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***Abstract* - The cardiac stroke volume can be measured non-invasively by monitoring the changes in the thoracic impedance due to flow of blood. This paper describes a system which monitors the thoracic impedance using spot electrodes. A high frequency current is injected in the patient's thoracic region and the resulting voltage waveform is sensed. This is used for obtaining the impedance waveform and its derivative, which is ensemble averaged. The stroke volume is calculated using the Kubicek's formula, and then the cardiac output is computed. Excitation and sensing circuits are battery operated and the patient is totally isolated from mains power supply.**