

Increasing Timely Family Meetings in Neonatal Intensive Care: A Quality Improvement Project

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ABSTRACT

OBJECTIVES: Timely multidisciplinary family meetings (TMFMs) promote shared decision-making. Despite guidelines that recommend meetings for all patients with serious illness, our NICU TMFM rate was 10%. In this study, we aimed to document a meeting within 5 days of hospitalization for 50% of all new NICU patients hospitalized for ≥ 5 days within 1 year of introducing interventions.

METHODS: A multidisciplinary improvement team used the Model for Improvement to achieve the study aim by targeting key drivers of change. To make meetings easier, we introduced scheduling and documentation tools. To make meetings more customary, we provided education and reminders to professionals. We defined a TMFM as a documented discussion between a parent, a neonatologist, and a nonphysician professional, such as a nurse, within 5 days of hospitalization. We used statistical process control charts to assess the monthly proportion of new patients with a TMFM. In surveys and feedback sessions, family and clinician satisfaction with communication was assessed.

RESULTS: TMFM documentation tripled during the intervention year when compared with the previous year (28 of 267 [10.5%] vs 70 of 224 [31.3%]; $P < .001$), revealing evidence of special cause variation on the statistical process control chart. Clinicians predominantly used ad hoc documentation instead of our scheduling and documentation tools. Parental satisfaction with care and communication did not vary significantly after interventions. Most physicians reported satisfaction with meetings. Nurses reported feeling empowered to request meetings.

CONCLUSIONS: An academic, quaternary-care NICU tripled TMFM documentation after introducing a multifaceted intervention. This improvement may represent changes in professionals' attitudes about providing and documenting family meetings.

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In this study, we sought to improve the timeliness of parent-clinician family meetings in our NICU in response to parental demand as well as expert recommendations.

In our NICU, some parents who expressed deep gratitude for their child's medical care simultaneously acknowledged deficits in the quality of parent-professional communication. These sentiments were consistent with responses to National Research Corporation and Picker postdischarge surveys by >500 families during the 5 years preceding this study. Although 98% of families were highly satisfied with clinical care, approximately half of responding families were dissatisfied with aspects of parent-clinician communication, such as inadequate parental involvement in medical decisions and inconvenient scheduling of family meetings.

Society of Critical Care Medicine guidelines recommend timely multidisciplinary family meetings (TMFMs) for all critically ill patients, including newborns, on the basis of evidence that these meetings promote shared decision-making.¹ The effect of increased communication on family outcomes is inconsistent. Although intensive communication interventions have improved satisfaction for the families of critically ill adults,² Clarke-Pounder et al³ reported that a NICU intervention deteriorated parental psychological outcomes.

Our baseline rate for providing multidisciplinary family meetings within 5 days of hospitalization was consistent with the 9% to 10% meeting rates that were reported in pediatric and adult critical care settings.^{4,5}

In this study, our primary objective was to provide and document a TMFM by the fifth hospital day for at least 50% of all new NICU patients within 1 year of introducing interventions. We chose a target of 50% (rather than 100%) to account for newborns who are hospitalized with low-acuity problems, such as hypoglycemia or transient tachypnea of the newborn.

During the study period, we aimed to increase clinician documentation of timely meetings, assess family satisfaction with

communication, and evaluate physician and nurse satisfaction with communication processes. The frequency of NICU family meetings has not been systematically measured and increased in previous studies.³

METHODS

Our institutional review board exempted this quality improvement (QI) project from review. Our multidisciplinary improvement team consisted of a neonatologist, a neonatal fellow, a certified nursing specialist, the nursing unit director, and a research assistant.

Setting

We conducted this study in an academic, quaternary-care NICU in the western United States with ~500 new patients annually. There are 22 beds arrayed in 5 open bays, with 4 to 6 infants sharing a bay with each separated by privacy curtains. A multiuse conference room in the NICU accommodates family meetings.

During the study period, 16 individual neonatologists served in the unit, each providing day and night coverage continuously in 14-day blocks. At any

1 time, the medical team consisted of 1 neonatologist, 1 neonatal fellow, 1 neonatal nurse practitioner, and 4 pediatric residents, whereas 110 registered nurses and 2 licensed social workers staffed the unit in shifts.

Context

The multidisciplinary improvement team defined the local problem and qualitatively described its potential sources. We consulted published guidelines and conducted a root-cause analysis to identify barriers to providing timely parent-clinician family meetings (Fig 1).⁶

Barriers in the local NICU culture included clinician attitudes that family meetings should be treated as an exceptional practice rather than a customary practice. For example, family meetings might be reserved to relay bad news or to discuss the discontinuation of life support.

