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INNOVATIONS IN MEDICAL EDUCATION

Decisions in the Dark: An Educational Intervention to Promote Reflection and Feedback on Night Float Rotations

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BACKGROUND: Night float rotations, where residents admit patients to the hospital, are opportunities for practice-based learning. However, night float residents receive little feedback on their diagnostic and management reasoning, which limits learning.

AIM: Improve night float residents' practice-based learning skills through feedback solicitation and chart review with guided reflection.

SETTING/PARTICIPANTS: Second- and third-year internal medicine residents on a 1-month night float rotation between January and August 2017.

PROGRAM DESCRIPTION: Residents performed chart review of a subset of patients they admitted during a night float rotation and completed reflection worksheets detailing patients' clinical courses. Residents solicited feedback regarding their initial management from day team attending physicians and senior residents.

PROGRAM EVALUATION: Sixty-eight of 82 (83%) eligible residents participated in this intervention. We evaluated 248 reflection worksheets using content analysis. Major themes that emerged from chart review included residents' identification of future clinical practice changes, evolution of differential diagnoses, recognition of clinical reasoning gaps, and evaluation of resident-provider interactions.

DISCUSSION: Structured reflection and feedback during night float rotations is an opportunity to improve practice-based learning through lessons on disease progression, clinical reasoning, and communication.

KEY WORDS: reflection; feedback; night float; residency.

INTRODUCTION

Accreditation Council of Graduate Medical Education duty hour restrictions led many internal medicine residency programs to adopt night float rotations.[1–3] Night float residents work overnight shifts admitting patients and then transfer patient care duties to a daytime physician team. A 2014 study estimated that nearly half of all admissions to an academic general medicine service were admitted overnight.[4]

Residents on inpatient day teams receive formal and informal feedback through attending supervision on rounds, frequent interactions with consultants and peers, summative evaluations, and longitudinal observation of patient outcomes.[5] Night float residents report insufficient feedback on their diagnosis and management decisions.[6] Barriers to receiving feedback on night float rotations include discontinuous training environments and clinical schedules, limited attending oversight, and fewer co-resident and consultant interactions.[6] Feedback to night float residents during handoffs is limited and underutilized.[7] Residents can track patient diagnoses and outcomes by chart review, but only do so for 3% of patient handoffs during night float rotations compared to 67% of patient handoffs during daytime medical wards.[8]

Several studies have reported structured feedback to augment night float education. Chart-stimulated recall with attending review of resident presentations and documentation at the end of a shift has been used to provide residents with feedback on communication skills, documentation, and clinical reasoning.[9] Attending worksheets analyzing resident admission notes have also been used to formalize feedback for night float residents.[10] These efforts have primarily focused on scheduled feedback from supervisors rather than resident driven learning. Few night float programs utilize reflection which incorporates critical thinking and the exploration of personal and emotional experiences which are important components of workplace learning.[11,12]

Practice-based learning requires residents to reflect on their clinical performance, seek external analysis, and engage in self-improvement.[13] To improve practice-based learning during night float rotations, we designed an educational intervention that integrated chart review with structured reflection and

encouraged resident-driven peer and attending feedback. We analyzed the lessons that night float residents inferred from chart review and reflection on their overnight decision-making and examined the utility of peer and attending feedback.

SETTING AND PARTICIPANTS

Second- and third-year residents ($n = 82$) who completed a 1-month night float rotation between January 2017 and August 2017 at an academic internal medicine residency program participated in this intervention. Ten residents were assigned to night float each month. Each resident completed approximately 21 shifts at a university, public county, or Veterans Administration hospital. They admitted a maximum of five patients each night. We estimate that on average, each resident admitted three patients per night shift (approximately 60 patients per month).

Attending physicians were present overnight at all three sites to manage separate hospitalist services and provide consultation to night float residents as needed. Patients admitted during a night float shift were presented in the morning to a day team consisting of medical students, interns, a senior resident, and an attending physician who cared for the patient for the remainder of the hospitalization.

PROGRAM DESCRIPTION

The intervention had two parts: (1) chart review with structured reflection and (2) resident-initiated feedback.

Residents were informed of the program learning objectives by email 3 days prior to the start of the night float rotation. Residents were provided instructions on how to maintain lists of patients they admitted in the different electronic health records (EHR) at each hospital. These lists were used to guide the reflection and feedback exercises described below. Residents received two email reminders to complete reflections and to solicit feedback for at least four patients. The intervention was presented as a pilot program in the night float rotation and residents were encouraged to participate but were not required to do so. The UCSF Committee on Human Research categorized the project as exempt.

