Rad-5 and MRL SpO2 Comparison Trial: A Prospective Analysis of Pulse Oximetry During Air Transport.

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Objectives

In a continuing effort to attain an evidence based standard of care with pulse oximetry monitoring, the Clinical Operations Team at REACH, Mediplane Inc. (Santa Rosa, CA) conducted a prospective study of portable SpO2 monitors during air transport of critically ill patients. The devices under review were the RAD 5TM (Masimo Corporation, Irvine, CA) and the Welch Allan MRL SpO2, the pulse oximeter currently at use in REACH operations.

Methods

The RAD 5 was placed on 3 different ships, the Bell 407, the Agusta 109 and the Cessna 421, which represent each airframe operated in the REACH fleet. This ongoing, prospective review was initiated 1 January 2007 and concluded on 27 March 2007. For the RAD 5, clinical crew members were educated on the operation and proper sensor placement according to the recommendations in the product DFU. Flight crews were instructed to use both oximeters during 100% of patient encounters, placing them on the patient "at time of contact." This was to ensure that a baseline SpO2 reading was obtained prior to initiating pharmacologic or other therapeutic interventions. Product failure was defined as failure to obtain a reading based on inadequate tissue profusion (physiologic failure).

Results

During the 3-month trial period, the pulse oximeters were evaluated on a total of 158 missions. The patient population was comprised of: 57% adult, 34% pediatric and 9% neonatal. Of these missions, 51 patients demonstrated clinical signs of hypoxemia with correlating findings on oximetry. Physiologic failure rates were MRL – 9 (5.7%) and RAD 5 – 4 (2.5%). Of these, both devices failed to obtain readings on 2 patients. This leaves independent system physiologic failure of MRL – 7 (4.4%) and RAD 5 – 2 (1.3%).

Conclusion

In a review of physiologic failure during air transport, the MRL had a 5.7% failure rate while that of the RAD 5 was 2.5%. The result was a more than two-fold increase in failure rate of the Welch Allan MRL oximeter over the Masimo RAD-5 oximeter.