

ORIGINAL RESEARCH

Nighttime Clinical Encounters: How Residents Perceive and Respond to Calls at Night

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BACKGROUND: Care fragmentation is common and contributes to communication errors and adverse events. Handoff tools were developed to reduce the potential for these errors. Despite their widespread adoption, there is little information describing their impact on clinical work. Understanding their impact could be helpful in improving handoffs and transitions.

OBJECTIVE: To better understand what clinical work is done overnight, the housestaff perceptions of overnight clinical work, and how handoff instruments support this work.

DESIGN: Real-time data collection and survey.

PARTICIPANTS: Internal medicine resident physicians.

MAIN MEASURES: Data collection measured information related to nighttime clinical encounters, including the information sources and actions taken. Surveys assessed resident perceptions toward care transitions.

KEY RESULTS: Of 299 encounters, 289 contained complete data. The tool was used as an information source in 27.7% of encounters, whereas the information source was either the nurse or the chart in 94.4% of encounters. Many encounters resulted in a new order for a medication, whereas 3.8% resulted in documentation. In the survey data, 73.6% residents reported the sign-out procedure was safe.

CONCLUSION: These data suggest that a handoff tool is not sufficient to address nighttime clinical issues and suggest that effective care requires more than just the information transfer. It may also reflect that electronic medical records have become a readily available information source at the point of care. Sign-out should support residents' ability to make sense of what is happening and integrate care of day and night teams, rather than solely transfer information. *Journal of Hospital Medicine* 2015;10:142–146. © 2015 Society of Hospital Medicine

For hospitalized patients, restrictions on resident duty hours and the hospitalist movement have led to fragmentation in care.¹ After 2003 duty-hour regulations were implemented, one study estimated an increase of 11% in care transfers for a given patient, whereas another study reported that an individual intern participated in 40% more handoffs.^{2,3} Although these changes have represented an improvement in safety with reduced provider fatigue and increased expertise in inpatient care, tradeoffs in safety may occur. Communication breakdown during care transfers has been implicated in many medical errors,^{4–6} and the ability to safely transfer a patient's care has been identified as a necessary clinical skill.⁷ The Accreditation Council on Graduate Medical Education has mandated that training programs include education to ensure effec-

tive handoff processes.⁸ The Joint Commission has developed a toolset for improving handoffs.⁹ Taking cues from the military and other industries that operate continuously, approaches designed to standardize handoffs have been developed.^{3,10–12}

The use of handoff tools has been reported to reduce the time required to transfer care from one provider to another,¹³ but evidence that these handoff tools improve quality of care is limited.^{14,15} Concern that patients have poorer outcomes in care transitions remains, particularly at night when many patients are cared for by “covering” or “night float” providers.⁶ Studies regarding the outcomes of patients at night have had mixed results.^{16–18} Uncertainty is inherent in the trajectories of individual patients and in the systems in which they receive care.¹⁹ The recognition of uncertainty reframes care transitions from a problem of improving information transfer to a problem of navigating uncertainty, or making sense. Sensemaking is an activity through which providers come to understand what is happening with a patient, in a way that allows them to take action.²⁰

We sought to better understand how to support providers' ability to make sense and act in uncertain situations, focusing on night float resident physicians. We hoped to better understand overnight encounters and the information needed to navigate them. We approached the issue in two ways: first, through

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assessing resident attitudes and perceptions of handoffs using survey methodology, and second, through assessing actual calls night float residents receive and strategies they use to navigate these scenarios. We focused on handoffs between the primary team and covering nighttime providers. Our goal was to use this information to understand what approaches could better support care transitions and handoff practices.

METHODS

General Approach

We surveyed residents regarding handoffs. We also collected self-reported information about calls received by night float postgraduate year (PGY) 1 (intern) residents and the strategies they used to address these calls.

Setting

Our study was conducted in the internal medicine residency program at the University of Texas Health Science Center at San Antonio, which has approximately 90 residents, 76 of whom are categorical. Residents work at 2 primary teaching hospitals: the Audie L. Murphy Veterans Affairs Hospital (ALMVAH), the 220-bed acute care hospital for the South Texas Veterans Health Care System, and University Hospital (UH), the 614-bed county hospital for Bexar County.

The residency program implemented a night float system in 1992. Daytime care is performed by multiple teams, which are comprised of one attending, one resident, and two to three interns. These teams sign out to the on-call team in the late afternoon to early evening. The on-call team in turn signs out to a night intern who is supervised by a resident and on-site faculty member. The night float intern is responsible for all patient care on five inpatient teams until 7 AM the following day, but is not responsible for admitting patients. In the morning, the night intern discusses overnight events with the day teams as they arrive.

