

# On-site Night Float by Attending Physicians: A Model to Improve Resident Education and Patient Care

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## Abstract

**Background** In 2003, the Accreditation Council for Graduate Medical Education instituted common duty hour limits, and in 2008 the Institute of Medicine recommended additional limits on continuous duty hours. Using a night-float system is an accepted approach for adhering to duty hour mandates.

**Objective** To determine the effect of an on-site night-float attending physician on resident education and patient care.

**Methods** Night-float residents and daytime ward residents were surveyed at the end of their rotation about the impact of an on-site night-float attending physician on education and quality of patient care. Responses were provided on a 5-point Likert scale ranging from 1, strongly agree, to 5, strongly disagree.

**Results** Overall, 92 of the 140 distributed surveys were completed (66% response rate). Night-float residents found the night-float attending physician to be helpful with cross-cover issues (mean = 2.00), initial history and physical examination (mean = 1.56), choosing appropriate diagnostic tests (mean = 1.79), developing a treatment plan (mean = 1.74), and improving overall patient care (mean = 1.91). Daytime ward residents were very satisfied with the quality of the admission workups (mean = 1.78), tests and diagnostic procedures (mean = 1.76), and initial treatment plan (mean = 1.62) provided by the night-float service.

**Conclusion** A night-float system that includes on-site attending physician supervision can provide a valuable opportunity for resident education and may help improve the quality of patient care.

## Introduction

In 2002, the Accreditation Council for Graduate Medical Education changed the landscape of medical training by implementing restrictions on both the total and consecutive number of resident work hours.<sup>1,2</sup> A 2008 report from the

Institute of Medicine recommends additional restrictions on resident duty hours and workloads, with a particular focus on the continuous duty period.<sup>3</sup> In response, some training programs have adopted a night-float system to obviate the need for overnight call while delivering care to patients and complying with Accreditation Council for Graduate Medical Education work hour standards.<sup>4-7</sup> Different models of night float exist, with most using residents to cover nighttime admissions and provide cross-cover, enabling ward teams to complete their patient care responsibilities during daytime hours.<sup>8</sup>

Night float is often a service-oriented rotation with no conference or attending physician-initiated teaching opportunities. Supervising attending physicians are often available only by pager for consultation. In some institutions, attending physician night-float rounds are conducted the following morning. Even though night-float systems may enhance the quality of life and well-being of trainees by eliminating overnight call,<sup>4</sup> concerns have been raised about the potential adverse effects on residents' educational experiences, as well as compromised patient care resulting from frequent handoffs, discontinuity of caregivers, and lack of direct supervision.<sup>9-14</sup>

In 1999, our institution implemented a night-float service in which residents and interns admitted patients to the general medicine ward teams and performed cross-

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cover. An off-site attending physician was available by pager. When surveyed about the rotation, residents generally were satisfied. Yet daytime ward residents indicated they were not always pleased with the quality of the workups and diagnostic procedures, and they did not always agree with the initial assessment and treatment plan provided by the night-float service.<sup>15</sup> In an effort to improve patient care and enhance resident education, in 2004 our institution implemented a designated on-site attending physician for the explicit purpose of supervising residents on their night-float rotation. In this article we describe this innovative night-float attending physician model and the lessons learned through its implementation. We also surveyed both night-float and daytime ward residents after the initiation of this on-site coverage to assess their perception of nighttime attending physician supervision on learning and patient care.

## Methods

### Setting

The J. Willis Hurst Internal Medicine Residency Training Program at Emory University comprises more than 150 residents (postgraduate years 1 through 3). The study was conducted at Grady Memorial Hospital, a 750-bed county hospital that serves as the main teaching hospital for Emory. Grady Memorial Hospital primarily serves an inner-city, indigent population in Atlanta, Georgia.

### Night-Float Team Structure

Five residents (postgraduate year-2 or -3) made up the night-float service. Each night 3 residents were assigned to admit patients and 1 resident provided cross-cover for the general medicine ward teams. One resident had the night off. The duration of the night-float shift was 12 hours, from 7:00 PM to 7:00 AM.

The night-float attending physicians were responsible for supervising and teaching the night-float residents between the hours of 10:00 PM and 4:00 AM, 7 nights a week. Two full-time attending physicians covered the academic year and moonlighting attending physicians periodically covered vacations. The night-float attending physicians were newly hired, recent graduates of the residency training program.

