Taylor & Francis
Online

Prehospital Emergency Care ›
Volume 9, 2005 - Issue 2

1,183 Views | 142 CrossRef citations to date | 3 Altmetric

FOCUS ON AIRWAY MANAGEMENT

Defining the Learning Curve for Paramedic Student Endotracheal Intubation

Henry E. Wamg, MD, MPH , Samuel R. Reitz, MEd, RN , David Hostler, Phd, NREMT-P & Donald M. Yealy, MD

Pages 156-162 | Received 03 Dec 2005, Accepted 15 Dec 2005, Published online: 02 Jul 2009

Cite this article https://doi.org/10.1080/10903120590924645

Sample our
Medicine, Dentistry, Nursing & Allied Health Journals
>> Sign in here to start your access to the latest two volumes for 14 days

Full Article | Figures & data | References | Citations | Metrics
Reprints & Permissions | Read this article | Share

Abstract

Background. Proficiency in endotracheal intubation (ETI) is assumed to improve primarily with accumulated experience on live patients. While the National Standard Paramedic Curriculum recommends that paramedic students (PSs) perform at least five live ETIs, these training opportunities are limited. Objective. To evaluate the effects of cumulative live ETI experience, elapsed duration of training, andclinical setting on PS ETI proficiency. Methods. The authors used longitudinal, multicenter data from 60 paramedic training programs over a two-year period. The PSs reported outcomes (success/failure) for all live ETIs attempted in the operating room (OR), the emergency department (ED), the intensive care unit (ICU), andother hospital or prehospital settings. Fixed-effects logistic regression was used to model up to 30 consecutive ETI efforts by each PS, accounting for per-PS clustering. For each patient, the authors

evaluated the association between ETI success andthe PS's cumulative number of ETIs, adjusted for clinical setting, elapsed number of days from the first ETI encounter, andthe interaction (cumulative ETIs × elapsed days). Predicted probability plots were constructed depicting the “learning curve” overall andfor each clinical setting. Results. Between one and74 ETIs (median 7; IQR 4–12) were performed by each of 802 PSs. Of 7,635 ETIs, 6,464 (87.4%) were successful. Stratified by clinical setting, 6,311 (82.7%) ETIs were performed in the OR, 271 (3.6%) in the ED, 64 (0.8%) in the ICU, 86 (1.1%) in other in-hospital settings, and903 (11.8%) in the prehospital setting. For the 7,398 ETIs included in the multivariate analysis, cumulative number of ETI was associated with increased adjusted odds of ETI success (odds ratio 1.067 per ETI; 95% CI: 1.044–1.091). ETI learning curves were steepest for the ICU andprehospital settings but lower than for other clinical settings. Conclusions. Paramedic student ETI success improves with accumulated live experience but appears to vary across different clinical settings. Strategies for PS airway education must consider the volume of live ETIs as well as the clinical settings used for ETI training. Key words: intubation; intratracheal; emergency medical services; learning; allied health personnel.

Keywords:

intubation | intratracheal | emergency medical services | learning | allied health

Related Research Data

Training in airway management
Source: Anaesthesia
Effect of varied training techniques on field endotracheal intubation success rates
Source: Annals of Emergency Medicine
Prospective study of manikin-only versus manikin and human subject endotracheal intubation training of paramedics
Source: Annals of Emergency Medicine
Assessing doctors' competence: application of CUSUM technique in monitoring doctors' performance
Source: International Journal for Quality in Health Care
Prehospital use of succinylcholine: A 20-year review
Source: Prehospital Emergency Care

Instruction of airway management skills during anesthesiology residency training

Source: Journal of Clinical Anesthesia

The perceived importance of paramedic skills and the emphasis they receive during

Related research

People also read | Recommended articles | Cited by 142

Paramedic Training for Proficient Prehospital Endotracheal Intubation >

Keir J. Warner et al.

Prehospital Emergency Care

Published online: 30 Nov 2009

Prehospital Airway Management Training and Education: An NAEMSP Position Statement and Resource Document >

Maia Dorsett et al.

Prehospital Emergency Care

Published online: 10 Jan 2022

Information for

Authors

R&D professionals

Editors

Librarians

Societies

Open access

Overview

Open journals

Open Select

Dove Medical Press

F1000Research

Opportunities

Reprints and e-prints

Advertising solutions

Accelerated publication

Corporate access solutions

Help and information

Help and contact

Newsroom

All journals

Books

Keep up to date

Register to receive personalised research and resources by email

Sign me up

Copyright © 2026 Informa UK Limited Privacy policy

Cookies Terms & conditions Accessibility

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG

Taylor & Francis by informa