Original Article

An attending physician float shift for the improvement of physician productivity in a crowded emergency department

Muhammad Umer Nasim¹, Chintan Mistry¹, Robert Harwood¹, Erik Kulstad¹, Laura Tommaso²

¹ Department of Emergency Medicine, Advocate Christ Medical Center, Oak Lawn, IL, USA

² Advocate Lutheran General Hospital, Park Ridge, Illinois 60068, USA

Corresponding Author: Muhammad Umer Nasim, Email: umernasim@gmail.com

BACKGROUND: Patients backlogged in the emergency department (ED) waiting for an inpatient bed (boarders) continue to require the attention of ED physicians, exacerbating crowding in the ED. To address this problem, we added a "float shift" to our winter schedule solely to care for boarders. We sought to quantify the effect of this float shift, hypothesizing greater physician productivity.

METHODS: We performed a retrospective observational study in our community hospital ED, measuring the number of new patients seen in each 10-hour shift in the presence or absence of a float shift physician. We calculated the number of new patients seen per shift for each of the 7 daily shifts, during February (float shift scheduled) and May (float shift unscheduled) of 2008. We then compared the mean number of patients seen per shift in February with May.

RESULTS: Total monthly patient volume was 6 656 for February and 6 775 for May, with the mean daily census being 230 and 219 patients, respectively. The number of new patients seen during each shift was greater in February than in May, with a mean increase of 1.1 patients per shift (with the float shift). Surveying participants about intervention effectiveness showed 92% of residents, but only 65% of attending physicians, in favor of maintaining the float shift.

CONCLUSION: The presence of a "float shift" physician caring only for boarding patients allows other physicians to maintain and even increase their productivity in our ED, despite the presence of longer throughput times and increased time on diversion.

KEY WORDS: Crowding; Physician staffing; Boarding patients; Float shift

World J Emerg Med 2013;4(1):10–14

DOI: 10.5847/wjem.j.issn.1920-8642.2013.01.002

INTRODUCTION

Emergency departments (EDs) are impacted by both external conditions, which may cause increased patient arrivals and internal or hospital conditions, which may also affect the environment of the ED. The ED is especially vulnerable to hospital inefficiencies, from slow turn-around times in the laboratory to delays in transport. One such condition that impacts many EDs is high inpatient census. When there is limited vacancy on the hospital floors, the ED at most hospitals must hold or board patients who require admission. It has been reported

that up to 22% of all ED patients at one time were boarded in the ED.^[1] The causes of boarding in the ED are related to hospital-wide systemic conditions.^[2] Unfortunately, the level of care that boarders receive declines over time, because boarders must be cared for in an environment that is neither designed nor resourced to allow for inpatient care while simultaneously providing emergency care.^[3] The American College of Emergency Physicians (ACEP) strongly recommends that specialized physician care appropriate to inpatients should be available for boarders, and that hospital staffing should allow for

adaptation to particular patient needs no matter their physical location.^[4]

The general flow and efficiency of the ED is compromised when boarders must be cared for in addition to emergency patients. Such conditions can lead to unsafe ED environments, which in turn can have negative effects on the communities that they serve.^[5] An important aspect of patient care that is compromised with crowding due to boarders is that physician care is spread thin. Throughout the ED the physician to patient ratio is affected, productivity of ED physician is impacted and to a considerable measure care that is needed for boarders is often not optimally performed according to the 2008 ACEP guidelines.^[4] These guidelines state that for the management of crowding due to boarders, expansion of EDs and ambulance diversion do not solve this complex matter even though these practices are common. ACEP cited costly solutions such as Fast Track Units, Observation Units, and Physician Triage as examples of additional staffing measures that may improve care and flow. No specific recommendations were made for increasing the level of staffing so that boarders could be adequately cared for.^[2] In 2008, it was reported that use of additional triage and/or the addition of a fast track physician correlated with larger volume centers, which frequently operate at or above capacity, whereas centers with a good balance of volume correlated with bedside registration and/or had eliminated triage.^[6]

As a solution, to address the increasing volume of ED boarders at our hospital, we piloted a program in which we added a float shift physician to our staffing model and tested the before-and-after effects of this program on physician productivity. The primary focus of this new physician was to care for boarding patients. This shift was intended to enhance the productivity of the physicians caring for emergency patients in the ED, thereby also optimizing the care of acutely ill patients. To measure the effect of this staffing change, we compared the productivity of physicians when a float shift physician was present with the productivity of physicians in the absence of a float shift attending physician.

METHODS

Study design and setting

This study was conducted in our community teaching hospital ED that holds a capacity of 50 licensed beds, serves patient volume of approximately 80 000 to 85 000 per year and supports a 3-year emergency medicine residency program. For the study in the period

of February and May 2008, the ED had a total of 11 shifts daily, scheduled to start at various times, each shift being 10 hours in length to service a 24-hour day. The department has 42 attending physicians and 36 residents, who work shifts in the ED, covering 110 hours daily of total attending coverage, and 110 hours daily of resident coverage. As the focus of this study was physician productivity improvement data, not involving human subjects or the collection of identifiable private data, no institutional review was required.

