

## Volume 15 - Issue 2, 2015 - Technology Update

### Point of Care : Integrated Testing Solution

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Point-of-Care testing offers not only a smart way of increasing patient safety, but also enables restructuring staff working patterns. If done in the right way, both are more than likely to increase the quality of care delivered, or efficiency and staff morale.<sup>1a 1b</sup> Cardiac surgery is increasingly being performed on patients who are 70-80 years of age. However, alongside the increase in age comes also an increase in the burden of comorbidities.<sup>2</sup> The complexity has also increased with operations on sicker patients and performance of multiple concomitant procedures. Cardiopulmonary bypass (CPB), which is usually an essential ingredient for these operations but it causes physiological and metabolic changes, all of which require regular monitoring at short intervals.<sup>3</sup> During most low-risk, single-procedure cases, an average of five arterial blood samples have to be processed and analysed ( blood gases, electrolytes, haemoglobin and blood glucose, etc.): once prior to induction of anaesthesia; every 20-30 minutes while the patient is in CPB; once prior to separation from bypass and at least once before the patient leaves the operating room. Often times when an arterial sample is taken, the activated clotting time (ACT), the test to monitor the appropriate effect of heparin on coagulation must be taken and testing can require one to five blood samples per surgical case. The ACT is measured in the operating room, next to the CPB machine, but traditionally carries with it a coefficient of variation of up to 25%. Many other blood analyses are traditionally processed outside the operating room. For example, blood gas analyses are routinely available in a central location outside of the theatre. However, queuing and delays can result, due to calibration and sample integrity issues (i.e. blockage by a poor sample). This traditional way of working has implications for patient safety at crucial times such as at point of induction of anaesthesia, and again at the separation from CPB), when the anaesthetic assistance leaves the operating theatre to process the sample. In addition human error (documentation and patient identification errors) may impact safety. True bedside testing at the point of care presents a number of obvious advantages, including minimization of transcription errors, faster delivery of results possibly leading to more timely treatment, and an operating theatre team that remains intact at crucial times during the procedure. In addition, there are the economic benefits to be derived from the use of point-of-care testing, including the optimal utilization of highly capable and trained professionals.

#### Emergency Medicine

In a recent article, Eichler and Jarvis have described how the introduction of point-of-care testing at their site has help provide timely, highquality care and a reduction in emergency department overcrowding.<sup>5</sup> Increased numbers of patients attending emergency departments cause significant logistical issues, including overcrowding and the lack of sufficiently trained staff. Point-of-care testing may help alleviate overcrowding by reducing the amount of time a patient will spend in the emergency department from the drawing of blood to the results being interpreted by the clinician. Point-of-care testing allows the analysis to be performed immediately at the patient's bedside by a healthcare professional. The results are displayed and recorded electronically on the hospital's server, which minimizes human error. The operating theatre and the emergency department are just two of the settings in which point-of-care testing may help improve patient safety, provide a more time-efficient service, and allow optimal use of valuable resources.

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