

Increasing Nurse-Physician Family-Centered Rounds Communication



A Quality Improvement Pilot Project

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ABSTRACT

Background: High-quality nurse-physician communication during family-centered rounds (FCRs) can increase patient safety.

Local Problem: In our hospital, interdisciplinary team members perceived that nurse-physician communication during FCRs declined during the COVID-19 pandemic.

Methods: Using quality improvement methodology, we measured nurses' perceived awareness of components of the shared mental model, nurses' attendance during FCRs, compliance with completing FCR summaries, and average time spent per FCR encounter.

Interventions: A structured resident huddle took place prior to an FCR. Residents used a tool to send individualized alerts to bedside nurses to prepare them for an FCR. Residents developed comprehensive summaries after each FCR encounter and sent a summary text to nurses who were unable to attend the FCR.

Results: We assessed 40 FCRs over 16 weeks. Nurses' perceived awareness increased from 70% to 87%. Nurse attendance increased from 53% to 75%.

Conclusions: We successfully piloted multiple interventions to improve nurse perceived awareness after an FCR.

Keywords: awareness, COVID-19, electronic health record, interdisciplinary communication, text messaging

Communication failures are the root cause of more than 60% of sentinel events.¹ Errors in nurse-physician communication particularly increase the risk of patient morbidity and mortality.^{2,3} To improve communication and patient safety, care teams can create shared mental models for their patients.^{4,5} Key components of the shared mental model include medical problems, escalation parameters, and the plan of care for the day.^{6,7}

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Evidence suggests that nurses can help create shared mental models during family-centered rounds (FCRs), defined as “multidisciplinary rounds that occur in patients' rooms in the presence of patients and family members and integrate their preferences in clinical decision-making.”^{8(p680)} Specifically, nurses can provide updated information on patient status, express concerns regarding plan feasibility, facilitate discharge education and planning, and offer family support.⁹ However, nurse-physician communication during FCRs subjectively declined during the COVID-19 pandemic at our institution. This was likely due to decreased nursing attendance related to evolving physical distancing guidelines and rounding structure. Ensuring that nurses can be physically present when physicians and other clinicians are communicating with the family is one way to improve nurse-physician communication during FCRs.⁹

Information technology (IT) alerts via phone call, pager, text, and hands-free contact device (eg, Voicera) can increase nursing attendance during FCRs.⁸⁻¹⁰ When nurses cannot attend

FCRs, secure text updates complement in-person communication in a way that reduces patient care interruptions, decreases “communication overload,” and maximizes workflow efficiency.^{11,12} As such, text messages can offer many of the benefits of direct communication when in-person communication is not possible. At our institution, resident physicians inconsistently leveraged their access to communication technology, and nurses absent from the FCR often received updates from patient families or the electronic medical record (EMR).

Quality improvement (QI) studies on nurse-physician communication during FCRs do not thoroughly explore the use of alert systems that are specifically integrated with the EMR.^{9,10} Also, studies on improving nurse-physician communication during FCRs track nursing attendance without assessing the intended effect of direct communication: a shared awareness of medical problems, escalation parameters, and the plan of care for the day.⁷

The global aim of this pilot project was to improve nurse-physician communication during FCRs and encourage a shared mental model. The specific aims of the project were to (1) increase nurses’ perceived awareness of 3 components of the shared mental model (medical problems, escalation parameters, and the plan of care for the day), (2) increase nurses’ attendance at FCRs, (3) evaluate resident physicians’ compliance with completing FCR summaries, and (4) evaluate the average time spent per FCR encounter.

METHODS

Setting and stakeholders

This project took place March 2021 through June 2021 at a 323-bed academic urban freestanding children’s hospital. The hospital medicine service has 3 primary academic rounding teams that each covers a maximum of 10 to 14 patients on multiple acute care units. These teams typically include 2 to 4 medical students, 1 to 2 interns, 1 senior resident, and 1 pediatric hospital medicine fellow and/or attending physician. Hospital medicine attending physicians change weekly, while interns and senior residents change monthly on a staggered schedule. Acute care nurses typically cover 3 to 4 patients on the same unit, cared for by physicians on different rounding teams. FCRs typically take place in the morning hours between 8 AM and 11 AM.

The improvement team included 2 pediatric hospital medicine fellows, the medical unit director of an acute care unit, a registered nurse, and the chief medical informatics officer. This project was undertaken as a QI project at our institution, and the team obtained a waiver from our hospital’s institutional review board.

