

Fiberoptic Intubation Skills Training Improves Emergency Medicine Resident Comfort Using Modality

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Abstract : Endotracheal intubation is a core procedure performed by emergency physicians. This procedure is a high risk, and failure results in substantial morbidity and mortality. Fiberoptic intubation (FOI) is the standard of care in difficult airway protocols, yet no widespread practice exists for training emergency medicine (EM) residents in the technical acquisition of FOI skills. Simulation on mannequins is commonly utilized to teach advanced airway techniques. As part of a program to introduce FOI into our ED, residents received hands-on training in FOI as part of our weekly resident education conference. We hypothesized that prior to the hands-on training, residents had little experience with FOI and were uncomfortable with using fiberoptic as a modality. We further hypothesized that resident comfort with FOI would increase following the training. The education intervention consisted of two hours of focused airway teaching and skills acquisition for PGY 1-4 residents. One hour was dedicated to four case-based learning stations focusing on standard, pediatric, facial trauma, and burn airways. Direct, video, and fiberoptic airway equipment were available to use at the residents' discretion to intubate mannequins at each station. The second hour involved direct instructor supervision and immediate feedback during deliberate practice for FOI of a mannequin. Prior to the hands-on training, a pre-survey was sent via email to all EM residents at NYU Grossman School of Medicine. The pre-survey asked how many FOI residents have performed in the ED, OR, and on a mannequin. The pre-survey and a post-survey asked residents to rate their comfort with FOI on a 5-point Likert scale ("extremely uncomfortable", "somewhat uncomfortable", "neither comfortable nor uncomfortable", "somewhat comfortable", and "extremely comfortable"). The post-survey was administered on site immediately following the training. A two-sample chi-square test of independence was calculated comparing self-reported resident comfort on the pre- and post-survey ($\alpha \leq 0.05$). Thirty-six of a total of 70 residents (51.4%) completed the pre-survey. Of pre-survey respondents, 34 residents (94.4%) had performed 0, 1 resident (2.8%) had performed 1, and 1 resident (2.8%) had performed 2 FOI in the ED. Twenty-five residents (69.4%) had performed 0, 6 residents (16.7%) had performed 1, 2 residents (5.6%) had performed 2, 1 resident (2.8%) had performed 3, and 2 residents (5.6%) had performed 4 FOI in the OR. Seven residents (19.4%) had performed 0, and 16 residents (44.4%) had performed 5 or greater FOI on a mannequin. 29 residents (41.4%) attended the hands-on training, and 27 out of 29 residents (93.1%) completed the post-survey. Self-reported resident comfort with FOI significantly increased in post-survey compared to pre-survey questionnaire responses ($p = 0.00034$). Twenty-one of 27 residents (77.8%) report being "somewhat comfortable" or "extremely comfortable" with FOI on the post-survey, compared to 9 of 35 residents (25.8%) on the pre-survey. We show that dedicated FOI training is associated with increased learner comfort with such techniques. Further direction includes studying technical competency, skill retention, translation to direct patient care, and optimal frequency and methodology of future FOI education.

Keywords : airway, emergency medicine, fiberoptic intubation, medical simulation, skill acquisition

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