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

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Abstract

Objective—Timely, multidisciplinary family meetings (TMFM) promote shared decision making. Despite guidelines recommending meetings for all seriously ill patients, our neonatal intensive care unit (NICU) TMFM rate was 10%. This study aimed to document a meeting within five days for 50% of all new NICU patients hospitalized five or more days within one 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 non-physician professional such as a nurse, within five days. We used statistical process control (SPC) to assess the monthly proportion of new patients with a TMFM. Surveys and feedback sessions assessed family and clinician satisfaction with communication.

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Contributors' Statements:

Dr. Sabnis conceptualized and designed the intervention, led the quality improvement team, carried out the final analyses, drafted and revised the final manuscript, and approved the final manuscript as submitted.

Dr. Hagen implemented the intervention, carried out initial analyses, and approved the final manuscript as submitted.

Dr. Tarn conceptualized the project, supervised data analysis, critically reviewed the manuscript, and approved the final manuscript as submitted.

Dr. Zeltzer conceptualized the project, supervised project implementation, critically reviewed the manuscript, and approved the final manuscript as submitted.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work and in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Result—TMFM documentation tripled during the intervention year when compared to the prior year (28/267 (10.5%) vs. 70/224 (31.3%); $p<0.001$), showing evidence of special cause variation on the SPC 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.

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

INTRODUCTION

In this study, we sought to improve the timeliness of parent-clinician family meetings in our neonatal intensive care unit (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/Picker post-discharge surveys by over 500 families during the five years preceding this study. Although 98% of families were highly satisfied with clinical care, about 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 (TMFM) for all critically ill patients, including newborns, based on 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, Clarke-Pounder et al reported that a NICU intervention deteriorated parental psychological outcomes.^{2,3}

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

In this study, our primary objective was to provide and document a timely, multidisciplinary family meeting by the fifth hospital day for at least 50% of all new NICU patients within one year of introducing interventions. We chose a target of 50%, rather than 100%, to account for hospitalized newborns having 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, to assess family satisfaction with communication, and to evaluate physician and nurse satisfaction with communication processes. No previous studies have systematically measured and increased the frequency of NICU family meetings.

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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 about 500 new patients annually. Twenty-two beds are arrayed in five open bays with 4–6 infants sharing a bay, separated by privacy curtains. A multi-use 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 one time, the medical team consisted of one neonatologist, one neonatal fellow, one neonatal nurse practitioner, and four pediatric residents, while 110 registered nurses and two 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 (Figure 1).⁶

Barriers in the local NICU culture included clinician attitudes that treated family meetings as an exceptional 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 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 (Figure 2).⁷ We annotated a statistical process control (SPC) chart to depict the timing of interventions (Figure 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 based on 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 Figure 1). We designed note templates 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. Based on 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 Figure 2) 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 (AS) 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 five or more 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 one 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 documented in the medical record. In addition to a parent and neonatologist, a ‘multidisciplinary’ family meeting required documented participation by a non-physician professional, such as a nurse or social worker.

We defined ‘timely’ as a meeting within five days, chosen through a consensus of local neonatologists who selected the target from within the 3–7-day range reported in intensive care studies.¹⁰ We excluded from analysis patients hospitalized fewer than five consecutive

days. Therefore, the denominator for this study consisted of all patients hospitalized in our NICU for 5 or more days.

The primary study outcome, the monthly timely, multidisciplinary family meeting rate, we defined as the monthly proportion of new patients with a meeting involving a parent, neonatologist, and non-physician professional documented during the first five 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.

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 Figure 3).¹² CAT-T, comprised by 14 items on a 5-point scale ranging Poor – Excellent, was designed to generate total scores ranging 0–14, with 1 point given for each “Excellent” response and no 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.

