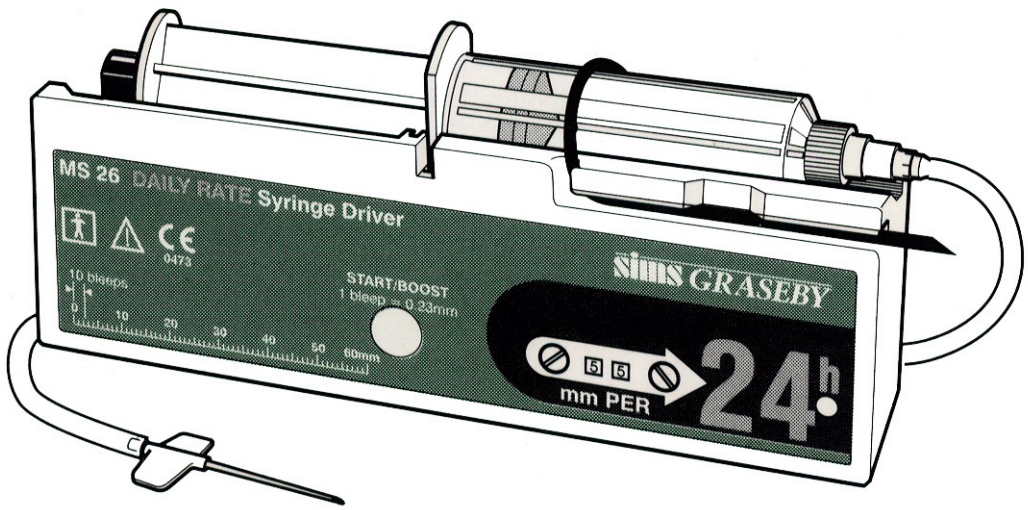
Use of the Graseby MS26 Syringe Driver For Palliative Care Within West Lothian

Training Pack



Welcome to the West Lothian Healthcare NHS Trust Syringe Driver training pack.

The Practice Development Team, Palliative Care Services, Medical Physics and Pharmacy departments have developed this within West Lothian.

The pack should be completed by registered nurses who have maintained their registration with the Nursing and Midwifery Council (N.M.C) and who care for patients requiring medications via syringe driver for palliative care.
The information contained within this pack applies to all care settings within West Lothian NHS Trust (WLHT).
Completion of the pack will support nurses in achieving competence and promote safe practice in the use of the Graseby MS26.

August 2003

Contents

Using This Pack

The pack is designed for you to work through and at the end of each section there are questions for you to test your knowledge. The answers are given in the back of the pack.

This symbol **!** indicates an important point of note usually highlighting potential clinical risk.

The performance criteria listed on page 4 must be achieved. Begin by completing the skills checklist. This will help you identify what you need to learn.

The pack is yours to keep as a resource and for future reference. A statement of competence is attached. This should be completed once you have achieved the objectives and retained for your own records. A copy should be forwarded to the Practice Development Facilitators and your line manager for Directorate Records.

What support is available?

Support in completing the pack and in using the syringe driver in clinical practice is available from the Syringe Driver Facilitator for your area and on request from the Practice Development Facilitators and the Palliative Care Team. Further information regarding the use of the syringe driver and symptom management in palliative care can be accessed in the Lothian Palliative Care Guidelines, which should be available in your area.

I rarely look after patients with syringe drivers; do I need to complete this pack?

Yes, all registered nurses in West Lothian who may have contact with patients requiring a syringe driver should complete this pack. It is important that you update your knowledge and skills regularly and are fully aware of WLHT procedures, including where to access information, help and advice.

I've been making up syringe drivers regularly for years; do I still need to complete this pack?

Yes, there have been recent and important changes to local practices including the model of syringe driver, documentation and procedure for use that you have to be aware of. All registered nurses who have contact with patients requiring a syringe driver should complete this pack.

Who can set up and maintain an infusion by syringe driver?

Registered Nurses who can meet the objectives listed and rate their competence as adequate to perform the procedure.

Syringe Driver Facilitator

NAME: _____ **CONTACT:** _____

Aims And Objectives

To enable the registered nurse to safely set up, operate and maintain a continuous subcutaneous infusion using the Graseby MS26 syringe driver for palliative care in a hospital or community setting in West Lothian Healthcare NHS Trust.

Learning Outcomes

After completing the pack the participant will be able to;

- Explain when the use of a syringe driver is appropriate in patient care.
- Demonstrate an understanding of how the MS26 syringe driver functions.
- Identify the equipment specified for use with the MS26 syringe driver.
- Demonstrate the correct procedure for initiating an infusion.
- Demonstrate the correct procedure for monitoring an infusion in progress.
- Assess the potential risks involved in using a syringe driver and take appropriate preventative action.
- Describe the recommended course of action to be followed if problems in infusion or adverse reactions occur.
- Demonstrate the safe administration of medications by syringe driver as per NMC Guidelines for the Administration of Medications and Lothian Palliative Care Guidelines.
- Identify and complete appropriate documentation as per WLHT procedure and NMC Guidelines for Record Keeping.
- Discuss the scope of accountability and legal issues in caring for the patient requiring a continuous subcutaneous infusion by MS26 syringe driver.
- List sources of professional advice and support in using the MS26 syringe driver in clinical care.

