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IoT BASED SALINE LEVEL MONITORING SYSTEM

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*Abstract-***:** *Traditional methods used for health care are becoming obsolete due to increase Most often due to negligence, inattentiveness and more number of patient's, the saline is totally consumed. Initially, this might be inferred as a casual phenomenon. But the consequences are often fatal. Just after the saline finishes, blood rushes back to the saline bottle due to difference in blood pressure and pressure in the empty bottle. Thus, Innovative health monitoring systems have being developed with less human intervention which will be available at low cost in rural as well as urban areas. The proposed system aims at trouble-shooting the above mentioned problem effectively .By means of this the nurse can monitor the amount of saline even in the control room. An automatic saline level monitoring consists of Level sensors which are used to determine the status of liquid in the bottle whether it is normal or warning status. The detection of saline drop rate is quite faithful. The output obtained from the sensor is processed to check whether the saline bottle is empty. When the level of saline dips below a certain level, the alarm sound will be produced. The proposed system eliminates continuous on vision/sight monitoring of the patient by nurses.*

Keywords: Transmitters, Real time, systems Sensors, Hardware, Monitoring, Receivers.

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I RELATED WORK

1.   **Mansi G. Chidgopkar , Aruna P. Phatale "Automatic And Low Cost Saline Level Monitoring System Using Wireless Bluetooth Module And Cc2500 Transreceiver " International Journal of Research in Engineering and Technology ; Volume:04 Issue: 09 |September-2015**

Traditional methods used for health care are becoming obsolete due to increase in population. Current health care system requires manual care takers and their heavy duties which is very time consuming job. Innovative health monitoring systems are required with less human intervention which will be available at low cost in rural as well as urban areas. Engineering   technologies are getting coupled with medical field to solve this problem. So phisticated health monitoring systems are getting developed with the help of electronic components such as sensors, PLC, microcontrollers etc. with easy interfacing. This paper mainly focuses on providing advanced saline level monitoring system. [1]

2.   **C.C. Gavimath , Krishnamurthy Bhat , C.L. Chayalakshmi , R. S. Hooli   and B.E.Ravishankera**

"Design And Development Of Versatile Saline Flow Rate Measuring System And Gsm Based Remote Monitoring Device " International Journal of Pharmaceutical Applications Vol 3, Issue 1, 2012.

As the world population grows, the need for health care increases. In recent years, progress in medical care has been rapid due to the advancements in the field of sensors, microcontrollers and computers. A major reason for this is the combination of the two important disciplines namely medicine and engineering. This paper describes the development of an automatic saline monitoring system using a low cost indigenous sly developed sensor and GSM (Global system for mobile communication) modem. This enables the doctor or nurse on duty to monitor the saline flow rate from a distance. The 8051 microcontroller is used for providing co-ordination action. An IR sensor is used at the neck of the saline bottle to know the flow rate of the liquid. The detection of saline drop rate is quite faithful. The output obtained from the sensor is processed to check whether the flow rate is slow, medium or fast and the same is transmitted through GSM technology to a distant mobile cell for future actions.[2]

3.   **Pattarakamon Rangsee, Paweena Suebsombut, Phakphoom Boonyanant "Low-Cost Saline Droplet**

Measurement System using for Common Patient oom in Rural Public Hospital '' The 4th Joint International Conference on Information and Communication Technology, Electronic and Electrical Engineering (JICTEE) 978-1-4799-3855-1/14 2014

The system can be used to check saline droplet of patients in each patient's bed in rural public hospital. By installing the measuring modules in all patients' beds, the system will show saline droplet status of each patient. So, nurses can accurately check saline droplet status of their patients on a computer including saline droplet statuses, saline droplet rate (drops per minute), and remaining time. The saline droplet statuses include four statuses that are Normal status (the system is working, the green light is shown on monitor), Warning status (sensor at critical point cannot detect saline, the yellow light is shown on monitor), Error status (droplet sensor cannot detect saline droplet, the red light is shown on monitor), and Chang New Bag (the blue light is shown on monitor). So, nurses do not need to go to patient's bed every time because they can check saline drop let status of each patient via this system. This system is a low-cost system and comfortable for a nurses. Therefore, in rural public hospital can use this system in common patient's room.[3]

4.P.Kalaivani, T.Thamaraiselvi, P.Sindhuja and G.Vegha ''Saline Level Monitoring System Using Arduino UNO Processor '' Asian Journal of Applied Science and Technology (AJAST) Volume 1,March 2017 .