Communication systems

Nurses and physicians at our institution carry work cell phones with texting capability. In 2018, the Institute for Health Innovation at our hospital designed RoundAbout, an application integrated with the EMR used to alert bedside nurses when physicians are rounding on their patients.¹³ The RoundAbout application, a tab in Cerner PowerChart (the EMR), integrates patient lists from Cerner PowerChart and nursing assignments from Cerner Clairvia to present an interface that allows residents to set a rounding order on their laptops. Next to each patient’s listing, a “Notify” button sends a text alert to the bedside nurse’s work cell phone. Residents typically send individual alerts just before rounding on the preceding patient. Upon implementation in 2018, rates of pre-FCR nursing alerts (via any means) increased. However, during the COVID-19 pandemic, alerts subjectively decreased to maximize physical distancing and discourage congregation during FCRs.¹³

Identifying communication problems

We held focus groups with pediatric residents and nursing shift coordinators to understand barriers and facilitators for nurse-physician communication during FCRs. Using QI methodology, we created a process flow diagram and conducted a failure mode and effect analysis. Although residents and nurses acknowledged variability in practice, teams generally reported the following 3 themes surrounding rounding procedures and process barriers:

1. *Before the start of an FCR, senior residents determine rounding order.* Setting a rounding order helped interns organize when to notify nurses to prepare for rounds. There were several process barriers to this step. Some residents did not determine a rounding order at all because they were unaware of this opportunity or faced conflicting tasks. Some residents did not verbalize their decision-making

- process for identifying patients with more acute needs or collect information from interdisciplinary team members, family members, or the EMR to optimize prioritization and flow.
2. *Intern physicians use RoundAbout to send nursing alerts during FCRs.* Without prompts from senior members of the rounding team and recurring, consistent guidance on how to utilize the tool, intern physicians did not incorporate RoundAbout into their workflow.
 3. *The bedside nurse joins the medical team for FCRs.* Nurses faced several barriers to FCR attendance and participation. They often faced conflicting tasks, including managing rapid response interventions, rounding with different medical teams, and assisting patients with activities of daily living. In addition, to solicit nursing input on FCRs, residents often asked, “Are there any nursing concerns?” Some nurses expressed that this language did not create an open-ended forum for meaningful nursing participation or make them feel valued when they were able to attend an FCR. Finally, nurses and residents at times felt uncomfortable rounding with a large team when unable to maintain physical distance during the COVID-19 pandemic. Team members learned to conserve personal protective equip-

ment (PPE) and hesitated to join FCRs for persons under COVID-19 investigation. At the time of this project, 1 year after the World Health Organization declared COVID-19 a pandemic, some of these behaviors persisted culturally in our work environment despite improved access to PPE.

Interventions and implementation strategy

Using this information, we designed a fishbone diagram (Figure 1) and a key driver diagram (Figure 2). The team adjusted interventions during multiple plan-do-study-act (PDSA) cycles. We introduced the QI project to residents when they received orientation for their hospital medicine rotation. We also contacted attending physicians on service before their week by email. Nursing leadership introduced the QI project via shift huddles.

For the first PDSA cycle, we instituted an in-person pre-FCR huddle among physicians to prioritize rounding order based on the patient’s illness severity, discharge readiness, psychosocial needs, availability of in-person translators for patients requiring language services, geographic location in the hospital, and nursing concern. This framework helped interns gather information from nurses and families while pre-rounding and triage conflicting tasks. At the same time, the