Skills Checklist

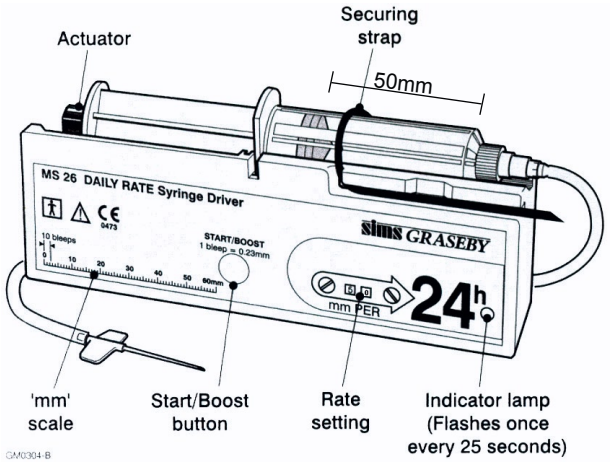
Self - assessment of Competence

Score: **1** = I feel fully competent **2** = I am unsure and need further information

Performance Criteria	Pre-training	Post training
Define the type of syringe driver used in West Lothian Healthcare NHS Trust		
Explain the difference between a Graseby MS16a and MS26 and the hazards which can occur as a result of confusion between the 2 models		
Identify the components and equipment which must be used with the syringe driver; size and type of • syringe • infusion set • dressing • documentation		
Perform safety checks to ensure that the syringe driver is working correctly prior to use for infusion		
Demonstrate the correct procedure for ordering a syringe of medication from pharmacy (hospital)		
Demonstrate the correct procedure for mixing medications for infusion by syringe driver		
Demonstrate the procedure used within WLHT for priming the infusion line and calculating the rate of infusion		
Site the infusion correctly taking account of the potential risks		
Describe possible causes and appropriate preventative action to avoid; • syphonage of syringe contents • over infusion of medications • under infusion of medications • abcess formation at needle insertion site		
Describe the action to be taken if the following occurs; • syphonage • over infusion of medications • under infusion of medications • uncontrolled symptoms • the alarm sounds • the needle on the infusion set requires resited		
Discuss the accountability and role of the nurse in caring for a patient requiring an infusion by syringe driver		
Identify sources of help and advice in using a syringe driver in clinical practice		

What Is A Syringe Driver?

A syringe driver is a small, portable, battery-driven infusion pump, which allows small volumes of medication to be infused subcutaneously over a 24-hour period.
The syringe driver works by pushing the plunger of an attached syringe at a continuous speed dependant on the rate at which the pump is set. Each syringe is filled with medication to a measured length in millimetres(mm) and the syringe driver is set to push the
plunger in mm of travel.
There are a number of different types of Graseby Syringe Drivers available for palliative care but only the Graseby **MS26 Daily Rate** Syringe Driver is used within West Lothian Healthcare NHS Trust.



! Different models of Graseby syringe drivers are in use in other Trusts including the Graseby **MS16a Hourly rate** syringe driver. The MS16a **(blue front facing)** and **MS26 (green front facing)** are very similar in appearance. Fatalities have occurred when the MS16a hourly rate syringe driver has been mistakenly set at the daily rate used with the MS26.
i.e. the contents of the syringe were administered over 1 hour rather than 1 day (24hrs).

Remember:
- **Always check that the model of the syringe driver**
- **An error can be FATAL**

Route Of Infusion

! All infusions should be administered subcutaneously. The MS26 syringe drivers do not have the correct safety features for intravenous use.

Indications For Using A Syringe Driver

A syringe driver should be used to obviate the need for regular injections when oral medications cannot be swallowed or absorbed e.g. due to persistent nausea and/or vomiting, dysphagia, impaired consciousness.

Advantages Of Using A Syringe Driver

The main advantages of using a syringe driver are:

- Continuous plasma levels of medication: avoiding the peaks and troughs of medications administered by intermittent injection.
- The facility to administer more than one medication in the same syringe to control different symptoms.

Remember -
Subcutaneous infusion of medications via a syringe driver is merely an alternative method of administering medications and is not a superior method of analgesia when the patient can take medications by mouth. Use should only be considered when the oral route becomes impossible or impractical.

Questions For Self-Assessment

1. Graseby syringe drivers are calibrated in

   mm or mls *(Circle the correct answer)*

2. Infusions by Graseby MS26 Syringe Driver should be administered

   subcutaneously intraveneously *(Circle the correct answer)*

3. List 2 differences between the Graseby MS16a and MS26 syringe drivers

•

•

4. Which model of syringe driver should be used in West Lothian for palliative care?

5. (a) Describe what would happen if a MS16a syringe driver was mistakenly set at the rate for a MS26

5. (b) Describe what would happen if the MS26 was mistakenly set at the rate setting for the MS16a

Now check your answers on page 24-27

Procedure For Setting Up A Syringe Driver

Do not set up a syringe driver unless you are confident and familiar with the procedure, protocol and equipment. Seek advice where necessary.

