

Avoiding Hyperoxemia During Neonatal Resuscitation: Time to Response to Different SpO₂ Monitors.

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Introduction

One to two percent of all births require aggressive therapeutic interventions such as neonatal resuscitation.¹ Neonatal resuscitation can lead to hyperoxemia and oxidative stress if excessive inspired oxygen (F_iO₂) is given however, so close monitoring of oxygen saturation values of these patients is necessary to avoid high SaO₂ values. Neonates are prone to exhibit motion and have low perfusion, both of which affect the accuracy and ability to obtain readings with most pulse oximeter technologies. In this study, the investigators tested the time it took for three different pulse oximeter technologies, the Masimo SET Radical, the Nellcor N-395 and the Ohmeda Biox 3700, to obtain stable oxygen saturation readings in newborn infants receiving resuscitation.

Methods

Nineteen newborns from the delivery room and five from the NICU, who required resuscitation, were used for the study. During each resuscitation, two sensors for two different pulse oximeter technologies were applied to the feet or left palm or wrist of the patient. There were 24 resuscitation events during the study. The pulse oximeters used were the Masimo SET Radical with an LNOP Neonatal sensor (n = 24), the Nellcor N-395 with the Oximax-N sensor, (n = 9) and the Ohmeda Biox 3700 with disposable neonatal sensor, (n = 15). The time for each pulse oximeter to reach a stable reading was measured with a digital stop watch and recorded.

Results: Time to Obtain a Stable SpO₂ Reading During Resuscitation

	Mean +/- std (sec)	Median (sec)	Range (sec)
Masimo Radical (n =24)	21.7 +/-7	21	18 - 32
Nellcor N-395 (n = 9)	67.3 +/- 13	71	40 - 89
Ohmeda 3700 (n = 15)	74.2 +/- 12	76	40 - 98

Discussion and Authors' Conclusions:

A fast and accurate SpO₂ reading during newborn resuscitation is essential because even brief exposure to excessive oxygen may result in damage to the immature lung. This study shows that the Masimo SET Radical pulse oximeter was significantly faster at obtaining stable oxygen saturation readings during infant resuscitations compared to the other two other pulse oximetry technologies. The authors of this study conclude: "Adequate and clinically useful reading of SpO₂ is possible during newborn resuscitation. The time to stable and adequate reading is significantly different between SpO₂ monitors. The SpO₂ monitor with the fastest response time would allow for more rapid adjustments of F_iO₂ during resuscitation and avoid unnecessary exposure to hyperoxia".

1. Leone TA, Finer NN. Neonatal Resuscitation: Beyond the Basics. Neo Reviews 2005; 6(4):e177-83.