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# **P-Score: A Reference-Image-Based Clinical Grading Scale for Vascular Change in Retinopathy of Prematurity**

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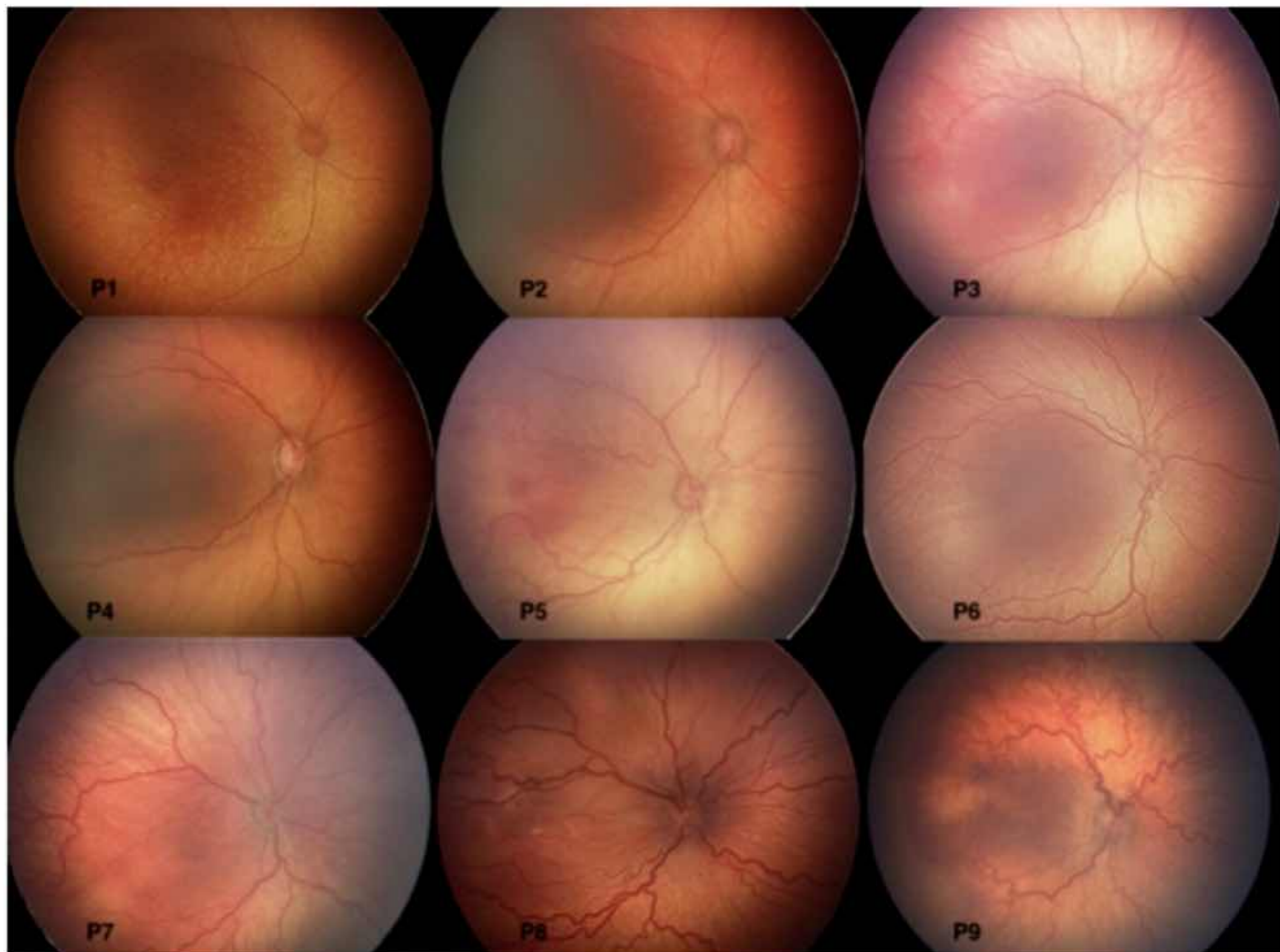
International Classification of Retinopathy of Prematurity Committee