Equipment

- Graseby MS26 daily rate syringe driver with plastic cover and holster
- 9v alkaline battery
- **Luer lok** syringe 20 / 30ml
- Green needle
- 25g winged infusion set
- Medications
- Diluent
- Syringe additive label
- Transparent dressing
- Prescription
- Syringe driver monitoring form

Access to a syringe driver within the hospital:

From October 2003 syringe drivers will be held in the Medical physics dept. To access out of hours contact the Directorate Nurse.

Prescription

The prescription should contain the following:-

- Date
- Patient details - full name, date of birth, unit no.
- Generic name of the medicine(s) in capital letters
- The dose in metric units avoiding the decimal point
- Route and time of administration. i.e. subcutaneous infusion by syringe driver over 24 hrs
- Signature of prescriber

Procedure

	ACTION	RATIONALE
1	Discuss the use of the syringe driver and explain the procedure to the patient Consider whether PRN medication will be required to control symptoms until the infusion by syringe driver takes effect.	To obtain informed consent and co-operation. Due to the slow rate of infusion there can be up to a 4 hr lag period until optimal levels of medication are reached.
2	Complete safety checks on the syringe driver prior to use	To check the syringe driver is functioning correctly for use.

! SAFETY CHECKS: must be performed when commencing an infusion

Ensure the correct syringe driver is being used:

– **MS26 Daily Rate Syringe Driver**
– **Green front facing**
– **mm per 24 hour setting**

No → **Stop Procedure**
Obtain MS26

Yes

Check the date of annual service

Out of date → **Stop Procedure**
Return to
Medical Physics

Current

Check battery:
9 volt (9v) alkaline battery, International code **– 6LR61**

Check date first used or if new, record date on battery
The battery will last 50 twenty-four hour cycles

No → **Stop Procedure**
Obtain New Battery

Yes

Insert the battery at the back of the unit (the alarm will sound for about 15 seconds) then press and hold the start / boost button. The syringe driver will self-test for several seconds

- You will **hear a whirring noise**
- **The motor will stop** after 10 seconds
- **The alarm** will then sound for about 15 seconds

Releasing the start/boost button starts the driver.

No → **Stop Procedure**
Return to
Medical Physics

Yes

Check the light is flashing.
The light on the MS26 should flash approx every 30 seconds.

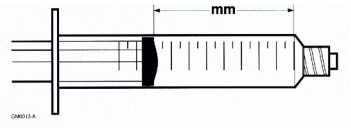
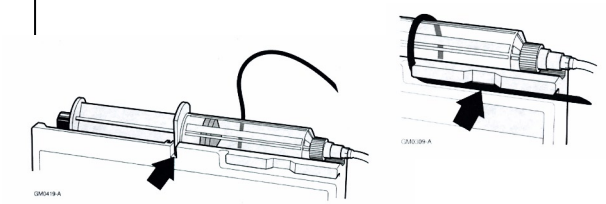
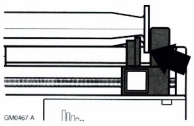
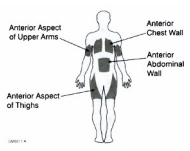
No → **Stop Procedure**
Return to
Medical Physics

The Syringe Driver is ready for use.
Remove the battery until ready to commence the infusion.

Check the compatibility of medications and diluent with the Syringe Driver section Lothian Palliative Care Guidelines or contact pharmacy for advice

Procedure Continued

	ACTION	RATIONALE
3	Assemble equipment. Check all packaging before opening and preparing the equipment on a clinically clean receptacle or surface. Hospital: 2 nurses to check the prescription and patient details according to WLHT policy	To reduce the transmission of micro organisms throughout and ensure that no equipment is damaged. To ensure that the correct drug, solution, amount and concentration is administered to the correct patient.
4	In the hospital setting order the filled syringe from pharmacy where possible. Orders should be placed by 2pm.	The syringe will be made under aseptic conditions and delivered to the ward.
5 **!**	In the community /out of pharmacy hours/ when the syringe needs refilled immediately; Draw up the medication using the appropriate diluent to dissolve, then add the second drug where required, adding more diluent to the total volume e.g. for the compatibilities of the drug combinations listed in the Lothian Palliative Care Guidelines approx. 14mls in a 20ml syringe and 17mls in a 30ml syringe. Only Luer lok syringes should be used	 The Luer lok mechanism reduces the risk of disconnection.
6	Invert the syringe to mix observing for cloudiness or crystallisation	This could indicate incompatibility of medications and / or solution. Discard if occurs. Re-check compatibility and mixing technique. Seek advice.
7	Attach a completed syringe driver additive label, taking care not to obscure the syringe	The contents of the syringe need to be visible for monitoring purposes
8	Connect the syringe to the infusion set and prime the line manually	**!** Syringes should be prepared immediately prior to use. The medications within the syringe are stable for 24hrs. Pharmacy filled syringes will be labelled with the expiry date/ time.