Barriers to holding meetings included the limited availability of both physicians and parents during daytime hours as well as parents' unawareness that they could request a meeting with their infant's physician. Parent-clinician language differences posed a barrier to meetings

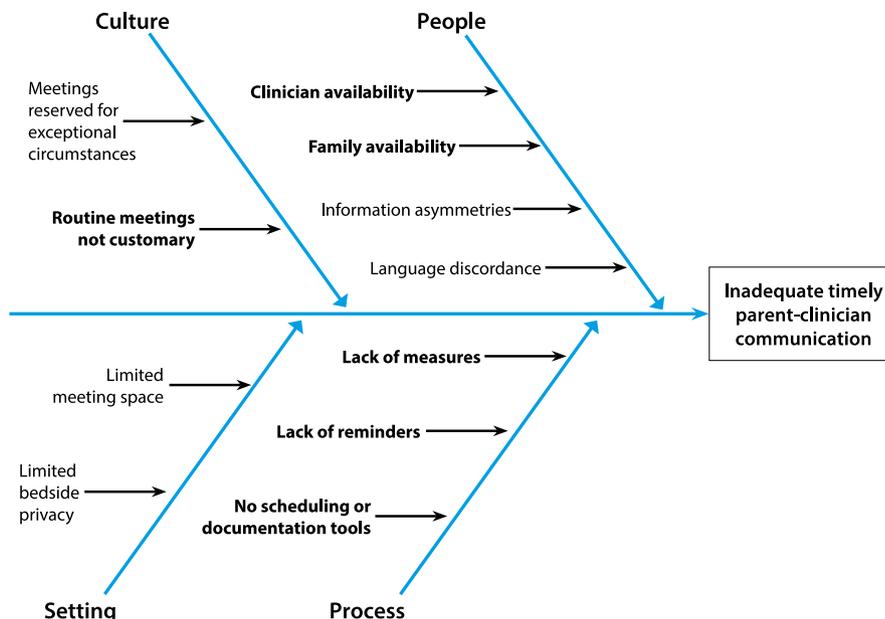


FIGURE 1 System- and person-level root causes of inadequate timely parent-clinician communication. For our study interventions, we targeted the barriers that are shown in bold.

because of the difficulties in using a language interpreter.

System-level barriers included limited space and privacy in the clinical setting as well as the lack of measures, reminders, and scheduling or documentation tools to support timely meetings.

Interventions

We used Model for Improvement methodology to define key drivers of change (Fig 2).⁷ We annotated a statistical process control (SPC) chart to depict the timing of interventions (Fig 3).

In February 2015, we introduced project aims and interventions to NICU professionals during events such as faculty meetings, nursing staff meetings, and morning rounds. We first introduced interventions into practice on March 1, 2015. We held feedback sessions with physicians and nurses, met monthly to review meeting performance, and adjusted interventions to improve or maintain performance over the course of 12 monthly plan-do-study-act cycles. We adjusted outreach to nurses and physicians and modified study tools on the basis of user feedback.

To make holding and documenting meetings easier, we adapted published scheduling and documentation tools.^{6,8} To avoid scheduling conflicts, the unit secretary maintained a written calendar of neonatologist availability for family meetings that the medical team or bedside

nurses could consult when seeking to schedule a meeting. To promote meeting documentation, we introduced family meeting note templates into the electronic medical record (Supplemental Fig 4). We designed note templates to be used to facilitate the recording of core family meeting measures, including timing and participants, as defined below. The improvement team provided no explicit guidance on the content of narrative documentation in family meeting notes; therefore, users were free to include any narrative they deemed germane to clinical care. On the basis of user feedback about the templates, we iteratively added links to automatically display elements, such as dates and names, as well as multiple choice lists that allowed users to report on aspects of family meetings, such as location, participants, and topics of conversation.

To make meetings more customary, we placed placards on rounding computers (Supplemental Fig 5) and prompts on daily rounding flow sheets to remind clinicians to consider whether a family needed a meeting. During weekly nursing staff meetings (called “huddles”), we reviewed project aims and monthly performance. Beginning in April 2015, we posted the monthly timely meeting rate in the NICU to publicize project aims and applaud performance improvements. Beginning in June 2015, the principal investigator (A.S.) e-mailed the attending neonatologist with a

reminder of study aims and measures before their 14-day service block.