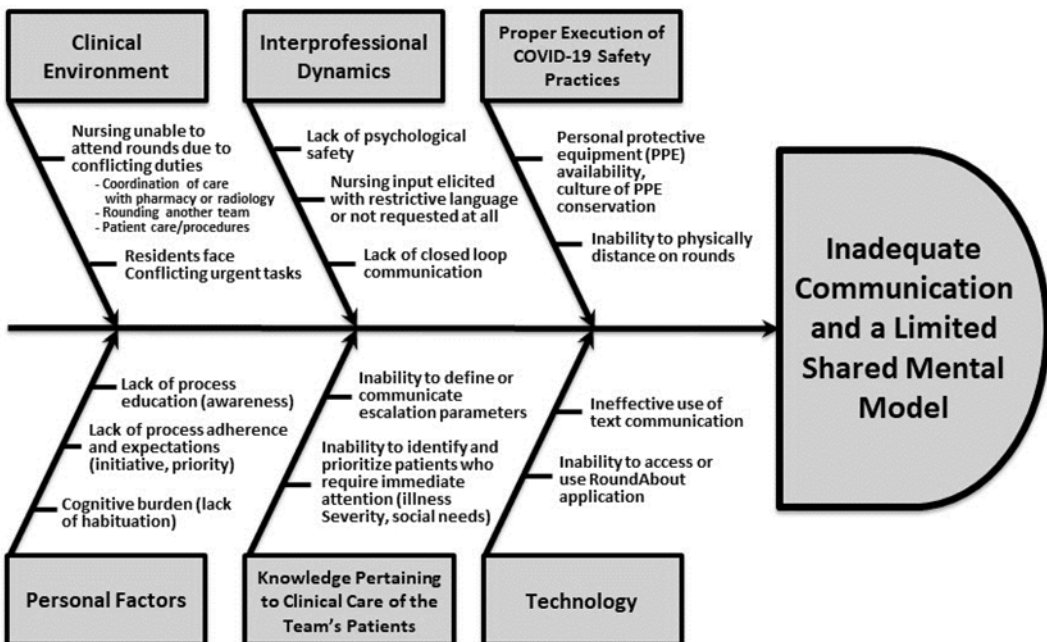


Figure 1. Fishbone diagram of family-centered rounds barriers and facilitators.

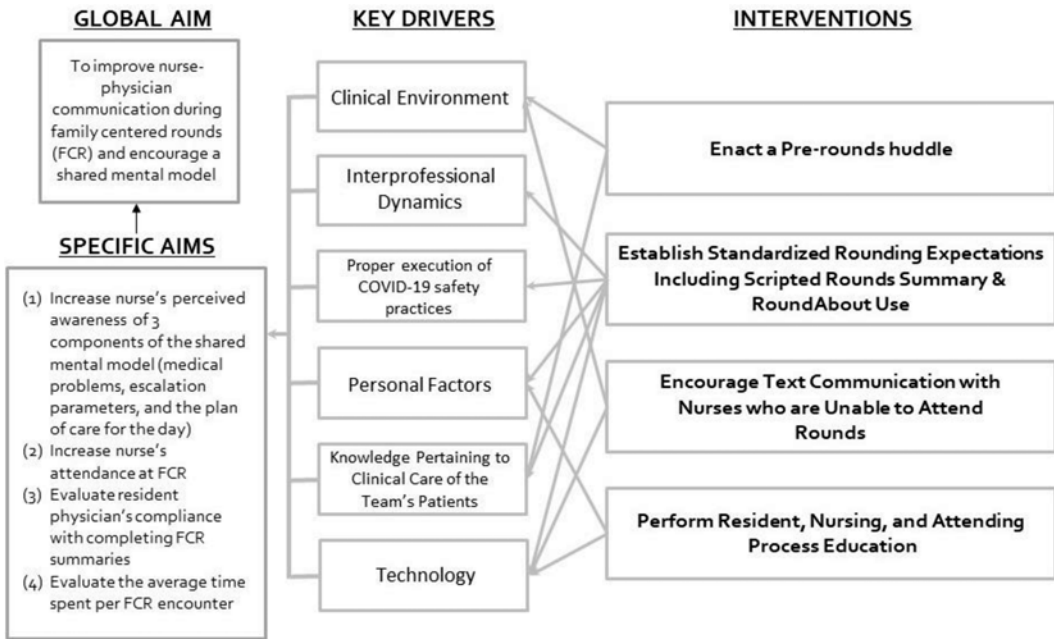


Figure 2. Key driver diagram of family-centered rounds barriers and facilitators.

QI team reintroduced RoundAbout to send nursing alerts.

During the second PDSA cycle, we introduced a standardized FCR summary at the end of each patient’s FCR, using a modified tool designed for encouraging shared mental models during patient handoffs.¹⁴ During this verbal summary, first-year residents briefly reviewed the patient’s medical problems, escalation parameters, and plan of care for the day. We coached senior team members to address knowledge gaps, engage nurses with inviting language (such as asking for “questions, comments, or concerns”), promote psychological safety by encouraging participation, and create shared mental models among interdisciplinary team members through closed-loop communication. Those who missed parts of an FCR received concise, comprehensive updates.

During the third PDSA cycle, we introduced standardized post-FCR texts for nurses unable to attend an FCR. We instructed interns to summarize medical problems, escalation parameters, and the plan of care for the day via text and invite closed-loop communication. Residents could copy and paste this information from the resident handoff document on their laptops into the texting platform to minimize workload.

