The future of cardiac surgery

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SUMMARY

Cardiac surgery has evolved over the last 50-75 years massively from crude removal of World War II shrapnel to fine delicate microsurgery. All these advancements were made possible by the surgeons who understood anatomy and physiology and also dared to dream. From closed heart pediatric procedures, the advent of extracorporeal circulation, to imaging of the heart and heart structures. All this has made cardiac surgery safe, accessible, and routine procedures to everyone with low mortality and morbidity rates. The future of cardiac surgery not only to make the incision wounds smaller, and the procedure faster but also making the procedures safer and more durable. With advancement of extracorporeal circulation, better valve repair techniques, better and longer lasting artificial valves, arterial grafting and complex procedures including aortic procedures. The use of robotics and minimally invasive procedures now provides a new dimension to open heart surgery – taking the taboo of a long median sternotomy scar away, making the procedure more accepting. In looking forward we must not forget the past, as newer technology provides new dimensions and attractiveness - emphasis on long-term results and outcomes should always be paramount. Cardiac surgery will remain what it has always been: a profession where art and science mix with skill and decisiveness rule for the betterment of our patients.

Optimizing pre-transfusion testing using the Lean initiative in transfusion medicine laboratory of the Hospital Raja Perempuan Zainab II, Kota Bharu, Kelantan

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SUMMARY

Pre-transfusion testing consists of two essential tests that are blood grouping with antibody screening (GSH) and crossmatching (GXM). Analysis of local GSH data between years 2017 and 2019 showed high GSH load (40,000 - 50,000 tests per year) with 60-70% samples not been crossmatched (unconverted GSH), which indicated the high likelihood of unnecessary GSH requests. High GSH load led to increase of workload, resources wastage and risk of blood sampling error. We aim to overcome these issues with the lean approach by reducing the rate of unconverted GSH to less than 30% as key performance indicator (KPI). Current data showed that processing and waiting time denoted 208 minutes and 31 minutes, respectively, in a testing batch of 12 samples involving 22 steps. Value stream mapping of processes throughout sample reception until disposal were category 9 value-added, 12 value enablers, and 1 waste. Wastage refers to GSH tests performed but eventually not proceeding for crossmatching and thus disposed. Fishbone Diagram used to elicit the causes that showed multiple factors of high unconverted GSH that were lack of knowledge among clinicians, insufficient information of test request guideline and inadequate work process review. The multiple Kaizen events showed that a low-effort high-impact action was GSH vetting by laboratory medical officers together with continuous education among clinicians regarding the indication of the test. Moreover, automation testing using IH-500 GSH-analyser aimed to streamline processes and reduce errors. Comparing pre-Lean (August-October 2021) to post-Lean (August-October 2022) data depicted almost achieved KPI (32.37% unconverted GSH), resulted in reduction of test workload, specimen rejection, and expenditure cut by RM 42,182.10. Sustainability of this project was planned by implementing the Kaizen approach as part of our quality culture, continuous knowledge sharing with other clinician colleagues and extending the practice to other hospitals in Kelantan.