	ACTION	RATIONALE
9	Measure the fluid length in the syringe.	 The MS26 administers the fluid in the syringe at a rate of mm of fluid length not mls. The fluid length at the start of the infusion should be documented for accuracy in monitoring the infusion once in progress.
10 **!**	Calculate the rate of infusion. The MS26 is a **daily** rate syringe driver Rate setting = mm per day (24 hrs) Ensure that all of the numbers can be seen in each window. Use the rate adjusting key to adjust the dials. 	Rate = fluid length in mm ÷ infusion time in days e.g. 50mm of fluid length in syringe when made up ÷ 1 day ∴ rate setting= 50mm Thus when the rate setting = 50 the syringe driver will administer 50mm of fluid over 24hrs A paper clip can also be used – do not use scissors which will damage the dials
11	Attach the syringe to the syringe driver: Place the flange of the syringe in the slot provided and secure with the rubber strap. 	**!** The syringe must be fitted correctly and securely. If not then the syringe may become dislodged and uncontrolled flow of medication to the patient can occur.
12	Fit plunger. Press white release button, then slide plunger assembly along until it presses securely against the syringe plunger. 	**!** The syringe must be fitted correctly and securely. If not then the syringe may become dislodged and uncontrolled flow of medication to the patient can occur.
13	Site selection considering patient preference and care needs; Chest wall - anterior, lateral to breast and below the breast in females Abdominal wall, Medial lateral, lower lateral ileal crest Anteriolateral aspects of the thigh Anteriomedial aspects of the thigh Anterior aspect of upper arm 	To promote comfort and compliance. Adequate subcutaneous tissue is required for absorption of medication.
!	Avoid: broken/irradiated skin, oedema Avoid the chest wall in cachexic patients	Medication absorption will be affected Danger of causing pneumothorax

	ACTION	RATIONALE
14	Insert the needle of the infusion set bevel facing down at an angle of 45 degrees into a pinched skin fold and following the natural curves of the skin. Lay flat and curl tubing once to secure but do not curl over the needle. Place a transparent dressing over the curl of tubing and needle.	To secure the cannula and allow the fluid to flow into the subcutaneous tissue. To allow visualisation of the insertion site and prevent the introduction of infection.
15	Insert battery into the back of the syringe driver. Correct insertion is confirmed by a high-pitched alarm, which sounds until the Start/Boost button is pressed. Check that the light is flashing Recheck the rate setting is correct.	To start the infusion by syringe driver Confirms the syringe driver is working To ensure accuracy and avoid error.
16	Place the syringe driver into the clear plastic case with the hole over the Start/ Boost button. Use the protective holster	To protect the syringe in the driver. **!** Ensure the syringe driver is placed correctly within the plastic cover. Misalignment or placement of the cover over the Start/Boost button could result in infusion of the syringe contents at an inappropriate rate causing overdose. To protect the medications in the syringe from light.
17	Do not place the syringe driver more than 75cm above the infusion site.	**!** Syphonage of medication could occur
18	Assess and address education needs of patient / family: • reporting effect of medications/using PRN for breakthrough symptoms • not to get the syringe driver wet • checking the site and reporting if it becomes red/ painful • who to contact if any problems arise	To encourage compliance To promote accuracy in symptom control To avoid malfunction of the syringe driver – if this occurs do not use and return to Medical Physics. Community setting Community setting
19	Complete documentation; • syringe driver monitoring form • medication chart • patients case notes	As per WLHT policy for the administration of medications.

Self-Assessment

6. List 5 safety checks, which should be performed before commencing use of a syringe driver.

7. What type and size of syringe should be used with the Graseby syringe driver?

8, Describe how the rate setting is determined when using the MS26.

9. (a) List considerations when selecting a site for infusion.

(b) What sites should be avoided?

10. Why should the syringe driver not be placed more than 75cm above the infusion site?

11. Describe the information, which should be provided to the patient and family.

Check your answers on page 24-27

Monitoring The Infusion

Frequency: **Hospital** = 4 hrly **Community** = daily / each visit

	ACTION	RATIONALE
1	Assess the patient: effect and side effects of medication.	To promote adequate symptom control.
2	Check the skin site for erythema, leakage, hardness or swelling.	Absorption of medications will be affected. Abscess formation can occur. Change site as soon as this occurs.
3	Observe the syringe and infusion set for kinks in the tubing, leakage, precipitation or discolouration of medication.	To check that the patient is receiving the medication they require. If discolouration / precipitation occurs- stop and discard infusion, check compatibilities and mixing technique, seek advice.
4	Check that the syringe is securely attached to the syringe driver.	To reduce the risk of the syringe becoming dislodged.
5	Measure the volume remaining in the barrel of the syringe. Calculate the amount infused over the previous 4 hrs example; If the fluid in syringe at start of infusion = 48mm then the Rate setting = 48mm per 24hrs In each 4hr period 48 ÷ 6 = 8mm should have infused Never remove the syringe from the syringe driver to measure the remaining length.	To check that the patient has received the required amount. **!** To avoid the risk of inadvertent administration of medication to the patient.
6	Complete documentation; Syringe Driver Monitoring Chart Version April 2003	As per NMC Guidelines for Records and Record Keeping and WLHT policy. Previous versions of the Syringe Driver Monitoring Charts do not meet the current requirements of WLHT and are obsolete.

