Evaluation of Hypoxic QC™
a QC material with a physiological oxygen saturation curve, for the verification of accuracy and precision of low \( pO_2 \) measurements

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Introduction
Existing Quality Control (QC) materials have a poor oxygen buffering. Thus, QC measurements at extremely low \( pO_2 \) values tend to have large ranges of variation.

This study details the performance characteristics of Hypoxic QC™, a ready-to-use pre-tonometered quality control that allows verification of \( pO_2 \) measurement methods at levels of 15 to 35 mmHg (2.0 to 4.5 kPa).

Performance and commutability
Hypoxic (under the name of TonomeTrol) has been utilized by the Wales External Quality Assessment Scheme (WEQAS) in their program. Results of 1457 participants are represented below (in red). For comparison, results of 1432 participants with a traditional aqueous material are represented (in blue). Bars represent 1 standard deviation.

Hypoxic clearly demonstrates superior performance overall as well as per analyser. Moreover, Hypoxic provides high commutability.

Saturation Curve
Hypoxic QC was compared against whole blood tonometry (Zijlstra et al., 2000) for recovery of partial pressure of oxygen (\( pO_2 \)) and oxygen saturation (\( sO_2 \)) values.

- \( pO_2 \) was measured on a Siemens RapidLab 855 blood gas analyzer.
- \( sO_2 \) was measured on Ciba-Corning Model 270 CO-Oximeter.
- Saturation data on fresh whole blood were adopted from Zijlstra et al., 2000.

Open ampoule stability
Ampoules were opened and left open on the table prior to measurement on an ABL510. Time interval varied from 0 to 30 minutes. \( pO_2 \) values were stable for well over 10 minutes.

Conclusions
Hypoxic / TonomeTrol • properties similar to fresh patient samples
• ideal to assess \( pO_2 \) accuracy
• down to 15 mmHg (2.0 kPa)
• ready-to-use on most common BGE analyzers
• highly stable \( pO_2 \) values after opening

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