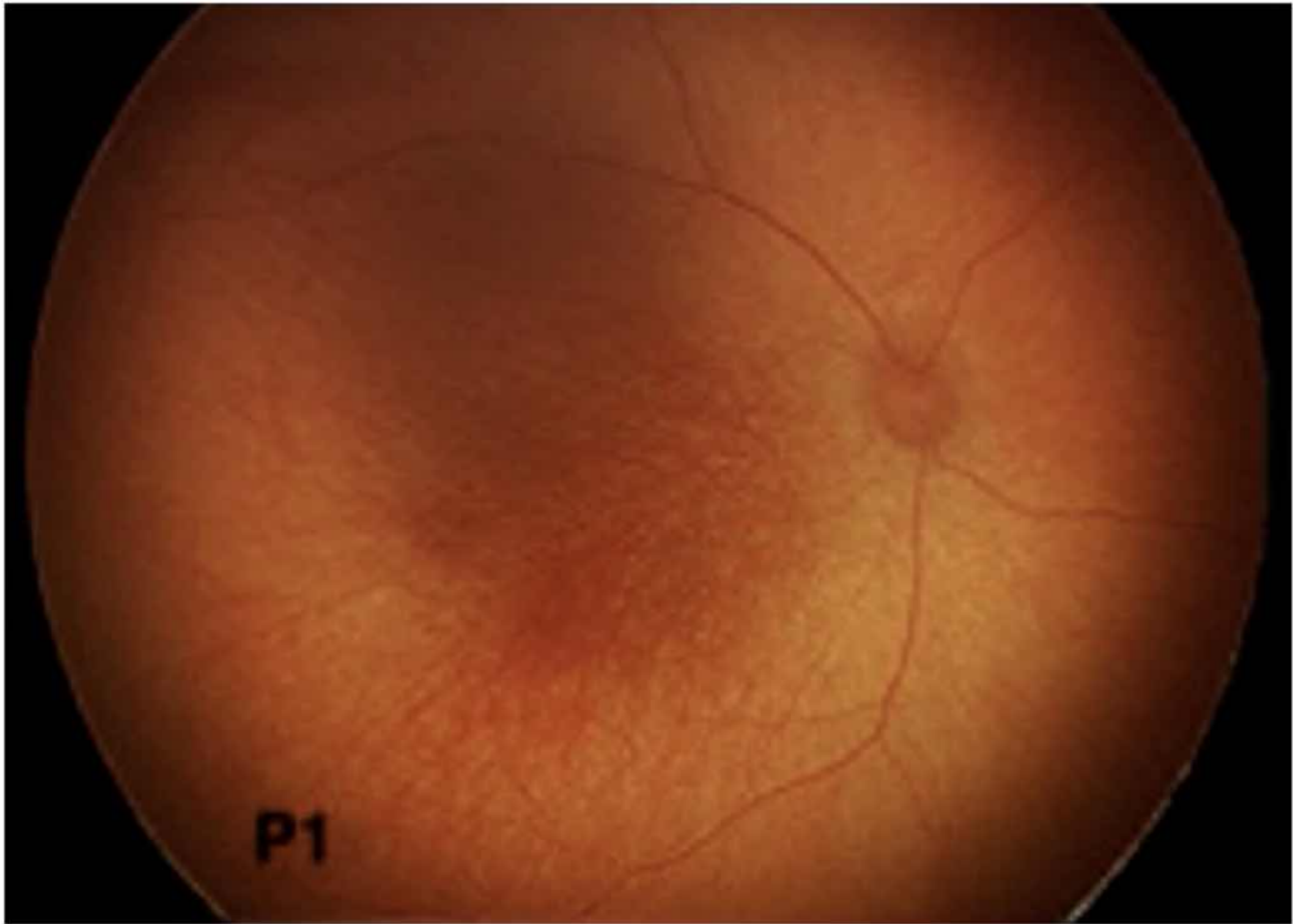
**Purpose:** The International Classification of Retinopathy of Prematurity Third Edition (**ICROP3**) acknowledged that plus-like ROP vascular changes occur **along a spectrum**.

