**1.0 INTRODUCTION**

* 1. **BACKGROUND TO THE STUDY**

Tele-monitoring is a medical practice that involves remotely monitoring patients who are not at the same location as the health care provider. In general, a patient will have a number of monitoring devices at home and the result of these devices will be transmitted via a telephone to the health care provider. A Tele-monitoring system incorporates innovation technology with in-home, self-monitoring assistance to collect real time updates regarding your loved ones vital signs. The self-monitoring test result are captured and transmitted to a central database that stores the information that can be accessed remotely by the patient, family and their health care team. Actions and modifications can be made with the results and can be utilized for on-going care recommendations. General Packet Radio Service (GPRS) is a data transfer specification used by the Time Division Multiple Access (TDMA) and Global System for Mobile communications (GSM) networks. The GPRS system makes use of the entire coverage area and frequency of its host networks to transmit data packets. Data packets are segments of data sent between computers or network devices. The GPRS system provide subscribers uninterrupted data connection instead of a dial-up connection. Global Positioning System (GPS) is a navigation system for portable devices. It uses a network of satellites surrounding the planet. A compatible device such a smart phone or a dedicated navigation device has a built-in receiver chip that picks up regular signals from the satellites. Each signal is time-coded so the device can calculate how far away it is from the satellite based on the time the signal takes to arrive. By combining the distances from at least four satellites, the device can calculate its position to within a few feet. It can also cross-reference this with map data to provide navigation such as driving directions. Emergency patient Transportation is handled with an ambulance which is a vehicle for transportation of sick or injured people to, from or between places of treatment for an illness or injury especially in emergency and I some instance will provide out-of-hospital medical care to the patient.

* 1. **THE STATEMENT OF THE PROBLEM**

The number of road accidents victims in every busy city like Kenya can be unimaginable. Immediate medical attention to critically ill patients and accident victims followed by transportation to a well equipped local facility within the golden hour can save many lives. Ambulances are specifically designed to carry emergency drugs and instruments. The inner area of an ambulance is fabricated in such a way that it houses emergency medicine, sterilizer, stretcher and so forth. The personnel inside the ambulances are specially trained to be emergency technicians. There exist a need to augment the skill of such paramedics with the Central Monitoring Station(CNS). The CNS helps in identifying the nearest and appropriate hospital and coordinating with the medical personnel of the hospital.

* 1. **PURPOSE OF STUDY**

The purpose of this project work is to design and implement a system that cater the specific requirement of acquiring physiological data, keyed-in data, patient snapshot, and voice signals and transmitting them using a cellular network to a Central Monitoring Station that helps in identifying the nearest and appropriate hospital and coordinating with the medical personnel of that hospital. Placing the system in an equipped ambulance that can take vital signs, assess oxygen saturation, monitor blood pressure etc. that will reduce the risk of death involved in Emergency Patient transportation. The aim of this work is to design a data transfer and navigation system into a telemonitoring system for the purpose of facilitating information passage between the operators of the telemonitoring system and ambulance drivers in Kenyan Hospitals for the emergency transportation of patients.

* 1. **OBJECTIVES**

1. To determine how the current hospital response system can be digitized and made more efficient.
2. To calculate the amount of funds and resources needed to build a well defined Hospital Emergency Response System for patients.
3. To determine a way the medical sector in the country can be made better.
4. To determine how long it take for hospitals to respond to an emergency
   1. **JUSTIFICATION**

This findings will reduce the response time needed by the hospitals to respond to the patients. User’s data such as the current location and the state of the injuries are enough for medical practitioners to determine the best approach to help the patient.

* 1. **SIGNIFICANCE OF THE STUDY**

Implementation of a GPS and GPRS based telemonitoring system for emergence patient transportation will be of immense benefit to the hospital. The system will assist the hospital achieve the following:

1. Improve the communication between the staff of the ambulance and the central monitoring station records.  
2. The doctor will understand the physical and physiological condition of the patient better so that right decision regarding administration of drugs and transport destination can be appropriately taken  
3. Administrative requirements including the location of the vehicle, patient’s attendance details can easily be retrieved.    

* 1. **LIMITATIONS**

1. Internet coverage in Kenya is not well established. Some areas are do not have stable internet connection, this will limit the system in terms of communications between the hospital and the patients.
2. Some terrains are not accessible due to poor infrastructure making it impossible for the medical practitioners to reach the patients.
3. Not every Kenyan has a smart phone with good internet connection. The entire system depends on a good smart phone for communication and locating the patient.
4. Due to the cost of material for implementing the hardware aspect of this project, the researcher was limited by financial and time constraints. So the system developed was a simulation of the GPS and GPRS based telemonitoring system for emergency patients.