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QUANTIFYING OFF-HOUR EMERGENCY PHYSICIAN COVERAGE OF IN-HOSPITAL CODES: A SURVEY OF COMMUNITY EMERGENCY DEPARTMENTS

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□ **Abstract—Background: Community emergency physicians (EPs) are often required to respond to unstable patients outside of their department during off-hours. Objective: The primary objective of this study was to describe the critical care responsibility of community EPs outside of their departments. Methods: A one-page survey was mailed to emergency department (ED) directors of 10 states and Washington, DC. Results: Three hundred forty of 1169 surveys were returned. The median (interquartile range [IQR]) number of hospital and intensive care unit (ICU) beds was 145 (IQR 60–242) and 11 (IQR 6–20), respectively. Median ED annual volume and ICU admission percentage was reported to be 25 K (IQR 14–40) and 5% (IQR 2–10), respectively. Seventy-six percent of reporting institutions require EPs to leave their department and respond to medical codes on the floors after hours. In 57% of institutions, the EP was the only physician required to respond. In addition, 48% of EPs must respond to unstable patients in the ICUs after hours. Hospitals in which EPs were required to respond to medical codes and unstable ICU patients were more likely to have fewer hospital beds (137 vs. 275; $p < 0.001$), fewer ICU beds (12 vs. 27; $p < 0.001$), and have a smaller ED annual volume (24 K vs. 39 K; $p < 0.001$). Conclusions: Many community EPs are responsible for covering critically ill patients outside of their ED. Further investigation is required to determine the impact on patient care.** © 2011 Elsevier Inc.

□ **Keywords—critical care; emergency service; intensive care units; health care surveys; emergency medicine**

INTRODUCTION

The practice of emergency medicine demands the competence to manage a wide spectrum of acute patient presentations, many of whom are critically ill (1). Emergency department (ED) visits and ED length of stay continue to rise in the face of declining numbers of EDs (2–4). There is ample literature to support the idea that emergency physicians (EPs) in large tertiary centers provide a significant volume of critical care and that critical care training of EPs is valuable and necessary (5,6).

The discussion regarding the ED management of critically ill patients transcends the experience of larger academic centers, however. Community EPs frequently shoulder additional clinical responsibilities, which may require them to respond to medical codes and unstable patients outside of the ED during overnight hours. This responsibility has not been well described in the contemporary literature. The objective of this study was to describe and quantify the critical care responsibility of community EPs outside of their department during overnight hours.

METHODS

A one-page survey was mailed to ED directors (EDDs) of community hospitals in 10 states (CA, FL, KS, KY, MI,

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MN, NY, PA, OR, TX) and Washington, DC. For purposes of this survey, a community hospital was defined as one without either an emergency medicine or an internal medicine residency program, but with an ED and an available intensive care unit (ICU).

A hospital mailing list was obtained through the American Hospital Association, selecting institutions in the selected states that reported having both an ICU and an ED (7). This list was then cross-referenced against the Accreditation Council for Graduate Medical Education database of residency programs to eliminate hospitals with either emergency medicine or internal medicine programs (8). Only a single mailing was performed.

There were 1169 surveys mailed to the identified EDD of each institution. The survey queried demographics, ED and hospital information, EP responsibilities to respond to medical floor arrests, EP responsibility to respond to unstable ICU patients, and interest in hiring a physician dual-boarded in both emergency medicine and critical care medicine. Statistical analysis included descriptive statistics and independent *t*-test, as well as chi-squared analysis. The database was kept as a secured Microsoft Excel for Mac (v. 11.5.4; Microsoft Corporation, Redmond, WA) spreadsheet and SPSS (v. 17.0; SPSS Inc., Chicago, IL) statistical software was used for data analysis. The study was reviewed and approved by the Institutional Review Board and was supported by an institutional grant.

RESULTS

There were 1397 hospitals identified in the target areas, of which 1169 (83.7%) met inclusion criteria and were mailed surveys. Three hundred forty of 1169 surveys were returned (29.1% response). EDDs identified themselves as urban, suburban, or other 21%, 33%, and 43% of the time, respectively. The median number of hospital and ICU beds was 145 (IQR 60–242) and 11 (IQR 6–20), respectively. The median ED volume and ICU admission percentage was reported to be 25 K (IQR 14–40) and 5% (IQR 2–10), respectively.

EDDs reported that 76% of their institutions require their EPs to leave the ED and respond to medical codes/arrests on the floors after hours (Table 1). In 57% of responding institutions, the EP responding from the ED was the only physician in the hospital required to respond. In addition, 49% of EDDs reported that their EPs must respond to unstable patients in the ICUs after hours. Data analysis revealed that hospitals in which EPs were required to respond to medical codes and unstable ICU patients were more likely to have fewer hospital beds (137 vs. 275; $p < 0.001$), fewer ICU beds (12 vs. 27; $p < 0.001$), and have a smaller ED annual volume (24 K vs 39 K; $p < 0.001$).

Table 1. Survey Results Reported as Percentage of Institutions that Require Each Particular Individual to Respond to Unstable ICU Patients or Medical Codes Overnight

	Medical Codes (%)	ICU (%)
Primary attending	20	57
Hospitalist or moonlighter	5	4
Resident*	16	16
Emergency physician	77	50
Other**	11	12

ICU = intensive care unit.
* Non-internal or emergency medicine residents.
** Including anesthesiologist, physician assistants, certified registered nurse anesthetists, or nurse practitioners.

DISCUSSION

This study evaluated a niche of EP responsibility not well described in the contemporary literature. The critical care burden of large tertiary EDs has been previously published, but this is the first report the authors are aware of that addresses the critical care burden shouldered by community EPs outside of their ED (6). The results of this survey illustrate that community EPs carry a heavy responsibility to cover critically ill floor patients and unstable ICU patients outside of their ED. These responsibilities may potentially interfere with ED patient care.

The institutions that require EPs to cover non-ED critically ill patients tended to be smaller and had less ICU bed capacity. Although physician-staffing patterns were not assessed in the survey, the median annual volume of these EDs was 25 K (IQR 14–40). This suggests that these EDs are more likely to have several hours per day of single-physician ED staffing, especially during overnight shifts, the time period in question. According to the most recent report from the National Medical Ambulatory Hospital Care Survey: 2006 ED Summary, 15.9% of all patients presenting to EDs in the United States needed to be seen within 15 min to avoid morbidity or mortality (4). Furthermore, Wang et al. reported that in the United States, the portion of ED patients with severe sepsis presenting to low-volume EDs ($\leq$ 20,000 visits/year) was 20.6% (95% confidence interval [CI] 14.9–27.8) while 53.5% (95% CI 46.0–60.9) presented to EDs affiliated with a medical school (9). This supports the assertion that a significant volume of critically ill patients requiring immediate physician evaluation present to smaller-volume EDs. It is clear that these EPs in certain institutions may risk getting caught attending to a non-ED patient when a critically ill patient needing emergent care arrives in the ED.

There is literature focusing on the management of critically ill patients in the ED (1,5,6,10–13). Svenson et al. retrospectively reported a 6-month experience of an ED