

Reducing rates of severe retinopathy of prematurity (ROP) in the NICU

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Background

Doernbecher Neonatal Intensive Care Unit had higher severe (stage 3 or plus disease) ROP rates when compared to other like institutions in the Vermont Oxford Network.

Aim

By December 2015, the DNCC will reduce rates of severe ROP from 15% to less than 10% in patients with a birth weight of less than or equal to 1500 grams.

Setting

46 bed – pod system, Level IV, Academic Medical Center, Regional Referral Center, Magnet Recognized. On average, we have 536 admissions with 92 VLBWs annually; 86% inborn, case mix with cardio thoracic and surgical patients. There is a hospital-based pediatric and neonatal critical transport team.

Mechanisms

- No current oxygen titration standard
- Order set in electronic health record (EHR) does not correlate with monitor default setting
- No formal utilization of histogram during bedside report to identify patients above or below target oxygen saturations
- No formal discussion of ROP during daily rounding for at-risk patients
- No information on current ROP rates or benchmarking data readily available to staff

Drivers of Change

- Standardize an oxygen management guideline (figure 2)
- Develop achievable compliance goals for saturation target (figure 2)
- Use histogram information during report to discuss trends and create conversations with team regarding potential changes needed to oxygen/ventilation management of infant (figure 2)
- Incorporate education regarding long term effects of ROP with the care team, specifically the impact ROP has on the life of patients and their families. (figure 2)

Methods

- Identified need for general ROP education and placed in online staff education modules
- Histogram education developed and placed in online staff education modules
- Developed Rounding Checklist & ROP added discussion added for at risk infants
- Readjusted bedside monitor default settings to reflect new oxygen saturation parameters
- Created EHR order set reflecting new oxygen saturation parameters
- Created Oxygen Management Guideline to standardize approach to desaturations (figure 1)
- ROP data incorporated into DNCC Safety Dashboard

Measures

- Process:
 - Bedside report audits of Histogram utilization
 - Percentage of EHR orders matching monitor oxygen saturation parameters
 - Percentage of DNCC staff reviewing general ROP education in online modules
 - Percentage of DNCC RN's passing Histogram online competency module
 - Percentage of Oxygen Management guideline compliance for at risk infants
- Outcome: The rate of severe of ROP compared to other like centers in the VON database
- Balancing: Alarm fatigue (measure in development)

Data

- 2013 DNCC severe ROP rates for infants \leq 1500 grams = 15%
- Baseline data August, 2014, for infants \leq 1500 gms infants with severe ROP (stage 3 or greater, and/or plus disease) = 15%
- Data collected in April, 2015, = 7% severe ROP in this population (January 2015 – April 2015 data).
- 2015 compiled data to be determined at year ending
- Downward trend displayed in Run Chart (figure 3)

Results

- Oxygen Management Guideline implemented, continuing to undergo revisions in real time
- Visual reminders made and placed on monitors to alert staff when at risk infant in need of oxygen management
- Placed quick-tip educational cards on informational wall in each pod regarding guidelines.
- Results of staff completing general ROP education – 100%
- Results of staff completing Histogram competency and with a passing goal of 100% = 100%
- ROP outcome measures posted into Safety Dashboard
- Tracking compliance of new oxygen management guideline adherence.

Discussion

There has been great success in decreasing severe ROP rates in infants less than or equal to 1500gms after implementation of specifically identified ROP education, histogram training, and an oxygen management guideline. ROP is multifactorial and these listed interventions are few of many components to decreasing severe ROP rates in the DNCC. Although ROP is still not fully understood, other known factors contributing to ROP include infection, specific diagnostic factors, gestational age at delivery, low birth weight, and transfusions. Many of these factors are not within our control and we have identified consistent oxygen management as an area which can be addressed and improved, having a positive impact on ROP outcomes. All risk factors have not fully been assessed within this team, but will be considered in next steps moving forward to decrease ROP rates in the DNCC. Increased alarm fatigue, resulting from narrowed oxygen saturation parameters, has become a concern for staff and has presented an unforeseen challenge. Next steps are to perform another audit of oxygen management compliance and collect data to measure alarm rates post oxygen management guideline implementation. Daily interdisciplinary discussions during rounds and histogram review on at risk patients are opportunities for further improvements.

