A systematic review to identify the factors that affect failure to rescue and escalation of care in surgery

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Background. *The relationship between the ability to recognize and respond to patient deterioration (escalate care) and its role in preventing failure to rescue (FTR; mortality after a surgical complication) has not been explored. The aim of this systematic review was to determine the incidence of, and factors contributing to, FTR and delayed escalation of care for surgical patients.*

Methods. *A search of MEDLINE, EMBASE PsycINFO, the Cochrane Database of Systematic Reviews, and the Cochrane Central Register of Controlled Trials was conducted to identify articles exploring FTR, escalation of care, and interventions that influence outcomes. Screening of 19,887 citations led to inclusion of 42 articles.*

Results. *The reported incidence of FTR varied between 8.0 and 16.9%. FTR was inversely related to hospital volume and nurse staffing levels. Delayed escalation occurred in 20.7–47.1% of patients and was associated with greater mortality rates in 4 studies ($P < .05$). Causes of delayed escalation included hierarchy and failures in communication. Of five interventional studies, two reported a significant decrease in intensive care admissions ($P < .01$) after introduction of escalation protocols; only 1 study reported an improvement in mortality.*

Conclusion. *This systematic review explored factors linking FTR and escalation of care in surgery. Important factors that contribute to the avoidance of preventable harm include the recognition and communication of serious deterioration to implement definitive treatment. Targeted interventions aiming to improve these factors may contribute to enhanced patient outcome. (Surgery 2015;157:752-63.)*

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THE OBJECTIVE REPORTING of clinical outcomes is essential to the delivery of safe and transparent patient care.[1,2] In addition, patient-reported and specialty-specific outcomes also contribute to the drive toward high-quality care.[3] The concept of failure to rescue (FTR) has emerged recently as an outcome measure that discriminates hospital performance. Defined by Silber et al,[4] FTR is the number of deaths in patients who develop a postoperative complication. Hospitals with the greatest complication rates, however, do not necessarily have the greatest mortality.[5] These observations suggest that high-quality postoperative care after a complication plays an important role in the avoidance of preventable harm. Several studies have defined the components of optimal patient management after a complication.[2,3] Other reports have provided valuable insights into organizational factors that contribute to adverse outcomes, including lack of beds in the intensive care unit (ICU), poor access to radiology services, and unstructured emergency

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operating schedules.[6,7] Despite this recent expansion in the evidence base, the impact interventions aiming to improve postoperative care have on FTR has not been explored previously.

This topic is important because previous studies have highlighted that suboptimal care and communication failures contribute to breakdowns in information transfer along the postoperative patient pathway.[8,9] Specifically, in the context of an unstable patient, early recognition of clinical deterioration may be the key to preventing FTR.

Escalation of care is a process that can be defined as the recognition and communication of patient deterioration so as to implement definitive management. Rapid escalation of care can accelerate appropriate management and recovery. In contrast, if patient deterioration is not recognized or not acted on in a timely manner, delay can lead to poor outcome. Studies have demonstrated that factors that impede escalation increase cardiac arrests and death.[10,11] Previous studies evaluating FTR have investigated the aftermath of complications; however, there is a paucity of literature exploring the antecedents to FTR and the role of escalation of care in this process.

The aims of this review are to (1) determine the incidence of FTR events, (2) identify the factors that contribute to high FTR rates and delayed escalation of care, and (3) summarize outcomes of interventions aimed at decreasing the rates of FTR and improving escalation of care.

METHODS

Data sources. The databases searched included Ovid MEDLINE (1980 to week 2, November 2012), EMBASE (1980 to week 2, November 2012), PsycINFO (1987 to week 2, November 2012), the Cochrane Database of Systematic Reviews (Issue 10, 2012), and the Cochrane Central Register of Controlled Trials (Issue 10, 2012). Conference abstracts and reference lists of included articles were hand searched to identify additional relevant data. The grey literature (work lacking bibliographic control) was searched using Google.

Search strategy. The search strategy employed the following terms (all searched as a keyword unless indicated): escalation of care, failure to rescue, rapid response, early warning score, critical care outreach, calling for help, patient deteriorat*, medical emergency team, postoperative care (title search), failure to escalate, postoperative complication (title search), resident supervision, clinical supervision, trainee supervision, requesting help, and requesting support. The terms 'patient safety'/(medical subject heading) and 'ward' were combined using "AND". An initial review of this combination revealed a large number of studies reporting escalation of drug dosage; therefore, to tighten the search specificity, the additional limit 'NOT drug*' was applied. All of these terms were then combined using the conjunction "OR" before limits were applied. Studies were restricted to those reporting human subjects in the English language, published from 1980 onward. The last search was conducted on November 15, 2012.

All retrieved articles underwent screening of the title and subsequent abstract by 2 independent reviewers to screen for relevance. Inclusion criteria for full-text review were articles reporting hospital-based evaluations focusing on adult patients that investigated the factors affecting escalation of care or the impact of hospital and patient characteristics on outcome measures, including FTR. Letters, commentaries, review articles, conference abstracts, and articles not fitting in with the aims of the review were excluded at this point.

The 2 independent reviewers then screened the full text of the identified articles to assess eligibility for inclusion. Any disagreements during selection of articles for full-text review were resolved after discussion with a third reviewer.

Data extraction. A data extraction form was designed by the research team to allow for consistent evaluation. The study setting, subjects, design, measures, and key findings were recorded for further analysis.

Assessment of study quality. Quality assessment of each of the studies was evaluated independently by 2 researchers using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers.[12] These criteria were chosen because the criteria included a rating scale for both qualitative and quantitative research, allowing a degree of direct comparison between articles, because there are some matching items on each rating scale. Mixed-methods studies were given quality assessment scores based on both the quantitative and qualitative quality criteria. Studies were not excluded based on their quality to ensure comprehensive capture of as many studies exploring escalation of care and FTR as possible. Had low-quality studies been excluded, some valuable qualitative and descriptive data may have been lost.

RESULTS

The search produced 19,887 citations with 9,414 remaining after limits were applied and duplicates removed. Of these, 8,566 articles were excluded after title review leaving 848 abstracts for further scrutiny. Abstract review led to exclusion of a further