Medical Record Extraction

We extracted family meeting measures and patient demographics from the medical records of all patients admitted to our NICU for ≥ 5 consecutive days between March 1, 2014 and February 29, 2016. Research assistants independently collected data after achieving at least 90% agreement with the principal investigator on family meeting measures over the course of 1 month of records. The principal investigator reviewed randomly selected records for accuracy and audited records based on discrepancies.

Family Meeting Measures

We constructed predetermined definitions for family meetings from a published intensive care bundle.⁹ We defined a “family meeting” as a conversation about the patient’s treatment or condition between a parent and the attending neonatologist that is documented in the medical record. In addition to a parent and neonatologist, a “multidisciplinary” family meeting required documented participation by a nonphysician professional, such as a nurse or social worker.

We defined “timely” as a meeting that occurred within 5 days of hospitalization, chosen through a consensus of local neonatologists who selected the target from within the 3- to 7-day range that was reported in intensive care studies.¹⁰ We excluded from analysis patients who were hospitalized for < 5 consecutive days. Therefore, the denominator for this study consisted of all patients hospitalized in our NICU for ≥ 5 days.

We defined the primary study outcome, the monthly TMFM rate, as the monthly proportion of new patients with a meeting involving a parent, neonatologist, and nonphysician professional documented during the first 5 NICU days.

Parent Satisfaction With Care and Communication

We assessed parent satisfaction as a secondary outcome measure as well as a measure of unintended negative consequences.

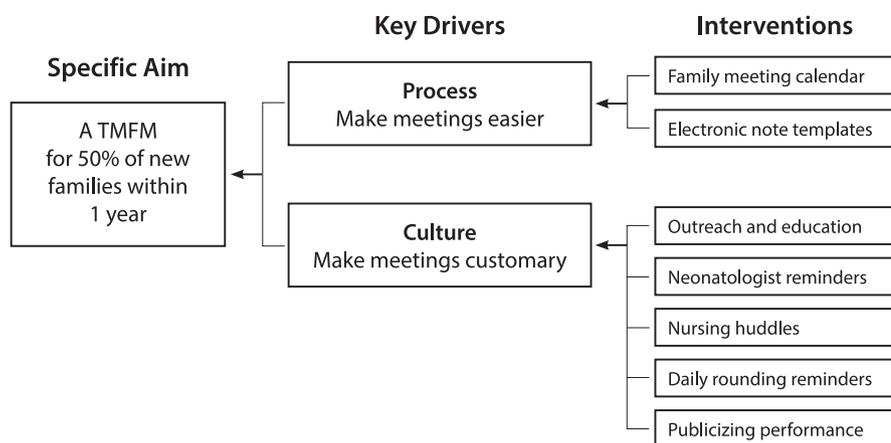


FIGURE 2 Key drivers of change: interventions to make holding and documenting family meetings easier and more customary.

