Sunderland NHS
Teaching Primary Care Trust

Syringe Driver Workbook

Developed: January 2004

Reviewed and updated : April 2006

INTRODUCTION

This booklet is designed to complement the Use of Syringe Drivers training session and successful completion of both will provide you with the required knowledge to care for patients who required continuous subcutaneous infusions/medication using a syringe driver in place within your role. The workbook should be used in conjunction with STPCT Policy for the administration of Medicines.

Practical skills will be assessed in practice.

The aim of this booklet is to help you to achieve the learning outcomes and these are clearly stated.

The references will help you with any further reading you may wish to undertake.

Following the study session you will be required to undertake observed practice relating to syringe driver practice until you feel competent / deemed competent.

It is important to remember that once any skill or area of knowledge has been learned, it is the responsibility of the individual to maintain and improve knowledge and competence (NMC 2002).

ASSESSMENT STRATEGY

Following the training session the Nurse will return to the clinical area and fulfil the following procedure chronologically.

1 Observation. The Nurse will observe the care and management of a patient with a syringe driver by a competent trained practitioner in his/her own clinical area / hospice.

2 Supervised Practice. A period of supervised practice will be undertaken and the Nurse will be supervised in the care and management of patients requiring the use of a syringe driver.

3 Assessment. Will be conducted by a Trained Nurse who has attended a Trust Training Day and is competent and assessed to care for patients with syringe drivers.

LEARNING OUTCOME 1: ALL ABOUT THE DRIVER

This workbook refers only to the use of Graseby Medical MS16A and MS26 syringe drivers for subcutaneous use.

1. What is a syringe driver?

2. What are the differences between the MS26 and MS16A syringe drivers.

3. Describe the functions on the syringe driver.

4. Describe the importance of the measuring gauge on the syringe driver

5. Explain why and when the alarm bell sounds.

6. Explain the function of the boost button facility.

7. What size syringes can be used on the driver?

LEARNING OUTCOME TWO:
INDICATIONS FOR USE AND DRUG SUITABILITY

1. What are the indications for setting up a syringe driver?

2. What are the advantages and disadvantages of a syringe driver

3. Which drugs are commonly used in the driver?

4. Which drugs are not suitable to be given by this method?

5. In general how many drugs may be combined into one syringe?

6. How will you access compatibility data?

7. What should you be aware of when using cyclizine?

8. What is the first line choice of dilutent for most agents?

9. Why is it important to measure the syringe and then prime the line when initiating a new infusion?

LEARNING OUTCOME THREE: SETTING UP THE DRIVER

1. What information should be given to a patient before the driver commences?

2. What equipment is needed for setting up a syringe driver?

3. Demonstrate how all the pieces are connected and how to prime the line.

4. Before attaching the syringe to the driver, what must you do first?

5. How do you start the infusion?

6. What does the indicator light show?

7. Which infusion sites would you consider for a syringe driver and why?

8. Which sites would you avoid and why?

9. Describe how and what you would observe/monitor when an infusion is in progress

LEARNING OUTCOME FOUR: TROUBLE-SHOOTING

1. A patient has a syringe driver with diamorphine. Over the last 12 hours he/she has required extra analgesia. What should you consider when assessing this?

2. Give four examples of what you would look at on the driver, to ensure it is not malfunctioning and causing the need for increase in medication.

3. The indicator light is not flashing. What should you do?

4. The infusion is too slow. What do you look for? Explain what your course of action would be.

5. The infusion is too fast. What do you consider?

6. A doctor has prescribed a drug that is not licensed for subcutaneous use. What would you do? Explain why.

7. The medication contained in a syringe driver has crystallised. What steps would you take to prevent this from happening on subsequent occasions?

Reading
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 analougue) 50mcg/ml 100mcg/ml 500mcg/ml
- Dolasetron ($5HT_3$antagonists) 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 luer lock syringe.

3 Draw up drugs in syringe. Make up the solution with dilutent to the recommended volume. **Measure against the gauge**. This must be done prior to priming the line to ensure that the patient receives the correct dosage of drug.

4 Attach syringe to infusion line and prime line.

5 The first infusion will be complete early 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.

$$\text{Rate} = \frac{\text{Fluid length in millimetres}}{\text{Infusion time in hours}}$$

$$= \frac{48 \text{ mm}}{24 \text{ hours}}$$

$$= 2 \text{ mm per hour}$$

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 battery.

