A Multidisciplinary and Multifactorial Approach to Increasing Neonatal Intensive Care Unit (NICU) Newborn Individualized Developmental Care and Assessment Program (NIDCAP) Referrals
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Aim:
The aim of this Quality Improvement project is to increase the number of NIDCAP referrals for qualifying infants to 50% by May 31, 2014.

Setting:
One Level IV Neonatal Intensive Care Unit (NICU) at a leading pediatric tertiary care facility in the Midwestern United States.

Mechanisms:
Only 17% of eligible infants were referred in 2012. A multidisciplinary team designed and implemented this Quality Improvement project. Institute for Healthcare Improvement (IHI) Model for Improvement was utilized.

Methods:
Potential barriers to referrals were identified and addressed. Changes were made to the referral process and documentation in the Electronic Medical Record, (EMR). Providers and nurses were informed of the changes and referral criteria at multiple times and in multiple ways. A member of the NIDCAP team attended weekly multidisciplinary rounds.

Measures:
Data was collected in the Research Electronic Data Capture (REDCap™). Comparison was made with the NICU data base. Final analysis was done using R Statistical Software.

Data/Results:
As of May 31, 2014, the target outcome was met: 52.3% of the infants meeting inclusion criteria of 32 weeks or less upon admission received a NIDCAP referral.

Discussion:
Infants born at ≤ 32 weeks gestation are at risk for developmental delays. Newborn Individualized Developmental Care and Assessment Program (NIDCAP) improves parental satisfaction, minimizes developmental delays, and decreases length of stay. Many strategies contributed to the increased referral rate in this NICU. More infants will now benefit from the NIDCAP framework for providing developmentally supportive care.
Figure 2

Secondary Objective #1: Comparison of the length of stay for infants enrolled in NIDCAP to the length of stay for infants not enrolled in NIDCAP
Figure 3

Comparison of gestational ages upon admission between those infants enrolled in NIDCAP and those not enrolled in NIDCAP
Figure 4

**Secondary Objective #2: Association between Elapsed NIDCAP Enrollment Time (NIDCAP referral date – NICU admit date) and Length of Stay**

While the association between time elapsed before NIDCAP enrollment and length of stay was not statistically significant ($r = 0.17, p > 0.05$), Figure 4 shows a "trend" toward increased length of stay with more elapsed time prior to NIDCAP enrollment. A larger sample size may have revealed more statistically significant findings. The trend suggests, however, that earlier referrals to NIDCAP may lead to shorter length of stays.
A Multidisciplinary and Multifactorial Approach to Increasing NICU NIDCAP Referrals

Clinical Problem
- Infants born at 32 weeks gestation are at risk for developmental delays
- Newborn Individualized Developmental Care and Assessment Program (NIDCAP)
- Improves parent satisfaction
- Minimizes developmental delays
- Decreases length of stay
- Only 17% of infants admitted to the Children's Hospital Colorado NICU at 32 weeks gestation received Developmental Care during the first quarter 2012

Objectives
- Increase NIDCAP referrals for qualifying infants by May 31, 2014
- Secondary Objectives:
  - Compare length of stay for eligible infants receiving NIDCAP with those that did not
  - Compare timing of initiation of NIDCAP
  - Investigate influence of number of NIDCAP assessments on length of stay
  - Investigate frequency of referrals by nurses, and identify possible gaps in educational efforts

Methods
- Developed an organization-wide quality improvement (QI) project in one Level IV Neonatal Intensive Care Unit (NICU) at a birthing pediatric tertiary care facility in the Midwest United States
- Presented project to unit QI team
- Identified potential referral barriers
- Resolved suspected referral barriers
- Changed order from "Developmental consult" to "NIDCAP consult"
- Restructured referral process by adding NIDCAP consult to admission order set
- Identified providers of referral criteria and changes to ordering at multiple times and in multiple ways (i.e., email, staff meetings)
- Utilized admission gestation of ≥ 22 weeks
- Initial admission weight of ≥ 1600 grams
- Infant with significant developmental concerns
- Presented project at nursing staff meetings
- Requested nurses to identify and refer infants using the NIDCAP assessment tool
- Updated QI care pathway
- Collected data in the Research Electronic Data Capture (REDCap) for final analysis
- Provided updates in quarterly NICU Newsletter

Results
- NIDCAP referrals increased to 53.3% by May 31, 2014
- Trend toward lower length of stay with earlier referral (within a few days of birth)

Implications
- Necessary elements to affect change include:
  - Focused alignment with organizational goals
  - Engagement of a multidisciplinary team that includes leadership, education of staff, and awareness

Conclusions
- Multifaceted approach resulted in increased referral rate
  - More infants now receiving benefits of NIDCAP
  - Sustaining efforts require:
    - Ongoing presence at weekly multidisciplinary rounds
    - Education via multiple avenues for bedside nurses and providers
    - Collaboration with multiple disciplines
    - Changing the culture of Developmental Care in the NICU is a continuous process, and must be relationship-based.