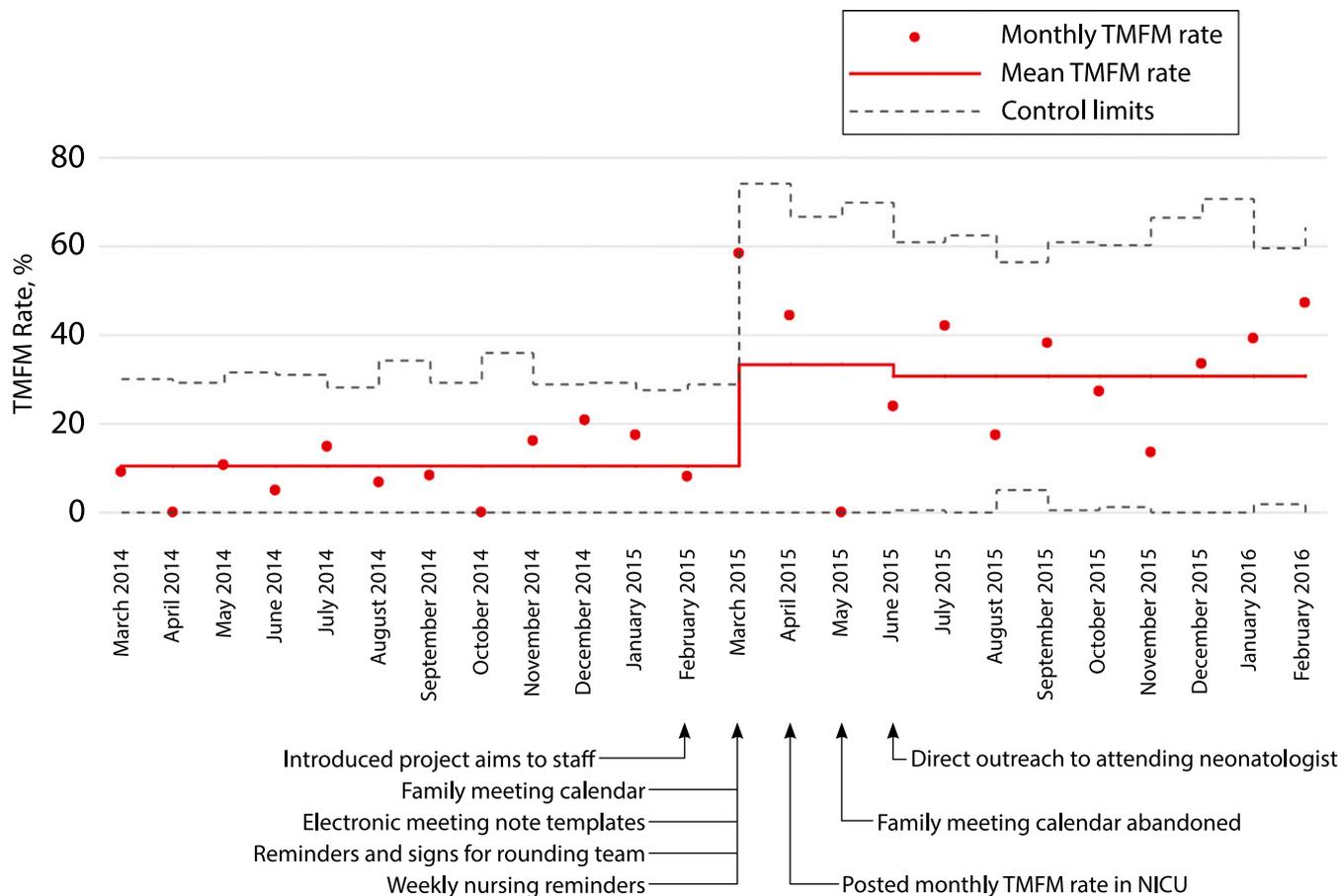


FIGURE 3 Annotated SPC chart of the monthly TMFM rate.

We assessed NICU families' satisfaction with clinician communication using the Communication Assessment Tool–Team (CAT-T), an instrument validated to measure patient assessment of clinician communication quality.¹¹ We adapted English and Spanish versions of CAT-T by replacing “my health” with “my child’s health” (Supplemental Fig 6).¹² The CAT-T, composed of 14 items on a 5-point scale ranging from “poor” to “excellent,” was designed to generate total scores ranging from 0 to 14, with 1 point given for each excellent response and 0 points given for all other responses. A research assistant approached families for survey participation during weekday daytime hours in a patient’s second hospital week.

In our health system, parent satisfaction with care and communication was assessed by using Press Ganey Associates Inc postdischarge surveys. Results were

reported as the proportion of “fully satisfied” responses. A change of survey vendors in July 2014 prevented a direct comparison with earlier results. Patients who were hospitalized for <5 days could not be distinguished for exclusion from these results.

Physician Satisfaction With Family Meetings

During the intervention period, we surveyed neonatologists and neonatal fellows after their service blocks. Surveys were used to assess the interventions’ unintended negative consequences that physicians identified during preintervention feedback sessions (namely, the added burden of providing meetings to most patients). Survey items were written to reflect concerns that were voiced by physicians (Supplemental Fig 7). Response options ranged from “strongly agree” to “strongly disagree” on a 4-point scale. Survey

responses could not remain anonymous because of the nature of the service schedule. Physicians provided feedback about interventions using open-ended survey items.

Analysis

We analyzed the meeting rate and CAT-T scores over time using *P*-type or *X*-bar SPC charts, respectively, with mean centerlines and control limits. We adjusted mean centerlines when data met established criteria for “special cause” variation (greater variation than expected by chance), including (1) a single point outside the control limits, or (2) 8 consecutive points above the preintervention centerline.¹⁵

For pre- and postintervention comparisons, we used Pearson’s χ^2 test for categorical variables (family meeting rates, survey results, and demographics), a 2-sample, 2-sided *t* test to compare continuous

demographic variables, and a 2-sample Wilcoxon rank sum test for time to a meeting.

