Retinopathy of Prematurity and Oxygen Within Limits (OWL)
Nursing Interventions in Very Low Birth Weight Infant
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Background
1. Retinopathy of Prematurity (ROP) is a proliferative neo-vascular disorder of retinal development that can lead to impaired vision and blindness.
2. Risk factors for the development of ROP include: prematurity and exposure to supplemental oxygen.
3. AAP recommends ophthalmologic examination in infants:
   a. born < 30 wks. or with birth weight <1500 gms
   b. infants with GA < 33 weeks with specific risk factors such as sepsis, extended use of mechanical ventilation with supplemental oxygen, iNO, and surgery.
4. Tight control of oxygen saturation leads to decreased incidence of severe ROP in very preterm infants.
5. Each NICU can establish screening criteria based on their experience.

Objectives
1. Educate staff on impact of oxygen exposure on ROP.
2. Increase compliance with O₂ saturation limits for very low birth weight premature infants at risk for ROP.
3. Evaluate and improve percentage of time infants spend in desired O₂ saturation range.

Problem
Minimal compliance with setting oxygen saturation alarm limits on monitor, initially set at 97%.
1. Significant rate of severe ROP requiring laser therapy based on VOX benchmark.
2. Concern over alarm fatigue and lack of response to alarms.

Implementation-Reinstate 2011 Guidelines
1. Re-educated staff to set limits on monitor 85-97%
2. Laminated signs at all bedsides, monitors, and ventilators
3. Monitored compliance
4. Determined percentage of time within desired range from printed histogram

5 Month Evaluation
Infants were in the appropriate oxygen saturation range (85-95%) for ~60% of the time regardless of postnatal age. Oxygen saturations were too high (>95%) for 1/3 of the time.

Results
Compliance with Set Limits
1. Saturation limit reduced to 95% on December 10, 2015.
2. Compliance was initially poor (<10%) and improved over time consistently great than 80% by July, 2016.
3. The average daily number of erroneously set upper saturation limit decreased from 14 to <2/day.

Revised Guideline Methods
1. Reviewed literature on recommendations for oxygen saturation goals and educate nursing staff.
2. Discuss histograms results with nursing personnel.
3. Continued to monitor compliance.
4. Avea ventilator has increase supplemental O₂/suction button which increases supplemental O₂ by 20% above baseline (i.e. 25% FiO₂ to 45% for 2 minutes) and then abruptly returns to baseline level of supplemental oxygen.
5. Discourage use of this button unless emergency and changed setting to 5% above baseline (i.e., 25% to 30%)