Emergency department operations and management education in emergency medicine training

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INTRODUCTION

Emergency department overcrowding is recognized as an increasing problem over the past 2 decades. From 1995 until 2008, the annual number of emergency department (ED) visits in the United States increased by over 28%, from 96.5 to 123.8 million, while the number of actual EDs decreased by over 12%. In 2010, the American Hospital Association reports that 38% of all EDs were at or beyond capacity; and urban and teaching hospitals at 51%. With the recent proposed health reform measures, greater than 2/3 of ED administrators surveyed anticipate continued increasing volumes.

Concurrent with the growing ED volume and increased concern for overcrowding has been an increasing movement related to operational considerations to enhance quality of care and process efficiencies to meet these needs. While there is a growing body of literature demonstrating the negative impact of ED boarding...
and overcrowding, identifying this as a health-system failure, there is little in the literature related to how these operational skills are being disseminated within emergency medicine resident education.[4-12]

**METHODS**

**Study design**

This study was administered as a closed-ended categorical web-based anonymous survey to all Emergency Medicine Residency Programs listed on the Society for Academic Emergency Medicine website (accessed at: http://www.saem.org/residency-directory). This includes all US-based Emergency Medicine Residency programs regardless of location, affiliation, or year’s in existence. Inclusion criteria for enrollment in the study included a valid email address for inviting participation in the web-based survey. This survey was developed and administered in late 2010 to early 2011 so any additional programs added since that time were not included. Questions were designed, reviewed, and assessed for face validity by 4 EM academic faculty physicians, 2 affiliate non-academic EM faculty physicians, and 2 hospital-based compliance officers in each of the 4 focus areas (documentation, billing/coding, core measure/quality indicators, and operations management).

Participants in the survey indicated their educational participation in each of the focus areas, how the education was delivered, and perceived level of resident understanding at the time of graduation. The data obtained from the 11-question survey were collected over a 6-week period during which the initial survey and automated reminders were sent until either the survey was completed or the study period ended. This study was reviewed and approved by the Institutional Review Board.

**Data collection and analysis**

An electronic web-based survey instrument, which used 11 closed-ended questions with categorical answer choices, was designed (Figure 1). All data were collected, compiled, and analyzed anonymously. The results were the frequency and means which were used to educate and enhance the quality of resident understanding in each of the 4 focus areas. In addition, the residency leadership scored their perceived resident understanding of each area at the time of graduation. Our study outcomes were to identify the current practice of integrating ED operations and management education into the core EM Residency Curriculum. Descriptive statistics were used to summarize and report the results.

1. Does your residency currently include ED operations or management training in the EM Residency Curriculum?
   a. Yes
   b. No
2. Which of the following administrative skills are currently taught in your residency program?
   a. Documentation
   b. Billing/Coding
   c. Core Measure / Quality Indicators
   d. Physician Quality Reporting Initiative (PQRI)
   e. Operations Management
3. Which of the following means are used to educate and enhance the quality of resident documentation?
   a. Didactic sessions on quality documentation
   b. EMR/EHR templates
   c. Direct attending feedback
   d. Annual department review of documentation quality
   e. Hospital compliance audit process education
4. Graduating residents understand the clinical, financial, and risk-management aspects of quality documentation?
   a. Strongly agree
   b. Agree
   c. Uncertain
   d. Disagree
   e. Strongly disagree
5. Which of the following means are used to educate and enhance the understanding of resident billing and coding?
   a. Didactic sessions on billing and coding
   b. EMR/EHR template feedback
   c. Hospital or corporate billing/coding compliance educational process
   d. Direct attending feedback
6. Graduating residents clearly understand the concept and application of billing/coding and RVUs?
   a. Strongly agree
   b. Agree
   c. Uncertain
   d. Disagree
   e. Strongly disagree
7. Which of the following means are used to educate and enhance the resident understanding of core measures?
   a. Didactic sessions on core measures / quality indicators
   b. EMR/EHR template reminders
   c. Departmental updates/electronic education
   d. Direct attending feedback
   e. Hospital educational modules
8. Graduating residents know current core measures/quality indicators followed in your department (the clinical care measures and documentation needs)?
   a. Strongly agree
   b. Agree
   c. Uncertain
   d. Disagree
   e. Strongly disagree
9. Which operational tools are taught uniformly in the residency program?
   a. Lean
   b. Six Sigma
   c. PDSA (Plan, Do, Study, Act)
   d. None
10. Which of the following means are used to educate and enhance resident understanding and application of ED operations?
    a. Didactic sessions on ED operations
    b. EMR/EHR reminders or reports
    c. Functional ED Dashboard
    d. Optional or required resident operations/quality project
    e. Direct attending feedback
11. Operations and ED management education should be an essential part of EM resident education.
    a. Strongly agree
    b. Agree
    c. Uncertain
    d. Disagree
    e. Strongly disagree