The night-float attending physician required each night-float admitting resident to present at least 1 admission for discussion, teaching, and formulation of an initial plan. The attending physician was available in person to discuss any other medical issues of new or cross-cover patients. The ward attending physicians also could be paged at night, but this typically did not happen. Additionally, during their work hours, the night-float attending physicians supervised all resident procedures and fielded queries from both residents and the emergency department personnel with regard to patient triage and management.

## Participants and Data Collection

Surveys for the present study were administered from December 2005 to December 2006, after the institution of on-site night-float attending physician coverage. Surveys were given to all night-float residents and all daytime ward residents at the end of each monthly rotation. Residents were allowed to complete a survey once as a night-float team member and once as a daytime ward team member. Night-float and daytime ward residents received similar paper surveys that assessed issues such as workload, restfulness, satisfaction, continuity of care, and quality of care provided by the night-float team. Respondents rated their agreement with survey statements on a 5-point Likert scale that ranged from 1, strongly agree, to 5, strongly disagree.

The surveys used in this study were nearly identical to instruments that were developed, pilot tested, and administered to 143 residents in 2000.<sup>15</sup> The surveys had good face validity as assessed by a group of physicians with expertise in scale development and educational evaluation. Psychometric evaluation of the instrument administered to 92 ward residents in 2000 revealed a 3-factor solution (corresponding to items 1–5, 6–8, and 9 in TABLE 2). Cronbach  $\alpha$  coefficient of reliability for the 9 items was 0.709. For items 1 through 5, which pertained to satisfaction/agreement with the night-float patient evaluation, Cronbach  $\alpha$  was 0.903.

Participation was voluntary and anonymous, and a resident's decision to participate did not affect his or her standing in the residency program. The Emory University Institutional Review Board approved the study. Analyses were performed using Statistical Package for the Social Sciences version 15.0 (SPSS Science Inc., Chicago, IL).

## Results

A total of 140 surveys were distributed during the study period. There were a total of 92 surveys completed, for a response rate of 66%. Night-float residents and daytime ward residents completed 34 and 58 surveys, respectively (TABLE 1).

### Daytime Ward Residents

Daytime ward residents were very satisfied with the quality of the admission workups, tests, and diagnostic procedures performed by the night-float service (TABLE 2). For example, the quality of workups received a mean score of 1.78 on a scale of 1 to 5. There was also a strong sense of satisfaction with the initial treatment plan established by night float (mean = 1.62). Daytime ward residents did not think that continuity of care or overall patient care suffered under a night-float system (mean = 3.12 and 3.88, respectively).

### Night-Float Residents

Night-float residents were satisfied with the quality of their initial workups (mean = 2.21) (TABLE 3). Similar to the

TABLE 1 BASELINE CHARACTERISTICS

| Characteristic                                                       | Daytime Ward Residents <sup>a</sup> (N = 58) | Night-Float Residents <sup>a</sup> (N = 34) |
|----------------------------------------------------------------------|----------------------------------------------|---------------------------------------------|
| Year of training <sup>b</sup>                                        |                                              |                                             |
| PGY-2                                                                | 41 (70.7)                                    | 30 (88.2)                                   |
| PGY-3                                                                | 16 (27.6)                                    | 4 (11.8)                                    |
| Male gender                                                          | 33 (56.9)                                    | 12 (35.3)                                   |
| Average night-float admissions/12-h shift/admitting resident         | NA                                           | 5.4                                         |
| Average maximum night-float admissions/12-h shift/admitting resident | NA                                           | 8.1                                         |
| Average cross-cover calls/12-h shift/cross-cover resident            | NA                                           | 46.9                                        |

Abbreviations: PGY, postgraduate year; NA, not available.

<sup>a</sup> Data are presented as N (%)

<sup>b</sup> Year of training was missing for 1 ward resident.

daytime ward residents, the night-float residents did not think that patient care or continuity suffered under a night-float system (mean = 2.94 and 3.50, respectively). Night-float residents found the night-float attending physician to be helpful with cross-cover issues (mean = 2.00), initial history and physical examination (mean = 1.56), choosing appropriate diagnostic tests (mean = 1.79), and developing a treatment plan (mean = 1.74) (TABLE 3). Overall, the night-float residents thought that the presence of an on-site night-float attending physician improved patient care (mean = 1.91). The residents did not believe that they required

further supervision when a night-float attending physician was present (mean = 3.82).

