Process Improvement with KKH Biochemistry Automation and Integration Project

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Background

Before the integration and automation project, KKH Biochemistry laboratory has 4 units of stand-alone analysers - 2 units of Beckman Synchron LX20 pro automated clinical chemistry and 2 units of Abbott Architect i2000SR immunoassay analysers. Non-automated processes are inevitable such as manual transferring of specimens from point to point, manual decapping and recapping of specimens and manual dilution of specimen when encounters with beyond analytical measuring range. For all spun pediatric specimens, we had to aliquot out the serum from the specimen into the sample tube before putting it into the analyser. When both biochemistry and immunochemistry tests were requested for a patient, two blood collection tubes instead of one would be obtained, that is, one blood tube for biochemistry tests and the other tube for immunochemistry tests. All of these processes lead to higher laboratory errors, wastages and cost of operation.

Result

We have met targeted turnaround time for selected key tests after implementation of the AIAS (Figure 1). Due to the wider analytical measuring ranges on the Abbott chemistry analyzers, we could reduce the total time spent on sample dilution by 88% (Figure 2). We have removed manual inspection of all blood samples' integrity as the Abbott System is able to perform serum indices (Figure 3). With the direct pediatric sampling feature, the requirement to transfer pediatric samples to the respective analysers has been greatly reduced, hence improving patient safety (Figure 4). We now require only one blood specimen tube instead of two as the AIAS can route each tube to both the chemistry and immunoassay analysers. The adult specimen tubes are now automatically decapped after centrifugation. After testing, the tubes are automatically sealed with aluminium foil by the re-sealer module. Both these features improve laboratory safety.



Aims

To streamline and improve work processes in Biochemistry laboratory with the Abbott integrated and automated systems (AIAS).





Methodology

In 2013, DPLM implemented the AIAS which is tailored to best fit the needs of Biochemistry and Immunochemistry laboratory. The AIAS includes Instrument Manager, Accelerator with centrifuge, decapper, resealer and track module with: two Abbott Architect c8000 chemistry analysers and two Abbott Architect i2000SR immunochemistry analysers.





KKH DPLM AIAS

Conclusion

Being the first AIAS installation in Singapore, we can be a role model here. Our laboratory leads by introducing direct pediatric sampling on the AIAS. Routine biochemistry and immunoassay tests can be performed on a single tube thereby reducing the usage of blood collection containers and overall cost saving. With more walk-away time, staff members are able to focus on other value-added activities.