ▶ **Cyclomydril (to dilate pupils)**
 - ▶ 1 drop to each eye every 15 – 20 minutes (3 times)
 - ▶ Commence 45 - 60 minutes prior to eye exam
- ▶ **Benoxinate (local anaesthetic)**
 - ▶ 1 drop to each eye at outset
- ▶ **Chloramphenicol (topical antibiotic)**
 - ▶ 1 drop at end of exam



SA ROP Screening Guidelines:

PREPARATION?

▶ Monitor for side effects:

- ▶ Apnoea
- ▶ Desaturation
- ▶ Bradycardia or Tachycardia
- ▶ Fever
- ▶ Vasodilation
- ▶ Restlessness
- ▶ Delayed gastric emptying
- ▶ Urinary retention
- ▶ Light sensitivity (dim lights, cover eyes)

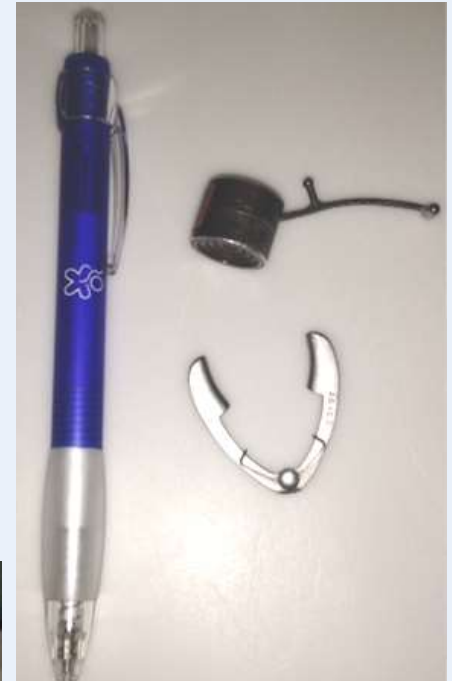
▶ Prevention of systemic absorption:

- ▶ Gentle pressure over nasolacrimal duct for 1 minute after instillation
-



SA ROP Screening Guidelines: **HOW?**

- ▶ Minimize pain/discomfort
 - ▶ Anaesthetic eye drops
 - ▶ Pacifier and oral sucrose (Syrup simplex)
- ▶ Examination by Ophthalmologist
 - ▶ Pupils must be adequately dilated
 - ▶ Binocular indirect ophthalmoscopy
 - ▶ Detailed notes



Sauer Infant Speculum

Screening Form

Appendix VII. ROP screening form

Date booked for examination:	_____	Hospital booked at:	_____
Name:	_____	Hospital number:	_____
Date of birth:	_____	Sex:	_____
HIV-exposed/-unexposed/unknown:	_____	Multiple birth (1,2,3):	_____
Birth weight (g):	_____	Growth at birth – AGA/SGA/LGA:	_____
Gestational age at birth:	_____	CPAP:	_____ Nasal O ₂ :
Duration of oxygen	_____ IPPV:	_____	_____

Indication for ROP screening in this patient: please tick appropriate box:

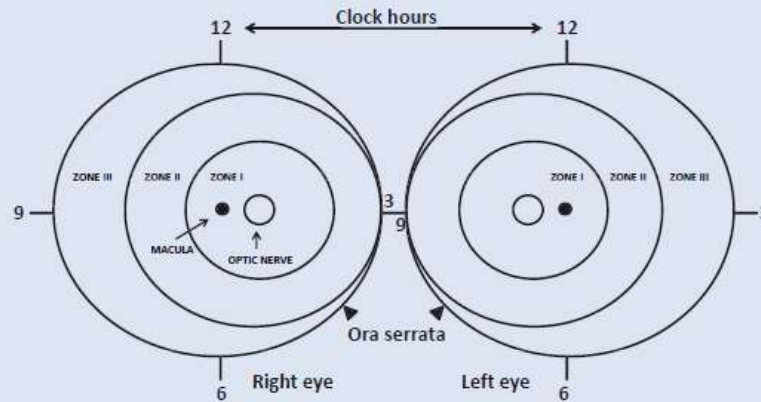
- weight <1 500g
- gestational age <32 weeks at birth
- weight 1 500 - 2 000 g with unstable clinical course