We conducted statistical analyses by using Stata/SE version 14 (Stata Corp, College Station, TX).

RESULTS

Demographics

NICU patients hospitalized for ≥ 5 days did not vary by patient or family demographics between the year before and the year after interventions (Table 1).

Timely Family Meeting Measures

We adjusted the centerline and control limits of the SPC chart (Fig 3) in the first month after the introduction of interventions when the monthly meeting rate met a criterion for special cause variation by rising above the preintervention control limits. We adjusted the chart again in June 2015 at the start of a run of >8 consecutive months with meeting rates above the preintervention centerline (further evidence of special cause variation).

Among eligible patients hospitalized for ≥ 5 days, the proportion of patients having a TMFM tripled during the intervention year when compared with the year before interventions (28 of 267 [10.5%] vs 70 of 224 [31.3%]; $P < .001$). Among eligible patients who had a timely meeting between a parent and a neonatologist during the

intervention year, twice as many of those timely meetings were multidisciplinary (ie, included a third nonphysician professional participant) (28 of 108 [26%] vs 70 of 138 [51%]; $P < .001$). The median time to a timely meeting decreased from 3 to 2 days ($P = .07$).

Meeting Documentation and Scheduling

Several proposed process changes did not take hold. Meeting documentation remained primarily ad hoc, with only 17% (24 of 138) of timely family meetings that were documented during the intervention period making use of the electronic note templates we introduced. From the outset, physicians found the new scheduling process cumbersome, made minimal use of the family meeting calendar, and abandoned its use 2 months after its introduction. Therefore, meeting scheduling remained ad hoc as well.

Parental Satisfaction With Care and Communication

Sixty-four parents from 41 of 174 approached families (24%) returned CAT-T surveys between November 2014 and April 2016 (mean score: 12.2 out of 14; 95% confidence interval: 11.2–13.1). Parental satisfaction with communication did not vary significantly during the study period; there was no evidence of special cause variation on the SPC chart of monthly

average CAT-T scores (data not shown).

Postdischarge parental satisfaction with care and communication also did not vary significantly before and after interventions (before: $n = 26$; after: $n = 34$; $P > .05$; data not shown).

Nurse and Physician Feedback

During feedback sessions, nurses expressed support for the study aims and reported feeling empowered to propose and document meetings between parents and physicians.

In the intervention period, 84% (16 of 19) of all neonatologists and neonatal fellows completed surveys after their service blocks. Most physicians did not report burdens resulting from family meetings. Among respondents, 81% (13 of 16) disagreed that “holding family meetings interfered with my other commitments,” and 75% (12 of 16) disagreed that “holding family meetings noticeably added to my work load.” Seventy-five percent of physicians (12 of 16) reported that no one asked them for “unnecessary” meetings during their previous service block, and 94% (15 of 16) agreed that “holding family meetings improved the care of my patients.”

DISCUSSION

This is the first NICU study in which timely parent-physician family meetings are systematically increased.³ After introducing interventions to make family meetings easier and more customary, we tripled the TMFM rate and doubled the proportion of documented timely meetings that were multidisciplinary.

The preintervention TMFM rate of 10% reflected the system- and person-level root causes of inadequate timely parent-clinician communication that we identified early in our improvement process. In the 2 months immediately after the introduction of our QI project, compliance with timely meeting documentation increased dramatically beyond baseline control limits followed by an equally dramatic drop to 0. With increased outreach to staff, including the introduction of e-mail reminders to service neonatologists, the meeting rate varied around an overall higher rate of 30% for the remainder of the study period.

TABLE 1 Demographics of Patients in the NICU Who Were Hospitalized for ≥ 5 Days

Characteristics	Total	Before Interventions (March 2014 to February 2015)	After Interventions (March 2015 to February 2016)	<i>P</i>
Patient				
Girls, <i>n</i> (%)	198 (40)	107 (40)	91 (41)	.9
Birth weight, kg, mean (95% CI)	2.33 (2.24–2.41)	2.33 (2.22–2.45)	2.32 (2.18–2.46)	.9
Gestational age, wk, mean (95% CI)	34.4 (34–34.8)	34.5 (34.0–35.1)	34.2 (33.6–34.8)	.4
Length of stay, d, mean (95% CI)	31.7 (29–34.4)	32 (28.1–35.9)	31.4 (27.7–35)	.8
Family and delivery				
Maternal age, y, mean (95% CI)	31 (30.4–31.6)	31.1 (30.2–31.9)	31 (30.1–31.8)	.9
Cesarean delivery, <i>n</i> (%)	299 (61.2)	164 (62)	135 (60)	.7
Multiple live births, <i>n</i> (%)	103 (21)	56 (21)	47 (21)	.99
Inborn, <i>n</i> (%)	303 (61.7)	170 (64)	133 (59)	.33
Not fluent in English, <i>n</i> (%)	66 (13)	30 (11)	36 (16)	.12
Total patients, <i>n</i> (%)	491 (100)	267 (54.3)	224 (45.7)	—

Demographics did not vary during the study period. CI, confidence interval; —, not applicable.

