

Nighthawk: Making Night Float Education and Patient Safety Soar

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ABSTRACT

Background Some residency programs responded to duty hour restrictions by implementing night rotations. Night supervision models can vary, resulting in potential patient safety issues and educational voids for residents.

Objective We evaluated the impact of multiple evidence-based interventions on resident satisfaction with supervision, perception of the education value of night rotations, and residents' use of online educational materials.

Methods The night team was augmented with an intern to assist with admissions and a senior resident (the "nighthawk") to supervise inpatient care and deliver a night medicine curriculum. We instituted a "must-call" list, with specific clinical events requiring mandatory attending notification, and reduced conflict in the role of the night float team. We studied patient contact, online curriculum use, residents' perceptions of nighthawk involvement, exposure to educational materials, and satisfaction with supervision.

Results During the first half of academic year 2016–2017, 51% (64 of 126) of trainees were on the night medicine rotation. The nighthawk reviewed 1007 intern plans (15 per night; range, 6–36) and supervised 215 hands-on evaluations, including codes and rapid responses (3 per night; range, 0–12). The number of users of the online education materials increased by 85% (13 to 24), and instances of use increased 35% (85 to 115). The majority of residents (79%, 27 of 34) favored the new system.

Conclusions A nighthawk rotation, a must-call list, and reducing conflict in night team members' roles improved resident satisfaction with supervision and the night medicine rotation, resulting in increased communication.

Introduction

When the Accreditation Council for Graduate Medical Education (ACGME) adopted 80-hour workweek restrictions, many programs implemented night float rotations for patient coverage.¹ The ACGME recently increased shift length for interns to 24 hours, yet many programs plan to continue using night float.^{2–4} The negative impacts of night float rotations on patient care, education, ownership of patients, resident satisfaction, and safety are widely reported.^{5–8} However, the educational void created by residents spending an increased percentage of training overnight is not well described.^{6,8,9}

Studies have found cultural barriers to seeking assistance in situations when attending physicians provide indirect supervision.^{10,11} Finding ways to counteract this "hidden curriculum" phenomenon by formalizing expectations for seeking supervision is critical during overnight shifts, when attending presence and direct supervision is diminished.^{3,4,10,11}

We instituted a pilot of a supervision system in response to a sentinel event; our system reduced ambiguity in resident expectations regarding

situations that required attending involvement, in line with ACGME directives regarding resident supervision. This provided an opportunity to optimize patient safety and improve education.^{4,12}

Methods

The interventions were implemented on the inpatient internal medicine (IM) teaching service at a military tertiary care facility during the first half of academic year 2016–2017. Categorical and preliminary IM residents participate in night float throughout the year, resulting in a wide range of trainee experience.

The preintervention night float team consisted of 1 postgraduate year (PGY) 2 or 3 resident and 2 PGY-1 interns responsible for new IM admissions and cross-coverage of existing patients. This structure often left inexperienced interns handling the needs of acute hospitalized patients without immediate supervision due to conflicting upper-level resident responsibilities. Opportunities to seek guidance from an in-house critical care fellow and an on-call attending were underutilized. A self-directed, online night float medicine curriculum was also underused.

Our intervention to address these issues consisted of the following:

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- We implemented a “must-call” list adapted from prior research,¹² in which certain clinical events require residents to notify the attending physician (BOX). Management plans were initiated by residents to allow for experiential learning, coupled with notification and discussion with the attending on call within 1 hour.
- We augmented overnight personnel to create 2 collaborative teams to reduce conflict among roles:
 - Admissions: 1 PGY-2/PGY-3 resident and 1 PGY-1 intern to assist (new intern rotation replacing a 2-week elective)
 - Cross-coverage: 2 PGY-1 interns and 1 “nighthawk” (new PGY-3 rotation replacing a 2-week elective)
- We added a senior resident in the role of nighthawk who:
 - supervised cross-cover interns to include receiving a written sign-out and observing handoffs between interns; and
 - educated interns on the night service using the online night float curriculum.

The primary outcomes we assessed included the involvement of the nighthawk, use of the online curriculum, and resident perceptions of the new rotation model. Data were collected between July 1 and December 14, 2016. Nighthawk involvement was measured by the number of intern plans reviewed and hands-on evaluations conducted (including codes, rapid responses, and intern requests). The nighthawk recorded these on a data sheet prospectively and provided them to the chief residents daily. Utilization rates of the night float curriculum were obtained from usage logs on the web-based platform Sakai (Aperio Foundation, Ann Arbor, MI). A single question, open-ended survey to gauge residents’ responses to the new experience was developed by the authors without further testing. Survey responses were categorized by the authors as positive or negative to determine percentages.

These interventions were approved by the Institutional Review Board as part of a sentinel event response plan.

Results

Nighthawk residents reviewed 1007 intern plans (15 per night; range, 6 to 36) and received oral handoffs and written transfers of care from off-going teams (something not feasible in the prior system due to conflicting duties). A total of 215 hands-on evaluations occurred (3 per night; range, 0 to 12). Rates varied during the data collection period (FIGURE). Compared with preintervention rates, use of the

BOX Clinical Events Requiring Notification of Attending Physician of Record During Overnight Hours

