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Wireless, Portable, Intelligent and Real Time Cardiac Arrhythmia and Patients' Vital Signs Monitoring System

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This study describes the development of a wireless, portable, intelligent, and real-time cardiac arrhythmia and patients' vital signs monitoring system that could sense the irregular heartbeat rate and how it has been related to other health parameters. Monitoring of other health parameters such as saturation (SPO₂), temperature, etc. is also considered in this study. This idea arose as a preventative measure to reduce the unexpected fatality rates caused by abnormal cardiac rhythm. The failure to observe this sudden fluctuation in the ECG and heart rate poses a grave risk to human life. The proposed technology would be linked to the mobile phones of caretakers or physicians. It will display the heart patient's state in real-time. The primary benefit of the developed technology in diagnosis and treatment via telecommunication (GSM technology) method was the ability to monitor cardiac arrhythmia parameters in real-time, even from a long distance, utilizing wireless technology. The network issue and the inaccessibility of the ECG waveform are significant drawbacks of this type of device, as the waveform can provide exact information on the state of the heart rhythm. Furthermore, this system's scalability is enhanced by adding many additional health monitoring sensors, resulting in a more precise arrhythmia output. The complete system has been tested with an ECG simulator for all its functions. The whole system can be upgraded by designing a machine learning algorithm so that it can read and analyze the ECG waveform.

Keywords: Wireless, Portable, Intelligent, Real-time, Cardiac arrhythmias, Vital signs, Heart rhythm, GSM technology