

## Expanding Needs for Point of Care Testing (POCT): Reviews, Evaluations, Updates

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**Background:** Our tertiary acute care hospital of 1,731 beds with combined outpatient attendances, emergency services and inpatient admissions reaching 909,712 (in 2014) instituted POCT governance in 2005. As more POCT resources have been requested recently, particularly by the Department of Emergency Medicine (DEM) for POC troponin-T, d-dimer, pBNP and INR, it was timely to critically appraise current POCT policies and procedures, conduct a verification survey of in-use POC tests and devices and determine if further governance enhancements were needed and new POC tests were justified.

**Methodology:** The current policy on POCT governance was reviewed. A verification survey was carried out by physical sighting of assets and referencing with inventory records. Performance in EQA (established in-house by the central laboratory) for POC blood glucose and blood gases were also studied. An evaluation of POC troponin-T tests on the Roche h232 device was performed in the areas of imprecision, method comparison with the central laboratory and meter-to-meter variation.

**Results:** The survey recorded 96 and 58 glucometers in inpatient and outpatient settings respectively. There were also 11 blood gas analysers in the ICUs. Compared to 2005, there was a decrease of 46 glucometers but an increase of 5 blood gas analysers. Day-to-day quality control, maintenance, training and competency testing existed but differed across POCT providers due to a lack of standardised SOPs and use of various forms. Twice-yearly EQA exercises (blood glucose and blood gases), started in 2005, yielded early good results (90 – 98% first-time success rates) and continued to be maintained at >85% in subsequent years, with 2015 EQA success rate standing at 93.2%. However, it was noted that only an average of 97% of the glucometers and 95% of the blood gas analysers participated consistently in the EQA exercises. Re-tests for initial failed returns and reminders to participate had to be followed up. For the Roche POC troponin-T test, total imprecision was <15% across clinically relevant concentrations. On comparison with central laboratory troponin-T test, POC troponin-T yielded 100% agreement (at 100% PPV; n=31) at the respective central laboratory and POCT cutoffs. Meter-to-meter variation (50-406 ng/L; 3 meters) was found to be statistically insignificant (ANOVA p=0.96).

**Conclusions:** While requirement for quick test results is often used as justification for POCT (especially for the emergency department), and notwithstanding test and device evaluations typically supportive of published test performances, other considerations such as financing model, compliance to quality control and EQA programs and structured training and competency testing are needed for a holistic approach to the introduction of new or additional POC tests. With the results of these review and evaluations, we recognised the need to enhance current POCT governance and practices (such as standardised SOPs) as we set forth to meet the clinical needs of the hospital in general and the emergency department in particular.