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PATIENT BODY WARMING SYSTEM

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Abstract - Patient body warming systems were developed in the 1980s and are acknowledge as being the most clinically effective patient warming modality. The advantages of avoiding hypothermia for patients undergoing major surgical procedures are well established and include decreased blood loss (with consequent reduction in blood product use) wound infection, duration of intensive care and hospital stay and cardiac ischemia and increased survival. Transient perioperative hypothermia occurs as a consequence of surgery and general anesthesia and is associated with increased blood loss, increased transfusion rates poor wound healing, increased duration of inpatient stays and higher rate of surgical site infection. It is well established that patient body warming system are frequently used in surgery in order to maintain normothermia and prevent such complications. Here in, we describe and compare commercially available warming system that are effective for maintaining normothermia during the perioperative period.

***KeyWords*:**Surgical, hypothermia, blood loss, patients, normothermia, hospitals.

1.INTRODUCTION

The patient body warming system is developed in 1980's and it being the most clinically effective patient warming system. With the using of this system is help us to avoiding hypothermia for patient undergoing major surgery. In this new generation of technology, we are trying to upgrade this system using the help of IoT. Therefore, IoT devices, also known as smart objects, are becoming more innovative and more efficient. As well as we also include the safety and alarm circuit which let us know that system is on or off according to patient's body temperature. There are many IoT applications in healthcare such as remote monitoring, smart sensors, and medical device integration.

IoT has great potential to keep patients safe and healthy and also improve how physicians deliver care. Healthcare IoT can also bolster patient satisfaction by allowing patients to spend more time interacting with their doctors because doctors aren't as occupied with the mundane and rote aspects of their profession.

The most significant benefit to IoT in healthcare is that it supports doctors in conducting more meaningful medical work in a profession that already is experiencing a global skilled labor shortage. IoT and healthcare have a healthy relationship, and great strides are being made using IoT to make healthcare and medical services more efficient, beneficial and affordable.

This system will be useful in future with the more features and latest technologies IoT is the trending technology and we are going to upgrade it in the medical side. With the help of this system patient can felt warm air and their body can balance proper temperature into AC room. This patient body warming system is useful in hospitals, clinic and if it possible then it can also use in the cold places. Also, this system has its security alarm which is measures how much patient need warmness so it can set alarm and warm the body through air. If the patient's body temperature matches with normal body temperature, then the machine will be automatically turned off.

So, there is no issue of any damage. Using temperature sensor, it can measure temperature and alarm circuit used as safety purpose. If patient's body temperature is stable after the system activation, then this system can automatically turn off.

2.METHDOLOGY

HARDWARE REQUIREMENTS

1) GSM800L

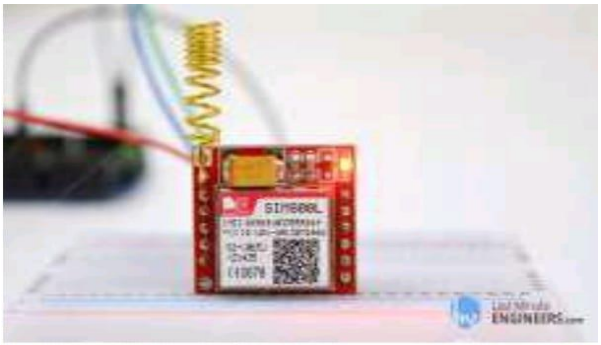

Fig -1: GSM800L

A GSM modem or GSM module is a device that uses GSM mobile telephone technology to provide a wireless data link to a network. They use SIMs to identify their device to the network. SIM800L is miniature cellular module which allows and receiving SMS and making and receiving voice calls. Low coast and small footprint and quad band frequency support make this module perfect solution for any project that requires long rang connectivity.

2) LED Display

Fig -2: LED Display

A LED display is a flat panel display that uses an array of light-emitting diodes as pixels for a video display. Their brightness allows them to be used outdoors where they are visible in the sun for store signs and billboards. In recent years, they have also become commonly used in destination signs on public transport vehicles, as well as variable-message signs on highways. LED displays are capable of providing general illumination in addition to visual display, as when used for stage lighting or other decorative purposes.

