



## Motivation

Cardiopulmonary bypass (CPB) poses a significant risk to patient homeostasis, making continuous acid-base balance monitoring essential. This is done using blood gas analyzers (BGAs).

### Preference

Perfusionists at IKEM have their own preferences in the use of blood gas analyzers. Used BGAs by IKEM include the B-Capta, BMU 40, and CDI 500.

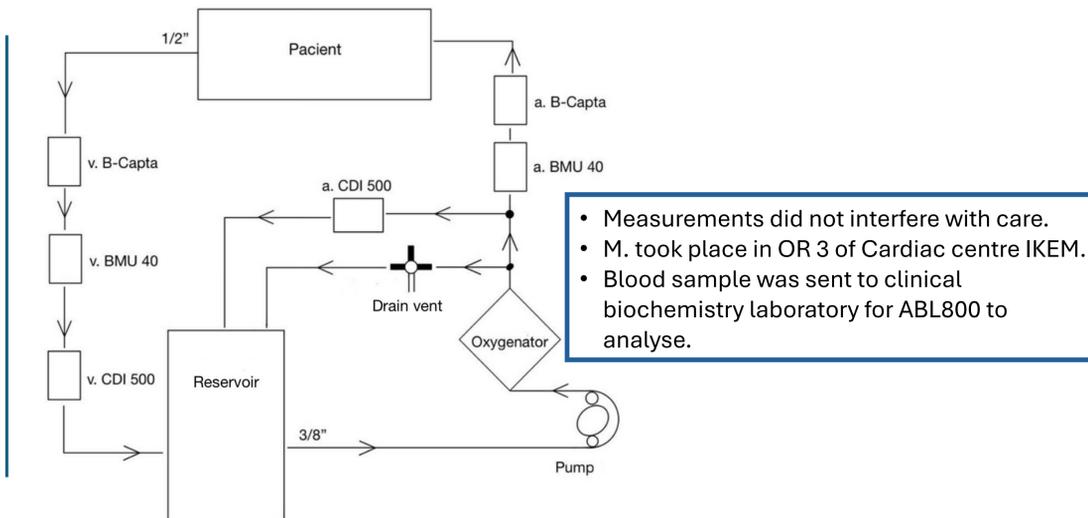
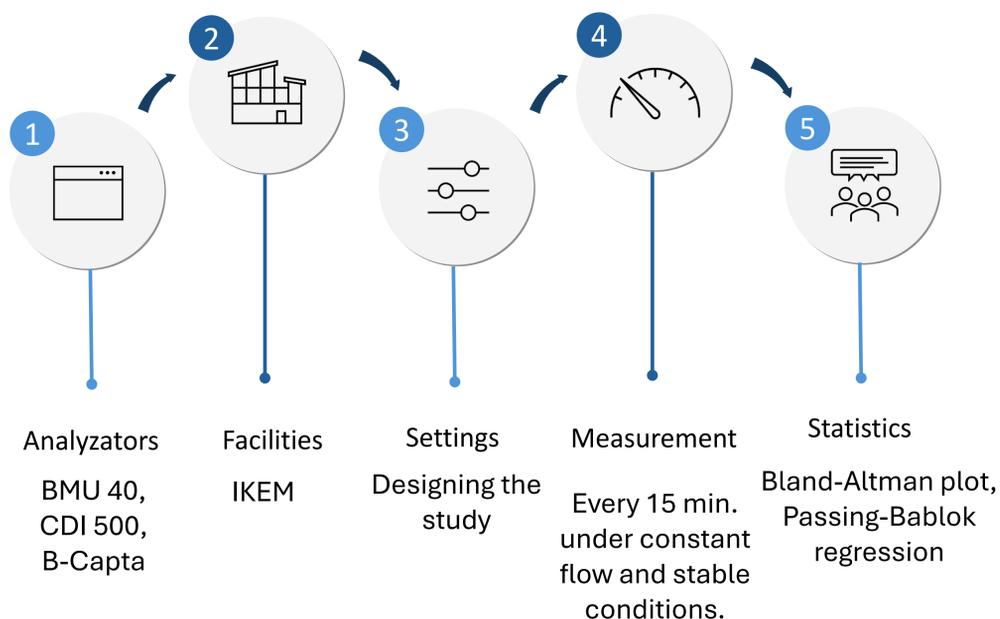
### Transition

IKEM is transitioning fully to B-Capta. The BMU 40 will be phased out, while the CDI 500 will be reserved for cases requiring the highest measurement accuracy.

### Need for statistical evaluation

Measurements from BMU 40, CDI 500, and B-Capta will be compared after calibration against laboratory results from the ABL800. The analysis will focus on arterial partial oxygen pressure (pAO<sub>2</sub>) and total hemoglobin concentration (HGB).

## Methods



- Measurements did not interfere with care.
- M. took place in OR 3 of Cardiac centre IKEM.
- Blood sample was sent to clinical biochemistry laboratory for ABL800 to analyse.

