# ABSTRACT BOOK

# 8th International Scientific Interdisciplinary Conference

## for medical students and young scientists

210 ХНМУ

http://isic.kharkov.ua

Kharkiv National Medical University, Kharkiv, Ukraine

*May 14th-15th, 2015*

MINISTRY OF HEALTH OF UKRAINE
KHARKIV NATIONAL MEDICAL UNIVERSITY

# Abstract book

of

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**Aheto Ebenezer, Davis Henry, Vasylieva O.V.**

## PHYSIOLOGICAL BASIS OF THE CARDIAC CYCLE

**Kharkiv National Medical University, Kharkiv, Ukraine**

**Introduction.** The heart is an organ located in the thoracic cavity between the lungs, behind the sternum and above the diaphragm. It consists of two pair of chambers (atria and ventricles) through which blood must circulate through in the heart. Blood moves first into the right atria then enters to the right ventricle through the tricuspid valve. Here the blood moves further through the pulmonary valve into the a.pulmonaris for the pulmonary circulation. Blood then returns to the left part of the heart through the pulmonary veins into the left atrium where it pushes through the mitral valve down to the left ventricle. From the left ventricle it moves through the aortic valve to the aorta where it goes to circulate through the rest of the body.

**Results.** Now as blood flows through the heart it produce sounds-why? This is due to blood rushing against the walls as well as hitting back against the various valves to prevent back flow of blood. There are basically 4 sounds produced by the heart-1$^{st}$ and 2$^{nd}$of which can easily be heard. $S_1$ is caused by closure of the mitral and tricuspid valves at the beginning of isovolumetric ventricular contraction. $S_2$ is caused by closure of the aortic and pulmonic valves at the beginning of isovolumetric ventricular relaxation. The third heart sound ($S_3$), when audible, occurs early inventricular filling, and the fourth heart sound ($S_4$), when audible, is caused by vibration of the ventricular wall during atrial contraction. Nevertheless there can be irregular heart sounds perhaps due to increase blood volume. Take for example A third heart sound occurs pathologically when the atrial pressure is unusually high, which typically occurs when the extracellular fluid volume, and thus the blood volume, is much higher than normal, such a "volume overload" characteristic of congestive heart failure.

Also when your heart beats, it contracts and pushes blood through the arteries to the rest of your body. This force creates pressure on the arteries. This is called systolic blood pressure. A normal systolic blood pressure is 120 or below. Now during relaxation and dilatation of the ventricles of the heart when the ventricles fill with blood the diastolic blood pressure is produced. A normal diastolic blood pressure number is 80 or less. During abnormalities or irregularities of heart pumping functions in vessels usually due to peripheral resistance or cardiac output, they may result in systolic and diastolic hypertension.

The clinical use of the ECG is it helps to understand how the heart works. With each heartbeat, an electrical signal spreads from the top of the heart to the bottom. As it travels, the signal causes the heart to contract and pump blood. The process repeats with each new heartbeat. The ECG thus helps to identify electrical signals at each phase and as a result we can easily identify at what phase there is a problem. Further more it helps us to know how fast your heart is beating, whether the rhythm of your heartbeat is steady or irregular and the strength and timing of electrical signals as they pass through each part of your heart. Doctors may also use ECGs to detect and study many other heart problems such as heart attacks, arrhythmias and heart failure.