Smart Stretcher and Integrated Medical Intelligence Systems for Unconscious Person

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***Abstract*:- India is one of the most populous countries of the world. Due to over population, ignorance of health have been remained the major problems in India. For every one minute a death swoops in because of unpredictable and unexpected accidents. To save a life is auspicious as well as precious. The idea here is to provide an intelligent smart health system using some sensors and microcontrollers which are implemented in stretcher. The aim of this system is to save many human lives by preparing intensive care unit in hospital, as their physical parameters are updated to hospital before their arrival to hospital.**

Keywords: Smart Stretchers, Arduino Mega2560 Microcontroller, IoT Module, Moving Motor Mechanism and Driver, Embedded C, ARDUINO IDE.

1. INTRODUCTION

Health is one of the global challenges for humanity. In the last decade the healthcare has drawn considerable amount of attention. The prime goal was to develop a reliable patient monitoring system so that the healthcare professionals can monitor the patients, who are either hospitalized or executing their normal daily life activities. Recently, the patient monitoring systems is one of the major advancements because of its improved technology. Currently, there is need for a modernized approach. In the traditional approach the healthcare professionals play the major role [1]. They need to visit the patient's ward for necessary diagnosis and advising. There are two basic problems associated with this approach. Firstly, the healthcare professionals must be present on site of the patient all the time and secondly, the patient remains admitted in a hospital, bedside biomedical instruments, for a period of time [2].

In order to solve these two problems, the patients are given knowledge and information about disease diagnosis and prevention. Secondly, a reliable and readily available patient monitoring system (PMS) is required. In order to improve the above condition, we can make use of technology in a smarter way [6]. A Stretcher is a Medical Device used to carry casualties or an incapacited person from one place to another It is a simple type of lifter, and still called by the name in some cases. A stretcher is usually moved by two people, one at the head and the other at the feet [8]. The casualty is placed on the stretcher and can then be carried or wheeled away. Stretchers are used if a person is unable to walk by themselves or if other requirements mean a "stair chair" (wheel chair), or similar device can be used. Most modern civilian stretcher includes straps to avoid further injury to the patient [9]. The casualty must be lifted (scoop) to be put on the stretcher. This lifting can be made manually, but it is also possible to use specific devices. These devices can also be used as stretchers, but only for short distances.

A long spine board can be used to scoop and carry the victim to the stretcher, in case a spine trauma is suspected, the victim is left on the board and tied to it and the board is simply put on the stretcher. The spine and overall immobilization can also be performed by a vacuum mattresses put on the stretcher. When there is no suspicion of spine trauma, the vacuum mattresses can be used as a stretcher (it has handles), which is best in narrow places when the stretcher cannot be kept horizontal. It is more secure and comfortable than strapping the casualty to the stretcher [10]. Some lifting devices are as stressful as manual lifting. Equipments need to be evaluated for ergonomics as well as user acceptance.

2. LITERATURE SURVEY

Trauma is one of the foremost causes of death in children and young adults. A decrease in the time between trauma and hospital arrival has reduced mortality rates Stretchers, chairs, and wheelchairs are the primary means of transporting patients in emergency departments. After a patient arrives in the emergency room, treatment priority is determined using a triage system, and a patient may receive treatment immediately or wait for hours. Thus, emergency department stretchers must be ergonomic, safe, and reliable. Furthermore, it is important that patients can be easily transferred to a stretcher with a minimal amount of movement.

Thus, an appropriate stretcher makes the job easier for the emergency medical personnel. Stretchers must serve a number of functions, and several investigations have been undertaken to design ergonomic transport devices. Customer satisfaction is critical for service providers, and the provision of quality products and services is an important way to increase customer satisfaction. Customer demand for quality service has increased competition among service providers, and the demand for quality in the health sector is no different. Emergency departments are the hospital showcase and, as such, their services should be of the highest quality.

➢ *DISCUSSION*

Stretchers are an indispensable piece of emergency department equipment. Many factors play a role in the choice of stretchers. They can be expensive, particularly

with added features in terms of material, utility, ergonomic design, and safety. Stretchers, chairs, and wheelchairs are the primary means of transporting patients in emergency departments. After a patient arrives in the emergency room, treatment priority is determined using a triage system, and a patient may receive treatment immediately or wait for hours. Thus, emergency department stretchers must be ergonomic, safe, and reliable. Furthermore, it is important that patients can be easily transferred to a stretcher with a minimal amount of movement. Thus, an appropriate stretcher makes the job easier for the emergency medical personnel.

3. EXISTING SYSTEM

Based on the survey, till now, even hospital aide informs the live status of patient, there is no any smart system to inform patients live condition to nursing home through online. Also it is must to inform immediately about accident to relatives and police station to precede legal activities. To overcome these issues, we are proposing an idea to implement a smart system in stretcher in ambulance itself. In existing, it is also noted that minimum two workers are required to push stretcher safely. The proposed system will help to overcome this problem also.

