

Accuracy of a Novel Bioacoustic Sensor in Adult Postoperative Patients with and without Lung Disease.

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Respiration monitoring is an important safety measure for spontaneously breathing patients in the operating room, post anesthesia care unit (PACU) and general care ward. Current methods for monitoring respiration include cannula systems, which can become occluded or dislodged and impedance pneumography which is prone to missing obstructive apneas. Macknet and coworkers from Loma Linda University Department of Anesthesiology, evaluated the accuracy of a new bioacoustic sensor from Masimo Corporation, in adult PACU patients with and without lung disease which is designed to continuously and noninvasively monitor patient respiration.

Methods

Nineteen adult, PACU patients without chronic obstructive pulmonary disease (COPD), (mean age 54.6 +/-20.7 years) and 11 PACU patients with COPD (mean age 51.1 +/- 9.8 years), were monitored with a nasal cannula connected to a BCI capnometer (SIMS, Waukesha, WI) and an adhesive bioacoustic sensor attached to the neck area and connected to an acoustic respiration monitor prototype (Masimo Corp, Irvine CA). Both the capnometer and the bioacoustic monitor from each patient were connected to computers for continuous data recording and analysis. Accuracy, bias and precision were calculated by comparing data from both the bioacoustic sensor and capnometer to a reference respiratory rate from a manual scoring system. Respiratory rate varied 3 to 28 bpm in the patients during the monitoring time which was 58.2 +/- 36.9 min.

Results

	Bias	Precision	% ARMS
Capnography vs Reference Value in Patients without COPD (n=11)	-0.48	2.20	2.25
Masimo Bioacoustic Sensor vs. Reference Value in Patients without COPD (n=11)	0.04	2.43	2.43
Capnography vs Reference Value in Patients with COPD (n=19)	-0.31	2.46	2.48
Masimo Bioacoustic Sensor vs. Reference Value in Patients with COPD (n=19)	0.01	2.76	2.76

Author's Conclusion

“This data suggests the new bioacoustic sensor may provide a system at least as accurate as capnography for monitoring respiration in spontaneously breathing patients with and without COPD. This device offers multiple benefits over existing devices and has a potential to improve monitoring of both healthy patients and patients with lung disease in a general care setting.”