Structured Reflection

We developed an electronic worksheet to guide residents in their reflections. The worksheet incorporated several questions from a prior intervention at our institution[14] and asked the resident to provide the patient's problem representation (single line summary) and answer four open-ended questions related to (1) the patient's clinical course, (2) how the differential diagnosis evolved, (3) challenging clinical decisions overnight, and (4) future practice modifications (Appendix 1). They were instructed to submit the reflection worksheet to a secure web-based application[15] for at least four patients. Patient identifiers were not included in the database or reflection worksheets.

Resident-Initiated Peer and Attending Feedback

Night float residents were instructed to solicit feedback on their overnight management of patients they admitted by sending secure emails to two senior residents and two attending physicians on day teams who took over the care of their patients. The patients chosen for soliciting feedback could differ from the patients chosen for structured reflections.

Daytime attending physicians were notified about the intervention by email at the beginning of each month and were provided instructions on the approach and language for delivering feedback (Appendix 2).[16,17] The daytime senior residents were not notified of the intervention but may have been aware of it if they completed a night float rotation during the study period.

Residents were asked to complete their reflection worksheets and send feedback solicitation emails during the night float rotation or up to 2 weeks following completion of the rotation. This time frame allowed time for patients' clinical evolution, especially for patients admitted near the end of the rotation.

PROGRAM EVALUATION

Structured Reflection

Sixty-eight of 82 (83%) residents who completed night float between January 2017 and August 2017 submitted reflection worksheets. All participating residents completed 3 or 4 reflections encompassing 248 unique patient encounters.

We used content analysis[18] to qualitatively examine resident reflections. Two authors (HL and KR) independently performed open coding using a data-driven inductive approach which involved identifying passages of the reflection worksheets that are linked by a common idea or topic.[19] HL and KR met regularly to iteratively refine and define coding categories. Coding disparities were resolved by negotiated consensus.[20] At the end of data analysis, no new codes were identified suggesting that coding saturation may have been reached.[18,20]

Twenty codes regarding night float resident management of admissions were identified in the reflections. These codes were categorized into 8 themes (Table 1). We quantified the number of reflections in each theme to better understand the topics reflected on by night float residents. Approximately half of the worksheets submitted by residents commented on diagnostic evolution. Some worksheets contained reflections on clinical reasoning pitfalls or how interactions with consultants, emergency department providers, or handoffs between medicine teams affected the care of patients. Approximately half of

Table 1 Themes and Representative Quotes from Resident Reflections

Themes and Definitions (N = number of reflections), total = 248 reflections	Coding Categories	Representative Quotes
Change in practice (N = 131): *self-identified plans to modify clinical practice*	Residents would change their practice by: • Obtaining a better history or more appropriate physical exam • Ordering diagnostic or imaging test • Obtaining consultation • Prescribing medication or procedure	"Ensure that patients … are thoroughly examined. I was unaware that this patient had an abscess on his left buttock. I only learned about this the next morning when overhearing RN sign-out."
Diagnostic evolution (N = 130): *final diagnosis differed from the original working diagnosis*	Diagnosis evolved based on: • Change in clinical status • Results of laboratory test • Results of imaging study • Specialist consultation	"[A man was] admitted with leukocytosis to 37. I thought he would almost certainly have underlying myeloproliferative disorder, though he ended up having streptococcal bacteremia."
Clinical reasoning (N = 67): *pitfalls in clinical reasoning that affected diagnosis or management*	• Incomplete illness script • Recognizing cognitive heuristics and biases	"I need to be aware of anchoring bias. [I] thought anemia was related to ongoing GI bleed though patient denied new hematochezia/melena … CT showed retroperitoneal bleed."
Resident-provider interactions (N = 62): *care transitions or interpersonal/professional interactions that impacted management*	• Transitions of care among emergency department and/or hospital-based providers • Differing provider approaches to diagnosis and management	"I was so concerned about how the day team would have reacted had I not ordered meningeal dosing [of antibiotics] that I treated him more conservatively than I would have [normally.]"
Systems barriers (N = 53): *systems infrastructure that impacted overnight care*	• Work compression • Lack of EHR interoperability	"Because outpatient notes are [not titled] in the [EHR], I could not find any rheumatology notes. Therefore, I did not know the answers to rheumatology's questions about how her prior APLS flares had presented."
Patient–provider communication (N = 36): *communication between patient and provider that impacted clinical course*		"Spending time to talk with him about next steps helped. He was hesitant to call any family that he hadn't spoken to in years, but I encouraged him to reach out for support. The next morning his whole room was full of family and friends!"
End of life care (N = 22): *care at the end of life was a predominant aspect of care overnight*	• Code status or goals of care • Patient death or dying	"I think we made the right decision to raise comfort care and advocate for it, but I empathize with [the family's] frustration at seeing their loved one fall ill so quickly and ultimately expire."
Medical errors and adverse events (N = 21): *reflections on impact of errors and/or adverse events as a result of hospitalization*	• Medical error • Side effect or non-preventable adverse event	"She underwent cardiac catheterization. She developed renal failure related to contrast from cardiac catheterization."

the worksheets described the residents' plans to change their future clinical practice.

