

The Impact of Masimo SET® Pulse Oximetry on the Reduction of ROP

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Retinopathy of Prematurity (ROP) is one of the most severe complications associated with the care for preterm infants. Although ROP may not yet be entirely preventable, the standard of care has proven critical in keeping the incidence and severity of this disease to a minimum.

The major risk factor is the degree of the prematurity, but there are many other associations. Hypoxia, hyperoxia and fluctuations of the arterial oxygen tension, even within the normal range, have all been implicated as etiological factors. This led us to believe that if we had a tighter control on the amount of oxygen that our patients received, we could significantly reduce the fluctuations in arterial oxygen tension.

In order to accomplish tighter control of oxygen, strict guidelines in the practice of increasing and weaning of FiO₂ and the monitoring of oxygen saturation were implemented throughout the infant's hospitalization, including the delivery room, and during transport.¹ Accurate feedback relating to the patient's oxygen saturation was a critical step to ensuring the effectiveness of our program. As such, we were very interested in incorporating an accurate, reliable pulse oximetry technology that would not be affected by motion and low perfusion, and thus work effectively for this challenging patient population.

Our clinical staff compared the performance of different oximeters - Ohmeda 3800, Nellcor N395, Philips/HP Viridia (Merlin) and Masimo SET Radical - particularly during challenging conditions often seen in the NICU. We selected Masimo SET (Signal Extraction Technology) because we concluded that it was more reliable during these special conditions.

After we installed Masimo Radicals, our ability to accurately monitor oxygen saturation improved dramatically. The response time of Masimo oximeters is noticeably faster, which is especially important during desaturations where every second counts. Masimo SET oximeters are also more accurate and reliable, avoiding unnecessary interventions and the nuisance of false alarms.

The table shows the incidence and trending of ROP III-IV and ROP surgery at Cedars Sinai Medical Center (CSMC) over a four-year period, as compared with the Vermont Oxford Network's (VON) data - the VON is a non-profit voluntary collaboration of over 380 NICUs of varying sizes that maintains a database including information about the care and outcomes of high-risk newborn infants.

| | 400 - 1500 grams ROP III - IV | | 500 - 1500 grams ROP Surgery | |
|-----------------|----------------------------------|-------|---------------------------------|--------|
| | CSMC | VON | CSMC | VON |
| 1997 | 12% | (10%) | 4.5% | (3.0%) |
| 1998 | 8% | (8%) | 1.5% | (3.0%) |
| 1999 | 4% | (8%) | 1.5% | (3.4%) |
| 2000 to present | 2.6% | N/A | 0% | N/A |

DISCUSSION:

We believe that the use of Masimo SET technology, especially with neonates, where motion and low perfusion are common, has helped our efforts to adhere to the oxygen titration guidelines in order to reduce severe ROP in the extremely low birth weight infants in our unit. This newborn's life was likely saved by Masimo SET pulse oximetry.

1. Chow LC, Wright KW, Forbis S, Sola A. Can Changes in Clinical Practice Decrease the Incidence of Severe Retinopathy in Extremely Low Birthweight Infants?. *Pediatric Research* 2001;49(4):400A/2081

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