Examination

Date: _____ Examiner initials: _____ Current age: _____

Anterior segment: _____

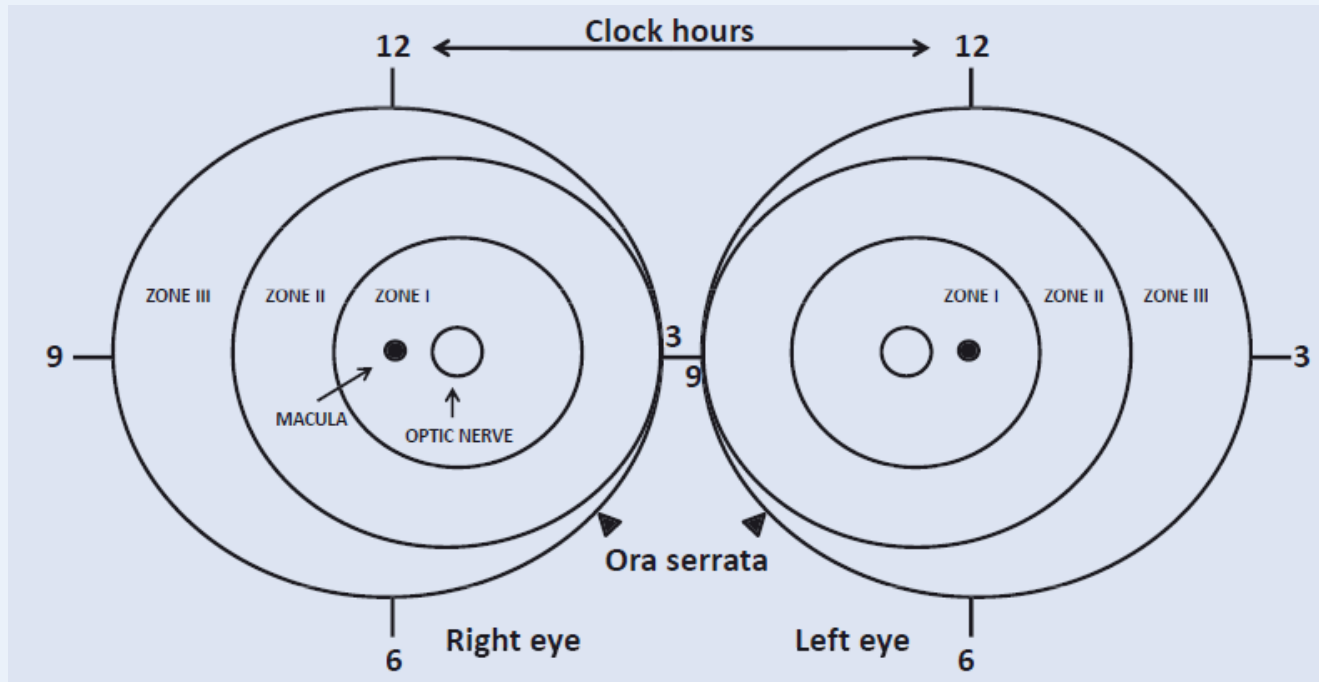
Fundus



Stage: _____

Plan: _____

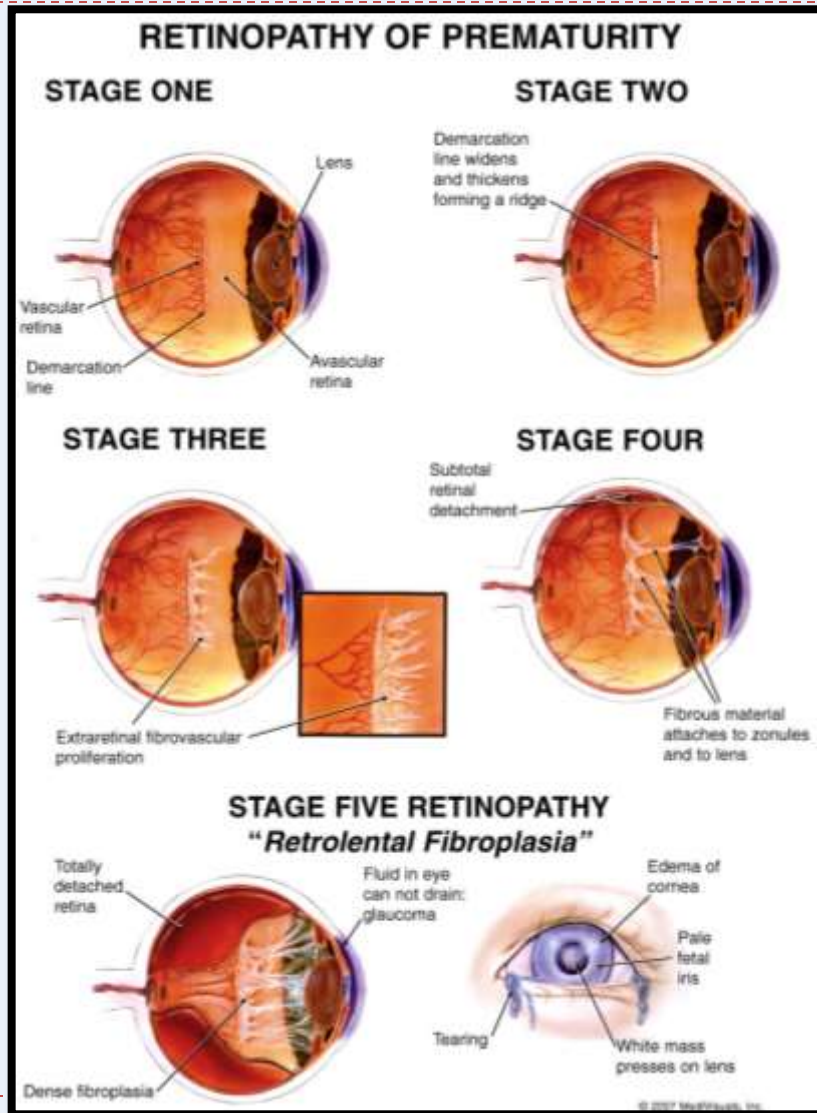
ROP Location



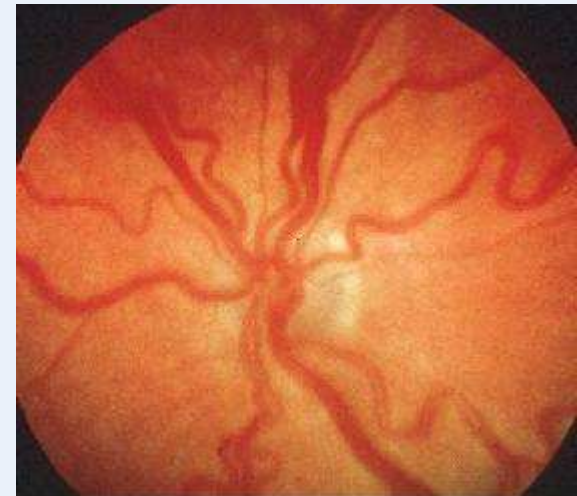
- ▶ Location
- ▶ Circumferential extent



ROP Staging & Severity



- ▶ With or Without Plus Disease
 - ▶ Vascular dilation & tortuosity



- ▶ Threshold Disease
 - ▶ 50% likelihood to progress to retinal detachment

SA ROP Screening Guidelines: **HOW?**

- ▶ Follow up as recommended
- ▶ Communicate with guardians
 - ▶ Counsel regarding ROP, consequences, follow up
 - ▶ Document conversations