Our health system assessed parent satisfaction with care and communication using Press Ganey Inc. post-discharge 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 hospitalized fewer than five 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 following their service blocks. Surveys assessed the interventions’ unintended negative consequences that physicians identified during pre-intervention feedback sessions, namely, the added burden of providing meetings to most patients. Survey items were written to reflect concerns voiced by physicians (Supplemental Figure 4). Response options ranged from Strongly Agree – 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 statistical process control (SPC) charts, respectively, with mean center lines and control limits. We adjusted mean center lines 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) eight consecutive points above the pre-intervention center line.¹³

For pre- and post-intervention comparisons, we used Pearson χ^2 test for categorical variables (family meeting rates, survey results, and demographics), a two-sample two-sided

t-test to compare continuous demographic variables, and a two-sample Wilcoxon rank-sum test for time to a meeting.

We conducted statistical analyses using Stata/SE version 14 (StataCorp, College Station, Texas).

RESULTS

Demographics

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

Timely family meeting measures

We adjusted the center line and control limits of the SPC chart (Figure 3) in the first month following the introduction of interventions, when the monthly meeting rate met a criterion for special cause variation by rising above the pre-intervention control limits. We adjusted the chart again in June 2015, at the start of a run of over eight consecutive months with meeting rates above the pre-intervention center line, further evidence of special cause variation.

Among eligible patients hospitalized for five or more days, the proportion of patients having a timely, multidisciplinary family meeting tripled during the intervention year when compared to the year prior to interventions (28/267 (10.5%) vs. 70/224 (31.3%), $p<0.001$). 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 (*i.e.*, included a third, non-physician, professional participant) (28/108 (26%) vs. 70/138 (51%); $p<0.001$). The median time to a timely meeting decreased from three to two days ($p=0.07$).

Meeting documentation and scheduling

Several proposed process changes did not take hold. Meeting documentation remained primarily ad hoc, with only 17% (24/138) of timely family meetings 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 two 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 – April 2016 (mean score 12.2 out of 14, 95% CI [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). Post-discharge parental satisfaction with care and communication also did not vary significantly before and after interventions (before: $n=26$; after: $n=34$; $p>0.05$; 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% (16/19) of all neonatologists and neonatal fellows completed surveys following their service blocks. Most physicians did not report burdens resulting from family meetings. Among respondents, 81% (13/16) disagreed that “holding family meetings interfered with my other commitments,” and 75% (12/16) disagreed that “holding family meetings noticeably added to my work load.” Seventy-five percent of physicians (12/16) reported that no one asked them for “unnecessary” meetings during their prior service block, and 94% (15/16) agreed that “holding family meetings improved the care of my patients.”

DISCUSSION

This is the first NICU study to systematically increase timely parent-physician family meetings.² After introducing interventions to make family meetings easier and more customary, we tripled the timely, multidisciplinary family meeting rate and doubled the proportion of documented timely meetings that were multidisciplinary.

The pre-intervention timely, multidisciplinary family meeting rate of 10% reflected the system-level and person-level root causes of inadequate, timely parent-clinician communication we identified early in our improvement process. In the two months immediately following the introduction of our QI project, compliance with timely meeting documentation increased dramatically beyond baseline control limits, followed by an equally dramatic drop to zero. 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.

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 towards 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 twenty percentage-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 intended to make holding and documenting meetings easier—a calendar and electronic templates—in favor of ad hoc procedures. Our findings

highlight 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 prior to 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 distinguish between meetings that were never held and those that were held but never documented. Furthermore, over days and weeks in the NICU, families have potentially valuable spontaneous encounters with their medical team that we could not capture. Nonetheless, we selected process measures of communication quality, namely timing and participants of family meetings, because we believed we could influence them through an intervention that targeted professionals, reliably measure them in all patients, and generate findings transferable to diverse inpatient environments.

Parents' satisfaction with care and communication, a secondary outcome surveyed 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 post-discharge survey, may have produced biased samples. Our intervention did not alter the manner of communication, 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

Conclusion

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 timely, multidisciplinary family meetings for hospitalized infants. Although clinicians favored ad hoc procedures over the tools we introduced, their increased documentation behavior reflected shifting attitudes towards 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 employed in this study to monitor clinician behaviors and overcome barriers to timely communication in order to promote shared decision making with the parents of hospitalized, seriously ill children.