Interventions

We are reporting on a piloted staffing model that was designed by the ED administration as a productivity improvement effort. To achieve improved physician to patient interaction and physician overall performance, we added a float shift physician to our total ED staff for a 10-hour shift and reassigned a physician on the regular ED shift to care for boarders for 10 hours. This intervention resulted in an availability of an attending physician, whose primary responsibility was to care for boarders. Each float shift physician would also see new patients in the ED as time and opportunity permitted.

Methods of measurement

To measure the impact of this staffing arrangement on physician productivity, we compared the number of new patients evaluated (which included all patients initially assessed) in each 10-hour shift when a float shift physician was caring for boarders (during February 2008) to the number of new patients evaluated in each 10-hour shift after the float shift had been removed (during May 2008). To obtain this information, we queried our ED electronic tracking board, extracting the number of new ED patients seen for each of 7 daily shifts (two 6 am-Adult ED shifts, one 6 am-Pediatric ED shift, two 2 pm-Adult ED shifts, one 3 pm-Pediatric ED shift, and a 12 pm-Fast Track shift) during February 2008 (when the float shift was present) and May 2008 (when the float shift was absent). Physicians are aware that their productivity is continuously measured for administrative purposes on an ongoing basis; no additional measurements beyond the baseline measurements were performed.

Primary data analysis

We compared the mean number of new patients seen per shift in February with the mean number seen per shift in May. Because the overnight shifts were not modified and were not assisted by the float shift, we did not include these in the analysis. We also compared the total

volume of patients that presented to the ED in February 2008 with the volume that presented in May 2008. In addition, we calculated the average door-to-disposition times and the total ambulance diversion times for each month. SPSS version 19 (IBM SPSS Statistics Inc., Chicago, IL) was used for calculations and statistical analysis.

RESULTS

Total patient volume, including all patients evaluated and treated in the ED, was 6 656 for February and 6 775 for May. Mean door-to-disposition times were 256 minutes for February and 222 minutes for May. Total time on diversion was 83 hours for February and 43 hours for May.

The number of new patients seen during each shift was greater in February than in May, with a mean increase of 1.1 patients per shift, or a total of almost 8 more patients seen per day while the float shift was active. Two daily shifts in February had significantly greater mean new patient volume than in May with 19 versus 17 patients respectively ($P=0.049$) in one of the shifts, and 22 vs. 19 patients ($P=0.012$) in the other shift. The table shows the mean number of patients seen during each shift in February and May, 2008 (Table 1). Physicians staffing the float shift saw a mean number of 4 new patients per shift.

Intervention effectiveness

To evaluate the effectiveness of our strategy we conducted an anonymous paper survey in February 2008 when the float shift was in effect, asking residents and attending physicians the effects of our strategy on a scale of 1–10 (1=no effect, 10=great effect). Survey questions comprised (i) resident education, (ii) the ED as a whole, and (iii) the desirability of being assigned to the float shift (attending physicians only).

Table 1. Mean number of new patients seen per shift

Shift	Month			May		
	February					
	Mean	25 th percentile	75 th percentile	Mean	25 th percentile	75 th percentile
6aF	19	16	21	17	15	20
6aB	19	17	22	17	14	20
2pF	21	20	25	21	18	24
2pB	23	22	25	22	21	25
6aP	19	16	21	19	16	21
12pFT	24	21	27	23	22	26
3pP	22	21	24	19	15	21

Both residents and attending physicians rated the float shift as beneficial to (i) resident education (resident mean score=8.5, attending mean score=7.9), and to (ii) the ED as a whole (resident mean score=9.2, attending mean score=7.8). Attending physician rating of (iii), the desirability of being assigned to the float shift, was low, with a mean score of 4 (Figure 1).

We also conducted a Yes or No survey regarding positive effect of the float shift in following concentrations: (a) teaching time available for residents' education, (b) procedures performed by residents, (c) time spent by the regular shift on caring for boarders, (d) volume of new patients seen by residents, and (e) the time spent on patient sign-out. Responses to the survey (yes or no) was encouraging as (a) teaching time available for resident education increased or 93% responded YES; (b) procedures performed by residents increased or 43% responded YES; (c) time spent by the regular shift on caring for boarders decreased or 100% responded YES; (d) volume of new patients seen by residents increased or 89% responded YES; and (e) the time spent on patient sign-out decreased or 91% responded YES (Figure 2,

Figure 1. Continuous questions.

Figure 2. Binary questions residents.

Figure 3. Binary questions attending.

Figure 3).

The survey responses showed that 65% of attending physicians and 92% of residents were in favor of continuing the float shift, with a resident mean score of 8.5, and an attending mean score of 7.9. However, the benefit to the ED as a whole was rated higher by residents (mean score of 9.2) than by attending physicians (mean score 7.8).

