Chapter 6  Timely Care Delivery

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In Crossing the Quality Chasm: A New Health System for the 21st Century, the Institute of Medicine established “timely” as one of the six dimensions of quality. “Timely” is defined as reducing waits and sometimes harmful delays for both those who receive and those who give care. 1 Crossing the Quality Chasm got significant public attention, as well as attention among healthcare professionals, leading to many interpretations of this dimension.

Paul Batalden, in the Institute for Healthcare Improvement 2009 Progress Report, stated: “…there are many principles of improvement that will and should withstand the test of time. We should focus on the basics—illness burden in individuals and populations, system performance (quality, safety, cost), and professional competence and joy in work—while enabling continual change.” 2 Timely care, particularly in the NICU, should be addressed using these basic principles.

NICU improvement teams look for a balanced approach to affect timely actions and responses: elimination of delays, balanced with dedicated time as appropriate, to thoroughly complete a patient care task or their improvement work. The clinical rationale for timeliness is to provide the right care at the right time, every time, without workarounds or excuses. The goal of this chapter is to describe the issues surrounding timely care delivery in the NICU and how the turnaround of critical tests and other important care processes can be improved.

Timeliness in Context of the NICU

In the NICU, timely care is often equated with quick, immediate action. This expectation of immediacy is visible every day in our NICUs, where time is a critical factor. Family expectations for a full-term, healthy baby are replaced with the anxiety and fear from suddenly having a very premature or very sick baby. What’s more, the clinical imperatives of transport, physician presence at delivery, diagnosis, consults, and treatment can conflict with the family imperatives of waiting to see, touch and hold their baby, waiting for interaction with the care team, waiting for results, and finally waiting for the baby to go home. Open communication about these different needs and the planning of the care delivery processes with the family helps to mitigate these conflicts.

Another issue surrounding timeliness is cost. Time spent, whether in work or rework, is a cost to organizations. Healthcare costs are expected to reach $4.3 trillion or 19.5 percent of the GDP by 2017. 3 This predicted rise in cost comes at the same time when hospital admission growth is in general slowing significantly. 4 In this environment, healthcare organizations tend to focus on the efficiency part of timeliness, such as
reducing staffing and increasing patient volumes, rather than on innovation and quality improvement. Often these efforts deflect the attention of healthcare providers away from delivering high-quality and safe care to patients.

Beyond the association of timely care with quick action and with cost-saving efficiencies, Webster’s online dictionary provides a definition of timely that is particularly relevant for the NICU. Webster’s defines timely as “occurring at a suitable or opportune time; well timed.” In complex environments such as the NICU, the appropriate timing of every action may be the most important consideration and can change the outcome of a life. True efficiency while delivering a care process is always a good thing; when engaging in something such as hand washing or parent education, effectiveness is obviously more important than haste.

**Aims and Measures for Improving Timeliness**

Several important standards and reports make it clear that timeliness is currently considered one of the most important aspects of healthcare quality. The Joint Commission standard, NPSG.02.03.01, addresses timeliness in patient safety goal 2C: “Measure and assess, and if appropriate, take action to improve the timeliness of reporting, and the timeliness of receipt by the responsible licensed caregiver of critical tests and values.” The emphasis on timely reporting of test results and other critical values is a primary way to improve timeliness in the NICU. As the aims and measures in Table 6.1 illustrate, one goal of the NICQ collaborative is to implement continuous assessment and measurement of processes related to timely reporting of results and delivery of care.

The Agency for Healthcare Research and Quality (AHRQ) has also provided some recommendations for addressing timeliness. In the 2007 National Healthcare Quality Report, AHRQ defines timeliness as “the health care system’s capacity to provide health care quickly after a need is recognized.” Three measures are referenced in the report, one of which has a direct impact on NICU patients and families: the interval between identifying a need for specific tests and treatments and actually receiving those services. The AHRQ report also relates the importance of timeliness to mortality and morbidity, stating:

- Lack of timeliness can result in emotional distress, physical harm, and higher treatment costs for patients.
- Timely antibiotic treatments are associated with improved clinical outcomes.
All of the teams in NICQ 2007 were positively influenced to organize their improvement work using clinical microsystem methodologies as described by Nelson, Batalden, and Godfrey in Quality by Design: A Clinical Microsystems Approach.⁷ There are two fundamentals of microsystem improvement that, in particular, relate to timeliness:

- Consider the development of a rhythm for the improvement work within the microsystem. From the daily huddles to the improvement team meetings to the annual department retreat; every staff member should be aware of what happens within their microsystem.
- Implementation cycles need to be shortened so that the benefit to the patient and family occurs in a more timely way. It is important to set a rigorous pace for both improvement and implementation.

Improvement work is often an add-on to a staff member’s current job. Leaders cite that available time is the issue. If improving the work is truly part of doing the work, planning among microsystem members, in particular leadership, is essential. Making time to assess, diagnose, and treat the microsystem is essential to successful and timely delivery of care.