Our findings highlight 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.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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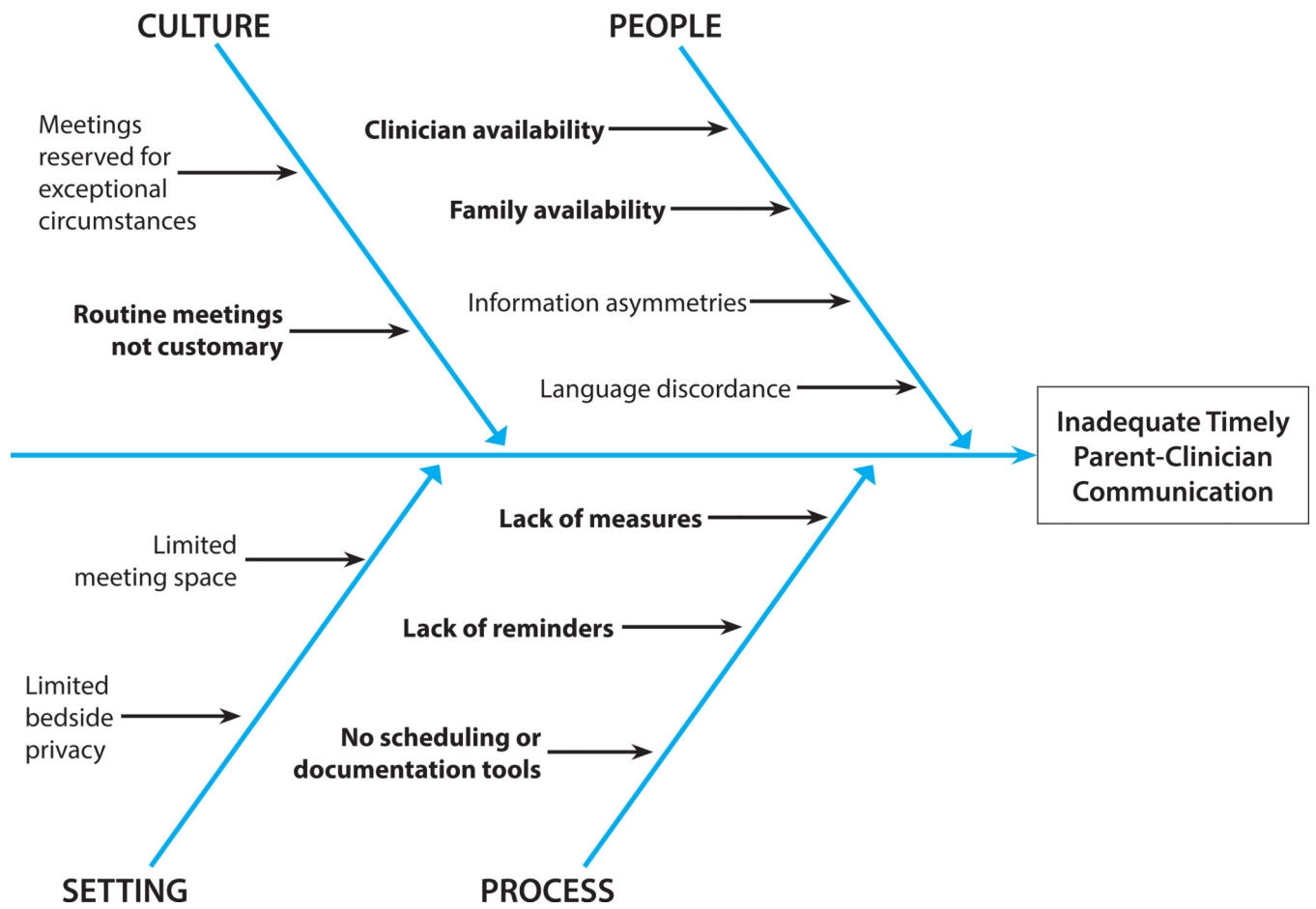


Figure 1. System- and person-level root causes of inadequate timely parent-clinician communication. (Our study interventions targeted the barriers shown in bold.)