*Figure 1. EM residency operations and management questionnaire.*
RESULTS
One hundred and fifty-six (156) programs were contacted via the anonymous web-based survey mechanism, with 112 participants starting the survey and 106 program leaders completing the study instrument (70%). Of the completed surveys, 82.6% stated having ED operations and management education within the training curriculum, with dedicated documentation training in all but 1 program (99%). Education in the following areas was also reported: billing/coding training (83%), core measure/quality indicators training (78%) and operations management training (71%). In all areas, the most common means of educating came through didactic sessions and direct attending feedback; 69%-94% and 72%-98% respectively.

Using descriptive analysis for the Likert scale questions (1: strongly agree – 5: strongly disagree) the residency leadership respondents were most confident with resident understanding of quality documentation (mean 2.04; SD 0.85) and core measures/quality indicators (mean 2.22; SD 0.70), and less so with graduate understanding of billing/coding/RVUs (mean 2.58; SD 1.01). Regarding operations and management education integration into the current EM curriculum, 91% of respondents either agreed or strongly agreed (mean 1.64; SD 0.66) (Table 1).

<table>
<thead>
<tr>
<th>Question</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>SEM</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation</td>
<td>106</td>
<td>2.05</td>
<td>0.85</td>
<td>0.08</td>
<td>1.89-2.21</td>
</tr>
<tr>
<td>RVUs</td>
<td>106</td>
<td>2.58</td>
<td>1.02</td>
<td>0.09</td>
<td>2.78-2.38</td>
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<tr>
<td>Core measure / Quality indicators</td>
<td>106</td>
<td>2.22</td>
<td>0.70</td>
<td>0.68</td>
<td>2.08-2.35</td>
</tr>
<tr>
<td>Ops curriculum</td>
<td>106</td>
<td>1.64</td>
<td>0.66</td>
<td>0.06</td>
<td>1.51-1.78</td>
</tr>
</tbody>
</table>

DISCUSSION
The fact that 100% of the survey respondents are supportive of curriculum development in areas of ED operations and management is not surprising given the current state of EM in the United States. Since the Institute of Medicine (IOM) report in 2004, ED overcrowding and patient boarding has continued to increase despite many ED-centric operational efforts at many institutions. Concurrent during this period is the increased reporting of core measures and operational benchmarks - with potential patient quality care implications and hospital financial ramifications. As such, hospital administrations are now reviewing compliance with these clinically and financially important national benchmarks. In addition, with the ongoing discussion of healthcare access and cost-efficiency reform, ensuring understanding of operational and quality efficiencies in EM training is essential in the preparation of all future (and current) providers.

Since the completion of this study, additional publications have discussed the balance of quality and efficiency. While there remains a substantial difference between consensus information and randomized controlled trials (RCTs), evidence of quality-based, efficient patient care modalities and understanding the process by which value-added operational decisions are made enhance any EM physician to the benefit of the patient. As it relates to core measures, many guidelines continue to lack RCT supportive evidence for the metric determinants. Although EPs are aware of the measures and their potential impact, our survey results suggest that many physicians continue to question the validity of the guidelines, and doubt the generalizable benefits to all presenting patients.

Limitations
This study was designed to sample all emergency medicine residency training programs in the United States as listed on the Society of Academic Emergency Medicine website at the time the research was performed. While each respondent may have differing perspectives of resident understanding at the time of residency completion, the residency leadership would have the greatest opportunity to understand respective strengths and weaknesses of their programs and the ongoing educational changes and approaches to each area. In addition, one cannot assume that the respondents perceive the difference between adjacent levels as equidistant for summative scale questions. This study design does not take into account any regional variances in response as all respondents were anonymous.

In conclusion, while most EM residency programs integrate basic operational education related to documentation and billing/coding, a smaller number provide focused education on the day-to-day management and operations of the ED. Residency
leadership perceives graduating resident understanding of operational management tools to be limited. While there are educational offerings and academies to facilitate this learning during the career of EM physicians, all respondents may agree that curriculum development of ED operations and management can be value-added in resident education.

ACKNOWLEDGMENTS
We would like to thank all of the program directors that took the time to complete the on-line questionnaire.

Funding: None.
Ethical approval: Not needed.
Conflicts of interest: No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.
Contributors: Nicks BA proposed and wrote the study. All authors contributed to the design and interpretation of the study and to further drafts.

REFERENCES

Received December 28, 2011
Accepted after revision April 19, 2012

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