Surgical safety checklists and short-term mortality

A population-based before and after study in Canada found that safety checklists did not reduce 30-day mortality or complications after surgery, although the study was limited by the variability in checklists, patients and hospitals and the lack of training for staff.

**Overview:** In England and Wales, 129,419 patient safety incidents relating to surgical specialties were reported in 2007 ([National Patient Safety Agency 2009](#)). Surgical safety checklists can improve outcomes by increasing teamwork and communication in theatre and by ensuring that evidence-based interventions, such as antibiotic prophylaxis, are reliably used. The World Health Organization (WHO) has developed a [Surgical Safety Checklist](#) as part of its 2008 Safe Surgery Saves Lives initiative. This 19-item checklist has been shown to reduce the rate of in-hospital death from 1.5% to 0.8% ([Haynes et al. 2009](#)).

**Current advice:** The WHO's Surgical Safety Checklist involves verbal confirmation by surgical teams of the completion of the basic steps for ensuring safe delivery of anaesthesia, prophylaxis against infection, effective teamwork, and other essential practices in surgery. A number of checks are completed before the induction of anaesthesia (‘sign in’), before incision of the skin (‘time out’) and before the patient leaves the operating room (‘sign out’).

The NHS has mandated the use of an adapted version of the WHO’s Surgical Safety Checklist in England and Wales. Healthcare organisations are required to:

- Ensure an executive and a clinical lead are identified to implement the surgical safety checklist within the organisation.
- Ensure the checklist is completed for every patient undergoing a surgical procedure (including local anaesthesia).
- Ensure that the use of the checklist is entered in the clinical notes or electronic record by a registered member of the team.

NICE guidance on surgical site infection provides recommendations on the procedures necessary before, during and after surgery to reduce the risk of infection. The NICE guideline on preoperative tests ([currently being updated](#)) covers tests that are carried out before elective surgery by doctors or
nurses in hospitals, preoperative assessment clinics or, in some cases, the GP’s surgery or health centres.

New evidence: A population-based study by Urbach et al. (2014) assessed surgical outcomes before and after the introduction of mandatory surgical safety checklists in Ontario, Canada. This study assessed all surgical procedures at each Ontario hospital 3 months before and 3 months after introduction of the Canadian Patient Safety Institute checklist, the WHO checklist, or a unique checklist devised by the hospital. The primary outcome was death in the hospital or within 30 days after surgery (operative mortality).

Data were available from 101 hospitals, 97 of which used a special intervention or educational programme for checklist implementation. The number of surgical procedures performed per hospital ranged from 9 to 4422 (median=654) during the 3-month interval before the checklist was implemented and from 2 to 4522 (median=633) during the 3-month interval after implementation. Analyses were adjusted for patient age, sex, urban or rural residence, socioeconomic status, and comorbidities and for admission category (inpatient versus ambulatory), procedure type, procedure status (emergency versus elective), and month of surgery.

The adjusted risk of death within 30 days after the introduction of surgical checklists (0.65%, 95% confidence interval [CI] 0.60% to 0.70%) was not significantly different from the risk before implementation of checklists (0.71%, 95% CI 0.66% to 0.76%, p=0.07). Likewise the adjusted risk of surgical complications within 30 days of the procedure was not significantly lower after the use of checklists (3.82%, 95% CI 3.71 to 3.92%) than before (3.86%, 95% CI 3.76 to 3.96%, p=0.53). These results did not vary in any subgroup analyses, including in high-risk groups such as elderly patients, patients who underwent emergency procedures, and patients who underwent inpatient procedures.

The authors suggested that the absence of an effect of surgical checklists may reflect inadequate adherence to the checklists, although self-reported compliance from June 2010 was 98%. Other widespread interventions to improve surgical safety could have affected the results, but none were introduced during the period studied. No formal training on using checklists was provided, and implementation was not standardised. Additionally, the retrospective analysis of administrative records may be less useful than a prospective study.

Commentary: “Surgical safety is a key public health concern in low-, middle- and high-income countries. The WHO Surgical Safety Checklist has been implemented with varying degrees of success in different organisations.

“One of the key aspects of implementation is that introducing a checklist cannot be done via a top-down approach through the traditional information dissemination routes used in most healthcare institutions. For any effect to be seen, staff must undergo sufficient training in the use of the checklist or the ‘5 steps to safer surgery’. In addition, a culture of patient safety must be developed that does not blame individuals but looks at systems in their entirety.

“The lack of effect in this study could be related to the retrospective analysis, the relatively small sample size, or the heterogeneity in types of patients and hospitals. While we wait for larger prospective studies that are more homogeneous in terms of types of hospitals, we should also be looking at data from local quality improvement programmes that include use of the surgical checklist.

“Checklists alone cannot be the answer to delivering safer care. A culture of reporting and learning from errors, better appreciation of human factors, and the ability to design, implement and evaluate large-scale quality improvement initiatives is desperately needed.” – Dr Sukhmeet Panesar, Honorary Fellow, Centre for Population Health Sciences, The University of Edinburgh

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