Physicians and nurses displayed a sustained increase in ad hoc documentation of timely meetings without any tangible reward. We speculate that the education and reminder elements of our intervention shifted attitudes toward normalizing routine multidisciplinary family meetings and contributed to the performance improvement. Publicly reporting meeting rates may have motivated physicians to hold and document more meetings. Weekly reminders may have empowered nurses to request and document more meetings. These findings suggest that reminders are somewhat effective for improving physicians' and nurses' compliance with a communication process measure.

Our interventions were effective, but less so than we had hoped. We demonstrated a systematic improvement in compliance with a timely family meeting process measure; however, there was a 20%-point gap between our improved performance of 30% and our goal of 50%. This shortfall is consistent with large-scale evidence of the barriers to improving physicians' communication behaviors.¹⁴

Physicians largely overlooked tools that were intended to make holding and documenting meetings easier (eg, a calendar and electronic templates) in favor of ad hoc procedures. Our findings reveal an opportunity to develop tools for offering and documenting family meetings that better conform to physicians' habits.

Impact on Professionals

Nurses were vocal champions of this initiative and reported being empowered by this intervention to request and document meetings. We noticed a qualitative increase in meeting documentation by nurses, although we did not collect data on the discipline of documenters. These results are consistent with evidence that NICU nurses are essential for communication with families.¹⁵ These findings are also encouraging in light of the evidence that nurses are frequently sidelined during NICU family meetings.¹⁶

Many neonatologists voiced concerns about this study before the introduction of interventions. Some worried that additional

family meetings would become burdensome. Others maintained that they met with most families and simply failed to document their meetings. In surveys during the intervention period, most physicians expressed support for the study aims and did not report excessive burdens on their time. These findings might reflect shifting attitudes about family meetings, but they also may be biased by the survey's lack of anonymity.

Limitations

Our results reflect the improved compliance of NICU professionals in documenting timely family meetings. The study's primary metric relied on clinician documentation, which could not be used to distinguish between meetings that were never held and those that were held but never documented. Furthermore, over the course of days and weeks in the NICU, families have potentially valuable spontaneous encounters with their medical teams that we could not capture. Nonetheless, we selected process measures of communication quality (namely timing and participants of family meetings) because we believed that we could influence them through an intervention focused on professionals, reliably measure them in all patients, and generate findings that were transferable to diverse inpatient environments.

Parents' satisfaction with care and communication, a secondary outcome that was surveyed for separately during the hospitalization and after discharge, neither improved nor deteriorated after the introduction of interventions. Patient satisfaction can be resistant to isolated changes in clinical processes, and improved satisfaction can be difficult to detect when baseline satisfaction with care is high.¹⁷ Low response rates to satisfaction surveys, both the CAT-T and the postdischarge survey, may have produced biased samples. In our intervention, the manner of communication was not altered, and increased meeting documentation did not necessarily reflect improved clinician communication behaviors. Nevertheless, delivery of timely communication is a valuable performance measure, independent of its effect on patient satisfaction.¹

CONCLUSIONS

In our NICU, we sought to remedy inadequate timely communication that was identified by parents and professionals alike. We designed interventions to make family meetings easier and more customary. Through sustained effort, we systematically increased documentation of TMFMs for hospitalized infants. Although clinicians favored ad hoc procedures over the tools we introduced, their increased documentation behavior reflected shifting attitudes toward timely communication with families. During the conduct of this study, NICU nurses, who are crucial for communicating with families and frequently marginalized during family meetings, felt empowered to request and participate in meetings.

Health systems can implement the methods that were employed in this study to monitor clinician behaviors and overcome barriers to timely communication to promote shared decision-making with the parents of children who are hospitalized with serious illness.

Our findings reveal opportunities for investigators to assess the effect of NICU communication interventions on additional outcomes, such as comprehension and shared decision-making, and to identify those subsets of NICU parents whom communication interventions benefit most.

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