HeartMonitor: An Integrated Home-Based and Mobile Heart Attack Monitor and Alert System

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Heart attacks are one of the most common heart problems and happen very quickly, so it is very important that people with a high risk of a heart attack be provided with devices that alert emergency services and family/friends on behalf of the potentially confused and in pain or unconscious person. The HeartMonitor system was designed and engineered with three components. A wet electrode based heart monitor vest sends the heart's pulse to the electronic hardware sitting in a vest pocket. The hardware consists of an AD8232 Heart Rate Monitor board, Arduino Mega 2560 microcontroller board, battery pack and Bluetooth wireless module. A heart monitoring app was coded to read the output and display a simple ECG on an Android phone. The app recognises when the heart stops (flat line) or goes into ventricular fibrillation (weak irregular electrical activity), and notifies the ambulance service (000), family and friends via the Android phone with the GPS location of the person who is having the heart attack. A safety feature coded into the app notifies the patient if an electrode disconnects, and this is not interpreted as a patient having a heart attack. The component cost of the system was approximately A$250. The device and app will save lives and allow people with a high risk of heart attack to live at home or move freely instead of having to be in a hospital.

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