

# The introduction and potential development of an inline blood gas analyser within adult and paediatric critical care.

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## Background

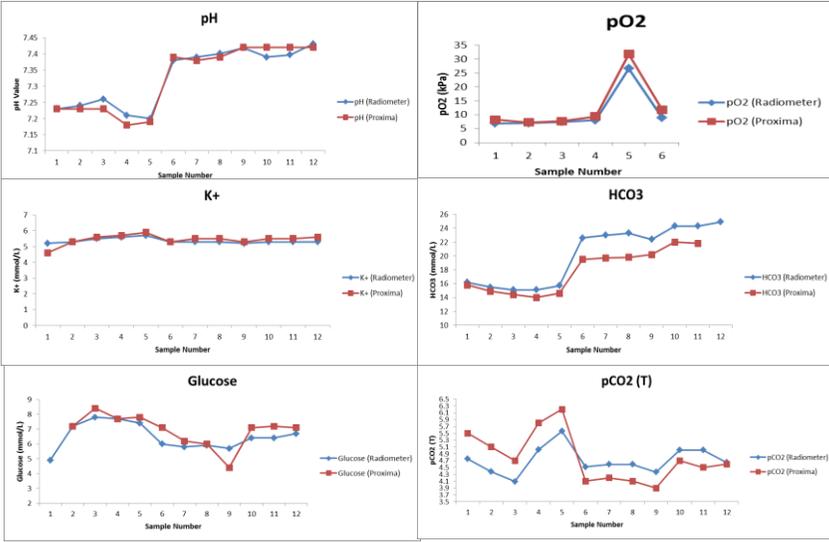
Arterial blood gas (ABG) sampling is an integral part of critical care diagnostics across adults, paediatrics and neonates that frequently guides clinical decision making and has a direct impact on patient care, as well as patient outcomes

On both the paediatric and adult critical care units, patients who require extensive multi-organ support; e.g. during ventilation, postoperative states, sepsis, transplant recovery or complex metabolic conditions, have an increased demand for close blood sample monitoring in order to direct therapy. The current gold standard ABG analysis technique can have several disadvantages in the critical care setting; time away from the bedside, incorrect samples, transporting blood and paediatrics with significantly smaller blood volumes at risk from excessive blood loss following frequent sampling.

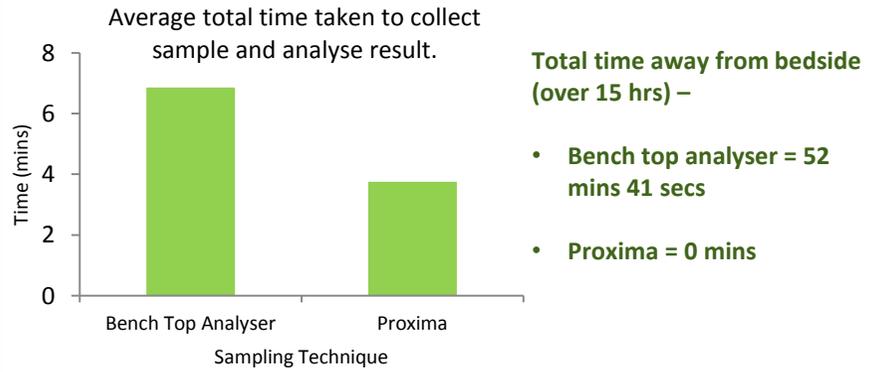
The time and blood saving impact of an inline analyser on care delivery has already been demonstrated by the initial Proxima investigation on adults (Mitchell et al, 2016). This trial looked at the practicality and application of the Proxima on both critical care units; documenting blood loss, time away from the bedside and accuracy against currently used bench top blood gas analysers.

**The world's first paediatric connection was undertaken by RMCH PICU during this evaluation.**

## Results



## 2 times faster compared to current practice



## Objectives

The main objectives of the evaluation included: measuring blood loss using the inline analyser in comparison to normal sampling methods, determining if nursing time could be saved at the bedside in comparison to normal sampling methods and comparing analysed results to evaluate the accuracy of this product.

## Patients

2 paediatric ICU inpatients (admitted for >72 hours, >10 kg) who had an arterial line in situ, and 1 adult ICU inpatient were selected to be included. A blood sample was taken and analysed by the inline gas analyser prior to a standard sample being run through the bench top analyser. This method was repeated as required in response to the patient's clinical condition.

## Staff Comments

- “The clear reduction of blood loss would make a real difference to the paediatric cases”
- “Time differences between sampling was noticeably reduced, having an obvious positive effect on nursing care and efficiency”
- “I am really impressed with the huge potential for this technology across several patient populations”
- “Easy to use, simple interface and practical for staff undertaking samples.”

## Future Work

CMFT are now undertaking a larger trial of the Proxima across PICU, working closely with Sphere, increasing data collection and accurate clinical application. We aim to conduct further trials across the adult and neonatal populations to help develop the Proxima for future use.