

Guideline: Syringe Drivers

The syringe driver is a means of providing effective symptom control via a continuous infusion in cases of unrelieved pain and other distressing symptoms when the oral and rectal routes are inappropriate. A variety of pumps are available, however these guidelines refer to the Graseby MS16a and MS26 models currently used within St Benedict's Hospice.

Graseby MS16a (Blue) calibrated in millimetres per hour

Graseby MS26 (Green) calibrated in millimetres per 24 hours

Indications for Use

The patient is unable to absorb, tolerate or take oral medications because of difficulty swallowing, persistent vomiting, bowel obstruction, severe weakness, semi-conscious state, comatose/moribund patients, administration of drugs by non-parenteral routes.

Advantages of using a syringe driver

- Delivers drugs at an even rate continuously, maintaining plasma concentration at an optimum therapeutic level.
- Increases patient control, removing the fear and pain of regular injections
- Allows delivery of drugs through a single site for days/weeks.

Disadvantages of using a syringe driver

- Local site reactions from irritant drugs
- Negative impact upon body image
- Potential of technical problems.

Strong opioid analgesics

- Diamorphine (offers high solubility) in ampoule sizes 5mg,10mg 30mg,100mg 500mg
- Oxycodone (OxyNorm) (ampoules in 10mg/ml, 1ml and 2ml sizes)

Anti-emetics (refer to nausea and vomiting guideline)

- Cyclizine (anti-histamine) 50mg/ml size
- Haloperidol (anti-psychotic, anxiolytic) 5mg/ml and 20mg/ml
- Metoclopramide (prokinetic) 10mg/2ml ampoules
- Levomepromazine (sedative) 25mg/ml

Others

- Midazolam (anxiolytic; anti-epileptic) 10mg/2mls

- Hyoscine butyl bromide (Buscopan) (anti-spasmodic) 20mg/ml
- Glycopyrronium (Robinul) (antimuscarinic) 400mcg/ml and 600mcg/3ml ampoules
- Octreotide (Somatostatin analogue) 50mcg/ml 100mcg/ml 500mcg/ml
- Dolasetron (5HT₃antagonists) 20mg/ml

Steroids

- Dexamethasone 8mg/2ml ampoules

Before commencing the driver

The patient should be prepared firstly to help understand the rationale for syringe driver use, also to be educated on functioning and safety of the device with a patient centred booklet distributed where needed.

TO SET UP MS16A - HOURLY RATE SYRINGE DRIVER

- 1 Calculate total doses of drugs required in 24 hours.
- 2 Depending on the volume of fluid to be infused select appropriate 10ml, 20ml or 30ml leur lock syringe.
- 3 Draw up drugs in syringe. Make up volume with diluent so that when measured against the mm scale it measures 48mm. This must be done prior to priming the line to ensure that the patient receives the correct dosage of drug. (eg 10ml Becton Dickenson syringe will require total volume of 8mls, 20ml syringe 13mls)
- 4 Attach syringe to Graseby infusion line and prime line.
- 5 The first infusion will be complete in approx 21 hours due to the priming of the line after measurement. This procedure must be followed when initially setting up a syringe driver and when resiting or altering the dose. When changing the syringe on a daily basis follow procedure as no. 6
- 6 Measure the length of volume in syringe on the syringe driver in millimetres and divide by infusion time in hours = Rate in millimetres delivered per hour.

