



Surgical Safety and Risk-Management in Surgery: Time For A New Paradigm

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Songkla Med J 2017;35(1):1-3

Surgical care is an essential part of health care service in all economical settings. It is estimated that 250–300 million surgical procedures are performed each year worldwide and the figure continues to grow.^{1,2} Surgical operations belong to the segments of the health industry that have the greatest risk of adverse outcomes. The rate of permanent disability or mortality after in-patient surgery is between 0.4 and 0.8% and approximately 50% of the adverse events are believed to be avoidable.³

In 2006, the World Health Organization launched a ‘Safe surgery safe life’ campaign that emphasises the use of surgical safety process including pre-procedure ‘sign-in and timeout’ and use of a structured 19-item checklist.⁴ The key impact objective was to improve in-team communication.⁵ However, there are other important issues besides encouraging use of a standard operating room (OR) checklist. Checklists designed by large health organisations may help reduce complications in some health care settings, especially those practicing with inferior standard prior to implementing the protocols,^{6,7} but such practices might not add anything to upper level hospitals where safe OR procedures are already followed. In such larger, modern

institutions, other key success factors for surgical safety should be more concerned with creating a safety culture within the surgical teams, meaning that all surgical practitioners should be aware of the importance of safe practices and positively engage in risk reduction activities.⁸

The fundamental tools leading to safer surgery are a surgical audit system and understanding risk management. Most surgeons are accustomed to individual case audits in the form of morbidity and mortality reviews, but modern surgical quality assurance should be extended from performing reviews on an individual case basis to systematic and focused collection of key elements in the whole process of surgical service, from surgical resources through surgical performance and outcome measures. These data, following peer-review, will provide a holistic picture of the service system and identify significant high priority issues that needed to be addressed.

As key safety issues and safety goals can differ among surgical groups, there is no single safety bundle that will suit all surgical settings. The surgical audit leads to risk identification which is an entry point of risk management. In addition, continuing audits can be part of a broader

monitoring tool which can provide risk–warning tools. To complete the loop, data collected in the process of an audit should be reviewed by stake holders at all levels, from front line practitioners to the policy makers. Without peer review, data such as surgical infection rates or cardiac related complications would not lead to an improved process, no matter how perfect collected data. Evidence from developed countries can be instructive, for example a study by the National Surgical Quality Improvement Program by the American College of Surgeons reported that the surgical audit program helped reduce complications and improve care.⁹ In addition, auditing allows benchmarking among institutes with comparable care level.

No two surgical patients ever enter an OR with the same operative risks. Various risk predicting systems for surgical patients have been proposed with an aim to assign individual patients to a category of risk. Most risk predicting tools are based on a scoring systems assessing things such as the patient’s physiological reserves and severity of the surgical procedure. Such risk scoring systems range from simple categorization such as the American Society of Anesthesiologists (ASA) physical status to multiparameter systems, e.g. the Portsmouth Physiological and Operative Severity Score for enUmeration of Mortality (P–POSSUM) scoring¹⁰ and the Acute Physiology And Chronic Health Evaluation (APACHE).

Apart from managerial science, much modern surgical technology is directed toward safer surgery. Surgery has entered an era in which instruments and techniques are geared toward less invasive procedure and enhanced recovery. However, introducing such new technologies into the practice has its own risks and require careful evaluation through surgical audits. On another front, risks in the past caused by inadequacy of skills is now alleviated by surgical simulation technology. Instead of climbing the learning curve with real patients, a trainee

currently develops his or her skills through practicing one manikins, animal models or cadavers, and computer simulation.

In summary, modern surgery has entered an era in which not only the operation but also the safety of the surgical environment are important considerations for a successful outcome. A culture of safety among all members of the surgical team is fundamental to the development of a modern, safe operating room.

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