

# REVISITING THE ROPScore: NEW EVIDENCES AND RECOMMENDATIONS FOR USERS

João Borges Fortes Filho, Gabriela Unchalo Eckert, Marcia Beatriz Tartarella, Bárbara Gastal Borges Fortes, Renato Soibelman Procianny

PROROP INVESTIGATIVE GROUP ON ROP / UFRGS / UNIFESP - BRASIL

**BACKGROUND:** Birth weight (BW) and gestational age (GA) are the most important risk factors for ROP. Screening criteria for ROP are based in BW and GA.

**Appropriate screening for ROP is costly and demands a heavy workload for ophthalmologists as well stress and physical impairment to the neonate.**

**We previously published on the ROPScore:**

ROPScore was developed using only one transversal evaluation of the weight gain measured after completed the 6<sup>th</sup> week of life.

ROPScore can be helpful in order to reduce the excessive number of ocular examinations performed in the same patient during screening.

ROPScore is a very useful tool to be adopted by ophthalmologists in charge of screening examinations in preterm newborns to detect ROP.

**OBJECTIVES:** If the ROPScore is used only after the completed 6 weeks of life we calculated that around 18% of the infants will miss the opportunity to be screened using this score because they were discharged from the NICU before 6 weeks of life.

This study aims to demonstrate the utility of ROPScore to predict risk to ROP earlier than 6 weeks of life in order reduce unnecessary ocular examination during ROP screening. **In this way, we evaluated the use of ROPScore at the second week of life.**

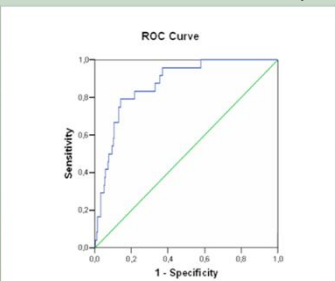
**METHODS:**

- **STUDY DESIGN:** a prospective and institutional-based cohort study, conducted from 2009 to 2012, included babies with BW  $\leq 1,500$  g and/or GA  $\leq 32$  weeks screened for ROP who survived from the initial ophthalmological examination performed between the 4th and 6th weeks of life to the post conceptional 45 weeks. There were no exclusion criteria.
- **SETTING:** HCPA in Porto Alegre RS, Brazil an University and tertiary hospital with a NICU with around 100 VLBW per year



- **CLINICAL OUTCOMES:** It was compared the number of eye examinations needed to be performed in each patient after the use of ROPScore with the number of examinations recommended by the Brazilian guidelines. This data was applied through a schedule model using ROPscore in patients with 2 weeks of life showing the reduction in the number of ocular exams.
- **STATISTICAL ANALYSIS:** UNIVARIATE / MULTIVARIATE / LOGSTIC REGRESSION (P < 0,05)
- **RECEIVER OPERATING CHARACTERISTIC (ROC) CURVES** Cutoff points for best performance of sensibility and predictive positive and negative values

**RESULTS:** Data on 235 VLBW preterm infants were included in the study



ROPScore AREA UNDER CURVE for severe ROP = 0,87 (P<0,001; IC95%: 0,81-0,93)

**Any stage of ROP**  
Cutoff value of ROPScore = 11,0

SENS = 94% (IC95% 87,9% - 97,5%)  
ESP = 25% (IC95% 20,9% - 30,0%)  
VPP = 28,0% (IC95% 23,6%-32,7%)  
VPN = 93,1% (IC95% 86,2%-97,2%)

**ROP grave**  
Cutoff value of ROPScore = 14,5

SENS = 96% (IC95% 78,9% - 99,9%)  
ESP = 59% (IC95% 54,3% - 63,5%)  
VPP = 11% (IC95% 7,0% - 15,8%)  
VPN = 99,6% (IC95% 98,0% -100%)

**Table 1. Demographic characteristics of the 235 included patients**

	Entire cohort
<b>Number of patients</b>	<b>235</b>
Mean BW (grams) *	1.230 ± 280
Mean GA (weeks) *	30 ± 2,2
Mean of weight gain at 6th week of life (grams) *	632,4 ± 242,7
ROPScore range (mean ± SD)	9,12-22,18 ( <b>13,9 ± 2,7</b> )

\*: Data presented in mean ± standard deviation; BW: birth weight; GA: gestational age

**We developed schedule diagrams to suggest ophthalmological examinations according to the ROPScore at second week of life and the babies GA.**

Esquema Padrão para Exames Oftalmológicos ROPScore de Muito Baixo Risco (E11.0)												
IG	26	27	28	29	30	31	32					
Exame 0 <sup>a</sup> semana	30	31	32	33	34	35	36					
Exame 2 <sup>a</sup> semana	31	32	33	34	35	36	37					
Exame 4 <sup>a</sup> semana	32	33	34	35	36	37	38					
Exame 6 <sup>a</sup> semana	33	34	35	36	37	38	39					
Exame 8 <sup>a</sup> semana	34	35	36	37	38	39	40					
Exame 10 <sup>a</sup> semana	35	36	37	38	39	40	41					
Exame 12 <sup>a</sup> semana	36	37	38	39	40	41	42					
Exame 14 <sup>a</sup> semana	37	38	39	40	41	42						
Exame 16 <sup>a</sup> semana	38	39	40	41	42							
Exame 18 <sup>a</sup> semana	39	40	41	42								
Exame 20 <sup>a</sup> semana	40	41	42									
Exame 22 <sup>a</sup> semana	41	42										
Exame 24 <sup>a</sup> semana	42											
Total de Exames	3 exames	3 exames	3 exames	3 exames	3 exames	3 exames	2 exames					
RISCO MÁXIMO	EXAMINAR SEMPRE.											

Esquema Padrão para Exames Oftalmológicos ROPScore de Baixo Risco (E14.0)												
IG	26	27	28	29	30	31	32					
Exame 0 <sup>a</sup> semana	30	31	32	33	34	35	36					
Exame 2 <sup>a</sup> semana	31	32	33	34	35	36	37					
Exame 4 <sup>a</sup> semana	32	33	34	35	36	37	38					
Exame 6 <sup>a</sup> semana	33	34	35	36	37	38	39					
Exame 8 <sup>a</sup> semana	34	35	36	37	38	39	40					
Exame 10 <sup>a</sup> semana	35	36	37	38	39	40	41					
Exame 12 <sup>a</sup> semana	36	37	38	39	40	41	42					
Exame 14 <sup>a</sup> semana	37	38	39	40	41	42						
Exame 16 <sup>a</sup> semana	38	39	40	41	42							
Exame 18 <sup>a</sup> semana	39	40	41	42								
Exame 20 <sup>a</sup> semana	40	41	42									
Exame 22 <sup>a</sup> semana	41	42										
Exame 24 <sup>a</sup> semana	42											
Total de Exames	4 exames	4 exames	4 exames	3 exames	3 exames	3 exames	3 exames					
RISCO MÁXIMO	EXAMINAR SEMPRE.											

- **CONCLUSIONS:**
- **ROPScore** is an excellent index of cumulative risk factors to detect severe ROP.
- Includes risk factors easy to record by the **1st ophthalmological examination.**
- **More accurate than BW and GA to predict any stage or severe ROP in VLBW.**
- **ROPScore is independent from the previous established screening criteria.**
- ROPScore is simple enough to be routinely used by ophthalmologists during the screening sessions.
- **ROPScore is helpful if applied as soon as the baby completes his second week of life.**