Sign-out consists of verbal and written communication. At ALMVAH, written documentation is created within the electronic medical record. Basic information is prepopulated, and clinical information is modifiable. At UH, written documentation is created in word processing software and maintained within a document saved electronically. It is expected that the day team update the modifiable information within these documents on a daily basis. The written documentation is printed and given to the covering interns (see Supporting Information, Appendix 1, in the online version of this article showing the sign-out tools used by our program.).

The day team is responsible for the content and level of detail in the written sign-out. There are three domains including: main diagnosis, clinical history and course, and plans of care. The clinical history and course is a synopsis of the patient presentation including current clinical status. The plans of care are

reserved for expectant management or conditional statements.

Survey Development

A survey regarding resident experiences and perceptions of handoffs was developed by the Department of Surgery, and we adapted it to the internal medicine residency program. The survey contained 48 questions focused on the following areas: attitudes toward night float, communication content, and night float behaviors (see Supporting Information, Appendix 2, in the online version of this article for the full survey). Some responses were recorded in a 5-point Likert-type format, in a range of strongly disagree to strongly agree. Others were recorded on a 4-point frequency scale from never to always. Paper and online survey versions were created, and residents could respond using either modality.

Survey Administration

All residents were asked to participate in the survey. Paper versions were distributed in March 2012. All residents also received an e-mail soliciting participation. Responses were collected anonymously. Reminders were sent on a biweekly basis for six weeks. Survey administration was concluded by May 2012, and no incentive was offered for completion.

Overnight Call Data

We asked the night interns at both hospitals to self-report activities in real time during their shift. To minimize respondent burden and obtain a representative sample, they collected data on their activities over 2-hour periods. On any given night, a predetermined period was assigned, and all periods were sampled equally over the duration of data collection. A total of six interns at both hospitals were asked to participate over 18 nights during a 3-month period in 2011. Convenience sampling was used, and participants were identified based on clinical schedules.

The tool allowed interns to record unique encounters initiated as a phone call or page. Open-ended responses were permitted for caller identification and encounter reason. The interns categorized the source of background information and were permitted to select more than one for any given encounter. Similarly, the interns were asked to categorize the type of action required to respond (see Supporting Information, Appendix 3, in the online version of this article for the self-report tool).

Overnight encounters were categorized as clinical, administrative, or pain related. Clinical encounters consisted of calls related to clinical conditions that would require clinical assessment and decision making, for example, a patient with new fever. Administrative encounters consisted of contact for reasons that would require only acknowledgement from a physician. An example of an administrative encounter

TABLE 1. Sources of Information by Encounter Type

Information Source	Encounter Type			
	Clinical*	Administrative [†]	Pain Related [‡]	All [§]
Only tool	2 (1.3%)	6 (6.3%)	2 (5.6%)	10 (3.5%)
Only nurse	30 (19.0%)	42 (44.2%)	12 (33.3%)	84 (29.1%)
Only chart [¶]	28 (17.7%)	14 (14.7%)	5 (13.9%)	47 (16.3%)
Only miscellaneous ^{¶¶}	4 (2.5%)	2 (2.1%)	0 (0.0%)	6 (2.1%)
Tool + nurse	10 (6.3%)	8 (8.4%)	5 (13.9%)	23 (8.0%)
Tool + chart [¶]	10 (6.3%)	5 (5.3%)	1 (2.8%)	16 (5.5%)
Nurse + chart [¶]	51 (32.3%)	12 (12.6%)	5 (13.9%)	68 (23.5%)
Nurse + miscellaneous ^{¶¶}	1 (0.6%)	0 (0.0%)	0 (0.0%)	1 (0.3%)
Chart + miscellaneous ^{¶¶}	3 (1.9%)	0 (0.0%)	0 (0.0%)	3 (1.0%)
Tool, nurse, + chart [¶]	19 (12.0%)	6 (6.3%)	6 (16.7%)	31 (10.7%)

NOTE: Combinations of information sources not shown had no encounters.

*Encounters related to conditions that required clinical decision making.

[†]Encounters related to notifications that only required acknowledgement by the physician.

[‡]Encounters related to pain management.

[§]All types of encounters.

[¶]Chart source indicates electronic medical record.

^{¶¶}Miscellaneous sources include laboratory, radiology, and others.

TABLE 2. Consolidated Sources of Information by Encounter Type

Information Source	Request Type		
	Clinical*	Administrative [†]	Pain Related [‡]
Only tool	2 (1.3%)	6 (6.5%)	2 (5.6%)
Only nurse	30 (20.0%)	42 (45.2%)	12 (33.3%)
Only chart	28 (18.7%)	14 (15.1%)	5 (13.9%)
Any combination with tool	39 (26.0%)	19 (20.4%)	12 (33.3%)
Any combination without tool	51 (34.0%)	12 (12.9%)	5 (13.9%)

NOTE: Miscellaneous source of information from Table 1 removed.

