Sustaining Improvements in Pediatric Critical Care Outcomes: Toolkit for a Structured Approach

INTRODUCTION

Target Audience
This toolkit is geared toward health care teams who have a basis of quality improvement and teamwork training with embedded coaches in their clinical area. Many of the strategies we describe can be used in a variety of clinical settings, although this project focused on the Pediatric Intensive Care Unit (PICU) at N.C. Children’s Hospital, which is part of University of North Carolina Health Care.

How to Use the Toolkit
The toolkit is organized into four main topics: managing the program, eliminating hospital-acquired infections, improving communication systems, and partnering with families. Within each topic, we have sections for 1) implementation, 2) results and lessons learned, and 3) tools. The Implementation sections describe strategies and changes that were implemented in the PICU with varying degrees of success in order for you to replicate an idea or use it as a jumping off point for your own new ideas. The Results & Lessons Learned sections include our successes and challenges in order to give your team some guidance about what might work more easily, what might be more challenging, and the risks to look out for. All tools can be downloaded at the link below and adapted for your own use.

http://www.med.unc.edu/cce/programs-initiatives/picu/toolkit

Background
The Improving Pediatric Critical Care (IPCC) program was formed in 2009 through a partnership between N.C. Children’s Center for Clinical Excellence and UNC Dance Marathon. The aim of the IPCC program was to create a coordinated approach for improving the quality and safety of care for critically ill pediatric patients at N.C. Children’s Hospital. For two years, UNC Dance Marathon provided grant funding to support a core team who worked with PICU staff to develop the program management approach. The quality and safety efforts focused on eliminating hospital-acquired infections, improving communication systems, and partnering with families. This toolkit is comprised of existing tools that were refined as well as new tools developed during the grant funding period.

MANAGING THE PROGRAM

Implementation
The advisory committee called PICU Partners in Improving Quality and Measuring for Excellence (PIQME) was the governing body for the initiative. The multi-disciplinary group consisted of unit leaders as well as frontline staff and met monthly to review project progress based on 90-day goals, to address issues impeding progress, and to promote sharing of lessons learned.
The program team included individuals in the following roles: PICU medical director, PICU nurse manager, program manager, quality analyst, and family-centered care specialist. The team oversaw program activities by leading the development of 90-day goals and monitoring the action plan to achieve them. They were responsible for maintaining and monitoring the quality dashboard and alerting PIQME to concerns; providing guidance to the project teams; facilitating widespread communication regarding improvements and accomplishments; and planning for sustainability.

The program team developed and implemented a stakeholder communication plan to reach PICU staff and family advisors, faculty and staff in other clinical areas, senior leadership, and Dance Marathon. Forms of communication included monthly newsletters, announcements in internal publications, posters presented at UNC Health Care’s annual Quality Expo event, a “traveling roadshow” consisting of short presentations and Q&A sessions with various groups. We published a quarterly report which included our dashboard as well as a 2-page overview of highlights of the program, results, outcomes, and plans for the next quarter.

Frontline staff members were appointed as project team leaders to ensure timely completion of objectives and report out at quarterly milestone meetings. Feedback was gathered from a larger group of frontline staff through electronic surveys.

Results & Lessons Learned
The communication strategies allowed efforts of the program to be more visible and impressed senior leaders, who regard the PICU dashboard as a high standard for the rest of the institution. The multi-disciplinary approach and inclusion of family advisors allowed for streamlined implementation.

Incentives and recognition were important aspects of the program. On a monthly basis, the names of individuals who had completed hand hygiene observations were read aloud at the advisory group meetings. The program management team sponsored contests for compliance with the Daily Goals Communication Sheets and for hand hygiene observations. We gave peer-nominated awards to individuals for performance during standardized rounds. Awards included free valet parking, vouchers for parking and food, and coffee mugs. When the PICU reached over a year without a ventilator-associated pneumonia (VAP), the Performance Improvement & Patient Safety department sponsored a pizza party for PICU staff and invited senior leaders to attend and recognize the staff. With grant funds, we printed large banners that read, “Thank you for 368 VAP-free days in the PICU” and posted them outside the PICU entrances. At the end of each project year, PICU staff, advisory group members, and senior leaders were invited to a celebratory meeting during which awards were presented and results displayed on posters.

