

Clinical Science

Surgical care checklists to optimize patient care following postoperative complications



Philip H. Pucher, M.D., Ph.D., M.R.C.S.^{a,*},
Rajesh Aggarwal, M.B.B.S., M.A., Ph.D., F.R.C.S.^{b,c},
Mark H. Almond, M.D., M.Sc., M.R.C.P.^d,
Ara Darzi, M.D., F.R.C.S., F.A.C.S., K.B.E.^a

^aDepartment of Surgery and Cancer, St Mary's Hospital, Imperial College London, London, UK;

^bDepartment of Surgery, Faculty of Medicine and ^cArnold & Blema Steinberg Medical Simulation Centre, Faculty of Medicine, McGill University, Montreal, QC, Canada; ^dDepartment of Respiratory Medicine and Allergy, St Mary's Hospital, Imperial College London, London, UK

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Abstract

BACKGROUND: Postoperative complications are common. Inconsistency in the care of complications is reflected in variable rates of failure to rescue. This study aims to develop and validate checklists for treatment of common postoperative complications.

METHODS: Initial checklists were based on best evidence, with expert clinician review. Casenote review was performed, comparing checklist item completion with outcomes. Logistic regression was performed for risk of further morbidity, considering American Society of Anesthesiology grade, age, sex, and checklist compliance. Checklists were finalized through end user multidisciplinary review.

RESULTS: Evidence-based checklists were developed. Retrospective casenote review revealed management of 86% (31/37) of these complications to be noncompliant with checklist-mandated care. This resulted in delays and errors in 65% (24/37) of cases, with median treatment delay of 6 hours (interquartile range 5.4 hours). Regression analysis revealed poor checklist compliance to be to only significant factor (odds ratio 6.75, 95% confidence interval 1.11 to 41.00, $P = .038$) for developing further morbidity.

CONCLUSIONS: Management of complications is highly variable, with failure to adhere to best practice principles significantly associated with an increased risk of further morbidity. This study presents an evidence-based framework for the development of checklists to standardize care.

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* Corresponding author. Tel.: +44-203-312-6666; fax: +44-203-312-6309.

E-mail address: p.pucher@imperial.ac.uk

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Despite continuing advances in surgical care, postoperative complications remain a common and accepted risk of surgery. Morbidity rates of up to 50% following major gastrointestinal surgical procedures are reported.^{1,2} The effective identification and amelioration of adverse events in the postoperative phase is vital to the successful recovery of patients who suffer complications. Unfortunately, this is

not always the case, with the quality of management of complications shown to vary greatly between institutions, as reflected by differing rates of death following the development of complications, that is, failure to rescue.^{3,4}

Investigation of the factors underlying this variability has identified certain structural factors, such as nurse:patient staffing ratios.⁵ However, this has accounted only for a small proportion of clinical variability seen. In a recent survey of 7,906 American surgeons, over 70% of respondents attributed witnessed medical errors to individual-level factors (ie, process), rather than system-level (structural) factors.⁶ Studies of error and patient safety have indicated that the majority of such process errors may be classified as errors of omission,⁷⁻⁹ defined as mental lapses or attentional failures,¹⁰ rather than active errors of commission, resulting in deviation from ideal practice and placing patients at risk of harm.

The reduction and mitigation of such failures, experts such as James Reason suggest,¹⁰ are best addressed through checklists or protocols. Functioning as mental aids or prompts, checklists can be effective in the structuring of both crisis management as well as routine care, with widespread use of checklists in other high-complexity industries such as aviation.¹¹ In these industries, checklists exist to guide the management of specific crises, such as engine flameouts or a failure to deploy landing gear. Thus far, checklists in surgery have been most widely employed as preoperative checklists¹² or to guide patient postoperative care in best case models of recovery. In this form, the effectiveness of checklists to promote adherence to best practice, and reduce variation in care, is well established with enhanced recovery protocols.¹³ Care outcomes have been shown to improve significantly in relation to levels of compliance with care protocols defining best practice care.¹⁴

Diagnosis-specific checklists have been more recently introduced for the management of operating room crises.^{15,16}

The standardized management of critical events such as operating room fires, or a failed airway, was significantly improved with the introduction of crisis checklists in a recent study reported by Arriaga et al.¹⁵ However, although intraoperative crises are, fortunately, rare (with an incidence of <1.5%),¹⁷ this stands in stark contrast to the high incidence of postoperative complications which may affect as many as half of the patients following major surgery.

The variability in the management of postoperative complications occurs despite established, evidence-based guidelines for the treatment of many of the most common complication types, such as catheter-associated urinary tract infections.¹⁸ It therefore stands to reason that a similar approach may be effective for postoperative crises also. We hypothesized that the development of checklists for common gastrointestinal surgical complications might therefore have a significant impact on reducing error and standardizing management of these conditions. This study sought to identify the most common complications occurring after complex gastrointestinal surgical procedures, and presents a structured development and validation of treatment checklists for patient management.

Methods

We adopted a multiphase, iterative design process. This was based in part on previously published checklist design methodologies, and involved initial literature review, followed by expert assessment, casenote-based validation, and end user feedback (Fig. 1).^{16,19,20}

Literature review

An online search of recently published literature was performed. The PubMed online database was searched for

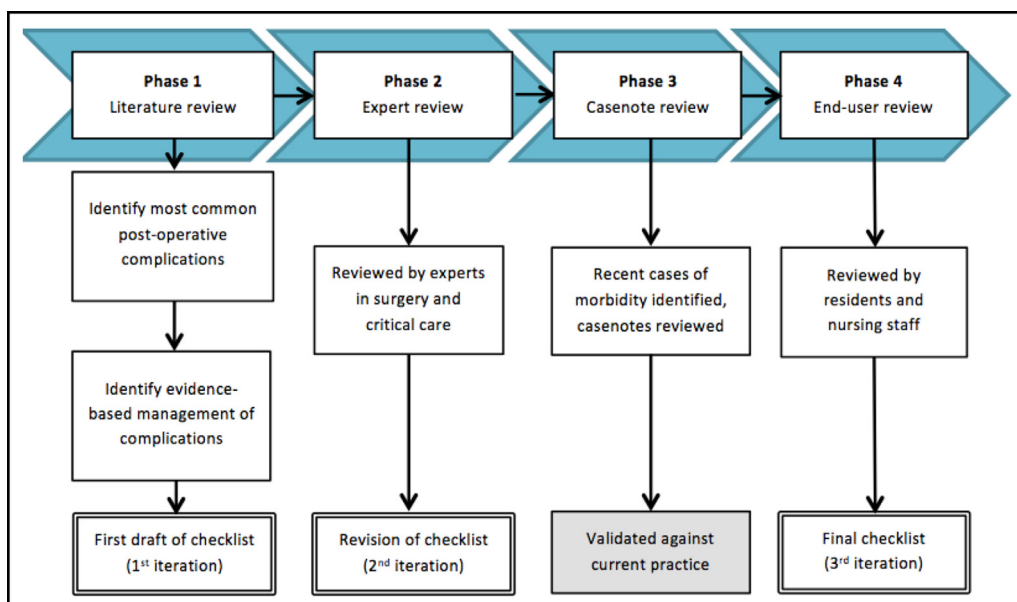


Figure 1 Iterative checklist development process.

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