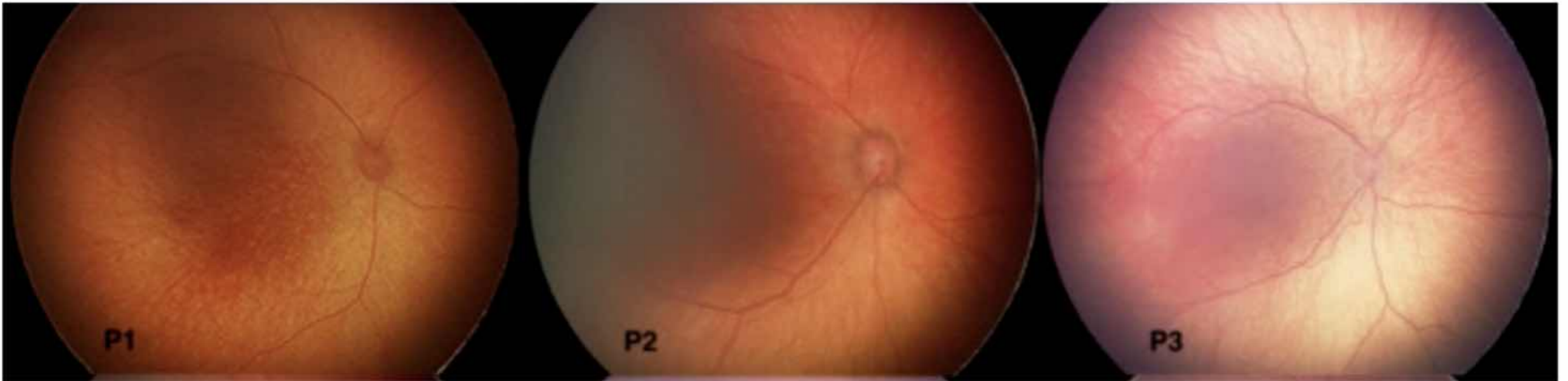
Historically, clinician-experts demonstrate **variable agreement** for plus diagnosis.

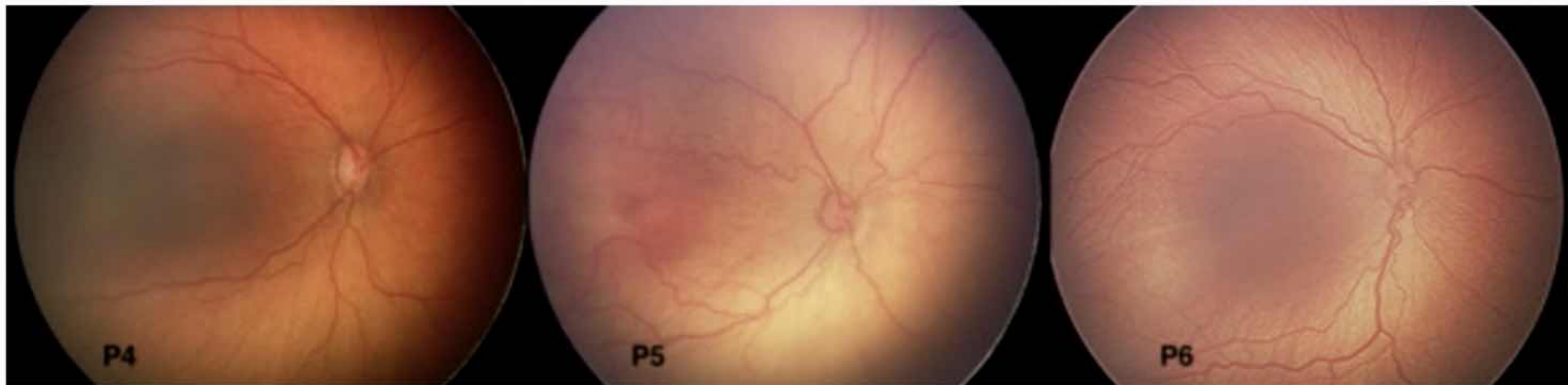
We developed a **9-photo reference-image** set for grading plus-like changes and **compared intergrader agreement** of the set to standard grading **with no-plus/pre-plus/plus**.

