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Rethinking Airway Management Training in Emergency Medicine Residency Programs: Improving Resident Airway Skills with a Comprehensive Airway Boot Camp Course

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those giving the presentations as for those listening. Residents are encouraged to use whatever medium of information best fits their learning style, such as: power points, Socratic discussions, videos, handouts, and pod casts. Presentations last 10-15 min each. Week three is focused on knowledge testing. Each presenter creates 3-5 questions with explanations focusing on the highlights of their individual topics. This is designed to solidify main teaching points from the previous two weeks.

Impact/Effectiveness: Simulation has become an integral part of residency training. Unfortunately, among many residency programs it is an isolated educational modality separated from a more conventional curriculum. Using the debrief model, the invaluable first hand experience gained through simulation cases is expanded and integrated into the curriculum, with residents taking charge of their education in an active and dynamic method of learning.

53 Residents as Investigators: Original Research as a Universal Standard for Scholarly Activity to Teach Evidence-Based Medicine

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Background: The Review Committee for Emergency Medicine (RC-EM) requires that all residents complete scholarly activity. This requirement facilitates their education in evidence-based medicine. The basis for modern medical education as pioneered by William Osler is practical experience. Yet, there is no stipulation specifying that this research requirement must take the form of a completed original research project; specific alternatives cited include review papers, case reports, and performance improvement projects. A recent national survey of all Emergency Medicine residency programs found no consistent interpretation and implementation of this requirement.

Educational Objectives: We sought to construct a research curriculum facilitating each resident serving as principal investigator on a single original research project as a graduation requirement. We designed an intensive didactic curriculum structured around establishing the residents as investigators on department protocols for the purpose of obtaining practical experience executing various study designs. Subsequently residents are expected to design and execute their own original research projects.

Curricular Design: The curriculum entails a two-week intensive seminar halfway through intern year comprising active resident participation in ongoing department protocols of various methodological designs (e.g., randomized controlled trial, cohort, case-control) to better understand the mechanics of executing a research protocol. To measure performance, we defined six serial milestones to track each

resident's individual research project from start to finish: (1) formulate a question with testable hypothesis; (2) develop protocol; (3) collect data; (4) analyze results; (5) prepare manuscript; (6) present and submit results for publication.

Impact/Effectiveness: The new curriculum began implementation in July 2015. Thus far, all 16 interns are on track for meeting the research milestones. In comparison to the last academic year, the number of newly submitted resident protocols to date has increased 67%, the number of abstract presentations 200%, and the number of peer-reviewed publications 150%.

54 Rethinking Airway Management Training in Emergency Medicine Residency Programs: Improving Resident Airway Skills with a Comprehensive Airway Boot Camp Course

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Background: For most residents in emergency medicine training programs, airway management skills are acquired and refined one case at a time while caring for patients in the emergency department and augmented with the obligatory off-service anesthesia rotation. Intubation experiences may differ between residents due to the variability of airway cases that present on any given day. Therefore, residents should be exposed to a standardized airway curriculum that covers core airway principals and management of difficult airway scenarios.

Educational Objectives: Improve all residents' airway management skills by providing them with an 8-hour airway course during intern orientation.

Curricular Design: The resident airway boot camp implements multiple learning modalities to engage the participants and more effectively reinforce basic and advanced airway concepts. Several interactive lectures incorporating an audience response system are augmented with hands-on breakout sessions. The hands-on training focuses on the familiarization of adult and pediatric intubation equipment and techniques, as well as airway adjuncts (i.e. bougie, extraglottic devices, video laryngoscopes and fiberoptic intubating bronchoscopes). Pig tracheas are used to realistically teach both surgical and percutaneous cricothyrotomy techniques. Finally, the residents test their newly acquired knowledge and technical skills by participating in 8 separate airway code simulations in a high fidelity simulation center.