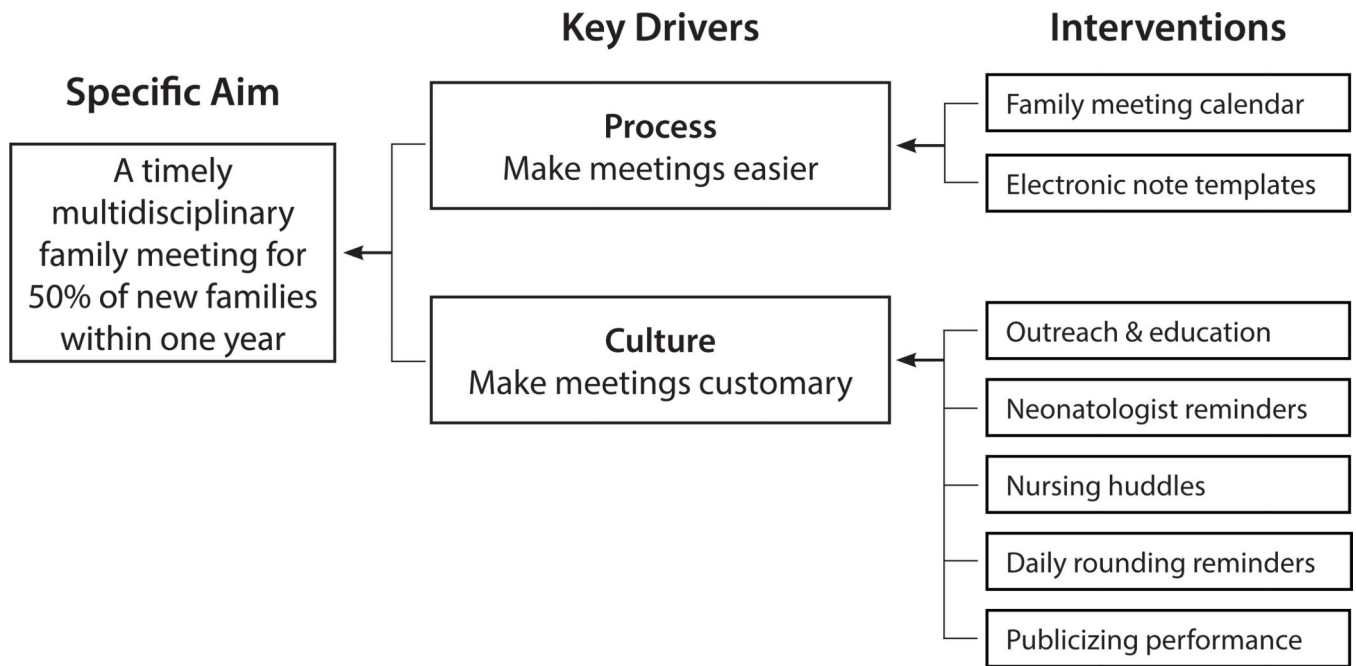


Figure 2. Key drivers of change: interventions to make holding and documenting family meetings easier and more customary.

