Airway Management by US and Canadian Emergency Medicine Residents: A Multicenter Analysis of More Than 6,000 Endotracheal Intubation Attempts

Goals/Objectives:

To determine success rates of endotracheal intubation performed in emergency departments (EDs) by North American emergency medicine residents.
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Methods/Inclusion:

During 58 months, physicians performing intubations at 31 university-affiliated EDs in 3 nations completed a data form that was entered into the National Emergency Airway Registry 2 database. Included were all patients undergoing endotracheal intubation in the ED. The data form included patients' age, sex, weight, indication for intubation, technique of airway management, names and dosages of all medications used to facilitate intubation, level of training and specialty of the intubator, number of attempts, success or failure, and adverse events. The investigators queried this prospectively gathered, observational data to analyze intubations done by US and Canadian emergency medicine residents.
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Major Findings:

Emergency medicine residents performed 77% (5768/7498; 95% confidence interval [CI] 76% to 78%) of all initial intubation attempts in the United States and Canada. The first intubator was successful in 90% (5,193/5,757; 95% CI 89% to 91%) of cases, including 83% (4,775/5,757; 95% CI 82% to 84%) on the first attempt. Success rates on the first attempt were as follows: postgraduate year 1 = 72% (498/692; 95% CI 68% to 75%), postgraduate year 2 = 82% (2,081/2,544; 95% CI 80% to 83%), postgraduate year 3 = 88% (1,963/2,238; 95% CI 86% to 89%), postgraduate year 4+ = 82% (233/283; 95% CI 77% to 87%), and attending physician = 89% (689/772; 95% CI 87% to 91%). Success rates by the first intubator were as follows: postgraduate year 1 = 80% (553/692; 95% CI 77% to 83%), postgraduate year 2 = 89% (2,272/2,544; 95% CI 88% to 90%), postgraduate year 3 = 94% (2,105/2,238; 95% CI 93% to 95%), postgraduate year 4+ = 93% (263/283; 95% CI 89% to 96%), and attending physician = 98% (755/772; 95% CI 96% to 99%). Rapid sequence intubation technique was used in 78% (4,513/5,768; 95% CI 77% to 79%) of initial attempts: it resulted in 85% (3,843/4,513; 95% CI 84% to 86%) success on the first attempt and 91% (4,117/4,513; 95% CI 90% to 92%) success by the first intubator. The overall rate of cricothyrotomy for all emergency resident intubations was 0.9% (50/5,757; 95% CI 0.6% to 1.1%). When an initial intubator failed, 40% (385/954; 95% CI 37% to 44%) of rescue attempts were performed by emergency medicine residents. Among emergency medicine residents, success on the first rescue attempt was 80% (297/371; 95% CI 76% to 84%), and success by the first rescue intubator was 88% (328/371; 95% CI 85% to 91%).
Conclusions:

Success of initial intubation attempts increased over the first 3 years of residency. This large multicenter study demonstrates the success of airway management by emergency medicine residents in North America. Using rapid-sequence intubation predominantly, emergency medicine residents achieved high levels of success.