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Clinical factors associated with the non-utilization of an anaesthesia incident reporting system

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Editor's key points

- Under-reporting of critical incidents is well known.
- This study shows that the incidents during regional analgesia, emergency procedures, or consultants working alone are less likely to be reported.
- In contrast, longer duration surgery, presence of a trainee, or severe complications prompted better reporting.
- This study highlights important clinical and cultural enablers and barriers to the reporting.

Background. Incident reporting is a widely recommended method to measure undesirable events in anaesthesia. Under-utilization is a major weakness of voluntary incident reporting systems. Little is known about factors influencing reporting practices, particularly the clinical environment, anaesthesia team composition, severity of the incident, and perceived risk of litigation. The purpose of this study was to assess each of these, using an existing anaesthesia database.

Methods. We performed a retrospective cohort study and analysed 46 207 surgical patients. We used multivariate analysis to identify factors associated with the non-utilization of the reporting system.

Results. We found that in 7022 (15.1%) of the procedures performed, the incident reporting system was not used. Factors associated with the non-use of the system were regional anaesthesia/local anaesthesia, odds ratio (OR) 1.64 [95% confidence interval (CI) 1.03–2.62], emergency procedures OR 1.15 (95% CI: 1.05–1.27), and a consultant anaesthetist working without a trainee, OR 1.71 (95% CI: 1.03–2.82). In contrast, factors such as longer duration of surgery, OR 0.85 (95% CI: 0.76–0.94), the presence of a senior anaesthesia trainee, OR 0.86 (95% CI: 0.81–0.92), and the occurrence of severe complications with a high risk of litigation (i.e. death, nerve injuries) were less associated with a non-use of the reporting system, OR 0.65 (95% CI: 0.44–0.97). Team composition and time of day had no measurable impact on reporting practices.

Conclusions. Clinical factors play a significant role in the utilization of an anaesthesia incident reporting system and more particularly, severity of complications and higher liability risks which appear more as incentives than barriers to incident reporting.

Keywords: human factors; incident reporting; patient safety

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Incident reporting has become the most popular and widely recommended method to measure undesirable events associated with hospital care.[1–3] In many countries, anaesthesia professional organizations have made incident reporting a centrepiece of their quality assurance (QA) and patient safety improvement programmes.[4–8] Beyond quality and safety issues, an incident reporting system can be useful in capturing rare events occurring during procedures, or with the introduction of new medications.[9] Accurate recording and systematic reporting of critical events are essential for the full utility of the systems to be realized. This is currently not the case. The utilization of anaesthesia reporting systems varies widely, from 4% to 85%.[10–13]

Little is known about which factors influence utilization of an anaesthesia incident reporting system. A number of studies have shown that education, feedback, safety culture, and the technical design of a reporting system do have an impact on reporting practices in anaesthesia.[14–18] However, key factors that may determine reporting behaviour are the clinical context and aspect of patient care in which reporting takes place. It is currently unknown whether, for instance, time constraints during emergency procedures, complexity of anaesthesia, level of training, or the occurrence of serious and potentially litigious events impact on the use of a reporting system. The purpose of this study was therefore to investigate whether these key aspects of anaesthesia practice had an impact on the use of an incident reporting system in routine practice.

Methods

Setting and data collection tool

The Alfred Hospital (Melbourne, Australia) is an adult university-affiliated hospital, with all types of medical and

specialized surgical services, including neurosurgery, cardiothoracic surgery (including heart and lung transplantation), and a level 1 trauma centre. About 22 000 patients every year are anaesthetized for surgery or another interventional procedure. Before the procedure, appropriate preoperative assessment and examination of the patient is performed by the anaesthetist. Since 1995, we have developed an electronic patient record (EPR) to capture all patient, procedure, and organizational-related information. Data captured include patient characteristics, past medical history and co-morbidities, current functional health status, medication usage, and the ASA physical status score. This is completed during the procedure by the recording of the anaesthesia techniques used, the surgery or interventional procedure undertaken, and the classes of anaesthetic drugs administered. Non-clinical information such as time of the day and week, duration of procedure, emergency status, resident and consultant ID, and supervision level of the anaesthesia registrar/resident ('trainee') are also recorded. The recovery room and 24 h follow-up section is completed after the procedure, during a systematic postoperative follow-up visit performed by an anaesthesia trainee or the QA officer. All anaesthesia-related events (intra- or postoperative) are recorded into the EPR.

