Increasing PCP and Hospital Medicine Physician Verbal Communication During Hospital Admissions

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ABSTRACT

OBJECTIVES: During hospital admission, communication between primary care physicians (PCPs) and hospital medicine (HM) physicians provides an opportunity for collaboration. Two-way communication facilitates collaboration by allowing the receiver to ask and respond to questions. At our institution, most HM-to-PCP communication occurred by telephone call after discharge. Our specific aim was to increase the percentage of patients for whom a telephone conversation occurred between HM and PCPs during hospital admission from 40% to >80%.

METHODS: An improvement team that included PCPs and HM physicians redesigned the process for communication with PCPs to emphasize collaboration during hospitalization. Interventions were used to target key drivers of information transparency, PCP and HM provider buy-in, the value of early call initiation, process standardization, accommodating provider availability, and preoccupation with failure. We used improvement-science methods and run charts to measure our progress and attain our goal.

RESULTS: The median weekly percentage of patients with a phone call completed during hospitalization increased from 40% to 85% at the satellite campus and 40% to 80% at the main campus. In addition to the standardized use of a telephone operator system to route calls and follow-up on unplaced calls, critical interventions included feedback on PCP call preferences to providers and the provider script for calls.

CONCLUSIONS: PCPs and HM physicians applied quality-improvement methodology to ensure reliable HM-PCP communication during hospital admission. Interventions to facilitate communication between providers and learners (who may otherwise have limited interaction), such as the scripting of phone calls and feedback from PCPs to HM physicians, were important for success.
Transitions in and out of the hospital are times of increased risk for pediatric patients. Effective communication between inpatient and outpatient providers at hospital discharge is often emphasized as an important target for improvement, but effective communication during the hospitalization provides advantages. Adverse events that are attributable to ineffective communication can occur not only at hospital discharge but also at hospital admission, when multiple sources of information are often needed to elucidate a patient’s complete clinical picture. Examples include medication errors, redundant or unnecessary testing, inadvertent exposure to a food or latex allergy, and exposure of staff to high-risk behavioral safety situations. Communication during hospitalization between outpatient and inpatient providers also provides an important opportunity for collaboration between primary care physicians (PCPs) and hospitalists to provide consistent care across the care continuum.

Two-way communication facilitates collaboration and offers an opportunity for the PCP to provide a historical background, ask clarifying questions, and discuss follow-up needs. At our institution, we previously improved the reliability of verbal communication between inpatient providers and PCPs at hospital discharge to >90% for patients who are on the hospital medicine (HM) service. Unfortunately, these calls occurred predominantly after hospital discharge, and many community physicians expressed frustration regarding this delay and the lack of an opportunity for collaboration in patient care; they provided no benefit over other means of communication, such as written discharge summaries. As an extension of our previous work, we sought to improve the timeliness of this communication. Our specific aim in this project was to increase the percentage of patients for whom a telephone conversation occurred between an HM provider and a PCP during hospital admission (ie, before patient discharge) from 40% to 80% for all patients who were admitted to our HM service in a 6-month period.

METHODS

Context

This study included all patients who were admitted to the HM service at an academic children’s hospital’s main campus (>500 inpatient beds) and its satellite campus (42 inpatient beds). At the start of the improvement process, the median length of stay (LOS) was 27 hours with an interquartile range of 19 to 43 hours at the satellite campus, and the median LOS was 34 hours (interquartile range of 21–53 hours) at the main campus. There are 4 HM teams at the main campus and 2 HM teams at the satellite campus. Phone calls to PCPs at the main campus are placed by residents, whereas calls are placed by residents, attending physicians, or nurse practitioners at the satellite campus.