Self-Assessment

12. What is the stated frequency of monitoring within West Lothian?

13. List 5 checks which should be made.

14. Describe how you would calculate the amount infused.

15. Where should the checks be documented?

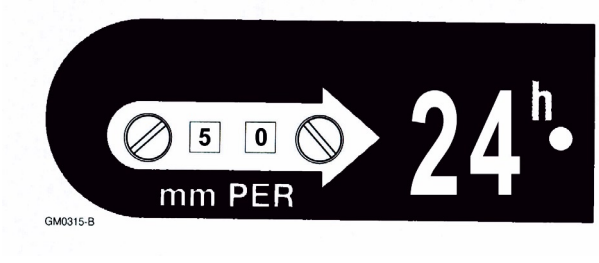
Check your answers on page 24-27

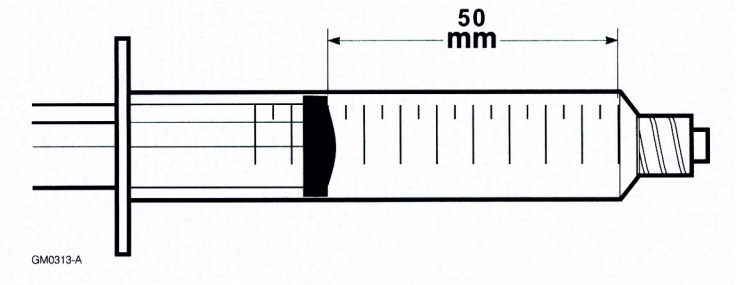
Renewing An Infusion By Syringe Driver

- Anticipate time of renewal so that a syringe can be ordered or made up appropriately.

! **It is unacceptable for the infusion to stop for a period of time awaiting a new syringe.**

- Consider the patients symptoms and response to medications to identify whether any changes are required to prescription are required.
- If the skin site is satisfactory a new filled syringe can be attached to the existing infusion set following the above procedure but omitting priming the infusion line.
- Measure the fluid in the syringe in mm of fluid length.
- Set the rate of the syringe driver in mm per 24hrs.





- Sites can be left intact if satisfactory for up to 7 days. When resited the infusion should be placed at least 3cm from previous sites.
- The syringe and line should be completely changed when the medication prescription is altered.
- A new infusion line should be used if moving to a new site.

Key Points For Practice

- All patients transferred into West Lothian who have an MS16a in progress, **must** have their syringe renewed, resited and changed to MS26 syringe driver following transfer.

- If the syringe driver gets dropped or wet there is a risk of malfunction. Even if the syringe driver is dried water may have got inside the workings.
  Do not use and return to Medical Physics.

- Cleaning: the outside surfaces and plastic / rubber accessories can be cleaned by wiping with a cloth slightly dampened with a solution of mild detergent and water. The holster can be hand / machine-washed.

- Hospital: syringes drivers must be returned to the central store as soon as possible when not required.

The Use Of The Syringe Driver For Symptom Control

1. Refer to the Symptom Management section of the Lothian Palliative Care guidelines.

2. Managing breakthrough symptoms.

a. PRN medications should be prescribed and administered to control breakthrough symptoms in addition to the medications by syringe driver.

b. The Start/Boost facility **must never** be used. It delivers too small a dose of medication for adequate symptom relief and administers a dose of **all** the medications in the syringe.

c. The rate of the syringe driver should never be increased once the infusion is in progress. The lag time in effect means;

- The patient does not receive the medication they require to control breakthrough symptoms when needed but over time accumulation of medications can occur resulting in toxicity.
- The increased rate administers an increased dose of all the medications contained within the syringe.

3. Analgesia via the syringe driver

a. Continuous infusion

The starting dose of diamorphine is dictated by prior opioid use.

Patients who are opiate naive

Start dose = 10mg per 24hrs
Elderly/renal impairment = 5mg per 24 hrs.

Patients already taking opiate analgesia

Conversion ratio

24hr subcutaneous diamorphine dose = 24hr oral morphine dose ÷ 3
⇒ 1mg diamorphine = 3mg oral morphine (MST / Oramorph / Sevredol)

This is the amount of diamorphine that will need to be given in the syringe driver to achieve equivalent analgesia.

Example;

The patient is taking MST 45mg every 12hrs
⇒Total oral morphine dose over 24 hrs = 90mg
⇒90mg ÷ 3 = 30mg diamorphine over 24hrs

3b. PRN analgesia

Ratio
Total 24 hr dose of oral morphine or diamorphine ÷ 6 = PRN dose

Example;

The patient has been taking MST 45mg every 12hrs

⇒ Total oral morphine dose over 24hrs = 90mg
⇒ 90mg ÷ 6 = 15mg Oramorph / Sevredol PRN

Total oral morphine over 24hrs = 90mg

⇒90mg ÷ 3 = 30mg diamorphine over 24hrs
⇒30mg diamorphine over 24hrs ÷ 6 = 5mg diamorphine PRN

! If the patient has been taking other opiates e.g. Oxycodone or Fentanyl – contact Pharmacy / Palliative Care Team for advice.

