Upgrade of POCT Diagnostics in the Home Oxygen Service to Deliver a Patient Centered Service and meet new ISO 15189:2022 Standards.

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Introduction

Arterial blood gas sample analysis on a portable blood gas analyser (Siemens EPOC) has been in use since 2012 by the HDFT respiratory Home Oxygen Service (HOS). The device, whilst performing to an acceptable standard, was becoming less reliable and there were challenges with obtaining arterial samples from some patients; the clinical and cost effectiveness of the service was starting to decline. This was identified and escalated during our annual clinical/cost effectiveness analysis of the service.

ISO 15189:2022 standards specify the need to engage with patients directly to design, review and influence our pathology services.

Service Evaluation

A method comparison was carried out between the Siemens EPOC NXS and Abbott iStat Alinity. The analytical performance of the devices was compared against the Werfen GEM5000 blood gas analyser. The performance and precision was acceptable and similar for both devices (Figure 1 shows the iStat Alinity performance).

Whilst both devices were suitable, we opted to procure the iStat Alinity and place into the HOS for the following reasons:

- The clinical team preferred the functionality and ease of use of the iStat Alinity.
- Connectivity and purchasing options were more flexible.
- Remote management of the device and electronic transfer of results was more practical,
- The POCT data management system AegisPOC is also owned by Abbott, easier to coordinate the connectivity.
- The G3+ (blood gas only) cartridges were cheaper than the EPOC cards as we are only paying for the tests we need.
- The iStat Alinity was more suited for other services that were under consideration such as the hospital at home pathway so more scalability and adoptability options.

Patient Centered Design

Previous an arterial blood gas sample was collected for this service but a capillary sample is easier to collect and is less painful for the patient. We explored whether it was suitable to move to capillary sample collect to improve the patient experience but maintain the clinical quality of the service.A literature review was performed; an arterial sample is the gold standard and capillary samples are known to underreport p02. The British Thoracic Society (BTS) guidelines acknowledge this but consider capillary samples to be acceptable for use in the HOS to monitor and guide oxygen treatment following an initial arterial blood gas analysis. Our clinical fellow used the BTS guidance to develop a clinical training programme for capillary sample collection and this was adopted into service use with the iSTAT Alinity.

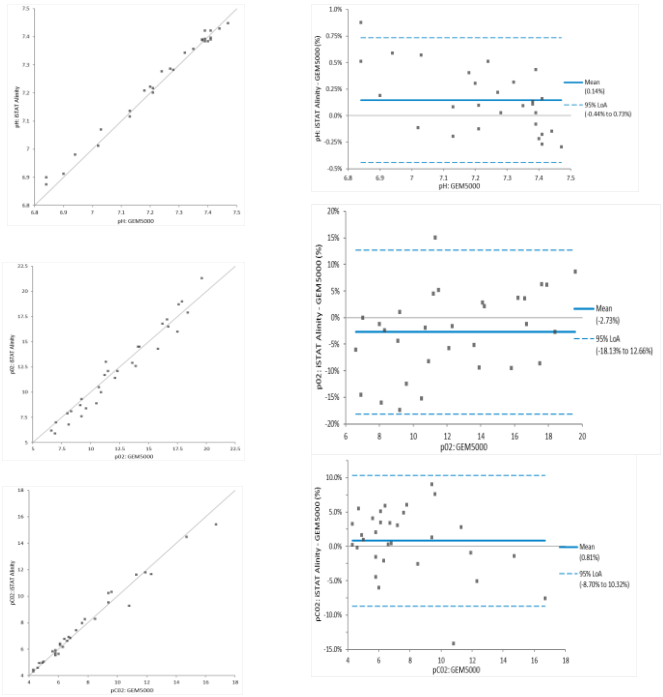

Figure 1: Correlation of the iStat Alinity against the GEM5000 for pH, PCO_2, PO_2

Findings and Improvements

Thirty patient feedback surveys were conducted to evidence whether the change in the diagnostic testing and sample collection led to an improvement in the patient experience. All patients responded positively stating a strong preference for capillary sample collection. The nursing team found the device more practical and easier to use

The service was assessed by UKAS in September 2024 and was the first home oxygen service to be accredited against ISO 15189:2022 in the UK. There were no findings against the service and the whole multidisciplinary team were commended for developing the service in this way by the UKAS assessment team. There was strong evidence to support that we had considered the impact of the service on patients and had improved their experience. Balancing clinical accuracy and best outcomes with enhancing patient experience meant that the service was well received by staff and patients alike.

The clinical protocol for capillary sample collection was adopted improve patient experience on Wensleydale ward for patients on non-invasive ventilation (NIV). Dr Wakefield recognised an opportunity to integrate capillary sample collection into NIV oxygen monitoring in place of continuous arterial sampling to improve patient experience and free up medic and staff time (capillary samples can be collected by nursing staff).