

# On-line estimation of cardiac output with a new automated border detection system using transesophageal echocardiography: A preliminary comparison with thermodilution

**Journal of Cardiothoracic and Vascular Anesthesia 1994;8:625-630**

## **Authors**

Fausto J. Pinto, MD, Lawrence C. Siegel, MD, Adrian Chenzbraun, MD, Ingela Schnittger, MD

## **Abstract**

Continuous estimation of cardiac output would be extremely useful for hemodynamic monitoring of patients in the operating room and intensive care settings. A recently developed echocardiographic imaging system provides real-time automated border detection (ABD) with the ability to measure cyclic changes in cavity area, and thus calculate changes in intracavitary volumes. Eight patients undergoing cardiac surgery were studied with intraoperative transesophageal (TEE), and cardiac outputs obtained with this new imaging system were compared with thermodilution (TD). Triplicate measurements were obtained simultaneously at five intraoperative times, three before and two after cardiopulmonary bypass. The 91 of 120 measurements with adequate TEE and TD data were analyzed. The average difference between the two techniques (bias) was  $-0.2 \pm 1.3$  L/min. The limits of agreement (bias  $\pm$  2 SD) were  $-2.8$  L/min to  $2.4$  L/min. The average of the absolute value of the difference between measurements made with the two techniques was  $0.9 \pm 0.8$  L/min. Linear regression yielded the equation:  $ABD = 0.64TD + 1.57$  L/min ( $r = 0.71$ ). The average difference between the two techniques (bias) for detecting changes in cardiac output between sequential intraoperative times was  $0.1 \pm 1.1$  L/min. With further development, this new method shows promise for measurement of cardiac output in selected patient care settings.

## **Keywords**

cardiac output, measurement, thermodilution, transesophageal echocardiography