Original Article

# Perioperative anesthetic documentation: Adherence to current Australian guidelines

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## Abstract

**Purpose:** The lack of adequate perioperative documentation has legal implications and can potentially affect the quality and safety of patient care. Despite the presence of guidelines, the adequacy of perioperative documentation in Australasia has not been adequately assessed. The aim of this study is to assess the adequacy of anesthetic documentation on the pre and intraoperative encounters and to test the hypotheses that documentation is incomplete in the settings of emergency vs. elective procedures, regional vs. general anesthesia, and manual vs. electronic documentation.

**Materials and Methods:** The study was an observational retrospective study in the setting of a 250-bed teaching hospital in metropolitan Adelaide, Australia. The perioperative records of 850 patients were analyzed. A scoring system was designed, based on a policy statement from the Australian and New Zealand College of Anesthetists and a survey of the hospital anesthetists. Scored and categorical data was analyzed using Chi-square test. Numerical data was analyzed using student *t*-test. The null hypothesis was accepted or rejected at 0.05 significance.

**Results:** There were significant deficiencies in the adequacy of preanesthetic and intraoperative records. This has been shown to be true in all cases. Documentation was found to be poorer in the emergency setting when compared to elective cases (median scores 15 vs. 21 $P = 0.03$) as well as documentation of airway assessment for cases done solely under regional anesthesia (42 vs. 85%, $P = 0.05$). There were no significant differences in the adequacy of electronic vs. manual records ($P = 0.92$).

**Conclusion:** There are significant deficiencies in the adequacy of perioperative records. This has been shown to be true in all cases, but is especially so in emergency cases and for patients having only regional anesthesia.

**Key words**: Anesthesia, documentation, electronic, emergency, regional

## Introduction

The anesthetic record is usually the sole documentation of an anesthetist's interaction with his or her patient. The record generally serves as a concise document of the relevant preoperative assessment, intraoperative anesthetic administration and physiological data, as well as the anesthetist's orders for the immediate postoperative management.

The lack of clear and adequate documentation has not only medico-legal implications, but can potentially affect the quality and safety of patient care. Examples include the documentation of an unexpected difficult airway event or an allergic reaction to an administered medication. It is not surprising, therefore, that the importance of maintaining an adequate, accurate, and legible anesthetic record has been emphasized by numerous professional bodies including The Australian and New Zealand College of Anesthetists (ANZCA),[1] The American Society of Anesthesiologists (ASA),[2] and The Canadian Anesthesiologists Society (CAS).[3]

In addition to assessment of the adequacy of anesthetic documentation on both the preoperative and intraoperative encounters, this study aimed to test the hypotheses that documentation is incomplete in the settings of emergency procedures, regional anesthesia, and manual documentation,

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when compared to that of elective procedures, general anesthesia, and electronic documentation, respectively.

## Materials and Methods

A retrospective study analyzing perioperative anesthetic documentation was performed as a part of the process of quality assurance and self-audit in the setting of an Australian metropolitan 250-bed teaching hospital. The anesthetic records of all patients who received an anesthetic (general, regional, and anesthetist-administered sedation) during the month of January 2010 were analyzed. In the institution, preanesthetic documentation is performed by manual entry of relevant information by an anesthetist on a pre-designed form. Intraoperative documentation format varies according to the operating site allocated for the surgical procedure, as not all operating sites are equipped with an electronic Anesthetic Information Management System (AIMS), WinChart® (WinChart Health Informatics, Sydney, NSW, Australia). Documentation in the remaining theaters is performed manually.

Local Human Research Ethics Committee (LHREC) approval was obtained. As anonymity was maintained in this retrospective audit, informed consent from each patient was not required. The primary investigator accessed the anesthetic records. A scoring system was designed for objective assessment of the adequacy of the records studied [Table 1]. The scoring system was based on the ANZCA's Recommendations on the Recording of an Episode of Anesthesia Care.[1] A survey of anesthetists (both consultants and registrars) at the hospital was conducted to determine the adequacy of entries not specifically outlined in the policy document. These included airway assessment and description of the process of informed consent. Each anesthetic encounter was scored from 0 to 27 depending on the adequacy of documentation, with 0 being allocated to no documentation and 27 to a record that meets all recommendations.

The data was recorded on a Microsoft Excel data sheet. Statistical analysis was performed using SAS/STAT® software (SAS Institute Inc., Cary, NC, USA). Scored and categorical data was analyzed using Chi-square test, whereas numerical data was analyzed using student *t*-test. The null hypothesis was accepted or rejected at the 0.05 significance.