Interventions

The project was championed by PCP leaders and physicians on the HM service. Team members included PCPs from 4 practices, 4 HM physicians representing both sites, a pediatric chief resident, representatives from physician services, and Physician Priority Link (PPL) (a 24-hour, institutional telephone operator service that is available at both campuses). At the onset of the project, the team reviewed the existing process and conducted a modified failure modes and effects analysis for failure to complete calls during hospitalization. The primary failure mode was late initiation of the phone call process. Other failure modes included the absence of an identified PCP, perceived inconvenience for the PCP, and perceived lack of value of the communication. These failure modes informed the development of the key drivers to achieve the project aim. The theory of improvement, including key drivers and targeted interventions, is depicted in Fig 1. Key drivers included information transparency, HM and PCP buy-in, the high value of calls, the early initiation of calls and/or sufficient time to complete the calls, the standardization of the call process, the availability of HM providers and PCPs, the identification of the correct PCP, and preoccupation with failure. Interventions targeting key drivers were information dissemination, PCP feedback to HM providers, the provider script for phone calls, standardizing the call trigger to hospital admission, routing all calls through the PPL operator service, and the follow-up of incomplete calls by the PPL operator. Resources were not allocated to address the failure mode of absence of an identified PCP, which led to a target call completion goal of 80% for this initial work.

Information Dissemination

Information on the project’s purpose and interventions was disseminated by using several avenues, targeting our key drivers of information transparency and HM and PCP provider buy-in. Information about the purpose and goals of the project was shared with PCPs via a monthly staff bulletin newsletter and to HM physicians at updates during weekly team meetings. A member of the improvement team conveyed project updates and information on planned interventions monthly with a preexisting group of community PCP leaders and solicited feedback. Physician services representatives incorporated information via visits with referring PCPs over a several-month period.

PCP Feedback to HM Providers

Feedback on interventions was solicited from community physicians via e-mail and during face-to-face visits by physician services representatives. Additionally, feedback from community-physician leaders was requested at monthly community-physician leader meetings by an improvement team member and shared with the improvement team to guide plan-do-study-act cycles. Specific feedback could be disseminated to HM attending physicians in real time or periodically at divisional meetings and to resident physicians in real time or during monthly orientation sessions. This structure for feedback was vital to maintaining provider buy-in throughout the improvement process.

Provider Script for Phone Calls

Because HM providers may be reluctant to call PCPs until more of a patient’s clinical course is known, communication with PCPs was scripted to target the key drivers of
provider buy-in and high call value by standardizing the interaction. Key components of the script included (1) discussion of the initial treatment plan, (2) the solicitation of additional pertinent information from the PCP, and (3) transition planning. For most patients on the HM service, discharge planning could reasonably begin at hospital admission. For other patients (ie, those with medical complexity or extended stays), the script indicated the need for a follow-up call to the PCP later in the hospitalization. The script was developed by the improvement team, which included PCPs as well as HM providers.

**Phone Calls to PCPs Triggered at Admission and Routing of Calls Through PPL**

To address our key drivers of early call initiation and high call value, the preexisting process for provider communication at discharge was reorganized so that phone calls to providers were routinely triggered at hospital admission (Fig 2). Calls continued to be routed through the PPL operator service to ensure a standardized, measurable process and provider availability. The call process was modified so that HM providers were instructed to call PPL to initiate contact with PCPs on admission after attending staffing and the establishment of an initial plan of care. As before, after receiving the call from the HM provider, PPL would then contact the patient’s PCP, who was expected to return the call within 1 hour; once the PCP returned the call, PPL would page the HM provider with the expectation of a return call from the HM provider within 2 to 4 minutes. For patients who were admitted after 8 PM, phone calls to PCPs were initiated by the HM provider the next day to allow for the staffing of the patient and establishment of a clear plan of care.

**Follow-up on Unplaced Calls**

The provider-driven phone call process was reinforced by an electronic health record (EHR)–triggered function, which identified unplaced calls for mitigation. The previous process (triggered by a discharge order) was modified so that when a provider placed an order to admit a patient to HM, the EHR (EpicCare Inpatient; Epic Systems Corporation, Verona, WI) generated a message to the PPL operator in-basket. As in the previous process, the in-basket was checked against PPL phone logs by using a simple search function to identify calls that still needed completion. If a patient was identified as needing a call, the PPL operator paged the HM provider via text page. If the HM provider was ready for the call to be placed, the operator would either connect to the PCP’s backline number or the HM provider would be paged back when the PCP returned the call per the process described above. The process was additionally modified to have PPL-initiated calls only occur at the batch times of 1 PM, 4 PM, and 8 PM, compared with the previous process having 2 batch times as well as a period during which every discharge order...
triggered an immediate call from PPL. HM providers were still able to initiate calls outside of batch times by calling PPL directly (Fig 2). This process adjustment allowed time for HM providers to clarify plans of care and prevented the premature paging of HM providers by PPL.