3) Microcontroller

Fig -3: Microcontroller

A microcontroller is a small computer on a single VLSI integrated circuit chip. A microcontroller contains one or more CPUs along with memory and programmable input/output peripherals.

4) Pulse Sensor

Fig -4: Pulse Sensor

Pulse Sensor Amped is a greatly improved version of the original Pulse Sensor, a plug-and-play heart-rate sensor for Arduino and Arduino compatibles. It can be used by students, artists, athletes, makers, game & mobile developers who want to easily incorporate live heart-rate data into their projects. Pulse Sensor Amped adds amplification and noise cancellation circuitry to the hardware. It's noticeably faster and easier to get reliable pulse readings. Pulse Sensor Amped works with either a 3V or 5V Arduino. Lastly, the Pulse Sensor creators have also streamlined and improved the Processing visualization software and Arduino code that comes with this hardware.

5) Temperature Sensor(LM35)

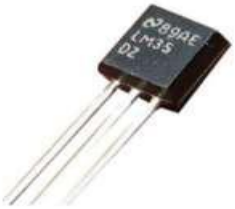

Fig -5: Temperature Sensor (LM35)

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. The LM35 device does not require any external calibration or trimming to provide typical accuracies. Lower cost is assured by trimming and calibration at the water level. The low-output impedance, linear output, and precise inherent calibration of the LM35 device makes interfacing to readout or control circuitry especially easy. The device is used with single power supplies, or with plus and minus supplies.

6) Buzzer

Fig -6: Buzzer

Buzzer or beeper is an audio signaling device. which may be mechanical, electromechanical or piezoelectric. Typical uses of buzzer include alarm devices, timer, train and conformation of user input such as a mouse click or keystroke.

7) Arduino Nano

Fig -7: Arduino Nano

The Arduino Nano is equipped with 30 male I/0 headers, in a DIP-30 like configuration which can be programmed using the Arduino software integrated development environment (IDE), which is common to all Arduino boards and running both online and offline. The board can be powered through a type-B mini-USB cable or from a 9 V battery.

3. Working

The patient body warming system is developed in 1980's and it being the most clinically effective patient warming system. With the using of this system is help us to avoiding hypothermia for patient undergoing major surgery. In this new generation of technology, we are trying to upgrade this system using the help of IoT. Therefore, IoT devices, also known as smart objects, are becoming more innovative and more efficient.

Healthcare IoT can also bolster patient satisfaction by allowing patients to spend more time interacting with their doctors because doctors aren't as occupied with the mundane and rote aspects of their profession. The most significant benefit to IoT in healthcare is that it supports doctors in conducting more meaningful medical work in a profession that already is experiencing a global skilled labor shortage.

IoT and healthcare have a healthy relationship, and great strides are being made using IoT to make healthcare and medical services more efficient, beneficial and affordable. The IoT may mean a revolution in the diagnosis and treatment of disease. This system will be useful in future with the more features and latest technologies IoT is the trending technology and we are going to upgrade it in the medical side. With the help of this system patient can felt warm air and their body can balance proper temperature into AC room.

This patient body warming system is useful in hospitals, clinic and if it possible then it can also use in the cold places. Also, this system has its security alarm which is measures how much patient need warmness so it can set alarm and warm the body through air. If the patient's body temperature matches with normal body temperature, then the machine will be automatically turned off. So, there is no issue of any damage. Using temperature sensor, it can measure temperature and alarm circuit used as safety purpose.

4. CONCLUSIONS

Typically, the choice of intraoperative patient warming device depends on a number of factors such as cost, evidence-based practical and nursing preference. Forced-air, conductive warming systems and heated fluids have been shown to be effective for the prevention of hypothermia and its associated complications in surgical patients. For such critical conditions the doctors need to have an all-time update patient's health related parameters like their blood pressure, heart pulse and temperature. In this way IOT Based ICU Patient Monitoring System that helps in monitoring ICU Patients without any manual intervention. The output from sensor and amplifier circuit was connected to the Arduino .The observed output signal was periodic ac signal with amplitude varying from peak to peak according to person. A sinusoidal signal and the output from sensor were fed to Arduino and the counted pulse rate was successfully sent via Wi-Fi module.

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