

Unplanned extubation is a common and costly problem with a large impact on outcomes and hospital costs, yet it remains an under recognized problem. Prevention requires commitment not only from clinical care providers but from leadership as well. Prevention strategies include regular tracking and standardized care utilizing best practices.

The Society for Airway Management and the Patient Safety Movement Foundation have collaborated with multiple medical societies and safety organizations to address the issue of unplanned extubation. This collaborative is focused on increasing awareness of the magnitude of the problem and distributing tools to increase prevention. Among these tools are a core data set for standardized tracking and a set of best practice actionable patient safety solutions (APSS) which can be used by hospitals for their prevention efforts.

#### References

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### COMPARISON OF CRICOTHYROID MEMBRANE IDENTIFICATION WITH TWO ULTRASOUND TECHNIQUES IN PATIENTS WITH NECK PATHOLOGY

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Cricothyroidotomy is performed through the cricothyroid membrane (CTM). The CTM is usually inaccurately identified with the landmark technique, especially in obese subjects. Two ultrasound techniques have been described to identify the CTM: sagittal and transverse approaches. These ultrasound techniques have been shown to increase the accuracy in identifying the CTM but are associated with longer identification times.<sup>1</sup> We evaluated these ultrasound techniques on two subjects with different neck pathology.

This study was approved by London Research Ethics Committee (16/LO/2068) and registered with UK Clinical Trials (ISRCTN 11036029). A randomised crossover study was performed, comparing the sagittal and transverse ultrasound techniques on two subjects with different neck pathology in identifying their CTM. Subject A had previous hemi-mandibulectomy, neck dissection and radiotherapy and subject B has an enlarged thyroid gland as shown in Figure 1. Anaesthetists (ST3 level and above) were recruited from a single centre to participate in the study. Training of the ultrasound techniques were provided to the anaesthetists and adequate training time were permitted until they were confident with each technique before proceeding to the study subjects. The CTM of both subjects were demarcated by a radiologist with an invisible ultraviolet marker pen, which was only revealed with an ultraviolet torch. The main outcomes measured were time and accuracy of CTM identification with the sagittal and transverse ultrasound techniques.



Figure 1 Subjects' anterior neck appearances

Forty anaesthetists were involved in the study, with all (100%) proficient in utilising ultrasound in clinical practice. In subject A (previous neck surgery), the mean (SD) times to identify the CTM with the sagittal and transverse techniques were 69.0 (44.9) s and 41.3 (28.6) s, whereas in subject B (enlarged thyroid gland), they were 55.8 (32.6) s and 29.7 (15.6) s. Transverse ultrasound technique was significantly faster than the sagittal ultrasound technique ( $p < 0.001$ ). In comparing accuracy, the CTM of subject A was accurately identified by 18 (45%) anaesthetists with the sagittal technique and 20 (50%) with the transverse technique, whereas in subject B, it was accurately identified by 31 (78%) anaesthetists with the sagittal technique and 27 (68%) with the transverse technique.

Our study concluded that the most predictive factor in accurately identifying the CTM is the subject itself. Patients with neck pathology will present with a variance of surface landmark of neck anatomy. Further studies on ultrasound identification of CTM in patients with neck pathology should be explored.

Acknowledgement: Funding received from DAS small grant (WRKO-2016-0008).

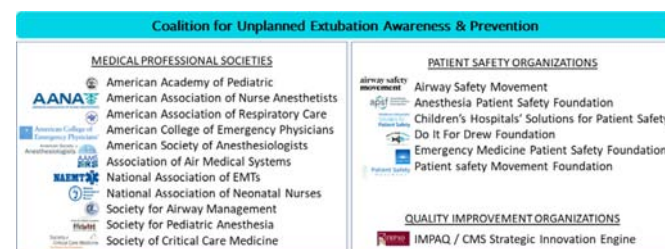
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### UNPLANNED EXTUBATION AWARENESS AND PREVENTION INITIATIVE: A PLAN FOR ZERO PREVENTABLE DEATHS.

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Drew Hughes died when his life sustaining breathing tube was unintentionally removed, starving his brain of critical oxygen. More than 33,000 adults die yearly from this preventable complication of the procedure that is intended to keep them alive. Inspired by Drew's tragic death, the Society for Airway Management formed a coalition of medical societies, patient safety organizations and quality improvement organizations, all with the common goal of increasing awareness and prevention and eliminating preventable death from unplanned extubation (UE).

Drew's death, although tragic, is not an isolated safety event. Unplanned extubation occurs in more than 120,000 adults and 80,000 neonates, in US ICUs alone. Da Silva's comprehensive review of the literature indicates that 7.3% of adult and 18.2% of neonatal ICU intubated patients experience the unintended removal of their breathing tube<sup>1</sup>. The very large variance amongst the hospitals involved in the review (adults 0.5% - 35.8%; neonates 1.0% - 80.8%) indicates that there is a very large opportunity for improvement. Unplanned extubation is not only common, it is very costly. UE increases the ICU length of stay from 9 to 18 days in adults and from 9 to 51 days in neonates, contributing to the \$40,000 average cost of a UE and \$7.8B in wasted US healthcare costs<sup>2,3</sup>.

Although the literature clearly shows that UE is common and costly, the gravity of this safety event is uncommonly recognized and frequently thought of simply as a "cost of doing business". Many institutions do not track UE, it is not a key performance measure despite the number of deaths caused by UE, and most major electronic medical records don't include UE as a data field.

Led by the Society for Airway Management, the coalition has launched a national campaign to reduce the incidence of preventable death from UE through increasing awareness, a toolbox of quality improvement best