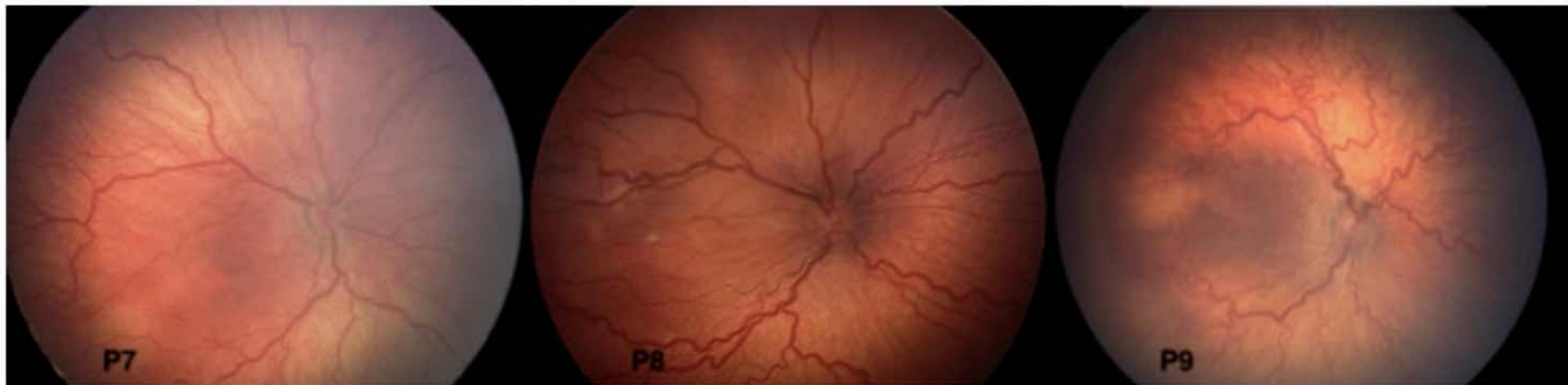
# 9-photo reference-image set











**Design:** Retinal photographic grading and expert consensus opinion

PARTICIPANTS:

- **Development:** 34 international ICROP3 committee members.
- **Validation:**
  - 30 ophthalmologists with ROP expertise
    - (15 ICROP3 committee members, 15 non-ICROP3 members)



## **METHODS:**

Nine ROP fundus images (**P1 through P9**) representing **increasing degrees of zone I vascular tortuosity and dilation**, based on ICROP3-committee's 34 members' gradings and consensus image review, were used to establish standard photographs for the "Plus (P) Score."

Study participants graded 150 fundus photographs two ways, **separated by a 1-week washout period:**

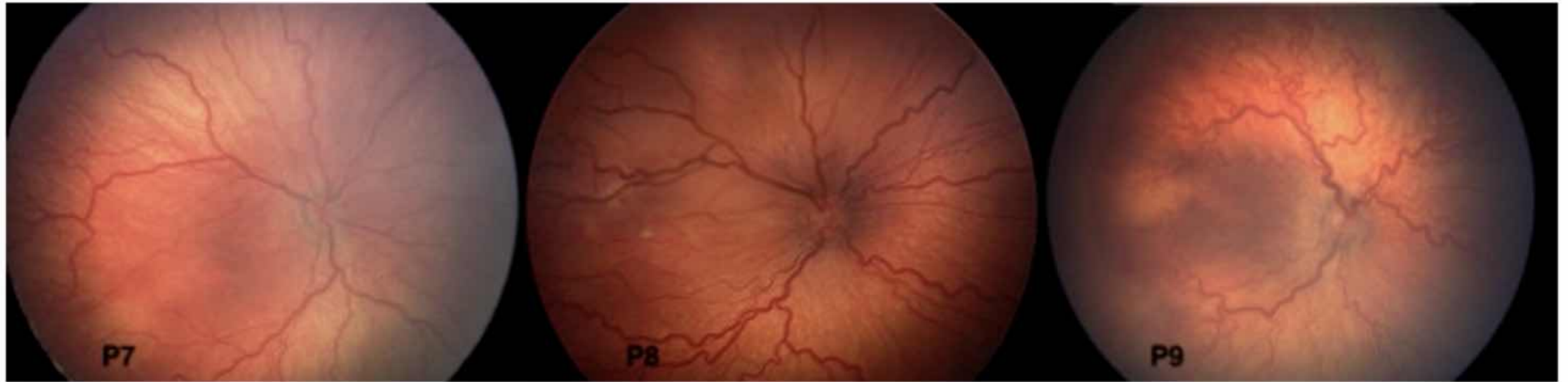
- (1) no-plus/pre-plus/plus disease,
- (2) choosing the closest P-Score image.

## Main outcome measures:

Intergrader agreement measured by intraclass correlation coefficient (ICC)

## RESULTS:

- Intergrader agreement was higher using P-Score (ICC **0.75**, 95% CI 0.71-0.79) than no-plus/pre-plus/plus (ICC **0.67**, 95% CI 0.62-0.72).
- Mean P-Scores for images whose mode gradings were
  - no-plus, pre-plus, and plus, were **2.5** (SD 0.7), **4.8** (SD 0.8), and **7.4** (SD 0.8), respectively.



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## Conclusions:

- **Intergrader agreement** of plus-like vascular change in ROP using the P-Score is **high**.
- We recommend incorporation of this **9-image reference set** into ICROP3 and **clinician daily practice** alongside zone/stage/plus.
- P-score is **not** yet meant to replace plus diagnosis for treatment decisions, but its use at our institutions has permitted **better comparison between examinations for progression and regression, communication between examiners, and documentation of vascular change without fundus imaging**.
- P-score also could provide more detailed ROP classification for clinical trials, consistent with the spectrum of plus-like change that is now formally part of ICROP.