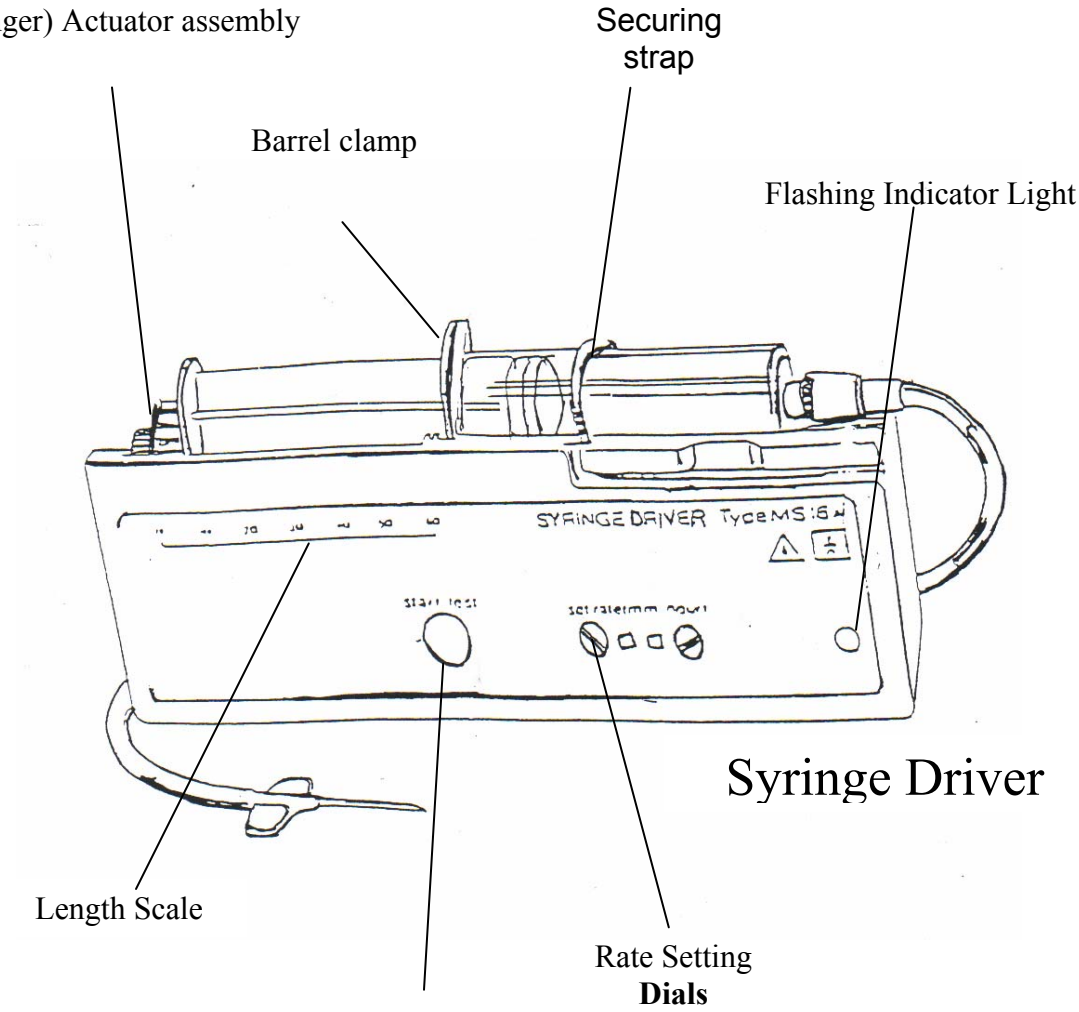
9 Insert the needle subcutaneously at an angle of 45°. Secure in place with Tegederm or Opsite making a loop with the infusion line.

10 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.

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



You will need
M.S. 16 syringe driver
9V Battery
Infusion Set
Luer Lock Syringe
Occlusive dressing
Needle to draw up drugs
Drugs to be used and diluent
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 luer lock syringe.

3 Draw up drugs in syringe. Make up volume with dilutent and measure against the mm scale. Set the rate on the syringe driver i.e. if syringe measures 40mm this is the rate set etc **Measure against the gauge** 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 infusion line and prime line.

5 The first infusion will be complete early 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

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

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 battery.

9 Insert the needle subcutaneously at an angle of 45°. Secure in place with Tegederm or Opsite making a loop with the infusion line.