Table 6.1 Sample Timeliness Aims and Measures for NICQ 2007

<table>
<thead>
<tr>
<th>Aims</th>
<th>Measures</th>
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| To improve processes of communicating changes and/or concerns in patient’s condition | • Staff satisfaction with revised communication processes  
• Night shift understanding and usage of the SBAR (Situation-Background-Assessment-Recommendation) technique |
| To administer antibiotics within one hour of admission by December 1, 2008 | • Time to ampicillin  
• Time to gentamicin |
| To ensure that 100 percent of families whose infants meet criteria will receive CPR education prior to infant discharge | Percent of families whose infants meet criteria who receive CPR education prior to infant discharge |
| To complete circumcision at least 24 hours prior to discharge | Circumcision time as compared to discharge time |
| To ensure that all a.m. labs will be drawn by 0400 and will be available to review during shift change at 0700 | Tracking time of lab draws and lab results available at shift change |
### Aims

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<tr>
<th>Aims</th>
<th>Measures</th>
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<tr>
<td>To decrease the time from when the echo/head ultrasound results were known by the attending physician to the time these results were shared with the parents to no longer than six hours</td>
<td>Tracking time results known by physician to time parents were informed</td>
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<tr>
<td>To stabilize neonates who are less than 30 weeks gestational age using Golden Hour Clock worksheet with practices completed within one hour</td>
<td>Completion of Golden Hour criteria</td>
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| To ensure full compliance with patient safety goal 2C – Measure and assess, and if appropriate, take action to improve the timeliness of reporting, and the timeliness of receipt by the responsible licensed caregiver, of critical tests and critical results and values | • Using a children’s hospital patient safety scorecard  
• Using NICU-based audits |

### The Case for Timeliness

A review of the NICQ anonymous error reporting identified numerous reported errors that were due to delays in care. The majority of these delays listed poor communication and lack of teamwork as contributing factors to the delays. High-performing organizations, including NICUs, focus on failure in order to continually improve.⁷

Consider what could be done to eliminate the following errors:

- **Delay in consult:** A pulmonary consult for an infant being discharged is ordered. No response was received and the discharge was delayed by 48 hours. Despite the wait, the infant was discharged on oxygen *without* the consult being completed.
- **Delay in consult:** Waited three days for an ordered ophthalmology consult before the family was discharged and had to take the shuttle to another campus for the eye exam to be completed. The reporting staff felt that the discharge and equipment education were compromised.
- **Communication failure:** Attempted to move an infant who was to be withdrawn from support into another room after discharge. The move was delayed by two hours while the family waited for environmental services, causing anxiety among the family members.
Case Study
Timeliness is a critical component of all care delivered in the NICU. Consider the shared achievements of colleagues such as Yakima Valley in NICQ 2007 to begin or enhance your efforts to improve the timeliness of care for patients and families in your NICU.

BACKGROUND
Early, aggressive nutrition is well supported in literature as being imperative in the management of the very low birth weight (VLBW) infant, defined as birth weight < 1.5 kg. A 26-week gestational age premature infant receiving only dextrose will deplete 1 to 2 percent of endogenous protein stores daily, while it would accrue over 2 percent daily in utero. Studies show that high-dose amino acid administration immediately after birth is safe and limits catabolism, preserves endogenous protein stores, improves nitrogen balance, decreases the incidence of growth failure, and improves glucose tolerance.

This study was carried out in a 15-bed NICU within a 225 bed nonprofit community hospital. The NICU had 275 admissions in 2006, including 27 VLBW infants. Parenteral nutrition is prepared once daily in the inpatient pharmacy. Using standardized administration times, up to 24 hours can pass before patient specific parenteral nutrition can be started.

The study objectives were: 1) Primary outcomes: Reduce time to initiation of parenteral nutrition in VLBW infants and administer amino acid containing parenteral nutrition as the first IV fluid after birth; 2) Secondary outcomes: Reduce time for the infant to return to birth weight, days of parenteral nutrition, and length of stay.

METHODS
Beginning June 1, 2006, a “vanilla” starter parenteral nutrition was implemented. The mixture is called “vanilla” because it is clear in color unlike other parenteral nutrition with vitamins. This premade mixture for newborns is non-patient-specific and consists of 10 percent dextrose, 2 percent amino acids, and 1 unit/ml heparin. It is prepared in volumes of 250 mL with an expiration date at 14 days.

The pharmacy was alerted to an anticipated delivery of a VLBW infant, and removed one of the two premade vanilla starter solutions. It was hand-labeled with the patient’s name and sent to the NICU, to be used as the first IV fluids after IV access was obtained.

The vanilla starter solution program was implemented June 1, 2007. The study groups consisted of an historical control group of VLBW infants from February 2006 to May 2007, with data collection via retrospective chart review, and all VLBW infants admitted from June 2007 to May 2008 for whom prospective chart review was conducted.
RESULTS AND DISCUSSION

Data were collected on all VLBW infants in the designated time period. There were no significant differences in gestational age or birth weight between treatment groups.

The median time after birth to initiation of parenteral nutrition was 16.2 hours (the range was 2.3 to 25.4 hours) in the historical group, versus 1.4 hours (range 0.95 to 3.4 hours) in the prospectively studied group. This represents a 91 percent reduction in time to initiation of parenteral nutrition after birth for the second study group.

The cost of the service was found to be low, with the estimated annual cost of unused vanilla bags being less than $250. An additional benefit of the vanilla solution was fewer entries into IV lines since parenteral nutrition was started immediately after IV access was obtained, thus decreasing risk of contamination and infection. It was found that extremely low birth weight infants could not tolerate the 10 percent solution and a 5 percent dextrose vanilla solution has since been added.

Use of a premade “vanilla” parenteral nutrition solution significantly reduced time to parenteral nutrition initiation in VLBW infants in a community hospital, meeting the goal that all VLBW infants receive parenteral nutrition as the first intravenous fluids following birth.

Conclusion

Each NICU in the 2007 NICQ collaborative contributed to the body of knowledge in improving timely treatment, results and access to care. This knowledge is accessible and available to all who are interested. Although the authors of Crossing the Quality Chasm did not offer a simple prescription for improving timeliness or any other dimension of healthcare, this report provides a vision of what is possible and the path that can be taken.

References


Case Study References
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