

## **Alarms, oxygen saturations, and SpO2 averaging time in the NICU**

McClure C, Jang SY, Fairchild K. *J Neonatal Perinatal Med.* 2016;9(4):357-362. doi: 10.3233/NPM-16162.

**Background:** Alarm overload is a significant concern in the Neonatal Intensive Care Unit (NICU). Selecting a longer oxygen saturation (SpO2) averaging time will reduce the number of alarms but may mask fluctuations in oxygenation.

**Objective:** Characterize bedside monitor alarms in the NICU and estimate the impact of longer SpO2 averaging time and alarm delay.

**Methods:** All bedside monitor alarms were analyzed over a 12-month period in the University of Virginia NICU, using the default averaging time (8 seconds) and SpO2 alarm limits set at 88-95% for infants on supplemental oxygen. In 10 VLBW infants, SpO2 averaging time was lowered to 2 seconds for 24 hours and events of SpO2 out of the target range were estimated with 2-, 8-, or 16-second averaging time, with and without a 15-second alarm delay.

**Results:** There were 3,263,590 alarms in the unit over 12 months. Low or high SpO2 alarms constituted 79% of the total, and 55% of these events lasted <15 seconds. In 10 infants we estimated that increasing SpO2 averaging time from 2 to 16 seconds would have led to 53% fewer SpO2 alarms but the mean duration of alarms would have been 2.15-fold longer. Adding a 15-second alarm delay to 2-second SpO2 averaging in this analysis decreased SpO2 alarms by 67%.

**Conclusion:** Longer SpO2 averaging times mask the number and severity of events of aberrant oxygenation in preterm infants without decreasing total alarm time. Incorporating an alarm delay with shorter SpO2 averaging times can reduce alarm number and duration, and allow more accurate assessment of oxygenation, which may be important for research into consequences of aberrant oxygenation in this vulnerable population.