

Abstract Title:

Improving Pulse Oximetry Alarm Limit Compliance Rate in a Level III NICU

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Abstract Description:

Background: The Joint Commission Sentinel Event publication (2013) showcased the importance of medical device alarm safety in hospitals. Compliance with pulse oximetry alarm limits has been identified as an area for improvement in our NICU. Inconsistencies were observed in both ordering and complying with ordered O₂ saturation limits.

Objective:

Primary Aim: Decrease variability of pulse oximetry alarm limits and achieve > 80 % compliance with the ordered settings.

Secondary Aim: Decrease Retinopathy of Prematurity (ROP)/Chronic Lung Disease(CLD) over 2 year cycle. **Design:** After achieving faculty consensus for target pulse oximetry levels, compliance to new alarm targets was measured at baseline and after interventions. **Setting:** HUMC

Patients: Infants admitted to the NICU, October 2016-August 2018 **Interventions:** Education materials (BOOST/SUPPORT Trials), group lectures for all staff, reminder cards at bedsides were initial interventions. During PDSA cycle#2, reminder emails and 1:1 real-time discussions were instituted.

Measurements: Information including gestational age (GA), respiratory support and accuracy of alarm limit settings was collected as the baseline data. Unannounced random audits were performed for post-intervention data. Compliance percentage was calculated for all infants. Infants ≤32 weeks GA were analyzed as a subgroup. CPQCC database provided ROP rate.

Results: Baseline data collected over 2 weeks in 10/2016 (47 observations) revealed wide variability in O₂ saturation alarm limit settings with only 19% (9/47) compliance with the newly established targets. After initial interventions, random audits from 12/2016 to 1/2017 showed

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improvement from 19% to 42% (49/117) in adherence to target levels in all patients. In ≤ 32 weeks GA infants, rates were 56% (21/37). PDSA cycle #2 began with reinforcement of target levels via 1:1 reminders. Unannounced audits from 3/2017 to 12/2017 showed an additional increase in compliance with alarm limit settings from cycle #1: 42% to 73% in all patients (19/26) and 56% to 65% in infants ≤ 32 weeks GA. Sixty-five random observations were made during Sustainability Phase (2/2018 to 8/2018) with an overall compliance of 76%. ROP, especially severe ROP, rate decreased from 2016 baseline of 17.2% to 8.6% in 2017.

Limitations: Limitations included underestimation of compliance rates due to a small sample size and inability to confirm that all team members read educational materials in email communications.

Conclusions: Compliance with the set pulse oximetry alarm limits improved for all patients, with an associated decrease in ROP rate from 2016 to 2017. The 2018 CPQCC data is still preliminary and awaits confirmation.