

Strategies for Improving Education on Night-Float Rotations: A Review

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INTRODUCTION: Night float rotations (NF) have been developed as a means of achieving duty hour compliance among residency programs. These were initially pioneered in the late 1980s as a response to fatigue among residents. The NF experience had its genesis in work hour reform and providing hospital service more so than education. However, as NF has become ubiquitous, it is not clear that we have adequately revisited the educational component of this experience. We systematically reviewed the literature on educational aspects of a night float experience.

METHODS: PubMed searches were conducted for the terms “night float” and “night, curriculum, residency.” This yielded 320 articles. Concerning educational aspects of the NF reduced the total to 134 articles. Editorials and those concerning procedural volumes or handoffs were also excluded. Most articles used surveys as methodology, so formal statistical analysis was not possible.

RESULTS: In total, 42 independent articles were found that directly related to the educational value of NF rotations, spanning all of the medical disciplines. Each study was searched for interventions or strategies that may affect the educational value of the NF experience. These may be grouped broadly into 3 discrete categories: (1) attention to the sleep-wake cycle, (2) addition of personal to augment the experience and (3) incorporation of formal educational elements to night rotations. A summary of these strategies is presented in Table 3.

CONCLUSIONS: NF is a practical solution to the challenge of work hour restrictions in residency, and is likely to persist in the future. Some educational issues arise due to the altered physiology of a reversed sleep-wake cycle, which may be best resolved through structural limitations of the night rotations. Other deficiencies are based on lack of interactions, for which there are strategies to improving the NF educational experience. (*J Surg* 72:297-301. © 2014

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COMPETENCIES: Practice-Based Learning and Improvement, Patient Care, Interpersonal and Communication Skills

INTRODUCTION

Night-float (NF) rotations have been developed as a means of achieving duty-hour compliance among residency programs.¹ These were initially pioneered in the late 1980s as a response to fatigue among residents. In fact, by 1991, most obstetrics residency programs in New York employed the NF model.²

The initial requirements of American Council of Graduate Medical Education (ACGME) were effective in 2003, popularly abbreviated as the 80-hour workweek rules. In 2011, these rules were updated and included a cap of 16 consecutive hours for postgraduate year-1 residents. This rule effectively prohibited interns from taking overnight calls and promoted widespread adoption of NF systems.

The NF experience had its genesis in work-hour reform and providing hospital service more than education.³ However, as NF has become ubiquitous, it is not clear that we have adequately revisited the educational component of this experience.⁴⁻⁶ We systematically reviewed the literature on educational aspects of a NF experience.

METHODS

PubMed searches were conducted for the terms “night float” and “night, curriculum, residency.” This yielded 320 articles. Concerning educational aspects of the NF reduced the total to 134 articles. Editorials and those concerning procedural volumes or handoffs were also excluded. Most articles used surveys as methodology, so formal statistical analysis was not possible.

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TABLE 1. Advantages of NF Rotations

Improves daytime experience for other residents ¹²
Daytime education is not eliminated
NF residents may attend conference ¹³
No difference in trauma experience ¹⁴
No change in in-training examination performance ¹⁵
Independence and autonomy
Good staff interactions ¹⁶
Good for patients
Overall improved patient care ¹⁷
No change in morbidity ¹⁸
Resident mood and alertness may be improved ^{19,20}

RESULTS

In total, 42 independent articles were found that directly related to the educational value of NF rotations, spanning all of the medical disciplines.

From an educational perspective, it has been suggested that NF is associated with less didactic teaching and a decreased frequency of contact with attending physicians.⁷ In addition, multiple surveys have demonstrated resident dissatisfaction with the overall quality of the NF experience.⁸⁻¹¹ We first attempted to categorize the articulated advantages of a NF experience, which is summarized in [Table 1](#). Specifically identified educational disadvantages are listed in [Table 2](#).

In terms of objective data, few studies address the problem with an objective educational metric. We do have a standardized, residency-specific instrument in the annual in-training examination. Previous work has suggested that improved scores were associated with overall reduction in work hours.^{30,31} The single study reviewing the effect of NF has concluded that there is no demonstrable difference among in-training scores.¹⁵

Each study was searched for interventions or strategies that may affect the educational value of the NF experience. These may be grouped broadly into 3 discrete categories: 1—attention to the sleep-wake cycle, 2—addition of personnel to augment the experience, and 3—incorporation of formal educational elements to night rotations. A summary of these strategies is presented in [Table 3](#).

TABLE 2. Disadvantages of NF Rotations

Fatigue is worse ^{21,22}
Altered mood ²³
Worse at cognitive tasks ²⁴
Physical task training takes longer ²⁵
No formal education
Inadequate teaching ²⁶
Fewer interactions with faculty ²⁷
No feedback ¹²
No culture of learning
Residents do not attend daytime conferences ¹²
Decreased procedural experience ²⁸
Lack of continuity ²⁹
Poor staff interactions ⁹

TABLE 3. Potential Educational Improvements in NF Rotations

Normalization of sleep-wake cycle
Avoidance through moonlighters or hospitalists ³²
Avoidance through traditional call model ²⁷
Limitations in frequency and duration ³³
Day-float system ³⁴
Addition of personnel
NF team or tandem call ^{35,36}
Attending hospitalists or nocturnists ³⁷⁻⁴⁰
Increased supervision ⁴¹
Students ⁴²
Education component
Case-based self-study ⁴³
Morning or evening conferences ⁴⁴

Sleep Disturbances

The first strategy to deal with sleep disturbance is that of avoidance. In the long term, replacement of trainees with full-time night-time employees may provide the necessary service to allow residents to rotate on day call only. This would require significant financial investment from the hospital or department, but is a potential long-term solution. It also raises the question of the educational value of night call, which many trainees acknowledge to be a valuable part of their personal education. Some have suggested a return to a traditional call model.²⁷ Instead, minimizing the night experience to an occasional call from 5 to 6 nights per week may preserve the educational elements of night-time coverage without producing the sequelae of sleep deprivation and isolation. An alternative is a “day-float” model, where a period of home call may be followed by a day coverage resident.³⁴

Additional Personnel

Treating NF as an individual experience may be suboptimal. Indeed, the more people that are together, the better the experience may be. Several groups have identified that the addition of an in-house attending physician may augment the educational experience without substantially sacrificing autonomy.³⁷⁻⁴⁰ However, keeping the same residents on parallel tracks as a “night team” may also be advantageous.³⁵ Further, the addition of medical students may produce an environment where the NF resident is reminded of the academic mission of residency and improve the overall educational experience.⁴²

Educational Elements

There is clear evidence that self-study is an important part of adult education. For medical students, the addition of case-based, self-study has resulted in marked improvement on standardized testing.⁴³ Therefore, a similar assignment of modules to residents may result in improvements on in-training examinations.

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