Self Assessment

16. Describe the procedure for renewing the syringe of medication.

17. How long may infusion sites be left intact if satisfactory? (*circle the correct answer)*

    1 day 2 days 5 days 7 days

18. Describe the procedure to be followed if a patient was transferred into your care from out with West Lothian with an infusion by syringe driver in progress.

19. How should breakthrough symptoms be managed? (*circle the correct answer)*

A The rate of the syringe driver should be increased
B PRN medications should be used
C The boost button should be pressed

20. A patient has been taking 30mg of MST 12 hrly. What would be the equivalent dose of diamorphine via syringe driver?

21. Calculate the correct dose of PRN diamorphine when the patient is receiving 30mg of diamorphine per 24hrs.

Check your answers on page 24-27

Troubleshooting Problems In Infusion

PROBLEM	CAUSE	CHECKLIST	ACTION
Alarm sounds	Immediately after insertion of battery.	This is part of the safety check to ensure the battery is functioning and correctly placed.	Press the Start / Boost button and release. The indicator light should flash.
	Empty syringe/infusion ended.	Expected If unexpected - check equipment for malfunction	• Renew syringe • Assess patient and inform medical staff • Report incident • Return unit to Medical Physics for repair.
	Syringe driver has stopped – due to back pressure being exerted on the activator.	Is the tubing kinked or trapped? Is the solution too viscous or crystallised?	• Check line (straighten out or free tubing) • Stop infusion • Change the syringe and infusion set • Check compatibility: seek advice
	Battery discharging whilst syringe driver is running.	The flashing light is a visible indicator that the battery is sufficiently charged to complete the infusion. Extinction of this light indicates a discharging battery.	• Check battery is inserted correctly • If light not flashing then replace battery
	Malfunction		Return to Medical Physics Dept for repair.
Periodic click sound	The mechanism for pushing the syringe plunger is worn and is slipping causing the click.	The infusion has completed but the motor is still running and there is **NO ALARM** sounding. The indicator light still flashes and there is a periodic click.	Return to Medical Physics Dept for repair.
Indicator light has stopped flashing	Battery is low		Replace the battery. A new 9v alkaline battery should last for 50 days
The syringe driver won't start	Inactivation of START/ BOOST button Battery problems Malfunction	Has the START/BOOST button been pressed and held down for a few seconds then released? Has a new battery been inserted? Is battery inserted the correct way round?	Press START/BOOST button. Check placement Replace with new battery. Send unit for repair.

PROBLEM	CAUSE	CHECKLIST	ACTION
The infusion has not run to time	The rate was incorrectly set.	Was the rate setting correct? Was the fluid length measured correctly? Has the rate setting been altered? Is the syringe securely attached to the syringe driver ?	• Check documentation: previous recordings of setting up and monitoring procedure. • Are the calculations for volume infused correct ?
	Accidental damage	Has the pump been immersed in water?	• Return to Medical Physics Dept
The infusion is running faster than expected	Use of boost button	Has boost button been pressed (delivers 0.23mm per boost)?	**!The boost facility should not be used** • Assess patient • Inform medical staff • Complete incident report
	Syringe driver protective cover not fitted correctly with the hole over the start/boost button.	The start/boost button can be depressed leading to over infusion of drugs.	• Ensure plastic protective cover is fitted correctly. • Assess patient • Inform medical staff • Complete incident report
	Malfunction of syringe driver.		• Assess patient • Inform medical staff • Complete incident report • Return to medical physics.
Is infusion running slower than expected?	The rate was incorrectly set. Has the syringe driver sufficient power?	Is the rate setting correct? Is the light flashing?	• Check rate setting. • Replace battery if required.
	Is syringe correctly attached to syringe driver?	Is the activator flush against the plunger?	• Ensure syringe correctly fitted. • Complete incident form.
	Tubing/kinked or trapped.	Is tubing kinked or trapped?	• Check the infusion line from the patient to the syringe driver releasing any kinks or trapped line.
	Is there a blockage?	Check needle insertion site for any erythema, swelling, tenderness to touch or cannula displacement. Check syringe and infusion line for crystal formation causing a blockage.	• Set up new syringe and infusion. Resite at least 3cm away from the problem area, or use another recommended site. • Discard previously used syringe/line. • Check compatibility of medications/diluent. Seek advice.