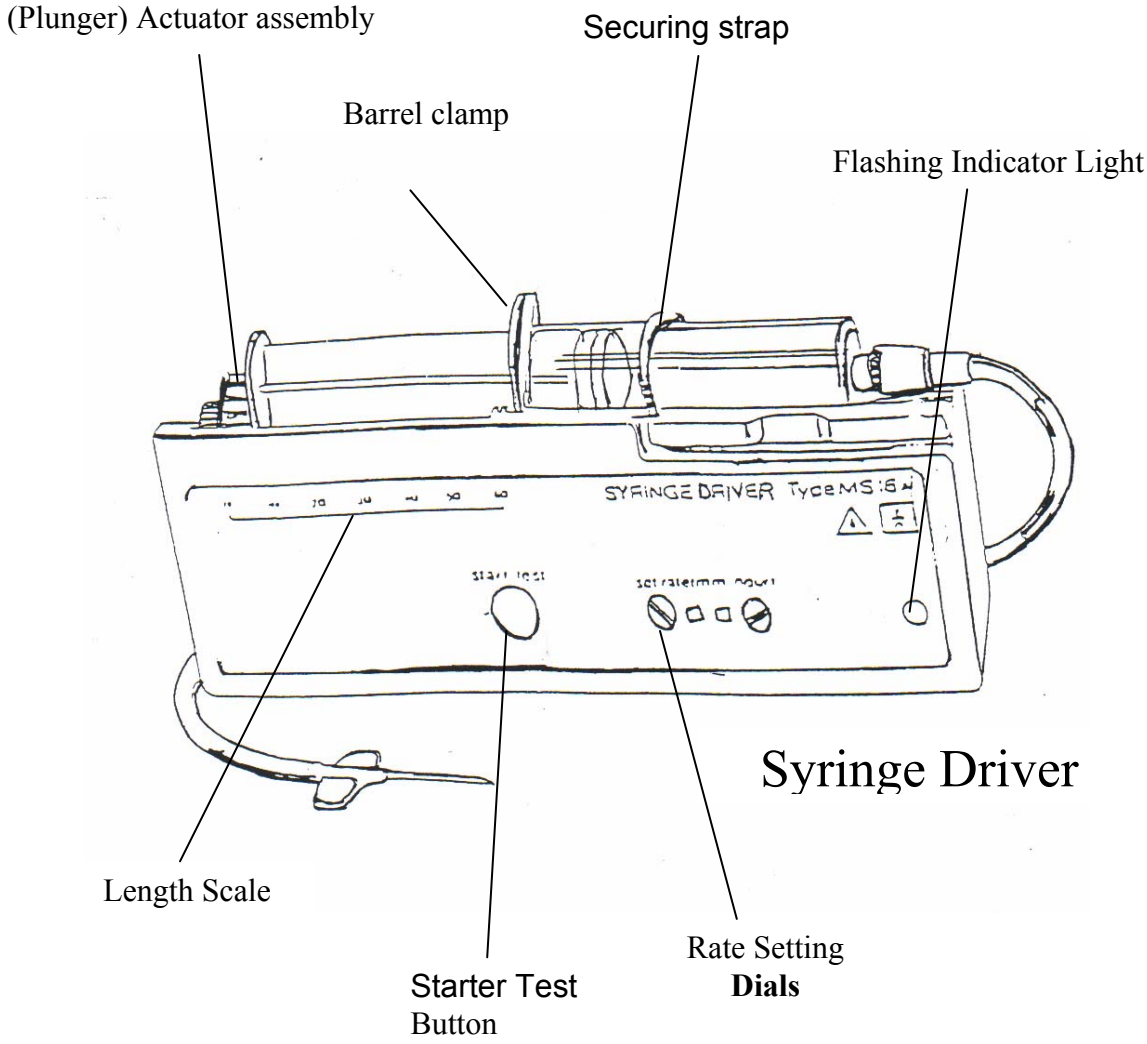
10 Push start/boost button. Listen for the buzz and make sure the light is flashing.

11 Place the syringe driver in the plastic holder; and if appropriate place in the shoulder holster to allow free movement of ambulant patients.

12 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.



You will need

M.S. 26 syringe driver
9V Battery
Luer Lock Syringe
Infusion Set
Sterile occlusive dressing
Needle to draw up drugs
Drugs to be used and dilutent
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 at **every visit** 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.

Trouble shooting guide

PROBLEM	POSSIBLE CAUSE
The infusion has ended early	Delivered dose too quickly because: • Incorrect rate setting • Scale length measured incorrectly
The infusion has ended late	Infusion ended late because • Incorrect rate setting • Scale length measured incorrectly • Skin site tissued
The infusion has stopped	The infusion has stopped because: • Blockage in the line • Battery exhausted • Skin site tissued
The syringe driver will not start	The syringe driver will not start because: • Battery inserted incorrectly • Battery exhausted • START button not depressed sufficiently

FURTHER READING

D.O.H. (1997) MDA Bulletin (MDA DB 9703) Selection and use of Infusion Devices for Ambulatory Applications.

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Dawkins, L; Britton, D: Johnson, I;Higgins, B; Dean, T (2000). A randomised trial of winged Vialon Cannulae and metal butterfly needles. International Journal of Palliative Nursing. 6.3 110-115

Latham J (1987) Syringe Drivers in Pain Control. Professional Nurse. April. pp207-209

Mallett J & Dougherty L (ed) (2000) Manual of Clinical Nursing Procedures. 5th ed. Royal Marsden Hospital. Blackwell Science.

Nicholson H (1986) The Success of the Syringe Driver. Nursing Times. Vol 82(9) pp49-51

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Ross, J: Saunders, Y; Cocherane, M: Zeppetella, G (2002) A prospective, within-patient comparison between metal butterfly needles and Teflon cannulae in subcutaneous infusion of drugs to terminally ill hospice patients. Palliative Medicine. 16. 13-16

SIMS Graesby (1998) MS16A & MS26. Instruction Manual

Weston A (1989) Graesby Syringe Driver. Nursing Times. Vol 85 pp60-61

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Certificate of competence in the care and management of a patient with a syringe driver

This is to certify that …… has attended a study session on the care and management of syringe drivers.

1 The participant attended a theory session.
…….. Signature of trainer.

2 This is to certify that …… has been supervised in the care and management of patients with syringe drivers and is deemed competent

Date…….Signature …….