Impact/Effectiveness: The participants (n=16) completed a survey before and after the airway boot camp, where they ranked their perceived skill level for different airway tasks. A comparison of pre and post survey results showed a statistically significant improvement in participants' perceived skill in 6 airway categories after completing the course: bag valve mask ventilation, adult endotracheal intubation,

Table 1. Residents' Perceived Skill Level Before and After Airway Course on a 10-Point Scale (1=lowest, 10=highest); n=16.

Airway Category	Pre-course mean \pm SD	Post-course mean \pm SD	p-value
Bag Valve Mask Ventilation	6.13 \pm 2.25	8.44 \pm 1.67	=0.0025
Adult Endotracheal Intubation	4.69 \pm 2.21	7.69 \pm 1.25	<0.0001
Pediatric Endotracheal Intubation	2.80 \pm 1.42	6.81 \pm 1.64	<0.0001
Use of a Bougie	2.94 \pm 1.69	7.25 \pm 1.34	<0.0001
Use of an Extraglottic Device	3.38 \pm 1.89	7.31 \pm 1.70	<0.0001
Cricothyrotomy	1.88 \pm 0.96	6.56 \pm 1.71	<0.0001

pediatric endotracheal intubation, use of a bougie, use of an extraglottic device, and cricothyrotomy (Table 1). Emergency medicine residents appear to benefit from a highly integrated, comprehensive airway training session, as a supplement to intubation experiences in the emergency department. The implementation of this curriculum ensures standardization of airway training for all residents.

55 Rural Emergency Medicine: A New Elective for Real World Experience

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Background: In the state of Arkansas, there are approximately 150 board certified Emergency Medicine (EM) physicians (MDs). Of those, only 25% practice in towns of less than 50,000 people and only 15% are practicing in communities with less than 25,000 people. Of the 73 hospitals in the state of Arkansas, > 40 of them do not have a board certified EM physician on staff in the emergency department (ED). This is an alarming statistic in a state where access to tertiary care may be several hours away. Having trained EM MDs in these rural communities, would be an invaluable resource. The decision to create and develop an EM rural rotation strategically exposes EM residents to the practice of EM in resource limited communities and facilitates recruitment of highly trained board eligible clinicians to these medically underserved areas.

Educational Objectives:

- Develop skill and expertise in the management of:
 - Critically-ill & critically-injured adult and pediatric patients in an environment with limited resources.
 - Various toxicological, environmental, and traumatic emergencies unique to rural communities.
- Learn to manage the flow of patients as a solo practitioner with limited support staff.
- Develop communication skills and cultural awareness necessary to respectfully and effectively interact with patients, families, and other health care providers in the area.

- Develop an understanding of the local EMS system, services provided by the rural site facility, and need to transfer patients to higher levels of care including EMTALA compliance issues.

Curricular Design: PGY-3 EM residents are offered the opportunity to select the rural rotation as their senior elective. Rural site selection is based on targeted needs that ensure an optimal educational experience. Housing, travel, and resident salaries are supported by grant funds from the Arkansas Department of Health. Residents are required to work 120 clinical hours for the month with an equal assortment of days, nights, and weekend shifts directly supervised by a board certified EM MD. To ensure residents meet educational program requirements, teleconferencing, asynchronous resources, and on-site grand round opportunities are available.

Impact/Effectiveness: Feedback from residents who have completed the rural rotation has been positive. They report having more autonomy and a better understanding of the difficulties that exist when practicing in rural locales. They also felt the rural rotation offered more insight into what they are likely to experience once they have completed residency and are practicing in their own. Of the four residents who have completed the rotation, one has committed to join the ED staff at the rural site upon completion of residency. With this being a primary goal, we consider the creation of this opportunity to be a great success.

56 Scientific Speaker Apprenticeship Program

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Background: Formal apprenticeship has long been part of medicine, yet no formal apprenticeship program currently exists to prepare physician leaders to present at scientific conferences.

Educational Objectives:

1. Understand the central components of quality presentation techniques.