Fig. 1: Diagram of cuvette integration into the CPB system

## Results

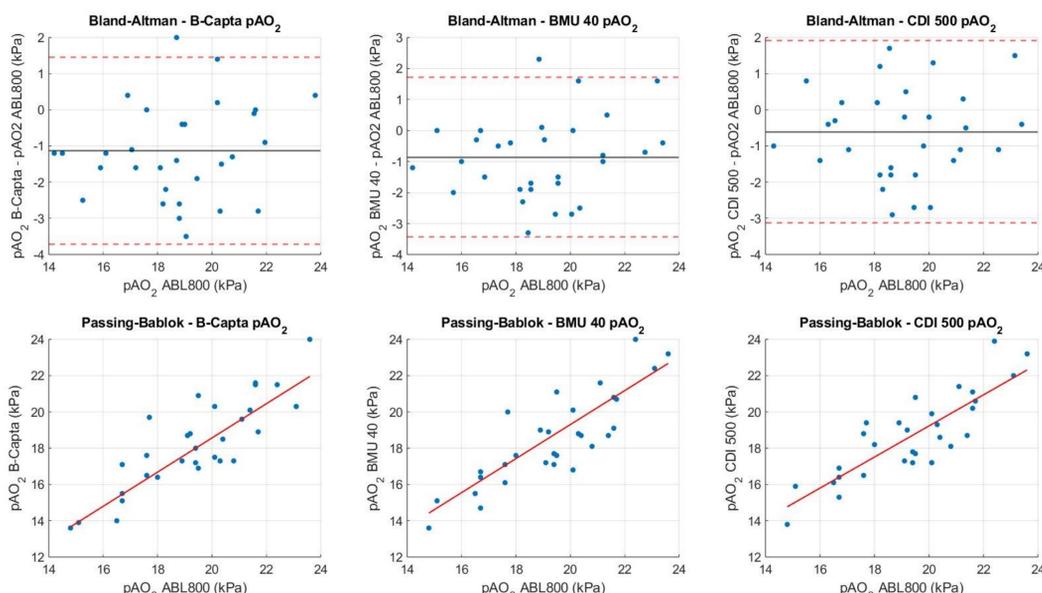


Fig. 2: Bland-Altman and Passing-Bablok regression pAO<sub>2</sub>

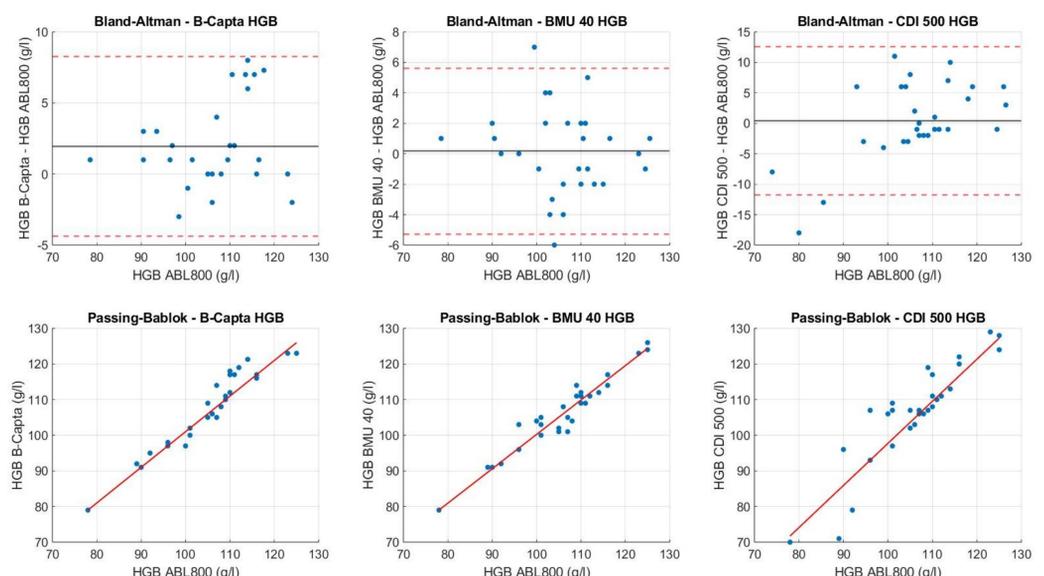


Fig. 3: Bland-Altman plot and Passing-Bablok regression HGB

## Conclusion

Following calibration, B-Capta showed the largest mean error in pAO<sub>2</sub> (-1.13 kPa) and HGB (+1.95 g/l), with the highest variability in pAO<sub>2</sub>. All monitors overestimated HGB compared to the ABL800; BMU 40 had the smallest error (+0.16 g/l), while CDI 500 had the highest HGB variability (SD 6.21 g/l). Passing-Bablok regression confirmed linear agreement with the reference. Despite differences, all devices remain clinically usable, though B-Capta was the least reliable. Limitations include a small sample size (n = 12) and single-unit testing, reducing generalizability. Recommendation: **Use additional stable BGA for verification and perform frequent calibration when using B-Capta. Additional research is needed.**

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