Some of the lessons learned throughout the two years include the following.
- Although frontline staff members were included in the advisory group and project teams, we could have engaged them even more, particularly those already trained as Six Sigma Yellow Belts.
- It is difficult to keep new staff oriented to various quality and safety approaches and techniques, especially residents who rotate through the PICU on a monthly basis. Therefore, frequent education is needed with both resident physicians and nurses.
- With our institution’s patient and family-centered care program being newer in development, we had to limit our activities in this area after the grant period due to resource constraints.
With the purpose of sustaining efforts in mind, we tried a strategy called “safety stand-downs,” which entails discussions within multidisciplinary groups regarding safety concerns and action planning for preventing serious adverse events. The PICU leadership team held three 90-minute sessions and required all staff (physicians, nursing staff, and respiratory therapists) to attend one session. The agenda included a large group discussion with stories and examples of safety concerns and small group sessions focused on alarm fatigue/general room safety, patient advocacy and infection prevention, and communication/handoffs. Staff feedback was positive in terms of increasing awareness of safety concerns as well as being helpful/meaningful/useful overall. Staff appreciated the multidisciplinary approach and open discussion. The plan is to hold safety stand-downs on a quarterly basis.

Please note that quality and safety efforts related to research and publication, whether internally or externally sponsored, should be reviewed by an Institutional Review Board to ensure compliance with human ethics regulations.

**Program Management Tools**

1. Structure diagrams
2. Measurement strategy
3. Dashboard example
4. Stakeholder communication plan
5. 90-day action plan (blank and example)
6. Daily goals contest poster
7. Safety stand-down packet

**ELIMINATING HOSPITAL-ACQUIRED INFECTIONS**

**Implementation**

The IPCC program sought to enhance improvements led by Six Sigma project teams to improve rates of central line-associated bloodstream infections (CLABSIIs), ventilator-associated pneumonias (VAPs), and Foley catheter-associated urinary tract infections (UTIs). We engaged staff in hand hygiene observations and immediate feedback and included the compliance data on our dashboard. We also developed strategies to better communicate about line maintenance and to address daily whether lines can be removed (see Improving Communication Systems where the Daily Goals Communication Sheet is discussed).

In addition to regularly conducted bundle audits and education, we put in place certain structures to ensure continuous monitoring and follow-up related to HAIs. All occurrences of an HAI are reviewed at the monthly mortalities and morbidities conference for Pediatric Critical Care Medicine. Posters with the number of days since each type of infection are kept up-to-date for everyone in the PICU to see. Each type of infection has an owner who is responsible for initiating the following steps for addressing a concern.
1) Owner calls meeting of improvement team (comprised of Green Belts from original Six Sigma project team and/or nursing performance improvement committee members)
2) Team reviews recent cases/deviations from process
3) Team develops action plan
4) Owner reports plan to advisory group
5) Owner monitors execution of action plan and reports out to advisory group until satisfactorily completed

We placed high importance on several strategies for hand hygiene compliance as we saw a direct correlation between decreased infection rates and better hand hygiene compliance. We intended to send a clear message that this is everyone’s responsibility by sending a letter from the Chief of Staff and Chief Nursing Officer reminding faculty and staff of the no tolerance policy for not adhering to hand hygiene practices.

- **Embedded staff observations with immediate feedback.** We identified individuals already working in the PICU in various roles to regularly conduct observations, give immediate feedback for compliance or non-compliance, and report back to the program team to record on our dashboard. We provided an observation form (or the option of using the iPhone application iScrub) as well as a script to use with individuals who were non-compliant. Roles asked to complete observations included back-up attending physicians, advisory group members, and nursing infection control liaisons.

- **Signage.** Hand hygiene posters were displayed throughout the PICU and in the waiting room and restrooms. The posters were rotated monthly in order to make them more noticeable. In addition, signs were placed at the foot of each patient’s bed (“Hi, my name is ____. Please remember to wash your hands.”)