The epidemic growth of wireless technology and mobile services in this epoch is creating a great impact on our life style. Some early efforts have been taken to utilize these technologies in medical industry. In this field, ECG sensor based advanced wireless patient monitoring system concept is a new innovative idea. This system aims to provide health care to the patient. We have sensed the patient's ECG through 3 lead electrode system via AD8232 which amplifies minor and small bio-signals to the arduino which processes them, along with saline level. Saline level is detected through IR sensors. The output of the electrical pulse is shown with the serial monitor. The saline level is indicated by LCD. The major output ECG analog signal is displayed on serial plotter. The outputs are displayed through mobile application.[4]

5.Priyadharshini.R, Mithuna.S, Vasanth Kumar.U, Kalpana Devi.S, Dr. SuthanthiraVanitha.N. ''Automatic Intravenous Fluid Level Indication System for Hospitals'' International Journal for Research in Applied Science & Engineering Technology ; Volume 3 Issue VIII, August 2015.

During recent years due to the technological advancements many sophisticated techniques has been evolved for assuring fast recovery of the patients in hospitals .For good patient care in hospitals, assessment and management of patient's fluid and electrolyte need is the most fundamental thing required. All most in all hospital, an assist/nurse is responsible for monitoring the fluid level continuously. But unfortunately during most of the time, the observer may forget to change the saline bottle at correct time due to their busy schedule. This may leads to several problems to the patients such as backflow of blood, blood loss etc. To overcome this critical situation, a low cost RF based automatic alerting and indicating device is proposed .Where IR sensor is used as a level sensor. It is based on the principle that the IR sensor output voltage level changes when intravenous fluid level is below certain limit. [5]
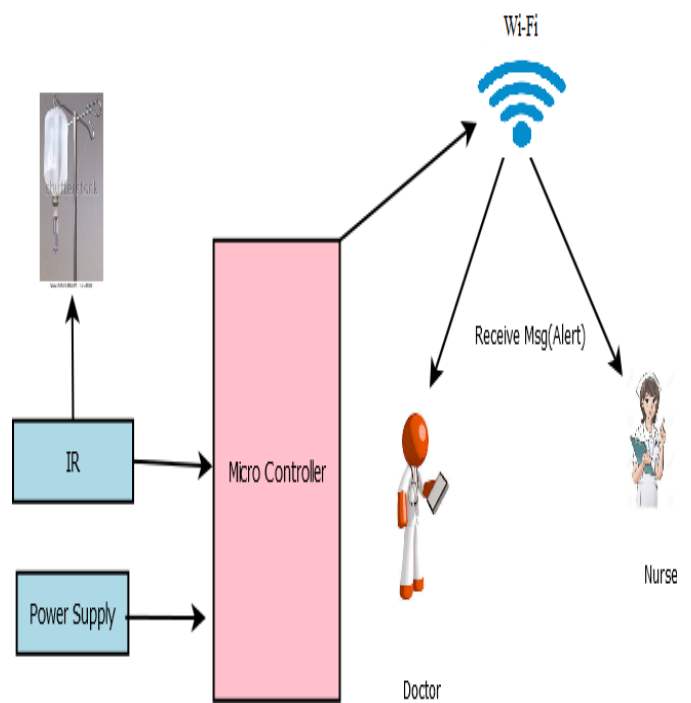
II SYSTEM ARCHITECTURE

Figure 1: System Architecture

Initially, this might be inferred as a casual phenomenon. But the consequences are often fatal. Just after the saline finishes, blood rushes back to the saline bottle due to difference in blood pressure and pressure in the empty bottle. Thus, Innovative health monitoring systems have being developed with less human intervention which will be available at low cost in rural as well as urban areas. The proposed system aims at trouble-shooting the above mentioned problem effectively .By means of this the nurse can monitor the amount of saline even n the control room. An automatic saline level monitoring consists of Level sensors which are used to determine the status of liquid in the bottle whether it is normal or warning status. The detection of saline drop rate is quite faithful. The output obtained from the

sensor is processed to check whether the saline bottle is empty. When the level of saline dips below a certain level, the alarm sound will be produced.

In our project the IR sensor can be used to measure the saline level. The content of saline in normal saline bag is 1000 ml. The saline bag is replaced by another when the saline falls below 50 to 100 ml. The critical level of saline is set to 70 ml which in between 50 to 100 ml so the nurse can change the saline bag when the liquid reaches to critical point.

III APPLICATIONS

- By using this system the patient can be analyzed by doctors in any part of the hospital .
- Used to transfer the information from the transmitter side to the receiver side wirelessly.
- The whole health monitoring system, which we have proposed can be integrated into a small compact unit as small as a cell phone.

IV CONCLUSION

In this proposes system which can automatically monitor the saline flow rate by using microcontroller. It can wirelessly send the data to nurses or doctors computer and display the results in the form of saline droplet rate, number of droplets coming from saline bottle, saline solution given to the patient in ml and remaining time to empty the saline bottle with the help of serial port test software. The system is reliable, cost effective and convenient for nurses. It can be reused for the next saline bottle. It is beneficial for nurses as well as doctors at rural hospitals. Nurses can easily monitor the saline level from distance. It is mainly advantageous at night timing as there is no need for nurses to go to patient's bed to check the level of saline in the bottle.

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