Abstract

Cardiac output (CO), in conjunction with hemoglobin concentration and arterial oxygen saturation are the cornerstones of oxygen transport. Cardiac output is the functional expression of cardiovascular performance and can be used to confirm the need for, or usefulness of treatment. Determination of cardiac output is an important procedure in interventional cardiology and also used in cardiothoracic surgery. Existing invasive cardiac output measurement methods are reasonably accurate, but their use is limited to the intensive care units. The risk of infection, blood loss or other complications associated with arterial catheters is also a matter of concern. Thus, a robust noninvasive alternative is considered to be desirable. Impedance cardiography (ICG) is one such method, which is noninvasive, easy to
use, provides continuous CO measurement and has a better accuracy than the existing minimally invasive techniques. Traditionally, ICG involves applying a current field longitudinally across a segment of thorax by means of a constant magnitude, high frequency, and low amplitude alternating current. Most commonly implemented methods utilize the dependency of the peak systolic upslope of ?Z(t) on the volumetric changes. However, change in the bioimpedance due velocity-induced blood resistivity variations has also been recently explored. This paper presents a detailed study of impedance cardiography as a tool for measuring the cardiac output and the issues related with it.

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Measurement of Cardiac Output using Bioimpedance Method

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