Four-wavelength near-infrared peripheral oximetry in cardiac surgery patients: a comparison between EQUANOX and O3.

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Near-infrared spectroscopy (NIRS) is a continuous and noninvasive technology that measures regional tissue oxygen saturation (rSO2). A new 4-wavelength generation of NIRS monitors is now available. We aimed to compare peripheral somatic rSO2 values given by the 4-wavelength EQUANOX™ 7600 device (Nonin Medical Inc., Plymouth, Mn) and O3™ device (Masimo Corporation, Irvine, CA). Twenty adult patients scheduled for conventional elective cardiac surgery with cardiopulmonary bypass over a 4-month period were included after local Ethics Committee approval. For each patient, 2 NIRS sensors (EQUANOX and O3) were placed over the medial part of the forearm. Thirteen couples of measurements were performed at predefined intraoperative time points. We compared 260 couples of absolute intraoperative rSO2 values. No significant difference was found between both monitors: EQUANOX median rSO2 60% (95% CI 57-62) versus O3 median rSO2 62% (95% CI 61-64), P = 0.103. Bias was 4.0% and limits of agreement were ±26.3%. Significant correlations were evidenced between EQUANOX and O3 rSO2 absolute values: rho = 0.758 (95% CI 0.701-0.806), P < 0.0001, and rSO2 percent maximum difference versus baseline: rho = 0.582 (95% CI 0.188-0.815), P = 0.007. While absolute values of rSO2 given by both devices were equivalent and well correlated, the clinical agreement is probably not acceptable, meaning that EQUANOX and O3 are not interchangeable in routine practice.