The information system also integrates an incident reporting feature for all events occurring during the perioperative period. The form includes one open text and 16 predefined categories of incidents which are defined as *unintended events or outcome which could have, or did reduce the safety margin for the patient.*[19] These predefined categories result from a consensus conference organized in the department of anaesthesia. The form also includes a text box for narratives and a check box 'no incident' which has to be completed when no undesired event has occurred during the intraoperative period (Fig. 1). All medical and QA staff (including consultants) is instructed in the collection of data and also receive a booklet of instructions and item definitions for the completion of the incident section of the EPR. For every procedure, it is mandatory for staff members to fill in the pre- and intraoperative sections of the EPR. The third section (postoperative period) is usually completed by the QA officer or anaesthesiologists completing the daily postoperative follow-up visit. Regular feedback is provided to staff members regarding the overall use of the system. Staff members are also encouraged to provide comments and suggestions for improvement. This is done by the QA officer during personal encounter, usually once a week and during the mortality–morbidity meeting, scheduled every Friday afternoon. During this meeting, incidents are discussed and staff members involved in the process usually describe the sequence of event and suggest a number of corrective strategies to avoid incidents occurring again. Incidents are also analysed outside the mortality–morbidity meeting, as part of the departmental QA programme.

Study design, risk factors, and outcome variable

After institutional ethics approval, we performed a retrospective cohort study using data collected and recorded between April 2002 and June 2006 in the anaesthesia EPR. We included all inpatient and ambulatory procedures performed with an anaesthetist in attendance. Before the analysis, we checked files for double entries and illogical values, using specific structured query language (SQL) clauses. We excluded all double data entries and used logic imputation to correct errors. We recoded and aggregated comorbidities and Australian Medicare procedures into ICD-10-AM category codes using mapping tables to create 13 distinct blocks of surgical intervention, as described previously.[20] Recorded details of the drugs administered and anaesthesia procedures were used to create five categories: general anaesthesia with/without regional nerve block; general anaesthesia with advanced monitoring (i.e. arterial catheter, central venous-line, pulmonary artery catheter); general anaesthesia with blood transfusion; anaesthesia solely with regional nerve block; and sedation with/without combined local or regional anaesthesia. Staff characteristics and team-composition-related factors such as training level or presence of a supervising consultant in theatre were classified according to College (ANZCA) specifications for training and supervision.[4] We also used timing, duration, emergency, and after/late hour status of procedures, to classify some aspects of working conditions. In-hours procedures were those performed between 7:00 a.m. and 6:59 p.m. and after-hours those between 7:00 p.m. and 6:59 a.m. Late-hours procedures were those starting within hours but extending into the after-hours period and associated with day/night shift changes of the anaesthesia team. All procedures during day and night time performed on a non-scheduled basis were defined as emergency procedures. Anaesthesia-related complications identified during the follow-up visit were classified according to a previously described classification scheme into: (i) death, (ii) increased care/risk with irreversible deficit, (iii) increased care/risk with reversible deficit, (iv) increased care/risk without function deficit, and (v) no change in hospital course.[21] To measure risk of liability in anaesthesia-related complications, we performed a broad literature search of anaesthesia-related liability cases in the USA, Australia, Canada, and the UK. We identified all types of undesired anaesthesia-related events which were usually followed by compensation claims.[22–25] According to their reported frequency among claim files, a histogram was built and events were classified into three equal categories: low, intermediate, or high incidence and risk of liability. The few events recorded in our EPR that could not be clearly identified in the literature (i.e. hoarse voice) were discussed with a second consultant anaesthetist and classified following consensus. The no-risk and low liability risk categories were aggregated.

To measure the non-use of the incident reporting system, we developed a combined outcome which integrated both the 'no incident' variable and the 16 different categories of predefined incidents variables of the EPR. Non-utilization of the reporting system was defined as a missing value in all the 16 predefined categories of incidents and in the 'no incident' field of the patient record (either an incident has occurred or not).