Study of the Intervention
All the patients admitted to the HM service during the study period were eligible for inclusion. Improvement work began at the...
satellite campus because provider teams were smaller, consisting of either a direct-care attending, direct-care nurse practitioner, or an attending with a single resident. As the process was spread to the main campus, some interventions were implemented simultaneously at both sites, whereas some were targeted to 1 of the sites. Active improvement continued until goal performance was met for 6 months followed by periodic checks for sustainability to 1-year postgoal.

**Measures and Analysis**

The measure used to determine improvement was the percentage of patients admitted to the HM service for whom a phone call between an HM provider and the PCP was documented as occurring between the time of admission and discharge from the hospital. Each week, a random sample of 20 patients was selected from an EHR-generated list of weekly admissions to the HM service at each site. If <20 patients were admitted to a site during a week, then all patients were included in the sample. The medical record numbers, admission times, and discharge times for these patients were forwarded to PPL and manually compared with PPL phone records; all calls that were routed through the PPL operator system were documented with a time stamp. A successful call met the following criteria: (1) the call was connected between an HM provider and the PCP; and (2) the time stamp of that call indicated that the call occurred during the patient’s hospitalization. The measure was generated by dividing the number of successful calls by the number of calls in the sample.

Data compilation occurred weekly on the basis of the availability of relevant personnel and data were plotted on a run chart. Run chart medians were established and adjusted by using the rules for special cause variation in run charts.\textsuperscript{17,18} The improvement team met biweekly to review current performance, analyze failures through a review of calls that were not successfully completed, and conduct plan-do-study-act cycle modifications to the interventions.

**Ethical Considerations**

Our project complied with the institutional review board (IRB) policy on systems improvement. The project was deemed to be systems improvement by the IRB and therefore was exempt from formal IRB review.

**RESULTS**

From August 31, 2015, to March 19, 2017, there were 1797 discharges from the HM service at the satellite campus. The percentage of these patients with a phone call during hospitalization increased from 40% to 85%; our goal was achieved after 27 weeks, and performance was maintained for 1 year postimprovement (Fig 3).

From November 23, 2015, to March 19, 2017, there were 5527 discharges from the HM service at the main campus. Interventions began at the main campus on January 24, 2017, after initial improvement at the satellite campus. The median weekly percentage of main campus patients with a phone call during hospitalization increased from a baseline of 40% to 80%. Our goal was achieved after 15 weeks, with performance maintained for 1 year postimprovement (Fig 4).

At both the satellite and main campuses, establishing an expectation for telephone calls to PCPs during admission, routing calls through PPL, and using the PPL service to follow-up on unplaced calls were all temporally associated with improvement in but not the achievement of goal reliability. Variability in call rates for low-acuity patients (such as patients who were admitted to medical beds to await psychiatric placement) initially persisted at the satellite campus. The dissemination of PCP feedback, which included the fact that phone calls were considered valuable for psychiatric patients in medical beds, to satellite campus providers was temporally associated with improvement to reach the goal. At the main campus, residents often deferred phone calls on the day of admission because of discomfort with the process of engaging with PCPs for treatment planning. The implementation of the provider script was temporally associated with improvement to reach the goal at the main campus. On the basis of real-time feedback from HM providers and PCPs, we conclude that the improvement process did not lead to an increase in phone calls per patient.

**DISCUSSION**

PCPs and HM physicians collaborated in applying quality-improvement methodology to increase the reliability of verbal

![Figure 3](https://www.aappublications.org/news)

**FIGURE 3** Weekly percent of patients with HM–PCP calls during hospitalization at the satellite campus.
communication between HM providers and PCPs during hospitalization to 85% at the satellite campus and 80% at the main campus, with the goal performance being achieved in a 6-month time span and sustained for 1 year postimprovement. The triggering of calls to PCPs at admission, routing calls through PPL, using PPL to follow-up on unplaced calls, feeding back information to providers, and the provider script for phone calls were critical interventions associated with improvement. A strength of our work is the successful facilitation of a complex communication process among providers who may otherwise have limited interaction and limited knowledge of priorities for communication.