➢ *DISADVANTAGES*

- No automated system for information sharing.
- Time delay may occur to begin treatment.

4. PROPOSED SYSTEM

The proposed system consists of two sections namely stretcher section and hospital section. In stretcher section, there are many health monitoring sensors to monitor patient live health parameters that are implemented in stretcher. This information is updated to hospital via server for every second. Also it is necessary to inform about accident and patient personal details to nearby police station along with location. For this, a biometric sensor is used to get patient personal information.

This information is updated to hospital and police station through Internet of Things. With this information, an alert will be messaged to patient's relatives by cop. Second section is hospital section. After reaching hospital, it is must to admit the patient in intensive care unit as soon as possible. But there are many obstacles that may interfere between entrance and care unit. Till now, hospital workers move the stretcher manually. It may take some time delay due to applying human power. To solve this issue, a stretcher control mechanism is implemented in this system which is controlled by microcontroller. By initiating this mechanism, stretcher moves automatically by stretcher moving mechanism with guidance of human. If the stretcher moves very fast or uncontrollable, then an emergency stop switch will be activated automatically to stop litter. A sonic humidifier sensor is implemented to detect whether any person or other object interferes in stretcher path. If any interfere occurs, alerting system is activated to avoid such interferes.

➢ *BLOCK DIAGRAM*

STRETCHER SECTION

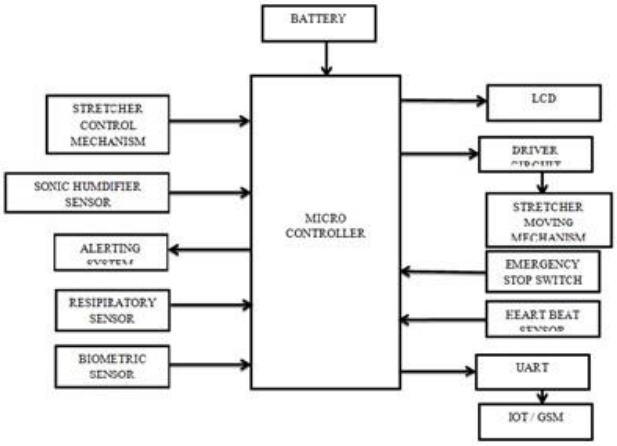

Fig.1 Block Diagram for Stretcher Section

MONITORING SECTION

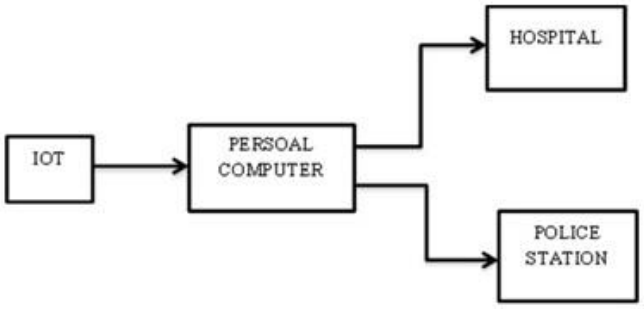

Fig.2 Block Diagram for Monitoring Section

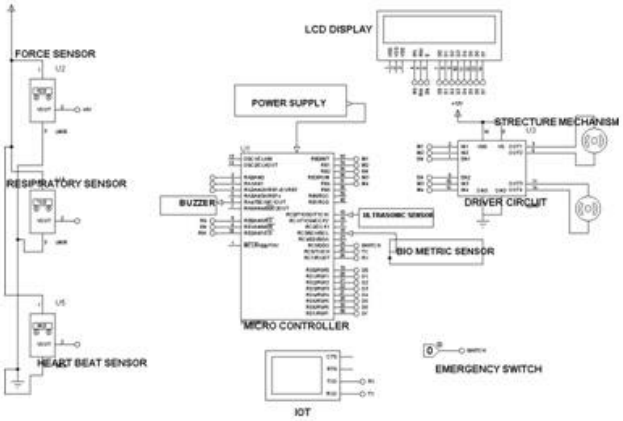

Fig.3 Circuit Diagram of Proposed System

5. MECHANISM

The challenges of managing unconscious patients lend themselves to standardized multidisciplinary approaches and algorithms. An alarm-triggered management routine designed for patients presenting with Heart Beat, has been shown to optimize assessment and treatment. Checklists for healthcare professionals have also shown utility in the management of patients health. Intuitively, simulation-based education is an ideal way to train a multidisciplinary team to work collaboratively and effectively. Simulation training for core medical trainees in the care of unconscious patients has shown some positive effect.

Fig.4 Hardware Design of Proposed System

6. CONCULSION

As health care services are important part of our society, automating these services lessen the burden on humans and eases the measuring process. Also the transparency of this system helps patients to trust it. As continuous monitoring of patient condition is performed, physician can analyze current status of patient which will help to take decision him to provide suitable treatment.

7. REFERENCES

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