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Smart Saline

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Abstract - *Nearly in the entirety of the medical clinic, an attendant or overseer is liable for observing the saline level persistently with no interferences. Because of the carelessness and obliviousness towards saline culmination by specialists, medical attendants or overseer of the patients and absence of attendants with adequate aptitudes in emergency clinics and their inordinate outstanding task at hand, an immense number of patients are biting the dust and are being hurt in the medical clinics. We proposed framework is manufactured utilizing Internet of Things(IoT) stage. The proposed framework involves sensors which will go about as a level sensor for checking the basic degree of the saline in the saline jug.*

Key Words: Saline, IOT, Medical System, Level Monitoring.

1. INTRODUCTION

Because of the headway in innovation, the advancement in medicinal field is fast. A purpose for this is only the blend of medicinal and designing orders. At the point when the Normal Saline (NS) is to be put intravenously then it is called as sterile. Ordinary saline is for the most part alluded as sterile arrangement of sodium chloride (Nacl) in water. By and large, in medical clinics saline level is checked by attendants and patients family members. There is constantly a need to check the saline level after certain time.

So as to make the human services framework brilliant, it is required to mechanize the capacity of analysis, treatment, the board, and choice, so the administrations are accessible both for country and urban individuals. One of the significant provokes identified with the administration of medicinal services is to watch the saline level. Nearly in all medical clinics, a guardian/nurture is mindful to watch out for the saline level and in the event that they neglect to screen this, the patient endures. Saline jug when discharged and on the off chance that the needle isn't expelled from the patient's vein, at that point because of the weight contrast, the blood streams outward into the jug which may prompt genuine setback. In this way, it is the need to computerize the observation so as to forestall such mishap.

Because of the headway in innovation, the advancement in therapeutic field is fast. An explanation for this is only the mix of therapeutic and designing controls. At the point when the Normal Saline (NS) is to be set intravenously then it is called as sterile. Typical saline is for the most part alluded as sterile arrangement of sodium chloride (Nacl) in water. For the most part, in clinics saline level is checked by attendants and patients family members. There is constantly a need to check the saline level after certain time. The current framework for saline level checking is very tedious and badly designed for medical attendants. The primary target of proposed framework is to give solid, advantageous, easy and practical framework for saline level observing. As the saline goes beneath the basic level, it is important to change the saline jug. A programmed saline level observing framework comprises of IR sensors which are utilized to decide the status of fluid in the jug whether it is typical or cautioning status. Bluetooth module and CC2500 remote module go about as transreciever, because of which the notice can be sent to the medical caretaker on her portable just as PC. The speaker begins ringing when the fluid goes underneath the basic level and naturally medical caretaker will get the notice of caution. Writing computer programs is done in microcontroller ATMEGA 328 which is best appropriate for making the framework financially savvy.

2. LITERATURE SURVEY

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 harmaceutical

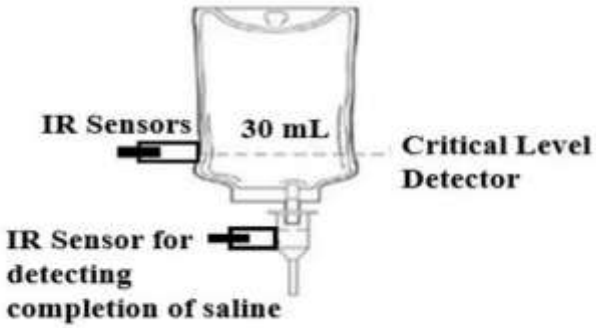
Applications Vol 3, Issue 1, 2012. As the world population grows, the need for health care increases. In recent years, progress in medical care has been rapid due to the advancements in the field of sensors, microcontrollers and computers. A major reason for this is the combination of the two important 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 coordination 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].

3. PROPOSED SYSTEM

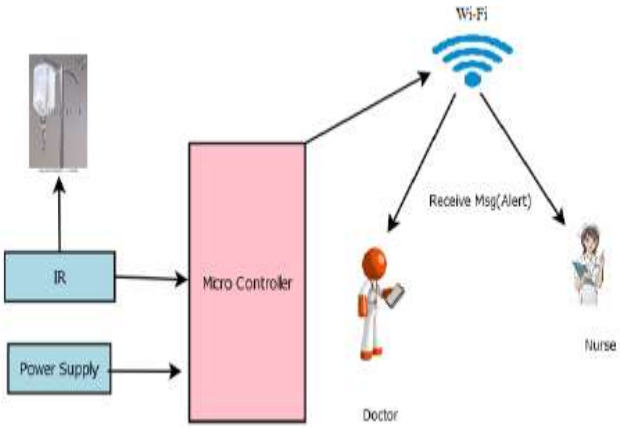


Fig 1: Block Diagram

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.

Step 1: 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.

This proposed system will function for two different scenarios which are explained below as follows: 1) Saline reaches at critical level. 2) Nurse fails to attend the patient to replace the saline bottle. In the 1st scenario, after getting consumed by the patient, saline reaches the critical level which is sensed by the IR sensors. This sensed output is sent to the micro-controller which scans the database for retrieving the contented information and buzzer starts ringing for alerting the nurses and doctors in the hospitals. A time limit will be set for ringing of the buzzer. An alert message is sent to the concerned nurses and doctors associated with the patient through the use of internet. If the nurse attends the patient, then she should stop the buzzer and reset the whole system. If she fails to do so, then 2 nd scenario takes place.

Step 2: POSITION OF IR SENSOR

In the 2ndscenario, if the medical attendant neglects to go to the patient inside the set time limit, the switch stream of the blood into the saline jug is halted. For this a spring-dc engine course of action will be made. The brace will be appended to spring, alongside the pressure and extending of spring, the clasp will likewise move in forward and in reverse headings. Again the IR sensor, at the neck of the saline jug will detect that the saline is completely devoured and signal will again begin ringing stronger to tell the medical attendant that the saline is completely expended and there is a prerequisite for substitution of saline container. The directions for System will be sent to produce cautions to nurture and other emergency clinic staff.

4. CONCLUSION

Right now which can naturally screen the saline stream rate by utilizing microcontroller. It can remotely send the information to medical attendants or specialists PC and show the outcomes as saline bead rate, number of beads originating from saline jug, saline arrangement given to the patient in ml and remaining time to discharge the saline container with the assistance of sequential port test programming. The framework is dependable, financially savvy and advantageous for medical attendants. It very well may be reused for the following saline jug. It is helpful for medical attendants just as specialists at rustic clinics. Medical attendants can undoubtedly screen the saline level from separation. It is mostly favorable around evening time timing as there is no requirement for medical caretakers to go to patient's bed to check the degree of saline in the container.

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