Members of the QI team performed biweekly check-ins during which we provided additional in-person education to nurses and physicians throughout the project to clarify rounding expectations, review how to use the available technology, and inquire about implementation barriers and facilitators. As the hospital culture and policy adjusted to changing COVID-19 precautions and procedures, we validated and reassured nurses and physicians regarding appropriate PPE usage and evolving physical distancing guidelines.

Evaluation plan

Instruments

We used 2 separate tools to collect data (see Supplemental Digital Content Appendix, available at: <http://links.lww.com/JNCQ/B80>). First, we created a survey to measure nurse perceived awareness of the 3 components of the shared mental model (medical problems, escalation parameters, and the plan of care for the day) using a modified tool designed for encouraging shared mental models during patient handoffs.¹⁴ To our knowledge, there are no published, validated tools to directly assess shared mental models during FCRs. We modified the instrument based on nurse and physician input, piloted the survey, and refined the instrument based on

feedback. For each patient, the survey asked, “I know the problems we are trying to address,” “I know the plan of care for today,” and “I know when to escalate,” measured on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). Research demonstrates that self-reported awareness is associated with actual awareness.¹⁵

Second, we created a checklist for attending physicians to document the start and end time of an FCR, whether the bedside nurse attended each FCR encounter, and whether the resident completed the FCR summary. We considered FCR summaries completed when the intern verbally summarized medical problems, escalation parameters, and the plan of care for the day at the end of the FCR encounter.

Data collection

We collected baseline data 5 times during 2 rounding weeks (March 8-16, 2021) for 3 separate teams. We then continued data collection to complete a total 16-week project period (March 8-June 28, 2021). To collect baseline and postintervention data, we conducted “FCR assessments.” Each FCR assessment consisted of 1 to 3 attending physician checklists and 6 to 12 nurse surveys. For each FCR assessment, members of the QI team asked the rounding attending physician(s) to complete an attending physician checklist during the FCR. Members of the QI team collected the attending physician checklists immediately after an FCR. We then surveyed nurses 2 to 4 hours after an FCR. We selected a convenience sample of patients by selecting every other patient on each team’s list by geographic order to reach a minimum of 6 patients. We left blank paper surveys in nursing team rooms for nurses caring for those patients, texted nurses to notify them that they may have surveys to complete, and picked up surveys 2 hours later. We excluded patients discharged before noon.

We chose to separate baseline data for the 3 hospital medicine teams because the teams share similar characteristics (eg, number/type of providers, number of patients rounded on, patient population, practice environment) but function independently. We assessed variation between teams on each day of data collection and variation of individual teams over time. During baseline data collection, we captured 6 attending physicians, 1 fellow, 10 interns at different stages of their inpatient rotation, and 3

mid-rotation seniors. The group of nurses involved in each assessment was heterogeneous.

We first monitored postintervention data on a smaller scale with 1 medical team. We collected data 2 to 3 times per week. This period spanned 2 resident rotation cohorts. We then expanded FCR assessments to 2 and then 3 teams. To more easily monitor postintervention changes over time, we consolidated all teams’ data into a larger FCR assessment, organized by date.

Measures

Outcome measures assessed “nurse perceived awareness,” the percentage of nurse surveys indicating “agree” or “strongly agree” for all 3 components of the shard mental model. We selected this measure because our fishbone diagram showed that nurses did not receive adequate information and resident baseline perceived awareness was already 95%. Also, although many nurses worked on the acute care units, the overall cohort of nurses remained the same, so we could track changes on a consistent group of participants. Process measures included the percentage of FCR encounters attended by nurses, as well as compliance with completing FCR summaries. We defined compliance with completing FCR summaries as the percentage of FCR encounters for which an intern completed the FCR summary. Our balancing measure assessed the average time per FCR encounter, based on the attending physician checklist. To calculate this value, we divided the total time spent on an FCR by the number of patients on the census list.

Analysis

We analyzed nursing awareness, nurse attendance, and compliance with completing FCR summaries using statistical process control P-charts. We assessed average time spent per FCR encounter using a statistical process control XmR-chart. We monitored for shifts, trends, runs, and astronomical points to identify special cause variation.¹⁶

RESULTS

We conducted a total of 40 FCR assessments. The response rates for attending physician checklists and nurse surveys were 100% (n = 67) and 89% (n = 306), respectively. Nursing perceived awareness (Figure 3) varied during baseline data collection over different days and between teams, with multiple points above and

