IOT BASED HYPOXIA DETECTION SYSTEM

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Abstract - *Pulse oximetry is a superior technique of quickly measuring the patient's blood oxygen saturation level (%SpO2) and sphygmo (pulse rate). No other non-invasive technique is as efficient as pulse oximetry in determining the decrease in blood oxygen saturation levels. If the pulse oximetry results are transferred wirelessly to a remote location like computer or cellphone, quick action can be taken to provide oxygenation to the patient and any untoward incident can be averted. This paper presents a wireless system for remotely monitoring a patient's blood oxygen saturation levels and pulse rate. The data is continuously transmitted to computer front-end as well as an sms is sent to the cell phone in case of emergency conditions like (%SpO2) falling below 90%or pulse rates below 60 or above 150. The system was tested on real-time patients and performed satisfactorily.*

Key Words: **Microcontroller, Wireless module, IOT, Sensors, Proteus, Matlab, LCD, Buzzer**

1. INTRODUCTION

The use of wireless technology in healthcare has proved to be a boon to patients. Medical condition of a patient can be quickly conveyed to the concerned personnel wirelessly over long distances and timely actions can be taken to avert any untoward incident. One of the particular interest of use of wireless technology in medical field is to remotely monitor vital parameters of the patient.

The impact of wireless technology in healthcare has proved to be enormous and its usage is rapidly spreading . Among the main benefits of incorporating mobile technologies into the field of medical care the authors of point out also that mobile solutions have been shown to help to improve patient safety and decrease the risk of medical errors.

1.1 Objectives

- To study Existing ICU Monitoring system.
- To design IOT based ICU patient monitoring and alert system.

1.2 Problem Statement

To provide automated solution for ICU patients monitoring using IOT based system.

2. LITERATURE SURVEY

Wireless Pulse Oximeter System:

Introduces Pulse oximetry is a superior technique of quickly measuring the patient's blood oxygen saturation level (%SpO2) and sphygmo (pulse rate). No other non-invasive technique is as efficient as pulse oximetry in determining the decrease in blood oxygen saturation levels. If the pulse oximetry results are transferred wirelessly to a remote location like computer or cellphone, quick action can be taken to provide oxygenation to the patient and any untoward incident can be averted. This paper presents a wireless system for remotely monitoring a patient's blood oxygen saturation levels and pulse rate. The data is continuously transmitted to computer front-end as well as a SMS is sent to the cellphone in case of emergency conditions like (%SpO2) falling below 90%or pulse rates below 60 or above 150. The Global System for Mobile Communication (GSM) is used as the wireless module. The system was tested on real-time patients and performed satisfactorily.

Portable Mobile Real Time Oxygen Monitoring Auto-Ventilation System:

Introduces Portable mobile real time oxygen monitoring auto ventilation system using a mobile phone, oximeter, mass gas flow controller, and a portable oxygen cylinder is proposed. The system consists of a tele-monitoring system and an oxygen tele-controller system. The tele-monitoring system consists of a mobile phone and a portable oximeter. The oximeter transmits the blood oxygen level and heart rate to the mobile phone for real time monitoring. The oxygen tele-controller consists of a mobile phone, mass gas controller, oxygen cylinder, and an oxygen mask. The mobile phone is used to control the mass gas controller to supply the patient with oxygen based on the real time monitoring values. The proposed system is designed to develop a portable mobile oxygen monitoring system for oxygen delivery at home and on the go activities for Chronic Obstructive Pulmonary Disease, Obstructive Sleep Apnea, and hypoxia related disease patients.

3. PROPOSED METHOD
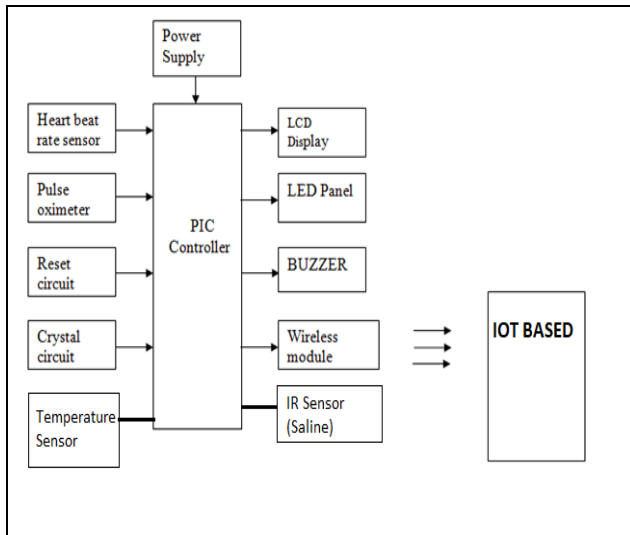
3.1 Block Diagram

Fig 1: Block diagram of proposed system

In this proposed system proximetry sensor ,IR sensor, temperature sensor are used to sense heart rate ,saline status, blood pressure status and temperature of patient's using wireless module, all information lively transmitted to smart phone using Bluetooth module and data also transmitted to cloud. Once data is uploaded to the cloud, it is stored in database to be analyzed. This analysis is performed autonomously, without human's intervention. If there is change in collected data then data is transmitted to cloud using IOT and if there is no change in collected data then it come back to previous state.
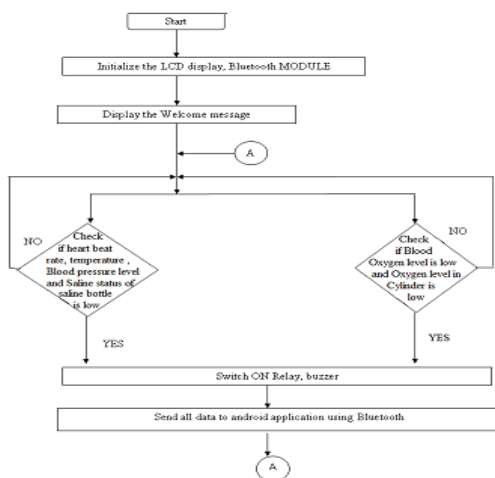
3.2 Flow Chart

Fig 2: Algorithm for Proposed system

1. Start

2. Initialize the LCD and display welcome message on the LCD.

3. Check the status of the sensors i.e. Heart beat rate sensor, Temperature sensor, Pulse oximetry sensor, IR sensor, Mass gas flow controller sensor.

4. If the heart beat rate, Temperature, Blood pressure, Blood Oxygen level is low then sensor is detected. If not then LCD displays the message welcome only.

5.If the Oxygen Level in Cylinder and saline status of saline bottle is low then sensor is detected. If not then LCD displays the message welcome only.

6. Then Relay, buzzer will be on.

7. And LCD will display the message.

8. All the data is send to android application using Bluetooth, IOT.

4. CONCLUSIONS

This system will allow healthcare personnel to monitor a patient's oxygen saturation, blood pressure level to the doctor for immediate treatment. The Device which are smaller, energy efficient, user friendly , accurate and also provide quality of health service. The performance of the system will be analyzed for its accuracy and reliability. This project is to design and develop a real time oxygen monitoring auto-ventilation system using IOT . We are using pulse oximeter, mass gas flow controller, oxygen level detection and temperature sensor**.**

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