

First Kenyan – Made Low Cost and Portable ECG Monitor

Muhuhu A¹, Samia B², Gaballa M²

¹Department of Clinical Medicine and Therapeutics, School of Medicine, University of Nairobi, P.O. Box 19676-00202, Nairobi, Kenya

²MP Shah Hospital, Nairobi, Kenya

Address for Correspondence: Dr. Alice Muhuhu. Email: amuhuhu@students.uonbi.ac.ke

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Abstract

Background: The World Health Organizations Global Status Report on Non Communicable Diseases (NCDs) indicated that chronic diseases, including cardiovascular disease, contributed to 74% of all deaths in 2012. Unsurprisingly, 77% of NCD deaths occurred in middle- and low- income countries, with the majority caused by cardiovascular disease. The rapid rise in NCD is predicted to impede poverty reduction initiatives in LMIC. Lack of adequate primary care, including access to physicians, technologies, and treatments, contributes to poor CVD outcomes. ECG devices have traditionally been used in large city hospitals in screening, diagnosis, and monitoring the treatment of cardiovascular disease. However, these devices are still largely inaccessible and unaffordable to most regions in Kenya.

Objective: To assess the implementation and impact of a low-cost wireless ECG device in remote urban areas in Kenya. We demonstrated the primary diagnostic capability and safety of a newly developed adhesive ECG monitoring device.

Methodology: This device provided similar diagnostic accuracy with superior noise-signal ratio and image acquisition reliability compared to conventional currently market-available ECG monitoring systems. It could distinguish various arrhythmias, including atrial flutter/fibrillation, ventricular premature beat, sinus pause, and AV block. Inter-device variability with other adhesive ECG monitoring devices was not significant.

Results: In this study, we demonstrated the primary diagnostic capability and safety of a newly developed adhesive ECG monitoring device. This device provided similar diagnostic accuracy and superior noise control and image acquisition reliability compared to conventional ECG monitoring systems. It could distinguish various arrhythmias, including atrial flutter/fibrillation, ventricular premature beat, sinus pause, and Mobitz type I second- degree AV block in a similar fashion as other commercial devices (Phillips and GE).

Conclusion: In this preliminary study, we proved that the new portable ECG monitoring device demonstrated comparable results with conventional ECG monitoring devices in detecting arrhythmias.

Figure 1: Image of the pocket size wireless ECG devices.

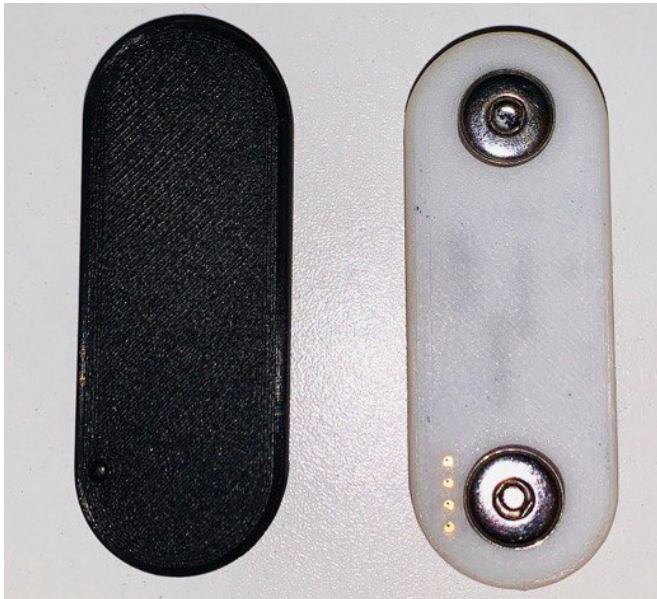


Figure 2: Image demonstrating the wearable ECG device with electrode adhesives



Figure 3: Dashboard showing real time ECG data, BPM, HRV, GSR, Steps, Acceleration and Temperature (BLE data transmission from hardware to software interface)

