Professional attitudes to a 'smart' tracheal tube: report of a survey of Difficult Airway Society delegates in 2018

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The intra-Tracheal Multiplexed Sensing endotracheal tube (iTraXS) was developed in collaboration by the University of Nottingham, Nottingham University Hospitals, and P3 Medical Ltd (Preston, UK), and funded by the National Institute for Health Research's i4i programme (II-LA-0813-20008; see Fig. 2). iTraXS allows continuous monitoring of multiple core standard physiological parameters such as temperature and oxygen saturations, and a range of novel cardiovascular data, including tracheal mucosal contact pressure and mucosal ischaemia. The potential benefits of such technology include reduced tracheal mucosal injury, reduced micro aspiration, reliable central monitoring, and confirmation of tracheal placement.

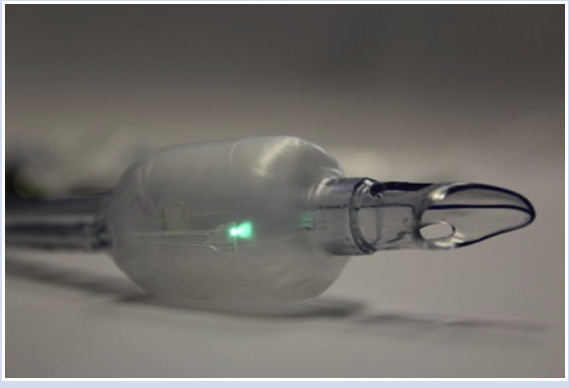

Fig 2 The intra-Tracheal Multiplexed Sensing endotracheal tube (iTraXS)

The Difficult Airway Response Team programme: a 10-yr follow-up

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Failures of airway management are a major source of morbidity, mortality, and hospital liability. We previously described the implementation of the Difficult Airway Response Team (DART) programme, a multidisciplinary collaboration between anaesthesiologists, otolaryngologists, emergency physicians, and trauma surgeons.[1–3] We report on aspects of the 10 yr experience of the DART programme.

This institutional review board (IRB)-approved study included all events for which DART was activated to manage adult patients from July 2008 to July 2018. The DART database was used to collect demographic and event data, including intubation technique and success or failure of each attempt. χ^2 testing with pairwise Bonferroni correction ($P \leq 0.05/6 = 0.0083$, statistically significant) was used to compare intubation technique success rates. Linear regression was used to model the change in technique prevalence over time.

During the period studied, 729 DART activations were recorded (57.8% males, mean [standard deviation, SD]; age: 55.6 [16.7] yr). The predominant locations for DART activation were intensive care units (n=373, 51.1%) and the emergency department (n=143, 19.6%). Of 729 patients, 125 (17.1%) were transported to the operating room for management. Risk factors for DART activation included known difficult airway, angioedema, current tracheostomy, airway bleeding, and BMI >30 kg m^{-2}. The primary techniques used were videolaryngoscopy (VL), direct laryngoscopy (DL), fibreoptic bronchoscopy (FOB) techniques, rigid laryngoscopy (RL), and surgical airway; supraglottic airway was used as part of airway management in 58 (8.0%) activations. Linear regression showed a significant increase over time in the percentage of attempts with VL (slope=3.0% yr^{-1}, 95% confidence interval=1.8–4.2%, P=0.0005). χ^2 analysis revealed higher rates of success for FOB techniques (133/179, 74.3%) than for either DL (143/277, 51.6%) or VL (142/267, 53.2%) (P<0.00001 for both). RL (48/74, 64.9% successful) was associated with higher success rates than DL (P=0.04) or VL (P=0.07), but these results were not significant after Bonferroni correction. Overall, 56 (7.7%) patients required a surgical airway (cricothyrotomy or tracheostomy). No airway-related mortalities occurred during DART activations.

The DART programme has successfully prevented airway-related mortality. Despite the increasing use of VL, other techniques, including surgical airways, continue to be invaluable for patient safety. Institutions should consider customising the DART programme to optimise their clinical practice.

References

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Paediatric emergency front-of-neck access: accuracy of cricothyroid membrane identification and hypothetical incision lengths

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The cricothyroid membrane (CTM) is the recommended site for emergency front-of-neck access (eFONA) in children in a cannot intubate, cannot oxygenate (CICO) scenario. We investigated the following: (1) accuracy of ultrasound in identification and measurement of CTM dimensions; (2) clinician accuracy in CTM localisation by palpation; and (3) the starting point and length of different hypothetical vertical incision strategies required to expose the CTM.

The study was a prospective observational study performed in a tertiary paediatric university hospital. Ethical