Update in
Anaesthesia

Editorial

Evidence to support the use of surgical checklists

Major morbidity following surgery occurs in 3–25% of patients being treated in a hospital setting.[1] In edition 24,1 of *Update in Anaesthesia* we published the World Health Organization's Surgical Safety Checklist with an accompanying editorial.[1,2] This checklist was constructed and distributed as part of the WHO's Safe Surgery Saves Lives campaign in 2008. The checklist serves as a generic template that can be modified for use in each theatre setting, making it adaptable for use in all healthcare sites in the poorest to the most affluent countries. At the time of its introduction there was increasing evidence that preoperative checklists are effective in reducing adverse events and in enhancing team work in a theatre environment. The WHO checklist was introduced without specific evidence that it would affect outcomes, but because it seemed a sensible and intuitive development in the drive to reduce morbidity and mortality for the surgical population. The 'Time-out' part of the checklist, that takes place between the surgeon, anaesthetist and scrub nurse immediately prior to the commencement of surgery, has been widely adopted in the UK and the US. There is little data to demonstrate whether the checklist has been widely adopted in developing countries.

When first introduced in the UK the checklist was viewed with scepticism by some. However, there is now increasingly robust evidence to show that check-lists in general, and specifically the WHO's Surgical Safety Checklist, can dramatically effect morbidity and mortality in surgical patients. The strength of this evidence should highlight to all of us that simple safety systems like the WHO check-list are a priority or even an imperative.

A study published in 2009 in the New England Journal of Medicine (and supported by the WHO), showed that introduction of the WHO checklist in eight hospitals around the world was associated with a reduction in major complications from 11.0% to 7.0% - an absolute risk reduction 4% and a relative risk reduction of 36%.[3] Despite these dramatic results, several areas of weakness in the study design have allowed doubts to be raised about the study's validity. There was no attempt to allow for confounding variables, meaning that other non-measured factors could have accounted for the difference seen before and after introduction of the checklist. Measurement of outcome data, with feedback to surgical teams, was introduced to these centres as part of this study and it is recognised that knowing that your performance is under scrutiny can itself affect performance and therefore outcomes. To some it seems implausible that a strategy as simple as the WHO checklist could have had such a dramatic effect on mortality and morbidity when the specific checks do no particularly correlate with the recognised causes of surgical adverse events. In addition the hospitals where compliance with the checklist was best did not necessarily show the greatest reduction in adverse events.

A second major study, conducted in eleven hospitals in the Netherlands, was published in November 2010 and this study has gone a considerable way towards answering the criticisms of the former paper.[4] A comprehensive, multidisciplinary checklist was introduced to six of the hospitals, midway through a six-month period of data collection to assess the rates of adverse events, morbidity and mortality in these hospitals. Data from over 7000 patients showed that the number of complications per 100 patients decreased from 27.3 to 16.7. In-hospital mortality decreased from 1.5% to 0.8%, giving a relative risk reduction of 47%. The remaining five hospitals served as matched controls and outcome did not change over the study period.

Although this study used a more detailed collection of checklists that covered pre- and postoperative pathways of care, rather than focusing exclusively on the preoperative areas, several of the flaws with the earlier study were addressed. The Dutch study showed that compliance with the checklists correlated with fewer complications - the more checklist items that were missed the greater the chance of a complication occurring. The use of control hospitals excluded the influence of confounding factors and, by choosing hospitals with established systems for measurement and feedback on surgical complications, the effects of introduction of such a system were removed.

It is interesting to note that the incidence of all types of complication was reduced, even those that one would intuitively feel were attributable primarily to the surgical technique, such as haemorrhage and anastomotic breakdown. This suggests that there is some generic feature of checklists that enhances teamwork, communication and handover between and within teams that is to the benefit of the patient. Even though the checklist used differed from that promoted by the WHO, this study suggests that the results may be applicable to use of other checklists. These findings are also in line with those of another recent study that showed that introduction of a medical team training

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program for theatre staff in eighteen medical facilities was associated with an 18% reduction in mortality.[4]

It has now been two years since the launch of the WHO's Safe Surgery Saves Lives Campaign. Implementation of the surgical checklist has been effectively established in many countries and has become a standard of care. In many theatres the day begins with briefing and finishes with a de-briefing. The most recent evidence shows that, whether we are able to accurately measure it or not, these systems are likely to contribute to reductions in complications and to improve patient safety. I would strongly urge all theatre teams to incorporate team briefing, 'time-out' and team debriefing into their daily practice.

REFERENCES

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Editor's Notes

Dear Readers,

Welcome to *Update 26,1*. I hope that the last edition, 'Guidelines for the management of Emergencies in Anaesthesia' has been useful in your daily practice. Your feedback is always welcome and helps the editorial team to continue development of this journal, aiming to provide relevant and appropriate educational material for you on a regular basis.

My plans for future editions of *Update in Anaesthesia* are as follows. Edition 27,1 will follow in 2011. The emphasis of this edition will shift towards articles focusing on more basic aspects of anaesthesia, of relevance to all anaesthesia practitioners whether practicing in low-resource or affluent settings. Topics will include venous cannulation, use of a face mask, choice of anaesthetic technique and management of bronchospasm occurring during anaesthesia. As suggested by reader's feedback on the emergencies edition, we plan to produce a one page summary algorithm for all future articles that describe management of critical events in anaesthesia.

Intensive Care Medicine (ICM) is an area that has developed enormously over the last 30 years. Critical care is more expensive than regular ward care and so this area of medicine has largely been driven forward in wealthier countries. Although many of the most visible changes in Intensive Care Units involve advances in specific therapies and technologies, the major advantages of intensive and high-dependency care are a better nurse to patient ratio, regular medical review and thorough attention to detail in the management of each patient's basic medical needs. Major improvements in survival are achieved by administration of oxygen, early administration of antibiotics, timely surgical intervention and prevention of secondary infection by simple manoeuvres such as nursing patients in a head-up position. These basic strategies, that form the cornerstones of Intensive Care Medicine, are largely independent of resource availability and are applicable to any healthcare setting around the world. Most healthcare institutions have an area of the hospital or a section of a ward that is designated a high-dependency area. Edition 27,2 (December 2011) will be an expanded edition focusing on this area of medicine.

There were some notable topics missing from the emergencies edition of *Update*. An article describing management of massive blood loss was withheld whilst we waited for an updated guideline to be published by a subcommittee of the AAGBI council. This article and a summary of the most recent changes to the European Resuscitation Council's guidelines will be included in the ICM edition.

As always please email me (Bruce.McCormick@rdeft.nhs.uk) or Carol Wilson (worldanaesthesia@mac.com) if you would like to be added to our mailing list or if you have any requests or suggestions for future articles. Alternatively write to me at the postal address below.

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