### Discussion

We implemented a novel night-float program that used an on-site attending physician to supervise and teach night-float residents. In what has typically been a service-oriented rotation in most programs, ours is the first educational supervision approach of its kind. Both daytime ward residents and night-float residents were satisfied with the care provided when a night-float attending physician was

TABLE 2 DAYTIME WARD RESIDENT RESPONSES ABOUT PATIENT CARE ISSUES<sup>a</sup>

| Questionnaire Items                                                                                                    | Mean (SD)   |
|------------------------------------------------------------------------------------------------------------------------|-------------|
| 1. I was satisfied with the quality of workups (H&P, assessment, documentation) done by night float on new admissions. | 1.78 (.113) |
| 2. I was satisfied with the tests (labs, x-rays) and other diagnostic procedures done by the float team.               | 1.76 (.093) |
| 3. I was satisfied with the initial treatment plan of the float team.                                                  | 1.62 (.098) |
| 4. My ward team usually agreed with the assessment of the night-float team and rarely changed their treatment plan.    | 1.98 (.103) |
| 5. Cross-cover issues were adequately addressed by the night-float team.                                               | 1.78 (.123) |
| 6. Continuity suffers when patients are admitted by a float team and "handed-off" to another team in the morning.      | 3.12 (.148) |
| 7. It was difficult to become familiar with patients admitted by night float.                                          | 2.98 (.155) |
| 8. I think overall patient care suffers under a night-float system.                                                    | 3.88 (.137) |
| 9. I am able to take better care of patients during the day because of night float.                                    | 2.00 (.120) |

Abbreviation: H&P, history and physical examination.

<sup>a</sup> Responses range from 1, strongly agree, to 5, strongly disagree.

| TABLE 3      NIGHT-FLOAT RESIDENT RESPONSES ABOUT PATIENT CARE ISSUES AND THE NIGHT-FLOAT ATTENDING PHYSICIANS <sup>a</sup>                                   |             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Questionnaire Items About Patient Care                                                                                                                        | Mean (SD)   |
| 1. I was satisfied with the quality of the workups we did on new admissions.                                                                                  | 2.21 (.118) |
| 2. Continuity suffers when patients are admitted by a float team and “handed-off” to another team in the morning.                                             | 2.94 (.193) |
| 3. I think overall patient care suffers under a night-float system.                                                                                           | 3.50 (.212) |
| Questionnaire Items About the Night-Float Attending Physicians                                                                                                |             |
| 4. The night-float attending physician was helpful with cross-cover.                                                                                          | 2.00 (.184) |
| 5. The night-float attending physician was helpful with my patient workups (H&P, assessment, documentation).                                                  | 1.56 (.086) |
| 6. The night-float attending physician was helpful in deciding which tests (labs, x-rays) or other diagnostic procedures were appropriate for new admissions. | 1.79 (.132) |
| 7. The night-float attending physician was helpful with the development of my initial treatment plan.                                                         | 1.74 (.106) |
| 8. Overall the night-float attending physician improves patient care.                                                                                         | 1.91 (.166) |
| 9. I would have preferred to have more supervision during the night or someone more senior to discuss cases with.                                             | 3.82 (.130) |

Abbreviation: H&P, history and physical examination.  
<sup>a</sup> Responses range from 1, strongly agree, to 5, strongly disagree.

present. Night-float residents also valued the attending physician supervision and thought that such supervision improved patient care.

A rigorous comparison of the attending physician-supervised night-float model versus the initial resident-only model is beyond the scope of this article, which is intended primarily to describe this innovative program and share lessons learned. Nevertheless, readers may be interested to know how the present survey results compare with those obtained in 2000. In the present study, daytime ward residents provided higher ratings for the quality of the admission workups (1.78 vs 2.54,  $P < .001$ ), tests and diagnostic procedures (1.76 vs 2.18,  $P = .001$ ), and cross-cover care (1.78 vs 2.39,  $P < .001$ ) compared with the previous results.<sup>15</sup> Ward residents also reported a greater sense of satisfaction (1.62 vs 2.29,  $P < .001$ ) and agreement with the initial treatment plan (1.98 vs 2.57,  $P < .001$ ) established by night float. Whether these differences can be fully ascribed to the presence of a night-float attending physician is unclear. Indeed, other changes occurred between the times of administration of the 2 surveys; night-float teams of 1 resident and 1 intern were replaced by residents who worked independently, and the shift changed from 8 hours to 12 hours. Other changes in organizational culture and resident satisfaction (more globally) also may have occurred.

