

**Parameters derived from systolic  
anterior motion of anterior aortic wall  
and their correlation with left  
ventricular systolic function**

Thesis

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(قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا  
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ  
الْعَلِيمُ الْحَكِيمُ)

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## **List of Abbreviations**

<b>ACS</b>	.....Aortic cusp separation
<b>AO</b>	.....Aortic root
<b>ASE</b>	.....American Society Of Echocardiography
<b>CAD</b>	.....Coronary artery disease
<b>CK</b>	.....Creatine kinase
<b>CT</b>	.....Computed tomography
<b>CTR</b>	.....Cardiothoracic ratio
<b>DBP</b>	.....Diastolic blood pressure
<b>DM</b>	.....Diabetes mellitus
<b>EDD</b>	.....End-diastolic dimension
<b>EDV</b>	.....End- diastolic volume
<b>EF</b>	.....Ejection fraction
<b>EBCT</b>	.....Electronbeam computed tomography
<b>ESD</b>	.....End-systolic dimension
<b>ESV</b>	.....End -systolic volume
<b>FS</b>	.....Fractional shortening

**HF** .....Heart failure  
**HTN**.....Hypertension  
**HR** .....Heart rate  
**IVS**.....Interventricular septum  
**LAD** .....Left atrial diameter  
**LBBB**.....Left bundle branch block  
**LV** .....Left ventricle  
**LVEF**.....Left ventricular ejection fraction  
**LVH**.....Left ventricular hypertrophy  
**MRI** .....Magnetic resonance imaging  
**MDCT** .....Multidetector computed tomography  
**MI** .....Myocardial infarction  
**MR**.....Mitral regurgitation  
**NYHA**.....New York Heart Association  
**OMI**.....Old myocardial infarction  
**PET** .....Positron emission tomography  
**PND** .....Paroxysmal nocturnal dyspnea  
**PWT** .....Posterior wall thickness  
**RBBB** .....Right bundle branch block

**SAM** .....Systolic anterior motion  
**SBP** .....Systolic blood pressure  
**SPECT** ....Single-photon emission computed  
tomography  
**SD** ..... Standard deviation  
**SWMA** ....Segmental wall motion abnormality  
**Tc**.....Technicum  
**TDI** .....Tissue doppler imaging  
**TR**.....Tricuspid regurgitation  
**VCF** .....Velocity of circumferential fiber

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## INTRODUCTION

Left ventricular dysfunction is a condition in which the left ventricle of the heart was functionally impaired. This condition usually leads to heart failure, myocardial infarction and other cardiovascular complications. Diagnosis is made by measuring the diminished ejection fraction (*Carabello, 2002*).

The most well-accepted expression of global LV function is the ejection fraction which defined as the ratio of stroke volume to end-diastolic volume. Normal values of the left ventricular ejection fraction are 55% to 75% when determined by angiography and echocardiography (*Carabello, 2002*).

There are several methods to detect the LV systolic function such as nuclear imaging, computed tomography, magnetic resonance imaging and echocardiography.

A major clinical application of echocardiography is the assessment of ventricular systolic function. This is a fundamental part of the standard echocardiographic examination, but is especially important in patients with heart failure and post-myocardial infarction (***Bernard et al., 2007***).

The ejection fraction is most commonly used to assess the poor ventricular contractility by echocardiography using eyeballing, M-mode and Simpson's method (***Jae et al., 2007***).

The most common method for determining ventricular volumes is the Simpson rule or the "rule of disks". This technique requires recording an apical, four- or two-chamber view from which the endocardial border is outlined in end-diastole and end-systole (***Figenbaum et al., 2005***).

There are several limitations in using Simpson rule measurements of left ventricular volumes. First, apical views must be used, and myocardial dropout is

always a potential problem. For accurate volume determination, the transducer must be at the true apex and the ultrasonic cross-sectional beam must be through the center of the left ventricle (*Figenbaum et al., 2005*).

There is another measurement which may be of value in the assessment of left ventricular systolic function which is the systolic anterior motion of anterior aortic root. The movement of the aortic root in an anterior direction on M-mode reflects the filling and emptying of left atrium which is confined between the aortic root and spine. A decrease in atrial filling and emptying, for example with low forward stroke volume, result in decreased motion of the aortic root. (*Catherine et al., 2008*).

## **AIM OF THE WORK**

The aim of this study is to evaluate the systolic function of the left ventricle by the anterior systolic aortic motion of anterior aortic wall obtained from M-mode parasternal long axis view “Aorta – left atrium”.