## Results

A total of 887 patients were recorded to have received an anesthetic during the study period. Of these, the perioperative records of 850 patients were obtained and analyzed. The records of 37 patients could not be accessed at the time of conduction of the study.

**Table 1: Scoring system**

| Anesthetic documentation | Data field | Requirement | Maximum score |
|---|---|---|---|
| Preoperative encounter | Name, URN, gender, and weight | Each to be documented on both pre and intraoperative documents | 4 |
| | Date | Of preoperative assessment and procedure | 1 |
| | Name and signature | On both pre and intraoperative encounters | 1 |
| | Procedure | Brief description on both pre and intraoperative documents | 2 |
| | Medical status | ASA score | 1 |
| | Medications and allergy | On preanesthetic assessment | 1 |
| | Previous anesthesia | List and issues (or none) | 1 |
| | Airway, dentition, GORD | Airway: Mallampati score, Thyro-mental distance, and Dentition: Any loose, false, or broken teeth. GORD: Presence and severity. | 3 |
| | Pre-medications | If appropriate | 1 |
| | Anesthetic plan | Brief description | 1 |
| | Risks | Brief description (on either preanesthetic record or the consent form) | 1 |
| Intraoperative encounter | Anesthetic technique | Full details (General and regional) | 1 |
| | Drugs administered | Time and dose of administration | 1 |
| | Airway | Size and Type | 1 |
| | Breathing system | Breathing system, flows, and mode of ventilation | 1 |
| | Monitoring method | List and details (e.g. size and site of IAL or CVC) | 1 |
| | Vascular access and IVT | Site, Size of iv access. Type and volume of fluid infused | 1 |
| | Significant blood loss | Must be documented in: Intra-cavitary, major orthopedic, cesarean section, major gynecological, and urology procedures | 1 |
| Postoperative instructions | Postoperative recovery analgesia | Pain protocols when appropriate | 1 |
| | Postoperative ward analgesia | Documented on either operative record or medication chart | 1 |
| | Postoperative fluid orders | Orders to cover 24 h | 1 |

## Overall completeness

The overall median score of all records analyzed ($n = 850$) was 20/27. The preanesthetic record was found to be complete and legible (scored 17/17) in only 32% ($n = 272$) of the encounters. Similarly, the intraoperative encounter was deemed compliant with the chosen guidelines, scoring 7/7 in 27% ($n = 230$) of the encounters. None ($n = 0$) of the patients had complete preoperative and intraoperative records for the same surgical procedure. Figure 1 below outlines the percentages of adequate documentation on some of the scored entries.

Items least likely to be adequately documented were risk discussion (complete in 32% of cases) during the preanesthetic assessment and documentation of the breathing circuit, flows, and ventilation settings (complete in 29% of cases) during the intraoperative encounter.

## Subgroup analyses

*Elective vs. Emergency cases*

Documentation was found to be significantly poorer in the emergency setting than in elective cases (median scores 15 vs. 21, $P = 0.03$). This was true in both the preanesthetic and intraoperative records. Emergency cases were less likely to have complete documentation in the following fields ($P < 0.05$): Weight, previous anesthetic history, airway assessment, risk discussion, and ward analgesia, as outlined in Figure 2.

The anesthetic records were more likely to lack the name of the anesthetist or his/her signatures in the emergency setting, but this failed to reach the statistical significance ($P = 0.09$).

*Regional vs. General anesthesia*

A total of 177 cases (21%) were performed under regional anesthesia alone. The remaining 673 cases included a sedation technique or a general anesthetic There was no significant difference in the overall score ($P = 0.23$). Regional cases, however, were significantly less likely to have their airway assessment documented on the preanesthetic record (42 vs. 85%, $P = 0.05$).

*Manual vs. Electronic intraoperative records*

A total of 99 manual and 751 electronic intraoperative records were analyzed. Overall, there was no difference in documentation completeness. Manual entries were found illegible on a number of occasions. A number of entries scores were found to be significantly different ($P < 0.05$), as outlines in Figure 3 below.

