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Brief Reports

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ONE-YEAR EXPERIENCE WITH THE INSTITUTION OF A CRITICAL AIRWAY TEAM AT AN ACADEMIC MEDICAL CENTER

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☐ **Abstract—Background: At our institution, there were a number of adverse patient events related to an unstable airway that led to the formation of a designated critical airway response team (CAT). It was hoped that this would improve patient outcomes in such matters. Objective: Our aim was to evaluate the impact of the creation of the CAT. Methods: A review of the activations of the CAT for 1 year was conducted. Results: We reviewed 51 CAT activations, the majority (71%) occurred in the emergency department (ED) and the most common reasons for activation were angioedema (41%) and epiglottitis (12%). Fiber optic intubation was the most common method used to secure the airway, 22% of the cases were transported to the operating room for management. Only one surgical airway was required and no adverse outcome related to the airway occurred in the studied group. Conclusions: The creation of a critical airway has been considered a success in terms of patient management at our institution. It has been most commonly used in the management of life-threatening angioedema in the ED.** © 2016 Elsevier Inc.

☐ **Keywords—critical airway team; airway; angioedema; difficult airway; emergency**

INTRODUCTION

Emergency physicians and other clinicians are tasked with the management of airway emergencies. When a patient is determined to have a difficult airway, additional resources in terms of personnel and equipment may be urgently needed to minimize morbidity and prevent mortality. At our institution, before the creation of a difficult airway team, there was no standardized approach to such patients. Often a second-phase response was initiated after the initial providers realized securing the airway would be difficult. This process led to delays in definitive airway control. A number of events occurring in the emergency department (ED) and the inpatient setting that resulted in an adverse consequence for the patient led to a change in the manner in which difficult airways were managed at our institution. This article describes the approach developed and the initial results of implementation of this new approach.

MATERIALS AND METHODS

The setting of this report is an urban academic teaching hospital that is a Level I trauma center with an ED census of approximately 86,000 adults per year. Members of the departments of emergency medicine, anesthesiology, and surgery held a series of meetings with the purpose of

Institutional Review Board exemption was obtained for this study.

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Table 1. Critical Airway Team Members

Attending anesthesiologist
Attending trauma surgeon
Attending EM physician (when activation in ED)
Anesthesiology senior resident or CRNA
Surgery chief resident
Otolaryngology chief resident (when in house)
Respiratory therapist
Pharmacist
Nursing clinical coordinator
Members of treatment team when inpatient activation

CRNA = certified registered nurse anesthetist; ED = emergency department; EM = emergency medicine.

creating an improved method of managing difficult airways requiring urgent or emergent intervention. A multidisciplinary critical airway team (CAT) led by an attending anesthesiologist was formed and a single pathway established for its activation. The team members and their roles are described in Table 1. The CAT team can be activated by any advanced care practitioner (e.g., physician, certified registered nurse anesthetist, physician assistant, nurse practitioner) who believes an airway requiring intervention may be difficult. Valid reasons for activation include mechanical obstruction (e.g., angioedema), airway distortion (e.g., trauma related), morbid obesity, other anatomical issues (e.g., large tongue, facial malformation), known prior difficult airway, cervical spine injury or pathology, failed conventional approach to the airway and clinical judgment of the provider.

The CAT is activated through a call to the page operator who sends a group page to the team members and announces the activation overhead throughout the hospital with the location of the patient. Advanced airway equipment is brought to the bedside by the anesthesiology team, including a fiber optic intubation cart with video laryngoscope capability and an airway box containing additional equipment, such as laryngeal mask airways and equipment for a bedside surgical airway. Data regarding CAT activations were collected on a standard form including the reason for activation, patient demographics, site of the event, technique(s) employed, specialty of the practitioner successfully securing the airway, complications, and patient outcomes. As the reported information in this article used existing patient data, this investigation qualified as an exempt study by our Institutional Review Board.

RESULTS

The CAT was implemented in 2011 and we reviewed the 51 activations from July 1, 2011 through June 30, 2012. Two cases were excluded due to incomplete patient identifiers. Demographic information and the site of activation

Table 2. Demographic Information and Site of Activation

Demographic Characteristics	n
Sex	
Male	24
Female	25
Age	
<18 y	1
18–54 y	35
>54 y	15
BMI	
Normal (BMI 18–24.9)	16
Overweight (BMI 25–29.9)	16
Obese (BMI ≥30)	19
Site of activation	
Emergency department	35
Inpatient floor	8
Intensive care unit	4
Other	2

BMI = body mass index.

are listed in Table 2. The majority of activations occurred in the ED (71%). Table 3 lists the reasons for activation with the majority (41% of cases) being angioedema associated with angiotensin-converting enzyme (ACE) inhibitor use. Epiglottis accounted for another 12% of cases. The other causes for activation included head and neck abscesses, inhalation injury, airway trauma, foreign bodies, maxilla-mandibular fixation, prior radiation, and active bleeding. The four cases considered inappropriate were due to a miscommunication or an activation where potential airway management was needed but without a reason to suspect a difficult airway.

The resultant airway management is detailed in Table 4. Fiber optic intubation (55%) was the primary method for securing the airway. One surgical airway was required and 3 patients were treated with medical measures only. Eleven (22%) of the patients were transported to the operating room for definitive management, these were all ED cases. The service providing the definitive securing of the airway was anesthesiology in 85%, emergency medicine in 6%, surgery in 2%, and the remaining 8% did not have a definitive intervention. Four patients expired during their hospital stay, but none of the deaths were attributed to issues with airway management. A 5-year-old was transferred to a pediatric hospital after stabilization and endotracheal intubation. During

Table 3. Reasons for Activation of the Critical Airway Team

	n (%)
Angioedema	20 (41)
Other obstruction	16 (33)
Epiglottitis	6 (12)
Morbid obesity	2 (4)
Failed intubation attempts	1 (2)
Inappropriate activation	4 (8)

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