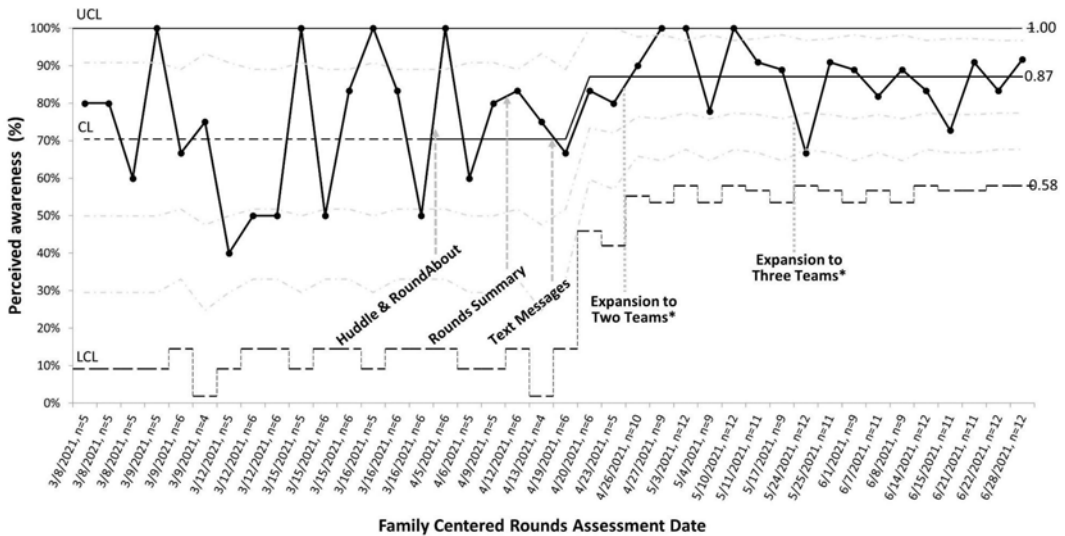


Figure 3. Nurse self-perceived awareness: Statistical process control chart. *Expansion without new intervention. UCL indicates upper confidence limit; CL, confidence limit; LCL, lower confidence limit.

below the 1-sigma lines. No points fell outside of the 3-sigma range. After implementing text messages, we observed a centerline shift in mean nurse perceived awareness from 70% to 87%. Nurse perceived awareness decreased below the 1-sigma line on 2 occasions post-intervention. The first event occurred when we expanded to 3 teams (May 24, 2021) as the third team adjusted to texting nurses. The second event occurred when an intern was unexpectedly absent in the afternoon (June 15, 2021) and a cross-covering intern assumed texts had been sent.

Mean nursing attendance on FCRs (Figure 4) increased from 53% to 75%, with a centerline shift approximately 5 weeks after the first intervention. Compliance with completing FCR summaries did not significantly change, with a mean of 84% over the course of 16 weeks.

Average time spent per FCR encounter did not significantly change, with a mean of 14 minutes over the course of 16 weeks. The moving range chart revealed only random variations within the control limits.

DISCUSSION

The QI team piloted multiple interventions to improve nurse-physician communication during FCRs. Before interventions, mean nurse perceived awareness was 70%. No points fell outside of the 3-sigma lines, but multiple points fell above and below the 1-sigma lines. Nonstan-

dardization of nurse-physician communication during FCRs likely contributed to variability in baseline nurse awareness. After standardizing the process with our interventions, mean nurse perceived awareness increased to 87%, and fewer points fell outside of the 1-sigma lines.

The primary drivers of increased awareness included post-FCR text messages and increased nursing FCR attendance. With regard to post-FCR text messages, nurse perceived awareness improved shortly after initiating this intervention. Also, during biweekly check-ins, nurses reported that post-FCR text updates improved awareness. With regard to nursing FCR attendance, this measure improved steadily as the project progressed, likely from increased nursing awareness of the QI project, improved resident RoundAbout compliance over time, and attitudinal change driven by improved nursing morale and a growing sense that nursing input would be valued on FCRs. Our interventions did not significantly change compliance with completing FCR summaries or average time spent per FCR encounter.