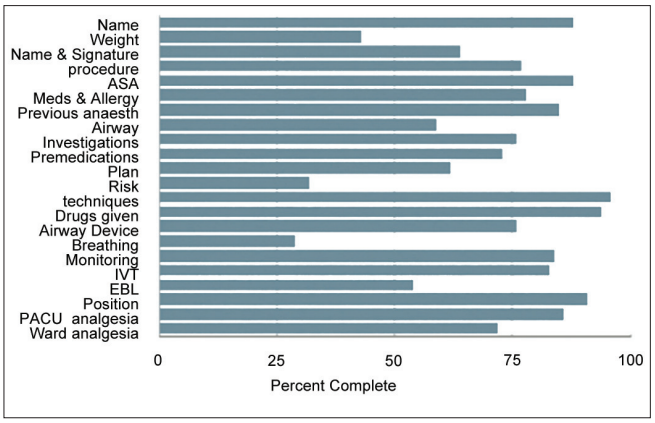


**Figure 1:** Percentages (%) of documentation entries found to be compliant with ANZCA guidelines

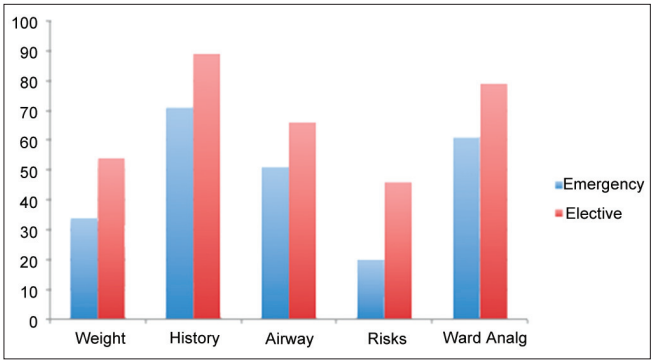


**Figure 2:** Percentages of completed enteries on emergency and elective procedures' anaesthetic records. Weight = documentation of patient's weight, History = Documenttion of Anaesthetic History, Airway = Documentation of airway assessment, Risks = Documentation of risk discussion, Ward Analg = Documentation of pain relief on the ward

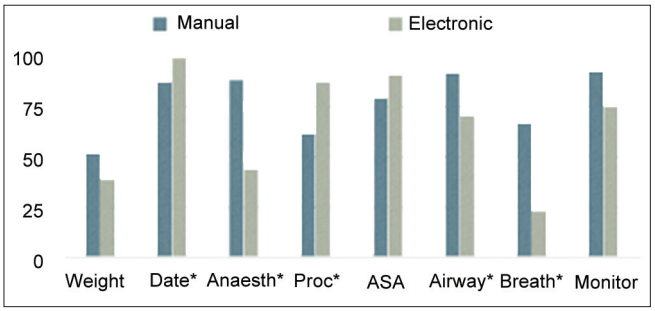


**Figure 3:** Percentages of completed entries on manual and electronic anaesthetic records. *Indicates a statistically significant difference. Anaesth = Anaesthetic technique description, Proc = Procedure performed, Breath = Breatbing circuit, Monitor = Monitoring used

# Discussion

Deutsch summarizes the legal importance of anesthetic documentation in his book Medical Records for Attorneys "…if there is a crisis in the operating room, one can generally say that the anesthetist is responsible, as a matter of general protocol. In such case, the quality of the anesthesia record will likely be the most critical documentary evidence in the case…"[4] In addition to the legal implications, the medical importance cannot be over-emphasized.

Examples of omissions potentially leading to disastrous effects include failure to document allergies during the

preanesthetic assessment[5] or an unanticipated difficult airway intraoperatively. The quality and accuracy of intraoperative documentation has been assessed in previous publications, especially in the setting of comparing electronic and manual records.[6-8] On the other hand, no published study assessed the adequacy of documentation during the preanesthetic visit against current Australian guidelines.

The most important finding of this study is that there are significant gaps in documentation of both the pre and intraoperative records, as demonstrated by the finding that none of the 850 patient records analyzed had adequate documentation of both encounters. One French study by Falcon *et al.*,[9] highlights similar deficiencies in both pre and intraoperative records, but the quality of documentation in our study was relatively poorer. Previous audits of intraoperative records have highlighted similarly significant deficiencies.[5-7]

The medical practitioner assessing a patient fitness for an anesthetic preoperatively may be different from the anesthetist administering the anesthetic on the day of the procedure. ANZCA encourages the preoperative assessment of patients by the administering anesthetist, but this is not a requirement.[10] It is also not uncommon to have a time gap of days or weeks between the assessment and the procedure. It is in these situations that the quality of preanesthetic assessment becomes highly relevant to providing a safe anesthetic.

