

Improved Pulse Oximeter Technology Changes Caregiver Practice Patterns: Masimo SET vs. Conventional Pulse Oximetry

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Introduction


“Monitors provide data upon which decisions about patient care are based. ICU practice patterns have been based largely upon the technology incorporated in monitoring systems.” Using the Masimo SET pulse oximeter these researchers sought to test the hypothesis that improved technology would change clinicians’ practice patterns.

Methods

Masimo SET pulse oximetry and conventional pulse oximetry (CPO) were prospectively studied on 68 adult post-op CABG patients. On arrival in the ICU, both the CPO (Ohmeda 3740) and Masimo SET pulse oximeters were applied to the same hand of the patient. Data from the pulse oximeters were continuously collected via computer until 4 hours post extubation or for a maximum of 24 hours. Patients were randomly assigned to have only one of the devices available on the computer display to the bedside caregivers with the other device “blinded”. No other clinical management was altered. The following were determined: time until weaning to $F_iO_2 = 0.4$, time until extubation and the number of ABGs obtained during weaning. Differences were analyzed using Student's t test. Significance was determined at $p < 0.05$.

Results

There was no significant difference in time to extubation [647 ± 335 (Masimo SET) vs. 705 ± 338 (CPO) minutes] or ventilator changes [2.6 (Masimo SET) vs. 2.5 (CPO)] in weaning to $F_iO_2 = 0.4$. However, there was a significant difference in the time to wean oxygen to $F_iO_2 = 0.4$ and the number of ABGs obtained when the Masimo SET pulse oximeter was used. See table below.

	 Masimo SET	CPO	Significance
Weaning time to $F_iO_2 = 0.4$	168 ± 66 min.	324 ± 263	$p = 0.02$
ABGs per patient (weaning to $F_iO_2 = 0.4$)	2.2 ± 0.9	3.8 ± 1.8	$p = 0.01$

Authors' Discussion and Conclusion

“Our data supports the hypothesis, that clinician's practice patterns will change when provided with improved pulse oximetry technology as with the Masimo SET pulse oximeter. The number of ABGs obtained and the time to wean to a low F_iO_2 was nearly half. This change in practice reduces the costs of oxygen supply and delivery and the associated risk of morbidity from excessive oxygen exposure. Clinicians achieved these efficiencies while decreasing the number of blood gases obtained. This change in practice could result in a savings of over 1200 ABGs in our cardiac intensive care annually. While accuracy of monitored data is often reported in studies of monitors, impact on caregiver behavior is a more relevant method of monitor evaluation.”