Abstract—to monitor the patients in ambulance from hospital to provide the necessary arrangements using body sensor networks. The patients can be monitored using an android device by the doctor using the data transmitted using the Zigbee protocol from the ambulance in the hospital. A sensor node is fixed to the electrocardiogram for the updated position of the patient and also a sensor node is fixed to monitor the blood loss and these records are transmitted to the blood bank in case of need. These sensor networks form a wireless sensor network and this project also helps the doctors in the arrangement of particular operation theatres and also provides timely help for the patients. A sensor node which monitors the congested routes is also used. Transmission and reception of the data are shared by the wireless sensor networks. This project is also very helpful in the arrangements for organ transplantation.

Keywords—Body sensors, NS2, Monitoring device, Smart ambulance, Zigbee protocol

I. INTRODUCTION

The day today deaths are increasing nowadays mainly in the ambulances due to the lack of timely help. So this project helps to monitor the patient from the hospital by the doctor so that he could make the necessary arrangements in case of emergency to save the patient. The equipments for the application of body sensor networks in ambulance include an electrocardiogram accompanied with a special type of sensor node that senses the periodic difference of the wave in electrocardiogram; blood loss is regulated by using a haematometer and a sensor for it and also a sensor to sense the traffic.

II. MONITORING THE ECG

The first step of this process is monitoring the electrocardiogram of the patient. A special type of sensor in this. The antenna in the sensor transmits the received sensation to the main gateway sensor. The microcontroller in the sensor is programmed in such a way that it senses the periodic difference and the amplitude of the electrocardiogram, interfacing of sensor is done with the electrocardiogram. Also the complete and clear picture of the P, Q, R, S and T wave’s data are transmitted to the gateway sensor.

III. EEG SENSOR

A special type of sensor is designed such that it is interfaced with the electroencephalogram. The brain waves are sensed by the special type of sensor and are sent to the main gateway sensor. This is very helpful in the case of brain death in the ambulance since the other sensors will be providing the data since it is a brain death the EEG sensor provides unspecified data. So the doctor could decide and provide necessary arrangements for the organ transplantation.

IV. VENTILLATION FOR THE PATIENT

A special type of sensor is designed in the ambulance to check the proper ventilation conditions for the patient. The sensor is programmed in such a way that the sensor is resistive to temperature, pressure and other environmental disturbances. Air quality monitoring sensor is used to check for the proper ventilation of the patient. When the quality of air is degraded the patient will be provided with a nebulizer for artificial breath from the hospital through switching devices in embedded systems.

V. BLOOD GROUP SENSOR

A special type of sensor is designed in such a way that the blood group of the patient is identified so that a regular system of check by the doctor reduces. A sample of blood will be made to drop ion the specimen and the colour change will be sensed by the sensor and this data will be sent to the main gateway sensor.

VI. BLOOD MONITORING SENSOR.

The blood loss volume in the patient is checked and monitored continuously in the haemotometer. A sensor is interfaced with the haemotometer so that it could provide the volume of blood loss and is sent to the main gateway sensor. When the doctor gets this data he will provide the necessary arrangements to get the blood before the patient arrives to the hospital.

VII. SENSING TRAFFIC

Traffic sensors are used for the status of traffic so that the ambulance could divert the route and acts through the global positioning system provided in the
ambulance. This sensor will not be interfaced with the gateway sensor.

**VIII. GATEWAY SENSOR**

A sensor is programmed in such a way that it receives all the signals from the various sensors having different applications. All the sensor nodes are connected to the main special type of sensor called the gateway sensor.

**IX. PROCESS:**

The ECG signal is received by a sensor and is sent to the main gateway sensor. Next the EEG reports recorded by the sensor are also sent to the main gateway sensor. Similarly the blood group and the volume of blood loss are all sent to the main gateway sensor. The function of gateway sensor is to receive all the signals from the multiple sensors. This forms a wireless sensor networks. Now the data are sent to the hospital through the Zigbee Protocol from the main gateway sensor.

**X. TRANSMISSION USING ZIGBEE PROTOCOL:**

The signals from the main gateway centre are transmitted to the destination through the zigbee protocol. Zigbee is a specification for a suite of high level communication protocols using small, low power digital radios based on an IEEE 802 standard for personal area networks. As they are used in mesh network to transmit information over long distances it is applied over this project.

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\begin{align*}
\text{bi;}_k &= W_i \cdot k \cdot W_i \\
\text{bi;}_0 &= 0 \cdot i \cdot M; 0 \cdot k \cdot W_i \\
\text{bi;}_0 &= (1 \cdot y)^i \\
\text{bi;}_0 &= 0 \cdot i \cdot M \\
\text{bi;}_0 &= (1 \cdot y)^i \\
\text{bi;}_0 &= 0 \cdot i \cdot M \\
\text{bi;}_0 &= y^A \cdot 0 \cdot k \cdot L^i \\
\end{align*}
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**XI. FUNCTIONAL EXPLANATION:**

Ecg sensor to gateway sensor Haematometer sensor to gateway sensor Traffic sensor to gateway sensor Gateway sensor to hospital through zigbee

**XII. MONITORING DEVICE:**

The data is monitored by the doctor through an android mobile. Application is being developed to monitor these types of patient data. The executed sample output is provided below

**XIII. MERITS:**

- Reduces the fatality of humans
- Personal care given to patients through automations
- Reduces the force on doctors

**XIV. DEMERITS:**

- Requires large investment
- Uses more applications
- Tedious to maintain
• Patient data is not secure

XV. STRATEGIES TO OVERCOME IT:
• Periodic maintenance
• Technical staffs must be placed for these type of monitoring

XVI. PURPOSE:
This project is mainly focused to avoid the loss of life in ambulance when they require timely help.

![Increase Of Day Today Deaths In Ambulance](image1)

Scope Of Reducing Day Today Death In Ambulance
X-axis= years
Y-axis=deaths

CONCLUSION
This project may save lots of life in and around the world and India might be the first country in developing this technology

FUTURE WORK
Our future work is to use the latest simulation software. We are working on the software Lab view instead of NS2 as there are more advantages in the lab view software and also now the data is now being monitored in the android device so we have planned it to develop it in iephone.

REFERENCES

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