Although several studies demonstrate improvement in FCR nursing attendance after introducing alerts via phone call, hands-free contact device, and pager, these studies used interventions that may be burdensome or disrupt workflow.⁹⁻¹¹ Because RoundAbout uniquely integrates the EMR with the nursing assignment list, users can easily and rapidly send bedside

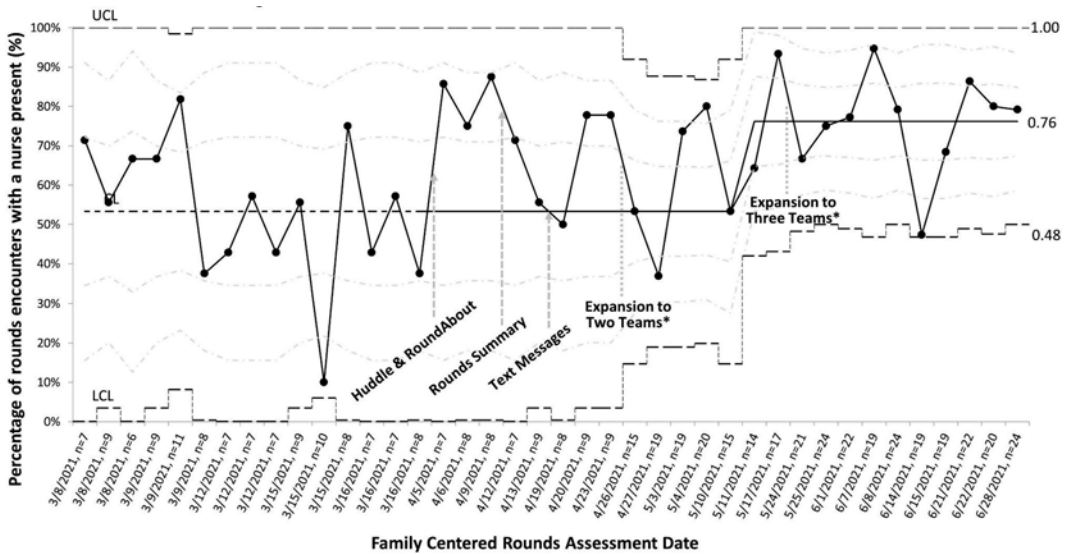


Figure 4. Nurse attendance during family-centered rounds: Statistical process control chart. *Expansion without new intervention. UCL indicates upper confidence limit; CL, confidence limit; LCL, lower confidence limit.

nurses streamlined alerts. Nurses reported that RoundAbout notifications and standardized language to solicit nursing input also made nurses feel valued, which is known to increase morale and meaningful participation on FCRs.^{17,18} This, in turn, likely increased nursing attendance and communication.

To the best of our knowledge, our project is the first project on nurse-physician communication during FCRs to evaluate perceived awareness as an outcome measure instead of nursing attendance during FCRs. This distinction is important because we observed a centerline shift in nurse perceived awareness directly after implementing post-FCR texts before we observed a significant increase in nursing attendance. This finding supports prior studies demonstrating improved collaboration and nurse-physician communication after initiating 2-way texting via smartphones.^{11,12,19} Our findings suggest that nursing attendance may be an important but limited metric when assessing interdisciplinary nurse-physician communication during FCRs. Nurses face conflicting responsibilities that may preclude FCR attendance, so it is not enough to implement QI interventions that target nursing attendance alone. Institutions aiming to improve FCRs should introduce post-FCR text updates jointly with interventions that increase nursing attendance.

More broadly, our multipronged interventional approach has the potential to improve

communication and therefore decrease communication errors, burnout, and error-related morbidity and mortality.^{20,21} The team worked with many stakeholders with established workflows, diverse backgrounds, differing expectations and values, and changing teammates. Because of the number of stakeholders involved in this process, institutions hoping to adopt similar interventions should recognize that persistence, stakeholder empowerment, and repeated process education during check-ins proved necessary to instill culture change. Institutions with existing technology-based communication systems will likely benefit most from these interventions.

Limitations

This project had several limitations. First, the project occurred at a single site at the end of an academic year. Second, as we implemented our interventions in rapid succession, it is difficult to isolate the effect of one intervention. Third, we did not have access to objective RoundAbout usage data or data on text messages. Fourth, postimplementation data collection occurred over 16 weeks; we would need 6 to 12 months of postimplementation data to confidently demonstrate sustained change.

CONCLUSION

We piloted an approach to identify and overcome barriers to nurse-physician communication during FCRs using technology. Post-FCR

text communication for nurses unable to attend FCRs likely improved nursing perceived awareness. This intervention can be implemented at hospitals with texting capability. Nursing alert systems integrated with the EMR can be efficient and effective tools for increasing nursing attendance on FCRs and nurse-physician communication during FCRs when combined with post-FCR texts and consistent, standardized nursing engagement on FCRs. Future studies can evaluate the sustainability of this effort and the direct impact of improved nurse perceived awareness on patient safety and outcomes.

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