Key Words: ROP, Histogram, Oxygen Management, Competency, Order Sets

Figure 1

Oxygen Management Guidelines

Maintain Saturations 88% - 95%

For babies born $\leq 33 \frac{6}{7}$

Saturation	Time in Range	Oxygen Adjustment
88% - 95%		0%
80% - 87% or 96% - 99%	60 seconds	↑ 2% or ↓ 2%
70% - 79% or 100%	60 seconds	↑ 5% or ↓ 5%
69% or less	30 seconds	↑ 5%

This guideline will remain the same for the entire length of stay when using oxygen.
Please use your clinical judgment and intervene as needed with suctioning, repositioning, etc.

Figure 2

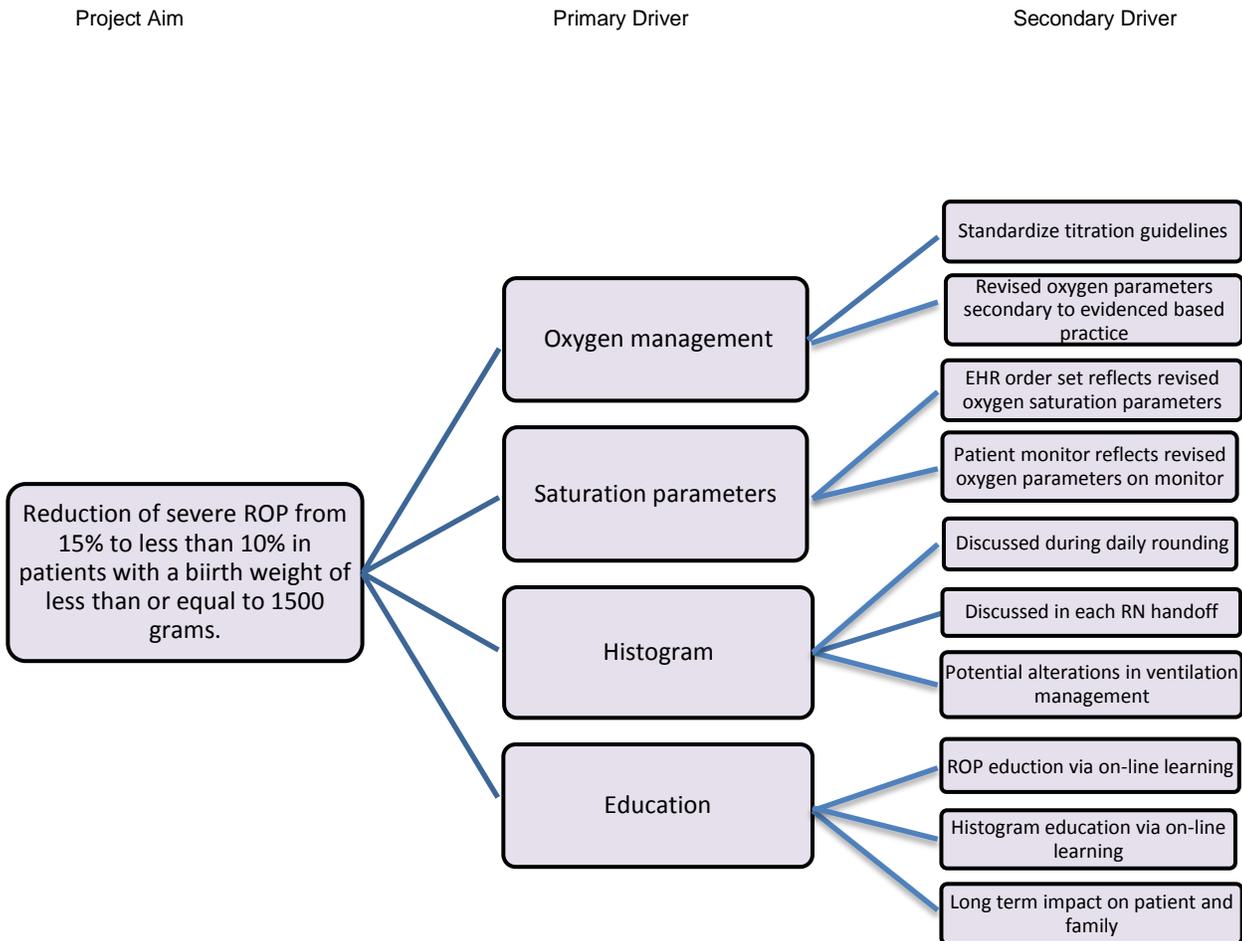


Figure 3