*Encounters related to conditions that required clinical decision making.

[†]Encounters related to notifications that only required acknowledgement by the physician.

[‡]Encounters related to pain management.

is restraint renewal. Pain-related calls consisted of calls for patients experiencing pain or requests for new or additional pain medications.

Analysis

Frequency and percentages were calculated for each category of encounter, including callers and reasons for calls. Comparisons were made between reasons for the encounter, the sources of background information utilized, and actions taken in response. Survey data were analyzed using Microsoft Excel (Microsoft Corp., Redmond, WA).

RESULTS

Encounter Data

Data from 299 encounters were recorded, and 96.7% (289/299) encounters were complete. Clinical encounters were most frequent at 54.7% (158/289), whereas administrative notifications or pain-related encounters

TABLE 3. Actions Taken by Physician by Encounter Type

Actions Taken	Encounter Type		
	Clinical*	Administrative [†]	Pain Related [‡]
Handled over the phone	78 (49.4%)	92 (96.8%)	23 (63.9%)
Evaluated the patient at the bedside	37 (23.4%)	2 (2.1%)	2 (5.6%)
Reviewed previously ordered labs or imaging	43 (27.2%)	12 (12.6%)	0 (0.0%)
Ordered new lab or imaging	44 (27.8%)	2 (2.1%)	0 (0.0%)
Ordered new medication	87 (55.1%)	1 (1.1%)	24 (66.7%)
Wrote cross-cover note	6 (3.8%)	0 (0.0%)	0 (0.0%)
Conferred with supervising physician	10 (6.3%)	0 (0.0%)	0 (0.0%)
Called consult	3 (1.9%)	0 (0.0%)	0 (0.0%)
Upgraded level of care	1 (0.6%)	0 (0.0%)	0 (0.0%)

NOTE: More than 1 action may be taken for any given encounter.

*Encounters related to conditions that required clinical decision making.

[†]Encounters related to notifications that only required acknowledgement by the physician.

[‡]Encounters related to pain management.

were 32.9% (158/289) and 12.5% (36/289), respectively. Nurses initiated 94.8% (274/289) of encounters.

Sources of information used by interns varied by reason for the call and are shown in Table 1. Responding to clinical requests, interns most frequently interacted with a nurse alone or in combination with the chart (51.3%, 81/158). Responding to administrative notifications, the interns most frequently spoke to only the nurse as the primary source of information (44.2%, 42/95). In pain-related notifications, the nurse alone as a source of information accounted for 33.3% (12/36) of encounters. The sign-out tool was not used in 72.3% (209/289) of encounters.

Use of miscellaneous information sources was infrequent; removing these left 279 encounters with complete information. To better assess the instances in which the handoff tool was used, we combined categories for information sources. These data are summarized in Table 2.

The actions taken by interns varied by reason for the call. Clinical encounters had the most variety of actions taken, with 55.1% (87/158) resulting in a new medication order and 49.9% (78/158) handled over the phone. Bedside evaluations occurred in 23.4% (37/158) of the encounters, and 3.8% (6/158) were documented in the electronic medical record. Administrative encounter responses were more homogeneous; 96.8% (92/95) were handled entirely over the phone. Responses to pain-related requests were similarly less varied than clinical encounters; 63.9% (23/36) were handled over the phone and 66.7% (24/36) resulted in a new medication order. Neither administrative nor pain notifications resulted in documentation in the electronic medical records. These data are summarized in Table 3. Despite the availability of a resident and attending overnight, only 6.3% (10/150) of the clinical requests led to a discussion with them; none of the

administrative or pain-related notifications involved discussion with either the resident or the attending.

Survey Data

Fifty-three residents completed surveys, for an overall response rate of 59.6% (53/89). All PGYs were represented; PGY-3s had a response rate of 68.0% (17/25), PGY-2s had a 58.3% response rate (14/24), and PGY-1s had a 55% response rate (22/40).

A night float intern was perceived to be safer than an on-call team performing the same job by 73.6% (39/89) of respondents. The written sign-out was considered a time saver by 66% (35/53) of respondents. The sign-out procedure was thought to be frequently or always safe by 73.6% (39/89). Overnight documentation within the electronic medical record was reported to be frequently or always completed by 58.5% (31/53).

