CORRESPONDENCE

Improved difficult airway documentation using structured notes in Anesthesia Information Management Systems

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To the Editor,

Difficult airway management remains a challenge and each encounter requires accurate and quality documentation.¹ Failure to document difficult airway may threaten patient safety during subsequent encounters. Complete documentation enables subsequent healthcare providers to plan approaches that avoid and minimize morbidity and mortality.² Our institution recently transitioned from a paper anesthesia record system to an Anesthesia Information Management System (AIMS) as part of the enterprise electronic medical record solution, Epic (Epic Systems Corporation, Epic Anesthesia Module, Verona, WI, USA).

During the transition from paper to the AIMS record, we elected to use the structured format for a difficult airway note provided by the vendor. Our goal was to determine if note quality and completeness improved with the use of the AIMS structured difficult airway note compared with paper records. Approval was obtained (December 13, 2018) from our institutional quality and risk management for this retrospective chart audit. Following a literature review, local airway experts participated in a nominal group technique to develop the Toronto Difficult Airway

Documentation (TODAD) checklist, which comprises 18 items that assess the completeness of a difficult airway note (Figure A). Each item on the checklist accounts for one point of a possible 18-point score. To determine what constitutes a high-quality note, we used the e-CRABEL (Crawford - Buresford - Lafferty) approach.³ The CRABEL score is reproducible and easy to use in objective assessments of medical record keeping quality. High-quality notes have previously been defined to have 85% of items in a checklist completed.^{3–5} Our primary outcome was the proportion of AIMS difficult airway notes scoring at least 85% (high quality) on the TODAD, compared with the legacy paper records.⁵

Based on a previous study on structured reporting, we determined *a priori* that a sample size of 80 charts would detect a 50% improvement in the proportion of charts scoring 85% of TODAD.⁴ We assumed a baseline proportion of 50% and an effect size of 50%. Study data were collected using REDCap hosted at our institution. JMP® (JMP®, version 14, SAS Institute Inc., Cary, NC, USA 1989–2019) was used for analysis where a two-tailed $P < 0.05$ was considered significant.

From the legacy paper records, we retrospectively accessed the last 40 consecutive difficult airway notes for patients undergoing non-airway surgery, who were intubated and flagged as “difficult airway”. We also retrospectively accessed the first 40 consecutive structured difficult airway notes from the AIMS. Two investigators independently reviewed and scored each note using the TODAD checklist with any disagreement resolved by consensus.

The proportion of difficult airway notes with a TODAD score of 85% was 13% of the paper records vs 60% of the structured AIMS notes (relative risk, 12.5; 95% confidence interval [CI], 3.2 to 49.2; $P < 0.001$) (Figure B). The mean

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Figure A) The Toronto Difficult Airway Documentation (TODAD) checklist. B) Box-whisker plots depicting higher TODAD scores for Anesthesia Information Management System structured difficult airway notes compared with the paper record TODAD scores.

TODAD quality score increased from 71% (95% CI, 68 to 75) for paper records to 86% (95% CI, 83 to 89) for structured AIMS notes ($P < 0.001$). A limitation of our

study was that our department did not use paper-based structured difficult airway notes prior to adopting the AIMS. Nevertheless, our AIMS system provided the

opportunity to use structured notes; we believed them to be superior.

In conclusion, we showed that using a structured AIMS difficult airway note improved the quality and completeness of difficult airway documentation. Institutions transitioning to AIMS should consider the use of structured, difficult airway notes. Further, the TODAD score may be used to monitor the quality and completeness of difficult airway documentation to ensure that vital information is available in the patient's electronic record.

Conflict of interest None.

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