Abstract:

Administering drug to patients by the oral, subcutaneous, and intravenous means is a fundamental concept for the treatment of diseases in clinical medicine. Traditionally, drug delivery to critical patient is accomplished by using the well known roller clamp drip delivery system. Here, the drug in liquid form and in a plastic bag is attached high in the roller clamp assembly. The amount of drug delivery to the patient per unit time is adjusted by the help of the natural gravity, and by setting the pressure of a clamp attached to the cord of the drip.

Although the roller clamp system have been in use in hospitals for many decades, this system has many disadvantages. Perhaps the main advantage is that the amount of drug delivered cannot be controlled accurately as this depends upon the setting of a simple clamp attached to the dip cord. Although less than the required delivery may not be important, delivery of large amounts of drug in short time could cause serious health risks to the patient, and this requires constant attention of the health nurse. Another important disadvantage is that there is no way for the health nurse to know when the drug is finished or if there is a problem with the drug delivery. There has been hospital reports in the past where the drugs had not been delivered at the required times because of the simple structure of the mechanism used.

This thesis describes the design, development, and the implementation of a microcontroller based intelligent and automatic drug delivery system, based on the principle of an intravenous infusion pump. The system is designed around a fast programmable microcontroller which controls all operations of the system. A stepper motor ensures accurate and precise delivery of drugs at exactly the required times of the day. The novelty of the designed system is that it provides remote wireless Bluetooth based communication to the health nurse monitoring the state of the system at any time while drug delivery is in progress. In addition, important safety issues and error condition, such as opening the door assembly, finish of the drug in the bag, air bubble in the tube, or any interruption to the delivery system can easily be monitored by the health nurse remotely, while the nurse is away from the patient’s bed side. With the designed system the health nurse does not have to carry out frequent visits to patient’s bed in order to check the state of the drug delivery system.

Key words: Drug delivery, Infusion Pump, Microcontroller System, Automatic Drug Delivery