An Efficient Intravenous Drip System For Hospital Environment

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Abstract. Healthcare system plays important role in leading a happy life of increased birth rates. At healthcare, preserving the safety of patient is by far the most important matter. Advanced health monitoring systems seem to be the most sought after anyway they offer accurate information while decreasing the hospital's medical professionals as well as attendees stress and over absence of many crucial information. It also is a tedious process and a harder task to demonstrate that a long and tiring method and a harder job is when the injected supplied to a fall’s prevention under a crucial quantity A simpler task is to manually monitor the level of inject able fluid, if not then done with the utmost care, the safety of an individual can be severely affected. This may result to blood or plasma flow becoming diverted through the bloodstream to the Drip tube. When the container is drained fully, air enters its tubing but in exchange enters the vein, which could be disastrous for the patient. So, it would prove very helpful to optimize this system. The blood glucose in the insulin travel container in use in clinics in this study was identified in this study. In this, whenever the IV drip was to be drained, the scheme we had also formed to connect two streams at a same intersection and access the network using control valves system of the Arduino is engineered so that if the injected reaches a dangerous threshold, It is sensed through the use of water content as well as the secondary moving fluid valve is stimulated. This requires use of the control valve as well as the flow analysis software to calculate the measured value.

1. Introduction
Due to excessive workload, individuals often forget to be doing their very essential job. The person will have a negative effect if staff working in healthcare would refuse to improve the IV Drip bottle once it has been emptied. They can transmit an alert signal on each device to remind the staff that now the fluid container is about to be empty, as everyone is aware of the tasks, and we won't forget many opportunities to monitor the system. Infusion liquid medication straight into to the blood vessels, that has a rapid, extra beneficial impact on the body especially in comparison in taking the drugs by throat. This is because during oral intake, digestive fluids will decrease the effectiveness of medicine until it is discharged into the bloodstream. Effective monitoring of a glucose injecting fluid velocity is needed to preserve the inner organs and bloodstream systemic circulation from overdose-induced damage. Approximate missing data of 19-27 % of customer medications administered have been shown through clear clinic observational studies. Also, the slightest dosage of mistakes could lead to severe patient medical problems. For e.g., even excessive drug injecting it into patient could possibly damage Blood vessels, result throughout the discharge of drugs to surrounding cells themselves. Through with a vessel, excessive drugs. It also could impede flow of blood, causes additional clot formation of red blood inside the bloodstream. Undoubtedly, it can cause heart failure due to increased cholesterol levels (hypertension). It contrasts, intravenous drug injection errors get a significantly greater proportion of connected fatalities in India (~19 percent) compared to other methods of medication administration.
Besides that, injectable intravenous drug errors in India get a significantly greater proportion of associated fatalities (~19%) compared to many other drug administration forms.

To improve injection reliability and patient safety, IV fluid monitoring devices are being extensively investigated. Recorded devices evaluate as well as show the imbued flow rate utilizing optical sensing components throughout aspects of particle score for every minute. Here, our model plays an important role in connecting the trip bottle multiples at the same time. So, without any error, we can deliver the drug in time. This will be controlled with solenoid valves connected to the system to regulate the fluid flow to the patient once another valve is automatically turned on and control the flow without any distortion once the channel is drained.

2. Existing Model

Infrared detectors, antennas transmissions, sensors, sound generators, etc. were part of a solution. Apparently, IR transducers transmit an IR rays received by Infrared sensor and the voltage produced is important. Monitoring systems are originally placed on either side of the solution vessel foundation. The Infrared electronic signal repeatedly communicates the signal to the saline solvent as well as the IR sensor begins processing it. Although 4.5V is measured as equivalent power output whenever the medication fluid passes well beyond the region protected by IR sensor throughout the dripping container, that voltage output of which will be calculated as 5V, more exposure was granted to the Ir signals that those from the previous state. The usual manual monitoring of an amount of fluid in such a container while utilizing the charged cell is disrupted by some other method. When 50 ml of liquid are left, the first accusation is provided, so unless the nurses and doctors are given sufficient time to enter the space to replace the container.

2.1 Direct therapy

Subcutaneous treatment is a clinical technique that provides liquids throughout the anatomy since they are directly inserted and thus efficiently spread into the systemic circulation. As compared to many other forms of access, this is not common for pathogens from of the surface of the skin to travel straight into to the vein. Solvent quarter the fluid of organic. Another highly common IV solvent used here is Lactated Ringer's. IV trip system risks Phlebitis Vein inflammation. Parasites. Extravasations. This happens when the fluid in the IV leaks into to the tissue covering the vessel. Through Atmospheric Aortic dissection. Whenever a gas bubbles (or air bubbles) hits the bloodstream, hypervolemia usually occurs. It is an abnormal increase in blood volume caused by an infection.

2.2 Connectivity

When we keep that channel with your – anti arm upon on the IV bottle Connectivity with the times the number while the ports on the IV bag was held by your – anti side, attach the spikes. It will take some Pressure and until it will go no further, you should continue to insert it. A few times, squeeze the drift Chamber until it is 1/3-1/2 full of fluid. On the other end of the tubing, remove the cap.