Prevention of ROP

- ▶ Preventable cause of blindness
- ▶ Greatest risk factor: **Oxygen therapy**
 - ▶ Hyperoxia causes damage to many organ systems
 - ▶ O₂ needs to be prescribed

Oxygen delivery	Flow (l/min)	FiO ₂ (%)
Nasal cannula		
High flow nasal cannula		
CPAP _____ cmH ₂ O		
Maintain Oxygen Saturation:	_____ to _____	%
If on O ₂ : Wean FiO ₂ if Sats	More than _____	%

- ▶ O₂ saturation must be monitored **continuously**
- ▶ Documentation



SA ROP Screening Guidelines: Oxygen Therapy

▶ Oxygen-air blender



▶ Pulse oximetry



▶ Aim for Sats of 88 – 92%

Appendix I. Oxygen saturation guideline*

Pulse oximeter saturation guideline for preterm neonates receiving supplemental oxygen

- (i) Babies receiving or likely to require supplemental oxygen should be monitored by continuous pulse oximetry.
- (ii) All neonates receiving supplemental oxygen (ventilator, CPAP, nasal prongs or head box oxygen) should be monitored with a pulse oximeter and saturation should be recorded. Oxygen should be humidified.

Infants	PaO ₂ (kPa)	Saturation range	Alarm limits
Preterm <36 weeks	6.5 - 9.0	88 - 92%	86 - 94%
CLD and 36 weeks PMA	8.0 - 10.0	90 - 95%	88 - 96%

PaO₂ = partial oxygen pressure; PMA = postmenstrual age.

- (iii) Nasal prong oxygen therapy: flow should be 0.5 - 1 l/min. A blender should be used to administer oxygen.
- (iv) Head box oxygen: flow should be 2 - 3 l/kg/min. Head box oxygen is not recommended, but if utilised, arterial saturation of oxygen should be monitored with pulse oximetry (SpO₂).
- (v) Pulse oximetry upper alarm should never be set at 100% if infants are receiving supplemental oxygen.
- (vi) Avoid SpO₂ changes >93 - 95% in very low birth weight infants (VLBW) (<1 500 g).

*Askie LM, Henderson-Smart DJ, Irwig L, Simpson JM. Oxygen-saturation targets and outcomes in extremely preterm infants. N Engl J Med 2003;349:959-967.

Medical Negligence Claims

- ▶ Hospital/Doctor/Nursing Staff

- ▶ Failure to: monitor and maintain safe Saturation levels
refer to Ophthalmologist for screening

- ▶ Ophthalmologist

- ▶ Failure to: inform parents
perform follow up
diagnose
treat

- ▶ **Damages will include**

- ▶ Cost of: special equipment
treatment & therapy
- ▶ Loss of earnings

In America:
Payouts of
\$1 to 6 million



Medical Negligence Claims: SA

DailyNews

Mom wins R7.5m hospital claim

October 7 2014 at 10:26am

By SHERLISSA PETERS

1.26 kg baby born in 2006



The Future in Screening: Telemedicine

- ▶ Retcam II: digital wide-field retinal imaging system with remote interpretation
 - ▶ Useful if limited ROP screening personnel
 - ▶ Non-physician personnel trained
 - ▶ Safe & easy to use
 - ▶ Reliable & accurate



▶ **BEYOND CHILD SURVIVAL**

- ▶ Focus on prevention...
- ▶ Screen appropriately...
- ▶ Treat early...



Kushandwizdom.tumblr



Thank you...

▶ Reference

- ▶ VISSER, L et al. Guideline for the prevention, screening and treatment of retinopathy of prematurity (ROP). **South African Medical Journal**, [S.l.], v. 103, n. 2, p. 116-125, nov. 2012. ISSN 2078-5135. Available at: <http://www.samj.org.za/index.php/samj/article/view/6305/4865>
- ▶ Date accessed: 29 Oct. 2014. doi:10.7196/samj.6305.