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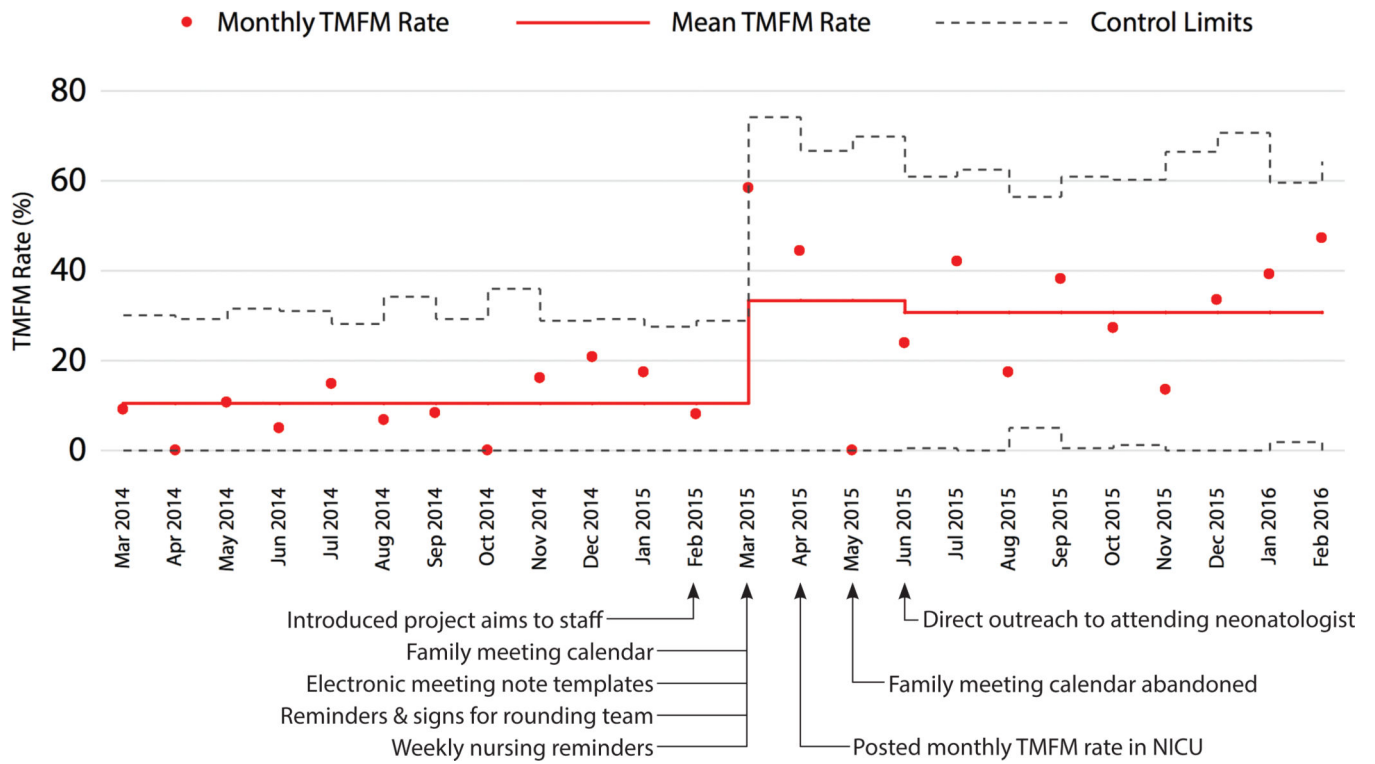


Figure 3. Annotated statistical process control chart of the monthly timely, multidisciplinary family meeting (TMFM) rate.

Table 1.

Demographics of NICU patients hospitalized for 5 or more days did not vary during the study period.

		Total	Before Interventions (Mar 2014 – Feb 2015)	After Interventions (Mar 2015 – Feb 2016)	<i>p</i>
Patient characteristics					
Female sex	<i>N (%)</i>	198 (40%)	107 (40%)	91 (41%)	0.9
Birth weight (kg)	<i>Mean (95% CI)</i>	2.33 (2.24, 2.41)	2.33 (2.22, 2.45)	2.32 (2.18, 2.46)	0.9
Gestational age (weeks)	<i>Mean (95% CI)</i>	34.4 (34, 34.8)	34.5 (34.0, 35.1)	34.2 (33.6, 34.8)	0.4
Length of stay (days)	<i>Mean (95% CI)</i>	31.7 (29, 34.4)	32 (28.1, 35.9)	31.4 (27.7, 35)	0.8
Family & delivery characteristics					
Maternal age (years)	<i>Mean (95% CI)</i>	31 (30.4, 31.6)	31.1 (30.2, 31.9)	31 (30.1, 31.8)	0.9
Cesarean delivery	<i>N (%)</i>	299 (61.2%)	164 (62%)	135 (60%)	0.7
Multiple live births	<i>N (%)</i>	103 (21%)	56 (21%)	47 (21%)	0.99
Inborn	<i>N (%)</i>	303 (61.7%)	170 (64%)	133 (59%)	0.33
Not English-fluent	<i>N (%)</i>	66 (13%)	30 (11%)	36 (16%)	0.12
Total patients	<i>N (%)</i>	491 (100%)	267 (54.3%)	224 (45.7%)	—