Sources Of Help And Advice:

Pharmacy Aseptic
St John's Hospital
Tel: 01506 419666
Ext 2461 / Bleep 647

Practice Development Facilitators
Nursing and Quality
Tel: 01506 419666
Ext 2807 / Bleep 623

Hospital Palliative Care Team
Switchboard. St John's Hospital
Tel: 01506 419666
Ext 3062 / Bleep 833 / 863

Community Palliative Care Nurse Specialists
Aircall via St John's Hospital switchboard
Tel: 01506 419666

Consultant in Palliative Medicine
Aircall via St John's Hospital switchboard
Tel: 01506 419666

Medical Physics Department
St John's Hospital
Tel: 01506 419666
Ext 2204 / 2287

Out Of Hours / Weekends

Fairmile Marie Curie Centre Tel: 0131 470 2201

! HAZARD NOTIFICATION

Hazards reported by the Scottish Home and Health Dept: serious incidents involving Graseby Syringe Drivers

1. Confusion between the MS16a Hourly rate syringe driver (mm per hour) and the MS26 Daily rate (mm per 24hrs) syringe driver resulting in the infusion of a 24hr dose of medication in 1 hour causing fatality.

2. Misalignment or placement of the plastic cover over the start / boost button resulting in the infusion of the syringe at an inappropriate rate causing over dosage.

3. Syphonage of syringe contents when the syringe driver has been placed >75cm above the infusion site.

4. Uncontrolled flow of medication when the syringe driver has not been correctly or securely fitted to the syringe driver.

Self Assessment

22. List the action you should take if;

I. The infusion is running faster than expected

II. The infusion is running slower than expected

III. The solution in the syringe or infusion line becomes cloudy, discoloured or crystallises

IV. List 3 reasons the alarm may sound

Check your answers on page 24-27

Professional Accountability And Relevant Policies

Professional Accountability

It is strongly recommended that practitioners review the implications of making changes to their practice in light of the updated Code of Professional Conduct (NMC 2002). Attention is specifically drawn to accountability in relation to consent as well as maintenance of knowledge and competence.

The Risk Management Strategy (WLHT 2003) supports a philosophy of "just culture" to ensure that in the event of a critical incident or near miss we adopt a process where we learn from our mistakes in order to improve practice and prevent repeated incidents. Practitioners are asked to consider the risks associated with this change in practice and take appropriate actions to manage them.

You have a legal and professional duty to care for patients and clients. A **duty of care** can be said to exist if one can see that one's actions are reasonably likely to cause harm to another person (Dimond, 2002). In law, the courts could find a registered practitioner **negligent** if a patient or client suffers harm because the registered practitioner failed to care for them properly. Harm may occur knowingly or unknowingly – not knowing that you are doing something wrong is dangerous – ignorance or lack or experience is no defence.

Employers are responsible for acts or omissions by the organisation as a whole or by staff members within it. **Liability** occurs in two forms **direct liability**, where the organisation is at fault and **vicarious liability** where they are responsible for the action of their employee during the course of their employment. If a registered practitioner wishes to practice outside local policy, they may lose the protection of vicarious liability, but will be judged against 'the standard of care required of the ordinary skilled person exercising and professing to have that specialist skill' (Dimond, 2002) i.e. reasonable care. **Reasonable care** is the standard of care expected from a 'reasonably competent practitioner' i.e. a registered practitioner, at the same level as you, carrying out the same procedure.

Self assessment :

Make brief reflective notes on your level of understanding of accountability and legal issues.

Note how you will address any learning needs identified.

Consider a critical incident where a syringe driver is set incorrectly and a patient suffers harm: what evidence might a court of law look for to prove negligence?

Now check your answers on p24-27 and complete the skills checklist on page 4. Discuss any further information or education needs you have with your Charge Nurse / Syringe Driver Facilitator.

Answers To Self Assessment

1. Graseby syringe drivers are calibrated in mm.

2. Infusions by Graseby MS26 Syringe Driver should be administered subcutaneously.

   They lack the safety features for intravenous infusion

3. List 2 differences between the Graseby MS16a and MS26 syringe drivers.

   MS16a = blue front facing, set in mm per hour, not used in West Lothian
   MS26 = green front facing, set in mm per day, the only model used in West Lothian

4. Which model of syringe driver should be used in West Lothian for palliative care?

   The MS26

5.

a. Describe what would happen if an MS16a syringe driver was mistakenly set at the rate for a MS26.

   The patient would receive the total daily 24hr dose of medications in 1 hour

b. Describe what would happen if the MS26 was mistakenly set at the rate setting for the MS16a.

   The patient would only receive a1/24th of their medication

6. List 5 safety checks, which should be performed before commencing use of a syringe driver.

1. Check the model is the MS26
2. Check date battery
3. Check date annual service
4. Insert battery the alarm should sound, press and hold start boost button – the syringe driver should self test
5. Check light is flashing every 30secs
6. Check compatibilities of prescribed medications and diluent

7. What type and size of syringe should be used with the Graseby syringe driver?

   Luer lok 20 and 30ml syringes

8. Describe how the rate setting is determined when using the MS26.

The MS26 is a **daily** rate syringe driver therefore rate setting = mm per day (24 hrs)

Rate = fluid length in mm ÷ infusion time in days

e.g. 50mm in syringe when made up ÷ 1 day ∴ rate setting= 50mm

Thus when the rate setting = 50 the syringe driver will administer 50mm of fluid over 24hrs

9.a. List considerations when selecting a site for infusion.