Furthermore, 20.7% (11/53) of respondents reported receiving a “do not do” list frequently or always, and 43.4% (23/53) of respondents reported giving a “do not do” list frequently or always. Conditional statements were reported as frequently or always given by 90.4% (47/52). A standardized verbal checkout was considered safer by 71.7% (38/53), standardized written documentation was considered beneficial by 94.3% (50/53), and a checklist to go over was considered beneficial by 84.9% (45/53).

DISCUSSION

Our goal was to understand how to better support care transitions and handoff processes. Our residents report that current approaches to care transitions are safe and useful. Although this perception is reassuring, it is difficult to know whether this reflects the actual delivery of safe care. A minority of residents report giving and receiving “do not do” lists, which are important aspects of care when giving guidance to a covering physician. Also, we find discrepancies between our survey results and nighttime call collection data in important areas. Although residents report that the written sign-out is useful, it was deemed useful for resolving a clinical issue only 27% of the time. Previous reports have found variable and conflicting rates of written sign-out utilization, as well as variable quality of a written sign-out,^{21–23} and our data support infrequent usage. Residents were much more likely to access the electronic medical record than they were to use the handoff tool. Additionally, although residents report documentation, very little actual documentation occurred. The high rates of calls for routine and pain-related notifications are notable and should be examined further for areas of potential improvement. Preemptive orders for routine, common, and benign conditions are often not employed as strategy and their omission can lead to higher workloads for nighttime physicians. Additionally, education and training may be necessary to help housestaff

understand how such a strategy is safely implemented, such as a specific regimen for mild pain, and why it is helpful beyond reducing nighttime workload, such as a proactive approach to clinical care.

Several important insights emerge from our results. First, the electronic health record is accessible, and providers use it frequently. This raises the question of the need for a handoff tool for information transfer. When data can be easily accessed, their presence in a physical tool may be less important. Because electronic health records can easily be leveraged to populate handoff tools, having a brief tool that minimizes information transfer but better supports clinical reasoning may be more effective.

Second, our data highlight the need to focus on the handback, or providing information back to the returning day team. Our experience and previous studies support that this process is not adequately developed.^{24,25} There is little opportunity for communication between the covering and primary providers, and there is little documentation. In our observations, 3.8% of calls resulted in documentation, whereas the majority of respondents to the survey state it is performed frequently or always. The reason for this discrepancy is unclear, but fostering more of a mentality that considers all of the providers involved in patient care to be part of the same team may help address this issue.

Third, clinical services assume providers have what they need to provide care in the form of the handoff instrument. In fact, providers have handoff instruments, but whether they need them is unclear. Based on these observations, overnight physicians are able to provide care in the vast majority of cases without the use of the handoff tool.

Fourth, our data demonstrate the social or relational nature of providing clinical coverage. The single most frequent action taken by covering residents was speaking to the nurse. This may not be surprising; however, when we reframe transitions of care and handoffs as a relational issue, we are forced to reframe potential strategies to improve these transitions. The problem we need to address is not only of information transfer; it is also of making sense of what is happening.

How do we make handoff tools more effective sensemaking tools? More focus on contingency statements might be an approach. These have the dual benefit of helping the covering provider to make sense using the primary team’s reasoning, as well as improving the primary team’s reasoning by making the potential complications more explicit. Another approach could be to reinforce relational actions, through providing guidance on who to call if there is a change in the status of the patient. We found that the night intern rarely discussed care with supervising physicians, indicating weak integration of the night team. The handoff tool could thus strengthen the

network of providers caring for the patient. A tool that emphasizes sensemaking may be a tool that captures the nonroutine aspects of care that are not already documented in the health record.

Our data are limited in that they were collected in a single institution over few nights with few interns. Our processes may not be representative, and our expectations for provider communication may not be the norm. Although a night float system of coverage is not the only model of providing care, it is common, and our handoff tool is similar to those reported in the literature. One area of concern is that our handback expectations may be less robust than other institutions. Despite this limitation, the larger issues of information transfer and sensemaking are generally applicable. Although we collected data over only 18 nights, we did obtain information on almost 300 calls, giving us a robust sample of actual issues that residents were called to resolve. Interns are the most involved in actually providing night coverage. Their response rate was 55%, slightly below our overall response rate of 59.6%, but representing the majority of interns. A 2-step process of sign-out may have ramifications on care transitions; however, these data were collected at night. Because the handoff tool information is the day team's responsibility, the process may have less impact on these results.

Coverage and care transfers are part of the inpatient landscape, and it may be unreasonable to expect care to be delivered by a group of providers who know the patient with the same level of depth at all hours of the day. By understanding that fostering effective care for patients requires providers to pay attention to not only how they transfer information, but also how they collectively make sense of what is happening, we will enable safer care.

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