- **Communication.** We also worked with the Hospital Epidemiology department to distribute letters to praised performers and repeat offenders. One of these letters resulted in an invitation to present at a division’s grand rounds.

- **Families.** We encouraged parents and other family members of PICU patients to speak up if they believe any of the medical care providers did not wash their hands before entering their child’s room or before examining their child. Family educational materials were included in the PICU handbook and on the website.

Additional strategies included placing hand sanitizer bottles in convenient places, like the nurse’s cart and the ventilator, and routine follow-up conversations with staff caring for patients who obtain an HAI.

**Results & Lessons Learned**

During the two years, the VAP rate decreased by 65%; the CLABSI rate decreased by 28%; and the UTI rate decreased by 7%. The PICU went for over a year without a VAP during this timeframe. With our grant funds, we printed large banners that read, “Thank you for 377 VAP-free days in the PICU” and posted them outside the PICU entrances. The Performance Improvement & Patient Safety department sponsored a pizza party for PICU staff.

Despite increased awareness and several successes, we still see hand hygiene compliance below our target of 100% with a median of 75% over the last two and half years. We learned that constant vigilance is necessary to maintain awareness and enforce compliance. Regular nurse education is needed regarding the oral care kits specialized for pediatrics. In addition, we would like to do more to
Infection Prevention Tools

1. Hand hygiene observation form
2. How to be hand hygiene compliant
3. Mock Script for Non-Compliance
4. Hand hygiene posters
5. Letter from Chief of Staff and Chief Nursing Officer
6. Head of Bead Elevation Audit Form
7. Oral Care Audit Form
8. Central Venous Line Maintenance Audit Form
9. Central Venous Line Anesthesia Access Audit Form
10. Foley Catheter and Central Venous Line Days Since Insertion Sign

IMPROVING COMMUNICATION SYSTEMS

Implementation

To improve communication systems, we implemented two main strategies: 1) the Daily Goals Communication Sheet to ensure that the entire team understands the documented plan for the patient each day, and 2) a standardized approach to daily multidisciplinary rounds to make them more effective and efficient.

Previous studies have demonstrated that implementation of daily goals sheets can reduce ICU length of stay, improve caregiver understanding of patient care goals, improve mortality rate, and reduce ICU costs (see references). Several draft templates of the Daily Goals Communication Sheet were tested, and the fellows were identified as the owner of the sheets during rounds. As part of the implementation, we established a system of communication with new residents each month prior to their rotation and during their orientation.

In order to change the culture of bedside rounds, we used several strategies and set a goal to decrease overall time for rounds. A “second attending” was established so the primary attending physician on service could remain uninterrupted during rounds. An implementation team was identified to develop a standard structure and then test it multiple times. Part of the structure was determining and reminding the team of the ground rules (see list below). Laminated rounds templates were placed at the bedside. Like the Daily Goals Communication Sheet, new residents were notified of the structure prior to their rotation and trained about their role during orientation. The program team recorded a video of morning rounds on one patient to use for training purposes. The video is available on the PICU intranet.

Ground Rules for Multidisciplinary Structured Rounds
- Do not report normal limits.
• Avoid repeating items already reported (it’s acceptable to say “other than the drips already reported…”).
• Refrain from non-essential interruptions, such as discussing other patients or signing forms.
• Resident is responsible for RT/RN information if they are not available.
• Fellow should report Daily Goals.

Results & Lessons Learned
Through staff feedback surveys, we learned that 87% of individuals surveyed felt that the Daily Goals Communication Sheet improved communication and patient care in the PICU. Challenges that we continue to work on include communication with consult services and adaption for more patient/disease-specific goals.

The majority of staff reported that the standardized structure made rounds “better” or “much better”, and a smaller number reported rounds as being the same. No one said rounds were “worse” or “much worse”. Almost all staff members who gave feedback reported better team communication and/or efficiency, especially with making the long term plan clear, and including structured teaching and making that teaching useful. The time per patient decreased from baseline (11 minutes) to post-implementation (10 minutes) 10 months later.