Patient comfort, mobility and care needs. Adequate subcutaneous tissue to support an infusion

b. What sites should be avoided?

Areas of broken irradiated or oedematous skin as absorption will be affected. Joints. The chest wall in cachexic patients. Within 3cm of previous sites

10. Why should the syringe driver not be placed more than 75cm above the infusion site?

To avoid risk of syphonage

11. Describe the information, which should be provided to the patient and family.

Care of the syringe driver, procedure to be followed if the site becomes red or inflamed, use of PRN medications for symptom control, who to contact if a problem occurs

12. What is the stated frequency of monitoring within West Lothian?

Hospital – every 4 hrs Community – daily / at each visit

13. List 5 checks, which should be made

1. Patient comfort- effect and side effects of medication
2. Site- erythema, hardness, swelling
3. Crystallisation or discolouration of the solution in the syringe or infusion line
4. Amount infused
5. Syringe securely placed on the syringe driver
6. Rate setting correct
7. Case placed correctly
8. Syringe protected from light and heat

14. Describe how you would calculate the amount infused.

1. Measure remaining fluid in the syringe
2. Subtract the volume remaining in the syringe from the volume at last measurement
3. At 48mm per 24hrs 8mm should infuse per 4 hr period

15. Where should the checks be documented?

The Syringe Driver Monitoring Form: 2003 version

16. Describe the procedure for renewing the syringe of medication.

1. Assess whether any changes to the prescription are required.
2. Order a prefilled syringe from pharmacy or make up the medications for use so that a syringe is available at the time required. Syringes are made up immediately prior to use
3. If the site is intact a new syringe can be connected to the infusion line.
4. Secure syringe to syringe driver
5. Check rate setting and indicator light flashing
6. Complete documentation

17. How long may infusion sites be left intact if satisfactory?

7 days. Be aware of the potential for sterile abscess formation

18. Describe the procedure to be followed if a patient was transferred into your care from out with West Lothian with an infusion by syringe driver in progress.

All patients transferred into West Lothian who have an MS16a in progress, **must** have their syringe renewed, resited and changed to MS26 syringe driver following transfer.

19. How should breakthrough symptoms be managed?

B PRN medications should be used

20. A patient has been taking 30mg of MST 12 hrly. What would be the equivalent dose of diamorphine via syringe driver?

30mg x 12hrly = 60mg oral morphine over 24hrs ÷ 3 = 20mg diamorphine per 24hrs

21. Calculate the correct dose of PRN diamorphine when the patient is receiving 30mg of diamorphine per 24hrs.

    30mg diamorphine ÷ 6 = 5mg PRN pain

22. List the action you should take if;

I. The infusion is running faster than expected.

- Assess patient- take appropriate action. Inform medical staff
- Check the rate setting;
  • is the syringe correctly attached to the syringe? • has syphonage occurred? • has the syringe driver been dropped or got wet? • Is the clear plastic cover placed incorrectly thus depressing the Start/Boost button. • Check calculations from previous volumes infused.
- Complete incident form

II. The infusion is running slower than expected.

- Assess patient comfort – do they require PRN medications?
- Check rate setting and previous calculations
- Check the syringe is securely placed on the syringe driver
- Is the indicator light flashing or has the battery discharged
- If malfunction – return to Medical Physics

III. The solution in the syringe or infusion line becomes cloudy, discoloured or crystallises.

- Stop infusion and discard syringe and line
- Assess patient
- Check compatibilities of medications and diluent
- Seek advice - pharmacy

IV. List 3 reasons the alarm may sound.

- The Start/Boost button is compressed
- End of infusion
- Blockage in line
- Malfunction

Accountability and legal issues

A court of law might look for the following evidence

- Patient Records Documentation / Prescription
- Policies/procedures/guidelines
- Training Programmes / Assessment of competence documentation / Training Records
- Performance Appraisal records
- Incident Reports
- Evidence for practitioner, patients, employers, colleagues, experts etc
- Equipment and records of maintenance

Graseby MS26 Syringe Drivers

Statement of Competence

I have completed the West Lothian Healthcare NHS Trust self-directed workbook for the MS26 syringe driver.

I acknowledge my professional accountability as defined within the Code of Professional Conduct (NMC 2002).

I have undertaken assessment of competence by the following process (tick one)

(a) Self assessment as I have prior competence in the use of MS26 syringe driver	[ ]
(b) Assessment on one occasion by the Charge Nurse / DN / Syringe Driver Facilitator as I have prior competence in the use of the MS16A.	[ ]
(c) Assessment of competence on three occasions (mock scenario or real situations)	[ ]

Practitioners Name …….....

Practitioners Signature …….....

Clinical Area ……. Directorate …….....

Date ……

Name of Charge Nurse DN / Facilitator who assessed competence *(where appropriate)*

…….....

The practitioner should take two copies of this statement and

a) Retain original for own record.
b) Forward a copy to Practice Development Team, Nursing and Quality for Trust Records.
c) Forward a copy to their line manager for Directorate Records.