Implementing on-site night-float attending physician coverage has several advantages. First, the presence of an on-site night-float attending physician who can teach, supervise procedures, and offer real-time feedback to house

staff converts what would ordinarily be a service-oriented rotation into an educational one. Indeed, according to the survey results, residents found the attending physician supervision to be appropriate and helpful. Second, because an on-site attending physician provides real-time input into diagnostic testing and decision making, evaluations of newly admitted patients potentially can be completed more efficiently and effectively. This could lead to more cost-effective care, although it was beyond the scope of the present research to assess this formally. Third, night-float rotations can be detrimental to resident quality of life compared with daytime rotations, which offer a greater opportunity to interact with colleagues. An on-site attending physician is able to assess coping skills and teach strategies for improved performance under these circumstances.

We have also learned several lessons about night-float attending physician coverage that may be helpful to other institutions that consider this model. First, having a small pool of dedicated nighttime attending physicians is probably better for resident education and supervision than a model that involves coverage by a large number of moonlighting attending physicians who also have daytime responsibilities. We believe the former approach instills a greater sense of ownership and level of engagement with the residents. In our model, 2 attending physicians were able to effectively cover the year, with limited use of moonlighters to cover their vacations. Second, a nighttime attending physician work schedule may be beneficial to junior faculty, in particular, who wish to pursue other opportunities that are

offered only during daytime hours. For example, one of our physicians completed a master of science degree in clinical research during the day, while earning a respectable salary as a night-float attending physician. Nevertheless, it is important to make sure that the attending physicians who are only working nights are interacting with their daytime colleagues, as this promotes their professional development and can aid in retention.

Third, night-float attending physicians may provide additional value to the hospital by assisting with appropriate and efficient bed utilization. A recent study demonstrated that involving full-time hospitalists in triage decisions dramatically reduced intensive care unit and emergency department diversion times, resulting in significant cost savings.<sup>16</sup> Lastly, it is difficult to imagine a situation in which the night-float attending physician salaries can be generated through clinical revenue alone. Although it is possible to capture an additional day of billing by seeing patients before midnight, most of the evaluation and management billing done by night-float attending physicians merely captures what would be billed later that calendar day by the daytime ward attending physician. The volume of billable procedures at night is unlikely to support the salary, which may need to be higher than that of a daytime position in order to entice physicians to work at night. Thus, institutions that consider the night-float attending physician model are likely to do so as an investment in resident education, patient safety, and more timely and effective patient care.

### Limitations

This article is primarily intended to describe a new educational program, and there are several limitations to its assessment. First, we relied on self-report and were unable to measure other indicators of quality and utilization, such as hospital length of stay and readmission rates. Second, the response rate of 66% was less than ideal and reflects the challenge of conducting unfunded studies at a busy county hospital, with medical residents whose time is at a premium. Third, our results are based on data from 1 institution and may not be generalizable to other teaching hospitals. Fourth, given the high clinical workload of night-float residents, the night-float attending physicians staffed only 20% of the overnight admissions. This might draw into question how much of an impact they had on resident education and patient care. However, it is important to note that, in addition to their admission duties, the night-float attending physicians were involved in numerous “curbside” consults and created an atmosphere of accountability that extended into every patient workup. Finally, the model described here involved 2 dedicated on-site night-float attending physicians whose primary job description was the education and supervision of night-float residents. Although

we believe, based on our experience, that this model is superior to having a year-round pool of moonlighting attending physicians with other daytime responsibilities, we did not formally study alternate models and cannot be certain whether those models would produce similar results.

### Conclusion

Medical residents were satisfied with patient care delivered by a night-float system that included an on-site night-float attending physician. Moreover, night-float residents valued the supervision and education provided by the on-site attending physician. In an era of decreasing work hours and greater discontinuity, academic medical centers must continue to search for innovative programs that foster resident education and patient safety while ensuring the well-being of trainees. Future research should assess the effect of on-site night-float attending physician supervision on clinical outcomes and the cost-effectiveness of patient care.

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