MEDICAL DRIP MONITORING AND AUTO-CONTROL SYSTEM

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DECLARATION

I, **EIKU GEORGE**, hereby declare that this project is completely based on my research work except for citations and quotations which have been specifically acknowledged. It has not been submitted to any other examining body or academic institution for any academic award.

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APPROVAL

This is to certify that the project proposal titled "medical drip monitoring and auto-control system" has been done under my supervision and is now ready for examination.

Signature.

……………………………………………………………………………………...

Date.……………………………………………………………………………………...

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LIST OF ACRONYMS

GSM…………………………………………. Global System for Mobile Communications

SMS…………………………………………………………. short message service

LED………………………………………………………… Light Emitting Diode

IV……....………………………………………………… Intravenous

AC…………………………………………………… Alternating Current

IC…………………………………………………………... Integrated Circuit

WHO…………………………………………………...World Health Organization

LCD…………………………………………………Liquid crystal display

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DEDICATION

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Abstract,

With the increasing growth of population in Uganda, health care plays a vital role in leading a contented life. In hospitals, ensuring the patients' safety is the most important thing. Hence automatic health monitoring systems are the most sought after because it gives precise information while reducing the stress of the medical practitioners and the attendants of the patients about missing certain critical data. Also, indicating when the intravenous fluid administered to the patient falls below a critical level is a tedious process and a tougher job. Monitoring the level of intravenous fluid level manually is a simpler job but if not done with utmost care may affect the health of the patient severely. This may lead to blood loss or backflow of blood to IV tube from their veins. If the bottle gets fully drained, air enters the tube and in turn into the vein, which may prove disastrous to the patient. So automating this system might prove really helpful. A system is designed such that if the Intravenous fluid reaches a critical level, it is sensed by the conduction pins set up and a solenoid valve quickly blocks the fluid flow, an alarm sounds and a message is sent to the nurses' phone indicating the fluid level in the bottle. When this is done, the nurse can easily identify the patient and go there directly to change the bottle rather than keep checking every patient to notice if the fluid has reached the threshold level. This requires the use of conduction system placed at different levels of the bottle, solenoid valve connected on the tube between bottle and patient's body and the GSM module, the buzzer and the two LEDS.

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CHAPTER ONE: INTRODUCTION

This chapter discusses the background, problem statement, objectives, justifications and the technical scope.

1.1 **Background of the study**

Generally, as the population growth increases, the need for health care also increases [1], [2]. Hence it is a mandatory thing for everyone in this world to take care of their health properly. For this matter therefore, maintaining patient's safety is the top most priority to be given in all hospitals. Now days, many automatic health monitoring devices are developed to ensure patients safety and to reduce the stress of the doctors and patience's attendants. The invention of such devices introduces a drastic change in medical field for monitoring the parameters like heart beat rate, detection of heart attack symptoms and much more automatically with interdisciplinary nature. Even though many advanced devices are used, ensuring the safety of the patients during IV period is still a challenging issue. Intravenous (within vein) therapy is the infusion of liquid substances directly into the vein. Therapies administered intravenously are often called specialty pharmaceuticals or drips. In other words, A drip is a short, small plastic tube that a doctor or nurse will put into patient's vein, using a needle. They will leave a plastic tube in so that fluids and medicines go directly into patient's blood [3]. A drip is applied when: -

Patients that have lost a lot of blood from an accident or major surgery or even prolonged illness - are given an intravenous drip which is intended to replace lost blood until the body can manufacture the lost blood itself [3].

Patients that have had major surgery may not be capable of taking solid food for some time until they recover sufficiently to feed themselves. Therefore, the patient is given a 'glucose drip' via a tube which is inserted into a nostril -and goes directly into their stomach. The drip not only contains glucose - it also contains salts and minerals. It is intended as a 'short term fix' until the patient can feed themselves again as stated by Bakash Kumar [4]

Even though monitoring the IV fluid level of patient is a nurse's duty, short of effective service will affect the patient health severely during illness if the assist does not monitor it regularly [5]. This may lead to blood loss or backflow of blood to IV tube from their vein. According to a survey conducted by Fremont Rideout Health Group Laboratory Services [6] This results in the reduction of hemoglobin level of patients and it may also make the person anemic. The task of assessing and managing the patients with sufficient skill needs to be a fundamental thing for a good patient care. Hence to assure the safety of the patient during IV period there is a need to develop an efficient health monitoring system. This can be achieved with the proposed idea of an automatic flow control drip. Automatic flow control of blood in drip is done with the help of sensing the amount of the level in the bottle. A level sensor is placed outside the bottle. It can be measured with the help of variations in the level of fluid. The main components are microcontroller, solenoid valve, ultrasonic sensor, blood carrying bottle, carrying stand and power supply. The major advantage of this project is that; when we are not able to stop the flow of fluid or if we made some

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