Introducing Oxygen Saturation Guidelines in Boston Medical Center's Neonatal ICU

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INTRODUCTION

- Long-standing debate regarding appropriate amount of supplemental oxygen for preterm infants
- Recent studies suggest 90-94% O2 saturation (SpO2) target
- Oxygen toxicity (above 94%) correlates with chronic lung disease (CLD) and retinopathy of prematurity (ROP)
- Insufficient oxygen levels (below 90%) are associated with necrotizing enterocolitis (NEC) and mortality

- Boston Medical Center (BMC) NICU: higher NEC rates than national average
- Each NICU patient's SpO2 is continuously monitored by pulse oximetry
- Patient monitors are alarmed and sync to phones that each nurse carries; nurses are notified when patient vital signs are outside the desired range
- Respiratory therapists (RT) are also trained and authorized to assist with oxygen delivery
- Prior to this project, alarm limits were set at 86-95% for infants born before 29 weeks gestational age (GA)

CAUSE AND EFFECT DIAGRAM

- Developed during an interdisciplinary team meeting prior to making project changes

AIM AND MEASURES

Aim statement: reduce the percentage of low saturation values to less than 10% by end of September 2017

- Outcome measure: percentage of time spent at low saturation values
- Process measures: percentage of alarm limits changed appropriately, frequency of RN/RT “check-ins”
- Balancing measures: percentage of time spent above 94%, RN, RT and other staff satisfaction

CHANGES MADE

1. Before week 9: Raise lower alarm limit (formerly 85-95% per NICU policy handbook, modified to 87-96%) for any infants receiving supplemental oxygen and controls for the project

   - Gestational Age (GA) and Oxygen saturation (SpO2) Target
   - SpO2 Monitor Alarm Limits
   - GA at birth < 34 weeks
   - 90-94%
   - 87-95%

2. Before week 9: Increase collaboration with respiratory therapy staff. Require “check-in” at beginning of shift, RN and RT to discuss collaboration and each infant’s case

3. Before week 12: Remind team members of revised oxygen range using laminated reminder cards at each patient’s bedside (example shown below)

4. 3 respiratory therapists responded and all commented that their interaction with the nurse was “positive”

<table>
<thead>
<tr>
<th>Selected Staff Comments</th>
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<tr>
<td>[The RT was] very helpful, what I need</td>
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<tr>
<td>I liked the intervention (check-in)</td>
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<tr>
<td>When it changed the infant’s settings, RT was made aware</td>
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STAFF RESPONSE TO RESPIRATORY THERAPY COLLABORATION

- 10 of 17 nurses responding to the survey were approached by respiratory therapy at beginning of their shift. Of these:

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