The New Education Frontier: Clinical Teaching at Night
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Abstract
Regulations that restrict resident work hours and call for increased resident supervision have increased attending physician presence in the hospital during the nighttime. The resulting increased interactions between attendings and trainees provide an important opportunity and obligation to enhance the quality of learning that takes place in the hospital between 6 PM and 8 AM. Nighttime education should be transformed in a way that maintains clinical productivity for both attending and resident physicians, integrates high-quality teaching and curricula, and achieves a balance between patient safety and resident autonomy. Direct observation of trainees, instruction in communication, and modeling of cost-efficient medical practice may be more feasible during the night than during daytime hours. To realize the potential of this educational opportunity, training programs should develop skilled nighttime educators and establish metrics to define success.

Educational models and mandates for physician trainees are evolving rapidly. Many authors have addressed the complexities faced by training programs and clinician–educators as they adapt to resident duty hours requirements, calls for increased value in health care delivery, and efforts to enhance patient safety.1–5 We believe an important but underappreciated challenge of this evolution in clinical training is the transformation of nighttime education, which we define as any knowledge, skills, or attitudes that trainees develop while working in a clinical setting between 6 PM and 8 AM. Teaching hospitals and training programs have traditionally provided less on-site attending supervision and limited diagnostic, treatment, and consultative options for residents and fellows who work overnight shifts.6,7 Financial and regulatory mandates to provide high-value care and enhance patient experience regardless of time of day are driving teaching hospitals to explore avenues for combining highly effective teaching and clinical care during nighttime hours, which cover more than half of a 24-hour work cycle in health care.8–11

In response to the 2011 Accreditation Council for Graduate Medical Education (ACGME) requirements, which mandate decreased maximum shift length for interns and enhanced supervision for physician trainees, training programs have increased staffing at night.12 We view this shift, which increases the number of nocturnal interactions between attending physicians and trainees, as a valuable opportunity to create a dynamic learning environment at night.

Opportunities in Nighttime Education
Nightime medicine offers a rich environment for clinician educators to address important competencies and curricular objectives. For example, handoffs between providers take place at the start, finish, and sometimes middle of nighttime shifts, providing opportunities for nighttime faculty to directly supervise or assess this process and enhance trainee communication skills. Similarly, safe transitions between nighttime and daytime teams require high-quality written documentation, with admission or cross-cover notes serving as the only enduring contact after the shift has ended. Nighttime faculty are well situated to use chart-stimulated recall with trainees as a workplace learning method to ensure that documentation is meaningful and that the reasoning embedded within notes is clear and logical.13

Calls to increase direct faculty observation of trainees have existed for decades,14 but the hectic pace of daytime activity in the hospital and the nonclinical schedule demands on daytime faculty make this laudable goal difficult to achieve. Nighttime clinical care is typically devoid of administrative demands, which affords more opportunities for faculty to observe direct patient contact and provide guidance and specific feedback for advanced learners. Attending physician input in real time at night represents a valuable opportunity to model judicious use of resources and cost-conscious care when laboratory, imaging, and consultant availability is limited.15–17

Building a New Model
To realize the potential of nighttime education, training programs will need to develop skilled nocturnal clinician–educators and establish metrics that define success. Transforming “night float” into “nighttime education,” however, requires overcoming several barriers. First, staffing overnight shifts with attending physicians who teach in addition to seeing patients must demonstrate a tangible educational and financial return on investment. Second, it is a challenge to recruit physicians to regular or even periodic nighttime work. Third, the quality of teaching will

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have to be high and offset the concerns that continuous on-site faculty presence erodes trainee autonomy. Confronting these issues will be critical to the success of a new model for nighttime education.

**Supporting return on investment**

Developing outstanding clinician–educators who cover nighttime shifts must become an explicit priority for academic and clinical departments. The Clinical Learning Environment Review Program, part of the ACGME’s Next Accreditation System (NAS), will increase alignment between the financial and quality assurance interests of training programs, academic departments, and their partner hospitals. 

Nighttime faculty presence will play an important role in fulfilling five of the six focus areas: patient safety, quality improvement, transitions in care, supervision, and duty hours oversight.

Additionally, increasing staffing at night can generate more revenue and boost cost savings. Attending physicians present in the evening can bill for admission services earlier and enhance billing for overnight procedures or intensive cross-cover care. Increased and early attending physician input on patient care decisions could lead to a decrease in errors, lengths of stay, diagnostic testing, and high-cost bed triage. Improvement in institutional quality and safety metrics could also justify increased nighttime staffing.

**Staffing to enhance education**

For specialties like emergency and critical care medicine and obstetrics that require 24/7 in-hospital coverage, staff frequently rotate through daytime and nighttime shifts, although some programs cultivate a cohort of nighttime physicians. While dedicated nocturnal clinician–educators might be best positioned to enhance nighttime teaching, clinical care, and supervision, we anticipate that many inpatient programs would use a combination of faculty and moonlighters to staff nights. For instance, internal medicine programs are likely to rely on a blend of nocturnists, rotating daytime hospitalists, and nonhospitalists.

Standardizing expectations for educational and supervisory responsibilities is likely more important than a particular staffing model. Although many academic hospitalist groups have on-site nighttime attending physicians, only 38% explicitly define a formal teacher or supervisor role. 

