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PORTABLE HEART DISEASE DIAGNOSTIC SYSTEME “PULSE”
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Relevance. Heart and cardiovascular disease are the number one cause of death worldwide. In order to increase life expectancy for these patients it is essential to perform early diagnosis and prophylaxis. But performing such a large scale analysis is too time consuming, labor intensive, expensive and almost unrealistic compared to the technologies and methods currently deployed. In order to confront this problem we must find a solution to each of the challenges presented above which are cost, time for analysis, availability and ease of use.

Goals: To build a personal device ECG “pulse” that is smart and affordable, utilizing the latest in technology. To develop software that analyzes the ECG signal automatically. To compare the readings from our device with standard medical ECG.

Materials and Methods. The system is made up of an ECG device containing the electrodes, microchip, Bluetooth transmitter, SD card, axial sensor and battery. An application for the patients was made for Android phone. A comparison test was made in the Pathological and Normal Physiology labs of BSMU.

To use the device the patient clips on new disposable conductive pads and sticks the device onto his torso in such a way that the top of the device is at the border between the his stomach and chest, then he turns it on and it starts recording to an SD card. To check the data he can use his phone. The patient can wear an ECG device for up to 24 hours.

The application connects to the device via Bluetooth and to the doctor via the internet. The doctor uses special software to analyze the signal.

Results and discussions. After comparing between our device and a standard medical ECG, the results were very similar with slight deference due to different electrode positioning. After analyzing the ECG signal in our software it was able to output all general data about the signal, and pinpoint all abnormal and suspected areas.

Conclusion. The personal device ECG “pulse” is effective. The device can be used by anyone thanks to its simplicity and owned by anyone thanks to its affordability. There is still more room for improvement in the future to provide higher accuracy results and more dynamic use.