We learned that it is challenging for some team members, such as respiratory therapists, to participate on rounds as well as to complete patient care tasks within the time they have available. After several months with the structure, it could still be more efficient and followed more consistently at night and on weekends. Some team members also find it challenging to balance teaching and problem-solving.

Communication Tools

1. PICU Daily Goals Communication Sheet
2. PICU Morning Briefing
3. PICU Multidisciplinary Bedside Rounds
4. Respiratory Therapist/ECMO Specialist/Nursing Rounds Report Template
5. Resident Physician Rounds Report Template
6. PICU Rounds Survey
7. Daily Goals Survey

PARTNERING WITH PATIENTS & FAMILIES

Implementation
Partnering with families involved several strategies throughout the two years. We recruited family members of recent PICU patients to serve as family advisors. They participated as members of the advisory group, attended focus groups, and/or served on teams to develop policies and materials. With
the family advisors, we developed a feedback survey that is distributed to families following their child’s stay in the PICU.

We used the feedback we gathered from families to inform several areas of the program.

- We instituted a grant-funded Parking and Meals Assistance program for families of patients who have spent at least 72 hours in the PICU and voice a financial strain. During the first year and a half of the program, we were able to provide 390 vouchers to 143 families. The vouchers are worth $8 and can be used at the parking deck or hospital cafeterias.
- Focus group participants chose a journal to give to parents with longer stays in the PICU (funded through another institutional grant).
- Family advisors wrote advice and guidance for other parents about what to expect during their stay in the PICU from their own experiences. Based on several requests, we included resources that allow families to support each other as well as financial tips. This information is included on the PICU website.

Through the PICU Family Update policy, we established the expectation that every family of a PICU patient should receive a daily update from a doctor and a nurse. The policy was developed as part of a Six Sigma project to improve communication between the health care team and families. Feedback from staff and families was that a more proactive approach to communication was needed. The Six Sigma project team included a family advisor as well as two bedside nurses, a fellow, the pediatric chaplain, and a family-centered care specialist.

Results & Lessons Learned

We measured patient and family satisfaction by 1) the percentage of people completing the feedback survey who said they would recommend the UNC PICU (mean 100%) and 2) the number of complaints reported to the Patient Relations department, which decreased from a mean of 1.9 complaints per month to a mean of 0.7 complaints per month.

As a result of the Six Sigma Family Communication project, 66% of families had daily documented communication from a doctor AND a nurse, a statistically significant difference from a baseline of 14%.

Finally, staff perception of patient and family centered care improved as indicated by a feedback survey conducted pre- and post- implementation of the strategies described above. Improvement was seen on all items:

- Open, honest, and clear communication among care team members and families.
- Partnering with families in the decision-making and provision of care.
- Policies and programs to promote family involvement.

More respondents reported that the PICU is doing above average or excellent (with patient and family-centered care) based on their experience in the PICU.

Although feedback related to hospital facilities can be difficult and take longer to address, we were able to respond to feedback from families about the PICU family meeting room by including it on the list of budgeted updates last year. The room was enhanced with new flooring, new furniture, and fresh paint. The many requests for sleep accommodations for family members will require a longer-term effort.
Our efforts to improve partnering with families in the PICU had widespread impact within our institution and led to program team members’ participating in the Institute for Patient and Family Centered Care intensive training seminar. As a result, there is a coordinated effort across hospitals to partner with families and identify staff roles to support these activities. The family centered care specialist from our program team is highly involved with this effort and was instrumental in obtaining a grant to support the development of the patient and family centered care program in N.C. Children’s.

We learned that identifying family members who are willing to help and participate in these efforts is relatively easy. However, coordinating their involvement is more difficult and time-consuming on the program management side. We found it challenging to schedule focus groups in order to accommodate various schedules, but even when we had low attendance, the feedback we received was forthcoming and extremely valuable. We found it effective to follow up with individuals who were not able to attend the focus group and gather their feedback through email or phone calls.

**Partnering with Patients & Families Tools**

1. PICU Questionnaire
2. PICU Family Update Policy
3. Ways to Participate in Your Child’s Care
4. What to Expect in the PICU
5. Josie King Foundation (Care Journal and free iphone app)
6. Partnering with families staff survey

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References