DISCUSSION

In a study of urban, non-teaching, non critical-access hospitals across four states, only 26% were found to report crowding.^[6] Nevertheless, where ED crowding is a problem, as in almost all tertiary care centers, it has a strong impact on their communities.^[7] The ACEP Task Report on Boarding describes three approaches that have been shown to alleviate the problem of boarders in the ED: moving boarders out of the ED and into inpatient areas, reorganizing inpatient discharge schedules to make them more efficient, and smoothing out the scheduling of elective surgeries.^[2] Because boarding itself is cited as a primary cause of ED crowding, we evaluated the implementation of a float shift physician as a novel approach and alleviation measure that may address some of the boarding effects by improving care to all patients in the ED.

Although overall productivity of the ED as a solitary unit would increase, in general, the productivity per provider would have been expected to actually decrease. In our analysis, the presence of a float shift physician whose primary responsibility is the care of boarding patients appears to allow other physicians to maintain or even increase their productivity in our ED. This

difference was apparent despite longer throughput time and increased time on diversion when the float shift was in operation. We found improvements in the number of new patients seen per shift despite having almost twice the number of hours on diversion, supporting the ACEP task force guidelines suggesting that going on diversion simply does not work.^[2] Use of a float shift will not remedy crowding, as the additional 10 hours of daily staffing did not result in a proportional increase in the number of new patients. An additional 20 patients seen might justify the cost based on our physician productivity statistics, but other site-specific factors will influence this. Another possible benefit of the float shift, in addition to increasing physician productivity, may be that the quality of care of boarding patients was improved or at least more focused on floor-appropriate care; however, we did not specifically examine this.

The addition of a float shift physician dedicated to the care of boarding patients resulted in some remedy to boarding problems, since we were better able to better follow the ACEP's recommendation that boarded patients should receive inpatient-specific care.^[2] In crowded conditions, improvement of quality of care for all patients in the ED where boarders are present is a welcome advancement. A trial of nurse practitioner, physician assistant, inpatient house-staff, or hospitalist coverage dedicated to boarders could also be beneficial as these providers specialize in inpatient care, and therefore may represent a more ideal solution than provided by emergency physician staffing.

A cost-benefit analysis would be useful in further studies, especially since the presence of a float shift physician appears to benefit some shifts more than others. For example, depending on the charges per patient, the additional new patients seen when the float shift is in operation might provide financial justification for the cost of hiring a permanent float shift physician. In addition, specific outcome measures, such as length of stay, would be useful.

In conclusion, in our ED, the addition of a float shift physician whose primary responsibility is the care of boarding patients appears to allow other physicians to maintain or even increase the number of new patients seen in the ED, despite the longer throughput times and increased time on diversion. Because the additional staffing did not dramatically increase the number of new patients, the use of an emergency physician to care for boarding patients may not be justifiable from a financial standpoint alone.

LIMITATIONS

This study is subjected to several potential confounders, and can only serve as a pilot study for further analyses, as we are simply reporting on a staffing model. For example, the data obtained during two one-month periods may not be a sufficient length of time to enable firm conclusions. It is also possible that seasonal differences between the two months we selected for this study could affect lengths of inpatient stay, numbers of admissions, and other variables. For the two periods, there are no control data for confounding circumstances such as average acuity of the patients seen or the complexity of their cases. Hospital system practices could also have been shifted between the two periods changing efficiency. Because at this hospital we have 11 shifts per 24 hours in the ED, the effect of transferring one physician from the regular shift to a float shift over a period of 10 hours was spread over 3 to 4 overlapping shifts. Therefore, we did not include in our calculations of physician productivity the possible influence of the regular shift being short one physician.

Funding: There was no grant support or other funding involved in this study.

Ethical approval: Not needed.

Conflicts of interest: The authors have no competing interests relevant to the present study.

Contributors: Nasim MU proposed and wrote the paper. All

authors contributed to the design and interpretation of the study and to further drafts. All authors read and approved the final version of the manuscript.

REFERENCES

- 1 Hoot NR, Aronsky D. Systematic review of emergency department crowding: causes, effects, and solutions. *Ann Emerg Med* 2008; 52: 126–136.
- 2 Asplin B, Blum FC, Broida RI, Bukata WR, Hill MB, Hoffenberg SR, et al. Emergency department crowding: high-impact solutions. ACEP Task Report on Boarding; 2008.
- 3 Hollander JE, Pines JM. The emergency department crowding paradox: the longer you stay, the less care you get. *Ann Emerg Med* 2007; 50: 497–499.
- 4 Cowling KM. Boarding of admitted and intensive care patients in the emergency room. Policy Compendium of the American College of Emergency Physicians 2010 edition.
- 5 Derlet RW. Overcrowding in the nation's emergency departments: complex causes and disturbing effects. *Ann Emerg Med* 2000; 35: 63–68.
- 6 Handel DA, Ginde AA, Raja AS, Rogers J, Sullivan AF, Espinola JA, et al. Implementation of crowding solutions from the American College of Emergency Physicians Task Force Report on Boarding. *Int J Emerg Med* 2010; 3: 279–286.
- 7 American Academy of Pediatrics Committee on Pediatric Emergency Medicine. Overcrowding crisis in our nation's emergency departments: is our safety net unraveling. *Pediatrics* 2004; 114: 878–888.

Received October 23, 2012

Accepted after revision January 15, 2013