Must-Call List

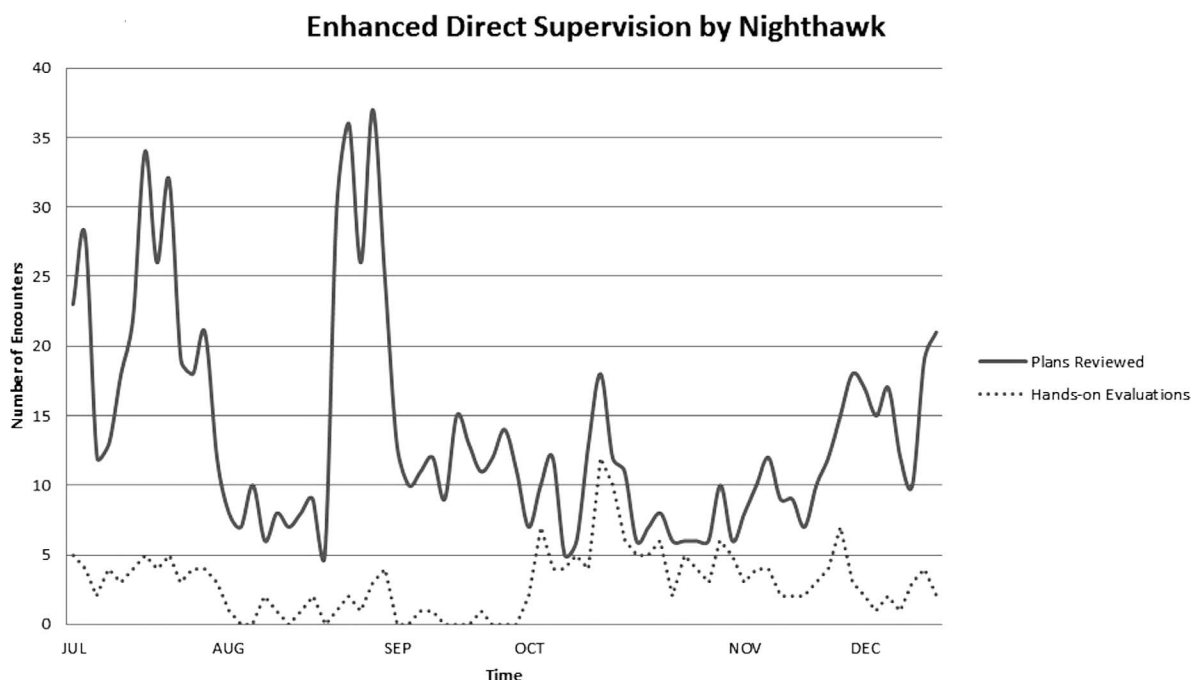
- Patient death
- Code blue
- Rapid response
- Consideration for transfer to higher level of care (ie, intensive care unit, telemetry)
- Discharging a patient at night
- Patient leaving against medical advice
- Fever in an immunocompromised patient
- Suspected gastrointestinal bleeding
- When consulting another service
- Prior to obtaining consent and performing an invasive procedure
- Critical radiographic findings
- Before ordering contrast radiographic studies

online night float curriculum increased by 35% (lecture downloads: 115 versus 85) and the number of unique users increased by 85% (24 versus 13). Survey data from all PGY levels revealed the majority of respondents who had experienced the rotation (79%, 27 of 34) reported they would either continue the nighthawk rotation or expand it to include weekend nights. Positive comments focused on improved patient safety through the benefit of having time to think about clinical decisions, being able to confer with senior residents on clinical issues, reviewing the night medicine curriculum, and perceiving a more appropriate level of supervision. Negative comments focused on reduced autonomy for cross-coverage interns, with a suggested solution of providing more guidance on the level of nighthawk involvement.

Discussion

The nighthawk pilot created an environment with reduced role conflict and increased supervision and use of the online curriculum. This enhanced communication within the larger care team, resulting in improved supervision and increased opportunities for collaborative learning during patient care, with residents indicating their preference for the new system due to improvements in patient safety, supervision, and education. This finding is illustrated by their desire to keep the nighthawk rotation, despite the loss of 2 weeks of elective time.

Our results are consistent with previous work that showed an additional in-house faculty member increased the educational value of night rotations.¹³ The must-call list elevated communication for acute clinical situations to attending physicians. That some trainees feel like the must-call list and nighthawk resulted in “too much supervision” is aligned with reports of discrepancies among residents and faculty regarding the ideal level of after-hours communication.^{12,14}

**FIGURE**

Longitudinal Impact of Nighthawk as Measured by Number of Plans Reviewed as well as Number of Hands-On Evaluations Provided by Supervising Resident

Note: A total of 55% (39 of 71) of residents responded to the survey (PGY-1: 58%, 18 of 31; PGY-2: 67%, 14 of 21; PGY-3: 37%, 7 of 19).

These respondents were in the minority, and being given the opportunity to develop their own treatment plan, while also seeking supervision overnight, contributed to resident satisfaction with the rotation.

Our data showed variable rates in utilization of the nighthawk by interns. Possible contributors include patient variability, differences among residents (ie, categorical versus preliminary), and prior clinical experiences, but differences also could result from variances in the desire for autonomy among interns. Given the emphasis the ACGME places on supervision and patient safety in its Clinical Learning Environment Reviews,¹⁵ strengthening direct supervision by senior residents and indirect attending supervision is likely beneficial for patients. Safety is further enhanced by the nighthawk's involvement with intern handoffs, which allows for situational awareness of the acuity of patients and opportunities to provide direct feedback on handoff quality.

Limitations of our study include the intervention being conducted in a single military residency, limiting generalizability. We did not assess changes in the knowledge of trainees due to exposure to the online curriculum, and we used a resident survey without validity evidence to gauge satisfaction. We lack data on resident and attending consultation during the preintervention period, and we did not track the number of plans changed by the nighthawk. Finally, we did not collect data on patient outcomes to

assess if enhanced supervision improved patient safety.

Conclusion

Reducing conflicting resident roles, enhancing supervision, and increasing teaching on a night float rotation via a nighthawk system and a must-call list improved communication among night team members, improved use of online educational materials, and increased resident satisfaction with supervision.

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