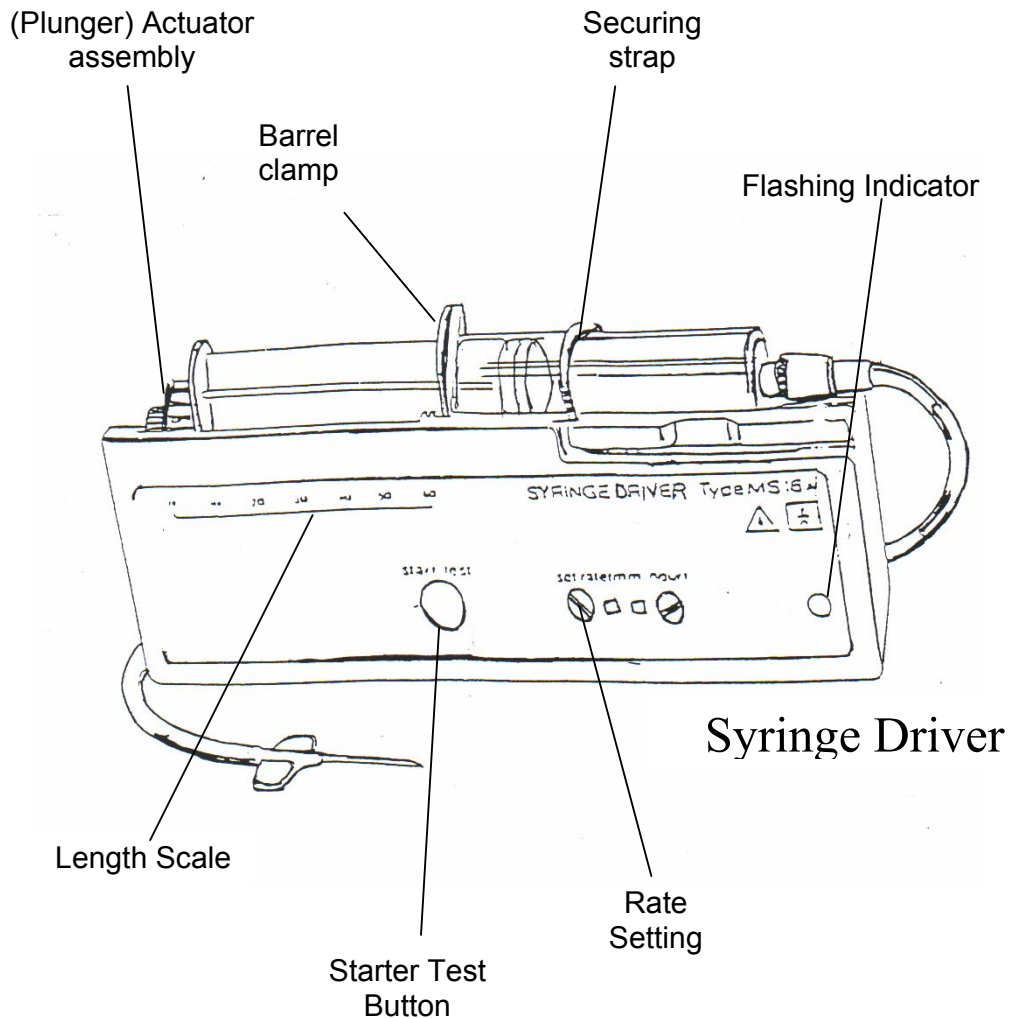
$$\begin{aligned} \text{Rate} &= \frac{\text{Fluid length in millimetres}}{\text{Infusion time in hours}} \\ &= \frac{48 \text{ mm}}{24 \text{ hours}} \\ &= 2 \text{ mm per hour} \end{aligned}$$

Therefore set rate dials at 02mm/hr

- 7 Decide on appropriate infusion site. The most suitable sites are: chest wall, abdomen or upper limbs. You may need to shave the area prior to siting.
- 8 Insert the needle subcutaneously at an angle of 45°. Secure in place with Tegederm or Opsite making a loop with the catheter.
- 9 Place the syringe in the driver. Move actuator assembly on driver to meet plunger on syringe if not already doing so and secure with strap.
- 10 Insert battery.
- 11 Push start/boost button. Listen for the buzz and make sure the light is flashing.
- 12 Place the syringe driver in the plastic holder; and if appropriate place in the shoulder holster to allow free movement of ambulant patients.
- 13 Every 24 hours remove syringe from the syringe driver and discard any unused fluid. Using new syringe draw up drugs required for the next 24 hour period, (1 ml less when not priming line)- measure length - set appropriate rate, and place into the syringe driver.

PROCEDURE FOR SETTING UP M.S.16A SYRINGE DRIVER

The M.S. 16A syringe driver is used for administration over a 24 hour period and is calibrated in millimeters per hours.



You will need

M.S. 16 syringe driver
9V Battery
Graseby Infusion Set
Leur Lock Syringe
Occlusive dressing
Needle to draw up drugs
Drugs to be used and dilutant
Recording documentation
Sharps Box
Drug additive label

TO SET UP MS26 - DAILY RATE SYRINGE DRIVER

- 1 Calculate total doses of drugs required in 24 hours.
- 2 Depending on the volume of fluid to be infused select appropriate 10ml, 20ml or 30ml leuc lock syringe.
- 3 Draw up drugs in syringe. Make up volume with diluent and measure against the mm scale. Set the rate on the syringe driver ie if syringe measures 40mm this is the rate set etc Do not prime the line before measuring the volume as this does not take into account the amount of drug in the line and the patient will receive a sub optimal amount of drug in the 1st 24 hours.
- 4 Attach syringe to Graseby infusion line and prime line.
- 5 The first infusion will be complete in approx 21 hours due to the priming of the line after measurement. This procedure must be followed when initially setting up a syringe driver and when resiting or altering the dose. When changing the syringe on a daily basis follow procedure as no. 6
- 6 Measure the length of the volume in the syringe driver on the syringe driver in millimetres. This measurement will be the rate delivered per day.

$$\frac{\text{Length of volume in mm's}}{\text{delivery time}} = \text{rate in mm's per day.}$$