Less than one-third of the preoperative assessments were found to be compliant with the current guidelines. Risk discussion was the least likely preoperative entry to be adequately documented. This might be due to the fact that printed leaflets describing the general risks of anesthesia are handed to patients presenting to the preanesthetic clinic. ANZCA recommends documentation of discussions of the anesthetic plan and risks specific to the patient and the procedure during the preanesthetic assessment.[1,11]

Intraoperative records were also found to be incomplete in 73% cases. Most of the deficiencies were in the areas of description of the breathing circuit and ventilation parameters as well as documentation of estimated blood loss. Demographic data was the most likely to be complete. They are usually in the form of preprinted adhesive stickers attached to the anesthetic record. Similar findings were reported on previous audits.[6,7,9]

There is usually less time available for assessment and optimization of patients in an emergency setting. This study found that documentation was significantly poorer in this subgroup of cases. This was true for both the pre and intraoperative records. Items that were least likely to be adequately documented in the emergency settings included airway assessment and surgical history. These findings are consistent with the findings of Falcon *et al.*,[9] (2422 patients), but smaller audits failed to confirm it.[6]

The inability to document airway assessment has significant importance in the emergency setting, where it is not uncommon to have the assessing doctor different from the anesthetist managing the airway in the theater. This can lead to potentially serious consequences.

Despite the fact that the overall documentation score was not different ($P = 0.23$), patients having regional anesthesia alone were significantly less likely to have their airway assessment documented (42 vs. 85%, $P = 0.05$). Most of these patients (125 out of 177) were pregnant patients undergoing Low Segment Caesarian Section (LSCS) deliveries or postpartum procedures. These patients are 10 times more likely to have a failed intubation compared to the general surgical population.[12] LSCS also has a conversion rate to a general anesthetic of 5-9%.[13] In these situations, adequate and clear documentation of airway assessment is of utmost importance. This study highlights a significant deficiency in airway assessment documentation in this subgroup of patients, with potentially serious life-threatening consequences.

Multiple previous audits have looked at the adequacy of manually recorded anesthetic charts vs. electronic ones.[6,7,14] AIMS were designed primarily as automated anesthesia record generators that were supposed to relieve anesthetists from the drudgery of manually entering physiologic data points.[15] Their use has been endorsed by Anesthesia Patient Safety Foundation (APSF).[16] They have also been recommended to enhance detection of adverse physiological events under anesthesia and as a tool for quality improvement.[8] They have been shown to produce more accurate physiological data than those produced by hand.[17-19] Because physiological data gets recorded automatically, AIMS avoids the process of "selective disregard"; where information that is not believed to be accurate is selectively omitted, thereby reducing variability of the anesthetic record, so that manual records appear "smoother." This has been confirmed in a confidential survey of New Zealand anesthetists, where nearly half admitted to intentionally altering observations and events.[20] AIMS are also increasingly utilized for managerial and clinical decision support. Examples include prompting the anesthetist to administer antibiotics within 30 min of case start. This utilization has been shown to improve clinical practice.[21]

In this study, there was no overall difference in adequacy between electronically or manually generated records. Manual records were occasionally difficult to read. Certain items were more likely to be adequately documented in the electronic setting; the date, the name of the anesthetist, and

the description of the procedure performed. These items are likely to be fed into the system preoperatively by the theater staff. On the other hand, manual records had better documentation of airway interventions and description of the breathing circuits and flows. These findings are similar to those found in previous audits.[6,7]

This study has many limitations. It is a retrospective audit, so it was not possible to ascertain the adequacy of documentation in different clinical situations. Examples include failure to document an unanticipated difficult airway or allergic reaction.

A second limitation is that this study was performed at one teaching hospital and does not reflect the practices in other hospitals. It also analyzed the performance of only one commercially available AIMS.

A third limitation is the assumption that the clinicians using the system are equally facile, so the individual performance does not affect the quality of record keeping. The month of January was chosen in an attempt to reduce the effect of user familiarity, as local trainee rotations take place during the months of August and February of each year.

Finally, this study used the ANZCA recommendations on preoperative records as the gold standard. While it is desirable to follow these recommendations, some of them can sometimes be considered impractical or unrealistic. Examples of such entries include flow rates or type of anesthetic circuits used.

Based on our data, we conclude that there are significant deficiencies in the adequacy of preanesthetic and intraoperative records. This has been shown to be true in all cases, but it is more pronounced in emergency cases and for patients having regional anesthesia as their sole anesthetic. Special attention needs to be given to documentation of airway assessments and discussion of risks.

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