

MACHINE TECHNOLOGY & CARING IN NURSING

(Technology at Fingertips-series-VI)

SYRINGE PUMPS

Mrs. Kavitha, Lecturer
MIOT College of Nursing

Venous or arterial application of a liquid into the circulatory system always requires a more or less exact dosage. The infusion technique employed determines the accuracy of the dosage. The required dosage accuracy is generally dependent on the patient's status as well as on the type and amount of fluid to be infused, the infusion equipment used and the surrounding conditions.



There are two main types of products:

- Infusion pumps
- Withdrawal pumps.

Infusion pumps are used to administer relatively small amounts of fluids at high, but controlled pressures.

Withdrawal pumps are used to remove fluid samples automatically, typically in medical or pharmaceutical applications.

Specifications for both types of syringe pumps include minimum and maximum discharge flow, syringe size, number of pumps per assembly, minimum and maximum step rate, accuracy, reproducibility, physical dimensions and weight.

Syringe Pumps

- A syringe driver or syringe pump is a small infusion pump used to gradually

administer small amounts of fluid (with or without medication) to a patient.

- These are pressure infusion devices which supply the content of one or more syringes simultaneously by means of a precision linear drive.

Uses

- Syringe Pumps are used to deliver precise amounts of fluid at specific time intervals
- This form of infusion is particularly suited for an exact administration of drugs with dosage rate of 0.1 to 200 ml per hour.
- Multiple medicines can be administered at once.
- The syringe pump can widely be used in clinic, such as CCU, ICU, etc.
- The most popular use of syringe drivers is in palliative care, to continuously administer analgesics, antiemetic and other drugs.
- In the case of a medication which should be slowly pushed in over the course of several minutes, this device saves staff time and reduces errors.
- The syringe pump can be used alone or with an I.V. infusion to administer a dose of most I.V. medications, such as antibiotics, histamine blockers, or diuretics.

In general, the only agents not recommended for use with the pump are chemotherapy drugs and other vesicants.

Loading the Syringe

- To facilitate loading, the pusher block can be released from the leadscrew by pressing the bronze button and can be manually moved along the guide rods to accommodate the syringes. First place the withdraw syringe in the withdraw syringe holder, using the spring loaded retaining clamp to retain the syringe barrel in the V of the syringe holder. Make sure the barrel flange is held firmly by the withdraw clamp and that the adjusting screws on the withdraw clamp are firmly tightened.
- The pump can accommodate syringe sizes from 10 to 100 ml. Once you place the syringe in the pump and program the infusion, the pump automatically dispenses the dose.
- The pump uses microbore tubing that's primed with 0.45 ml of the drug from the syringe. Although you need a new syringe and needle or blunt cannula for each medication, you can reuse the tubing for 48 to 72 hours (check your institutional policy).

Articles required to load the medicines:-

- Syringe pump,
- labeled syringe containing the medication, micro bore extension tubing, 20-gauge needle or blunt cannula, alcohol swabs, and Stopcock (optional).

Features

- Enhanced pressure trending for earlier detection of occlusion
- Extensive delivery mode combinations including ml/hr, body weight, mass, volume over time, custom dilution and intermittent, loading dose, bolus dose, standby, volume limit and rate



- Syringe sizes: accepts different syringe types,
- Mounts easily to an IV pole, an infant's isolet or radiant warmer.
- Pole clamp allows for rotation to accommodate various pole and vast orientations
- wide-ranging flow rates and the capacity to infuse at low rates with larger syringes
- Accurate and sensitive pressure sensor detects occlusion pressure accurately.
- Alarms are given in case of malfunction or operation error and the machine stops operation automatically.

Multichannel syringe pump

Cleansing and Decontamination

- Cleansing should be carried out with a damp disposable cloth (use warm water and general-purpose detergent).



- Dry thoroughly.
- Do not use chemicals such as Xylene, acetone/similar solvents as this will

cause damage to components and labels.

Syringe Pump Maintenance

- All syringe pumps are serviced regularly according to a defined schedule and at least annually, whether used or not.
- If a syringe pump has been dropped or submerged in fluid or if there is any doubt as to their handling operation whilst in use they should be withdrawn from clinical use, labelled 'Do Not Use' and sent to medical physics to be checked.

Reference

Pharmacy Practice News, May 2010

www.google.com