2.3 Time management

For example, with the micro drip set, they need 500 ml to introduce over 12 hours. The falls per minute will be the same as a milliliter every hour whenever the IV tubes are micro drip, 60 gtt/ml. Overall amount (500 ml), split in periods through overall duration (12), is equal to 41.6 ml, round to 42 ml each hour. Receiving an IV could be completely different by each person. Even so, generally, it requires around 25 and 45 minutes. The first one to finish their treatment for that too. Overall, regarding IV moisture treatment, they must intend to take an hour from your days.
2.4 Level monitoring difficulties

Which falls per hour, if the IV piping is micro drip, will be the same as the milliliters every hour, 60 gtts/mL. It's also feasible to label dripping containers. For example, with such a micro drip set, they need 500 ml to combine over 12 hours. Overall amount (500 ml), divided by total time in hours (12) and equal to 41.6 ml, round to 42 ml every hour by each person, obtaining an Intravenous can be different. Even so, based on the fall factors, it usually takes around 25 and 45 minutes for it to be associated with Meta and micro-drip. For just a given dripping room, the fall function reflects the amount of decreases each milliliters of Intravenous fluids (when the fluid drips from the hole into the chamber). Just use equation, amount (ml) divided by the time (standard rate volume(s)) if you really need to set it up on an IV intravenous infusion. Calculated by 60 min more than 60 minutes, that's also comparable to a milliliters IV fluid velocity. 100 ml categorized by 30 min, period 60 min throughout 60 minutes, equals 199.9, balanced to 200 ml/hr, and use this method.

2.5 Control system related issue

A vital mode of transmission of liquids as well as other pharmaceutical materials back into the blood circulatory system is the injectable (IV) drip. For its advantages, this same IV liquid is commonly will use. Even though IV saline is a secure, powerful and reasonably priced weapon, in using it there could be an amount of health problems.

3. Methodology

3.1 Solenoid valve

The flowing of fluid is controlled by control valve. In preparation for the machinery being used efficiently and properly, such valves are incorporated into machinery. Use of a plunger to unlock or close the valves is how a solenoid does, whether allowing the water to flow through it or sealing this off without leakage.

3.2 Flow rate analysis

\[ Q = Vt \]

Q is the quantity and t are the time elapsed. For water flow, the Standard unit is m³/s, but a range of many other Q measurements are in general use. For example, the cardiovascular of a relaxing older person blood flows at a rate of 5.00 liters (L/min). Flow Process Evaluation is used to help fully understand the current condition of any process flow system. Moving can be used within a falling plant to classify all items from raw materials by persons and disposal paths. Efficient streams exceed the production for products.

3.3 Dual channel connectivity

Most of the trip system had only option to connect one bottle at the time but there we modify the tubes and additional feature to control the flow rate. Here we modify the multi-channel adapter to connect the two are more bottles in the same time and the flow is same as per previous connection. This system has better option to remodify the traditional system.

3.4 Remote monitoring feature

Normally, this intravenous trip system needs someone to change the manual operation, but here we connect the two are more devices in the same connection, so we don't need to control it regularly and the solid valve is used to control the flow of the system and channel connection in a remote area.
Figure 1. Flow Chart of Trip system
Here, the device usually starts with a stream of 1051ml. "There are 2 methods connected to both the pumps, one controlling the rate of trips and then another open state channel I, current level referred as "C." The flow intensity is monitored by the water level sensor as well as the threshold of fluid denoted as "Q. If the condition \( Q = 150 \text{ml} \) is reached, the second channel solenoid valve would be simply switched further to control the flow. If the "no" condition means that the level is monitored by the water level sensor until the condition reaches \( Q = 150 \text{ml} \). Here, the system does not need any manual operation to update the trip again, when the condition passed, these were automatically transferred the channel.

Table 1: Measurement of Intravenous trip system.

| PROPOSED INTRAVENOUS TRIP SYSTEM MEASUREMENTS |  |
|---------------------------------------------|--|---|
| Main Spool length angle                     | 0.7330 | |
| Main Spool area                            | 1.1310e-04 | |
| Modulus of Intravenous tip B               | 2.1000e+09 | |
| Discharge coefficient                      | 0.6200 | |
| Spool clearance area m²                    | 1.310e-07 | |
| Spool clearance m                          | 3.0000e-06 | |
| Main Spool diameter measured               | 0.0120 | |
| Main Spool damping coefficient              | 200 | |
| Damping coefficient of material of cylinder | 20000 | |
| Main Spool spring stiffness                | 22000 | |
| Stiffness of material of cylinder           | 5.0000e+10 | |
| Main Spool mass                            | 0.0354 | |
| Cylinder pressure due to cylinder load     | 500000 | |
| Cylinder pressure due to cylinder load     | 500000 | |
| Supply pressure                            | 10000000 | |
| Drain pressure                             | 0 | |
| Quantity of fluid                          | 1051ml | |

3.5 Rigid plastic
A polymer which, under specified test conditions, has a toughness or transparent permeability compressive strength have between 10,000 and 100,000 pounds of force. Compact packages or containers sealed with heating or force were versatile packaging. Start standing up containers, of
example, with a zipper lock, embossed tubing, steam backpacks, etc. But at the other end of the spectrum are flexible packaging.

![Figure 2. Graph I Pharmacodynamics](image)

Pharmacodynamics characteristics of trips system in entrances channel I (A) intravenous injection at 1 mg/kg level and channel II (B) topical delivery at 1 mg/kg dose.

4. Conclusion

The Intravenous trip system generally used to deliver the drug as per basic procedure and advice from doctors here we resolve the issue of if the connection lost the timeline it can suck the blood in a reverse order, our system can make the multilevel connection for more dosage level (Drug bottles) and also have the system to maintain it remote. For those older patients who live at home, it could be more useful. The medical field is among the rapid advancement fields with distinctive innovations. The intravascular volume level measure is the much system that can prevent possible mistakes and be a life that brings. It significantly reduces the stress of the healthcare professional on the frequent need of client to verify mainly in order to care of the Intravenous fluids. And although recommended indicator of IV fluids level has important uses, like cheap price, reduced footprint, fast response and simple operation. In the patient health monitoring system, this development will be an essential unit.

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