

PulseCO: a less-invasive method to monitor cardiac output from arterial pressure after cardiac surgery

Hamilton TT, Huber LM, Jessen ME. *Ann Thorac Surg.* 2002 Oct;74(4):S1408-12. doi: 10.1016/s0003-4975(02)04059-6.

Background: Cardiac output is often monitored after cardiac operations with a pulmonary artery catheter. A new method has been introduced that measures cardiac output by lithium dilution (LiDCO) and uses these data to calibrate a system (PulseCO) that calculates cardiac output continuously from the energy of the arterial pressure waveform. It is unknown whether PulseCO measurements are valid early after cardiac surgery when changes in temperature and vascular tone or intermittent use of the arterial line for blood sampling may occur. This study assessed the reliability of cardiac output determinations by PulseCO in the first 8 hours after cardiac surgery.

Methods: After a one-time PulseCO calibration, cardiac output was measured in 20 patients who had undergone coronary artery bypass grafting at 0, 2, 4, 6, and 8 hours after arrival in the intensive care unit using (1) thermodilution through a pulmonary artery catheter (Thermo); (2) lithium dilution (LiDCO); and (3) PulseCO. Concordance correlations were calculated between methods, and differences were compared by Wilcoxon paired rank test and Bland-Altman analysis.

Results: Cardiac output ranged from 3.4 to 8.5 L/min. No significant differences were noted between measurements obtained by each technique at any time point. Concordance correlations and Bland-Altman analysis confirmed good agreement between PulseCO and Thermo determinations of cardiac output during the study interval.

Conclusions: PulseCO measurements remain reliable without recalibration for at least 8 hours after cardiac surgery and may offer a less-invasive approach for early postoperative cardiac output monitoring.