Resident-Initiated Peer and Attending Feedback

A 21-item post-intervention survey was sent to night float residents two weeks following the completion of the rotation to quantitatively assess the frequency and utility of feedback from attendings and residents and anticipated practice changes following the intervention (Appendix 3).

Forty-six (subsequently referred to as "respondents") of the 82 (56%) night float residents submitted the survey; some respondents submitted incomplete surveys, accounting for the different denominators that follow. Thirty of 46 (65%) respondents requested feedback from at least two attendings, and 28 of 46 (61%) respondents requested feedback from at least 2 peers. Of 79 feedback requests submitted to attendings,

residents reported receiving 55 responses (70% attending response rate). Of 77 feedback requests submitted to peers, residents reported receiving 65 responses (84% resident response rate).

Resident Assessment of Intervention

In the post-intervention survey, night float residents were also asked to rate the usefulness of the feedback provided by attendings and residents using a 5-point Likert scale (strongly disagree to strongly agree). Only 28 respondents answered this survey question. Among that group, 85% of the respondents agreed or strongly agreed that attending feedback was useful, and 78% rated peer feedback similarly.

Following the intervention, 37 of 46 (80%) respondents planned to follow up patients' clinical courses most of the time or always after handoffs, and 27 of 46 (59%) respondents

planned to solicit feedback most of the time or always after handoffs.

DISCUSSION

Our intervention addressed barriers to practice-based learning during night float rotations by encouraging residents to use their own patient care experience to drive learning through reflection and solicitation of peer and attending feedback. Structured reflection on night float facilitated residents' understanding of disease progression and analysis of their clinical reasoning. Residents considered how to transform their future practice through specific decisions such as when to call consultants overnight, which diagnostic tests or medications to pursue or withhold overnight, and how to better utilize the EHR to obtain accurate patient histories.

Residents' review of patient records disclosed diagnostic evolution or discrepancies between the initial and final diagnosis in nearly half of the worksheets, and often residents reflected on how their own cognitive errors may have contributed to diagnostic errors. In selecting four cases for reflection, residents likely chose patients with the greatest diagnostic uncertainty or vulnerability,[21] which may have accounted for the high rates of diagnostic evolution. Our findings mirror the results of the LOOP project, which was a multicenter program of structured feedback for residents performing overnight admissions. In that study, approximately 44% of admitting diagnoses were modified, and the intervention was rated as having high educational value.[22]

Communication and collaboration are crucial to effective clinical care. Residents often retrospectively reflected on their nighttime communication with patients, consultants, and interdisciplinary staff. Residents also described how they could have improved their handoffs to colleagues the next day. Since communication is rarely observed by supervisors, deliberate reflection on these interactions may partially address this gap in education.

There was lower participation in resident-solicited feedback than in the reflection exercises. Barriers to soliciting feedback include discomfort with acknowledging and sharing deficiencies, receiving disconfirming information,[23] and lacking relationships with attendings providing feedback.[24] Bowen et al. found that providers are more willing to deliver feedback on discrepant clinical decisions if they anticipate the receiver to be receptive.[25] Proactive contact by the night float resident may offer such reassurance, particularly in a large residency program in which provider familiarity may be limited. Most residents who participated in feedback solicitation and submitted the post-intervention survey found attending and resident feedback beneficial.

This study had several limitations. The selection of patients for reflection and feedback solicitation was made by the residents. It is possible that residents selected cases that were challenging while overlooking cases in which they felt certain but were ultimately incorrect in their diagnoses or management. We were unable to review the content of the feedback night float residents received from peers and attendings because they were private communications through secure email. Finally, it is unknown if this intervention will have lasting effects on residents' practice or will improve patient outcomes, even among residents who committed to behavior change on the post-intervention survey.

This intervention may be generalizable to other internal medicine residency programs with a night float rotation. The intervention is facilitated by an EHR with the ability to generate provider-level patient lists, an administrator or faculty member to email rotation objectives and instructions, and access to a secure survey site or online resident portfolios. A faculty champion is helpful to engage attendings and provide instructions on how to deliver effective feedback.

This intervention can be enhanced by training residents on critical reflection skills such as identifying specific and actionable goals and confirming or refuting practice patterns by using the literature. Additionally, residents can be trained on feedback solicitation as well as peer-to-peer feedback.

Reflection and feedback are instrumental to learning in any patient care setting but are particularly important during night float rotations when workload is high but attending and team-based feedback are low. This intervention was an opportunity to reinforce practice-based learning skills. Next steps include training residents and attendings on delivering high-quality feedback and aiding residents in developing their reflective skills.

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