The first step in enhancing nighttime education is delineating how clinical duties assigned to nighttime attending physicians integrate with their supervision and teaching roles. For example, an attending may alternate admissions with the resident, permitting some opportunity to be an available supervisor while simultaneously decreasing trainee clinical duties.

**Transforming the learning environment**

Nocturnal clinician–educators should have a firm command of multiple teaching modalities, familiarity with nighttime curricula, and skill in balancing supervision with resident autonomy. These elements will be central to transforming the nighttime learning environment.

**Teaching skills.** Teaching effectively at night poses unique challenges. Nighttime learners are sleep deprived, less alert, and express a higher degree of depressed mood. High clinical workloads for supervising physicians and residents amidst reduced staffing require teaching that is mostly integrated into busy workflows rather than delivered in conference rooms.

Faculty development should focus on advancing effective teaching skills, such as meeting residents at the bedside for physical examination of cross-cover patients, analyzing clinical reasoning during an admission, or actively modeling effective communication during nighttime codes. Many of these activities match strategies from the nursing and ambulatory care literature, where busy educators focus successful instruction on microteaching (lasting only minutes) embedded in clinical workflows. Faculty development should also promote behaviors that facilitate contact and teaching during nighttime hours, such as introductory comments like “I’m not here to sleep” and “my night is more interesting if I hear cases from residents.”

**Blended learning.** Although workplace learning is the cornerstone of nighttime education, robust curricula are a necessary adjunct to signal the importance of nocturnal learning. Previous studies examining residents’ perceptions of nighttime teaching have shown equivocal results. In our experience, a short “midnight conference” or “midnight report” has been a well-received teaching modality among trainees and the attending, who briefly reviews an active case or a common clinical topic, such as in-hospital delirium. When the instructor is not available for structured or intensive teaching, curricula can be asynchronously delivered to maintain the rich educational environment.

For example, a multicenter nighttime curriculum, implemented at 89 pediatric and combined medicine–pediatric residency programs, employed 10 online, case-based modules covering medical and communication topics. Learner surveys demonstrated an increase in perceived educational value of nighttime rotations as well as resident confidence and knowledge. The finding suggests that residents working night shifts may be situated to complete context-specific online modules, such as the American College of Physicians High Value Care curriculum.

**Oversight and autonomy.** Nighttime attending physician presence marks a shift from traditional supervision, based predominantly on oversight and indirect supervision, to a new blend of direct supervision and indirect supervision with immediate on-site availability. Although this evolution fulfills the NAS’s requirements of enhanced supervision, it may negatively affect learners’ sense of autonomy. Studies suggest, however, that increased attending presence does not diminish trainee or faculty perceptions of autonomy. Nonetheless, faculty will need to develop communication styles and behaviors that balance patient safety and efficient care with resident independence to facilitate professional growth.

**Measuring and Defining Success**

Measuring the impact of a new model is critical to sustainability and continuous improvement. In Table 1, we outline metrics to gauge the success of nighttime education programs. Importantly, training programs and
academic promotion systems must recognize educational efforts at night, which currently are largely invisible and underappreciated. This will require rigorous evaluation of nocturnal clinician–educators by trainees and the adaptation of current standards to which daytime clinician–educators are held accountable, including clinical productivity, curriculum development, scholarship, and educational presentations.

Conclusion

There has been a steady call to improve the quality, safety, and efficiency of medical care delivered in hospitals around the clock. The time has come for educators to provide high-quality medical education around the clock as well. Patients, hospitals, and trainees deserve access to a group of physicians who have the ability to transform nighttime clinical work into innovative and effective educational opportunities while delivering high-value care. These clinician–educators, in turn, require financial, workload, and curricular support from employers, training programs, and academic systems to help them succeed. The current training model, in which nearly all of the formal residency education is embedded into the daytime, while faculty and learners simply “survive” night shifts, will no longer suffice.

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Table 1

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<th>Audience</th>
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| Trainees            | • Performance on ACGME core competencies/outcomes-based milestones  
                     • Documentation of cost-conscious clinical reasoning  
                     • Completion of formal nighttime curricula  
                     • Completion of EPAs  
                     • Amount of direct observation by faculty  
                     • Amount of direct supervision of handoffs  |
|                     | Documentation of progress as stipulated in ACGME’s Next Accreditation System/specialty-specific Milestones Project  |
| Clinical enterprise and patients | • Nighttime revenue/billing  
                     • Clinical productivity/ RVUs  
                     • Resource utilization (test volume, bed triage, early discharge/length of stay)  
                     • Adherence to evidence-based protocols  
                     • Procedure complication rates  
                     • Adverse events  
                     • Patient satisfaction  | • Improved performance in hospital unit/program quality, safety, and efficiency metrics or dashboards  
                     • Improved departmental or hospital clinical revenue  |
| Faculty             | • Teaching evaluations by trainees  
                     • Publications and presentations  
                     • Development of educator portfolios  | • Academic productivity and advancement  |

*"Nighttime education" is defined as the development of trainees’ knowledge, skills, and attitudes when working in a clinical setting between 6 pm and 8 am. ACGME indicates Accreditation Council for Graduate Medical Education; EPAs, entrustable professional activities; RVUs, relative value units.

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