For Example

$$\frac{45 \text{ mm length}}{\text{one day}} = 45 \text{ mm per day}$$

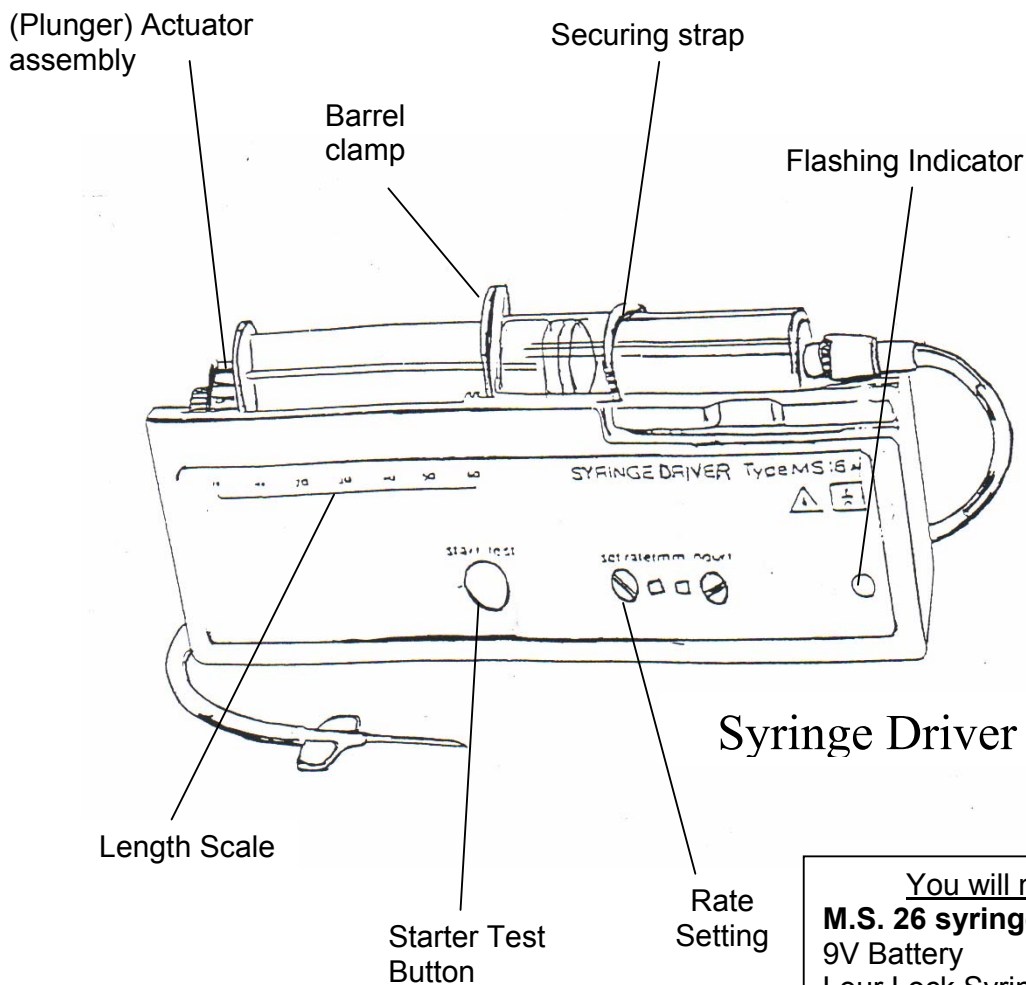
Therefore set rate dials at 45 mm

- 7 Decide on appropriate infusion site. The most suitable sites are: chest wall, abdomen or upper limbs. You may need to shave the area prior to siting.
- 8 Insert the needle subcutaneously at an angle of 45°. Secure in place with Tegederm or Opsite making a loop with the catheter.
- 9 Place the syringe in the driver. Move actuator assembly on driver to meet plunger on syringe if not already doing so and secure with strap.
- 10 Insert battery.
- 11 Push start/boost button. Listen for the buzz and make sure the light is flashing.

- 12 Place the syringe driver in the plastic holder; and if appropriate place in the shoulder holster to allow free movement of ambulant patients.
- 13 Every 24 hours remove syringe from the syringe driver and discard any unused fluid. Using new syringe draw up drugs required for the next 24 hour period, -measure length - set appropriate rate, and place into the syringe driver.

PROCEDURE FOR SETTING UP SYRINGE DRIVER MS 26

The Graseby M.S. 26 syringe driver is used for drug administration over a 24 hour period or of a few days at a time and is calibrated in millimeters per day.



Syringe Driver

- You will need
- M.S. 26 syringe driver**
 - 9V Battery
 - Leur Lock Syringe
 - Graseby Infusion Set
 - Sterile occlusive dressing
 - Needle to draw up drugs
 - Drugs to be used and dilutant
 - Recording documentation
 - Sharps Box
 - Drug additive label

Skin sites recommended

Abdomen
Thigh
Arm
Chest wall
Upper back

Skin sites to avoid

lymphoedematous regions
broken skin
tumour sites
skin folds
sites of irradiation
sites of infection

Monitoring of the syringe driver

Checks should be made every 4 hours to account for skin site, rate, battery and volume infused. These should be documented/signed by the checking nurse.

Upon discontinuation/removal of the syringe driver from the patient the rate should be amended to read zero in preparation for future use and new prescriptions to be calculated separately.