As in our previous work, we were able to adapt our PPL operator system and leverage an EHR-triggered system to improve the timeliness of phone calls between PCPs and HM providers. However, in this case, these interventions resulted in a lower level of reliability when applied at patient admission rather than at discharge. Although discharge phone calls between HM providers and PCPs had been occurring reliably for several years at the beginning of this project, the fact that PCPs valued phone conversation was still surprising and suggests that although many hospitalists embrace the idea of collaborating with PCPs, the benefits of communicating may not always be intuitive.

Another finding that arose during our root cause analysis of continued failures at the main campus was that many residents were uncomfortable engaging with PCPs early in a hospitalization. Because discharge phone calls had been a constant feature of resident training, some initial discomfort with making calls at admission was expected, but we did not anticipate that this would continue to be a major failure mode for months after the process began at the main campus. Providing a script for these calls that emphasized the collaborative purpose of the call may have changed the perception of the call's purpose from purely informational regarding patient course (in which case, early communication may be less desirable) to a 2-way conversation in which PCPs and HM providers both shared information that informed treatment planning.

Our 2 remaining failure modes included a short LOS with discharge before the completion of morning rounds and the lack of an identified PCP before discharge. These failures occurred most frequently in admissions after 8 PM. Phone calls to PCPs were not typically placed until after rounds the following morning because the calls were nonemergent. Additionally, although the identification of a PCP for follow-up is an expectation on the HM service at our institution, an appropriate PCP may not be identified until the time of discharge, leaving less time for call completion.

Although it is possible that the new process resulted in increased workflow interruptions for HM providers or PCPs, this is unlikely because both the previous reliable process and the new process required only 1 call per patient in most circumstances. Specifically, quantifying workflow interruptions among so many providers would be resource intensive; however, informal feedback from HM providers, community-physician leaders, and PCP members of the improvement team seemed to indicate no additional workflow burden. We also did not attempt to systemically assess the quality of communication between HM providers and PCPs, which represents an important next step in improving communication.

This study has several other limitations. Our process was dependent on the existence of PPL, and similar services may not be available at other institutions. We would note that PPL was not originally designed for the purpose of communication between HM physicians and PCPs; however, the routing of calls through PPL has not required staffing increases. We were also unable to account for phone calls placed to PCPs that did not use PPL. However, because most calls that were not completed at least had a call placed via PPL, it is likely that few calls were completed outside the PPL system. We also did not measure the effect of our new process on family or PCP satisfaction. Additionally, we did not specifically track whether further communication occurred between the HM providers and PCPs for prolonged admissions or for patients with medical complexity. Additionally, although EHRs are now being widely used, not all systems may have the same functionality. Of note, we used existing functionality within our EHR, which may aid in the utility of this approach by other institutions given the wide use of our EHR system.
In this project, we focused on facilitating phone calls during hospital admission to provide an opportunity for collaboration between PCPs and HM physicians. The quality of this communication likely varies among providers, and future researchers will need to define and measure call quality. Additional next steps include continuing to improve the efficiency of this communication and measuring the impact on patient outcomes, specifically looking at the changes in management that were the result of this improved communication. Additionally, we are actively working on methods to gather real-time PCP satisfaction with communication to further support our efforts.

CONCLUSIONS

PCPs and HM physicians collaborated in applying quality-improvement methodology to increase the percentage of phone calls between HM providers and PCPs occurring during hospitalization from 40% to 65% at our satellite campus and from 40% to 80% at our main campus over a 6-month time span, with results being sustained for 1 year. Interventions to facilitate communication between providers and learners (who may otherwise have little interaction) were important components of the improvement process. The results of this study may be of interest for adoption at any institution seeking to increase opportunities for collaboration between PCPs and HM providers.

REFERENCES

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