

More Reliable Oximetry Reduces the Frequency of Arterial Blood Gas Analyses and Hastens Oxygen Weaning after Cardiac Surgery: A Prospective, Randomized Trial of the Clinical Impact of a New Technology.

Durbin C.G .Jr., Rostow S.K. *Crit Care Med.* 2002 Aug;30(8):1735-40.

Introduction

Objective: Evaluation of the impact on clinical care of improved, innovative oximetry technology.

Design: Randomized, prospective trial.

Setting: Post cardiac surgery intensive care unit in a major teaching hospital.

Methods

Patients: A total of 86 patients after undergoing coronary artery bypass surgery.

Interventions: All patients were monitored with two oximeters, one employing conventional oximetry (conventional pulse oximeter, CPO) and one using an improved innovative technology (innovative pulse oximeter, IPO), on different fingers of the same hand. The outputs from both devices were collected continuously by computer, but only one device was randomly selected and displayed for clinicians.

Results

The amount and percentage of nonfunctional monitoring time was collected and found to be much greater for the CPO than the IPO (8.7% +/- 16.4% for CPO vs. 1.2% +/- 3.3% for IPO, $p = .000256$). Time to extubation was not different between the two groups (634 +/- 328 min for IPO vs. 706 +/- 459 min for CPO). Clinicians managing patients with the more reliable IPO weaned patients faster to an FIO₂ of 0.40 (176 +/- 111 min for IPO vs. 348 +/- 425 min for CPO, $p = .0125$), obtained fewer arterial blood gas measurements (2.7 +/- 1.2 for IPO vs. 4.1 +/- 1.6 for CPO, $p = .000015$), and made the same number of ventilator changes during this weaning process (2.9 +/- 1.2 for IPO vs. 2.9 +/- 1.7 for CPO).

Conclusions

Provision of more reliable oximetry allows caregivers to act in a more efficient and cost-effective manner in regard to oxygen weaning and use of arterial blood gas measurements. Investigating the effect of a monitor on the process of care, rather than simply its accuracy and precision, is a useful, relevant paradigm for evaluating the value and impact of a new technology.