

Syringe Driver Policy

For use by Specialist and Community and Primary Care Services across Camden Primary Care Trust

Summary

The policy covers all aspects of the management of patients who have their medication delivered via a Graseby MS16a Syringe Driver, including the indications for use; technical manual replacing the manufacturer's instructions; approved prescription and drug administration documentation and legal framework for practice; information for patients and carers; maintenance and safety of equipment; audit and quality assurance and contact details for the local Palliative Care Services.

**THE DOCUMENT PRECEDING THIS VERSION (DATED 1997) AND ALL
EARLIER DOCUMENTS ARE OBSOLETE AND MUST BE DISCARDED**

FOR FURTHER INFORMATION AND SUPPORT PLEASE CONTACT:

Author: Margaret Vincent, Clinical Nurse Specialist (Palliative Care)

Clinical Lead: Maggie Bisset, Nurse Consultant (Palliative Care)

**Palliative Care Centre
First Floor, Wolfson Building
Middlesex Hospital
48 Riding House Street
London W1N 8AA**

Tel: 020 7530 6200

Fax: 020 7530 6220

Start date 1st February 2004...

Review date 1st February 2006...

Agreed by the Medicines Management and Medical Devices Committee
On 8th January 2004...

SYRINGE DRIVERS

SECTION 1:	Introduction
SECTION 2:	Scope of Policy
SECTION 3:	Indications for Use
SECTION 4:	Manual for use in the Community (Using a Syringe Driver)
SECTION 5:	Documentation and Legal Requirements for use
SECTION 6:	Pharmacology of Syringe Driver Use
SECTION 7:	Information for Patients and Informal Carers
SECTION 8:	Maintenance and Safety of Equipment
SECTION 9:	Audit and Quality Assurance
SECTION 10:	References
SECTION 11:	Specialist Palliative Care Services for Support and Advice

ATTACHMENTS AND POLICY SECTION THEY RELATE TO:

Syringe Driver Check List (Section 4)

Syringe Driver Drug Added Label (Section 4)

Variable Dose Prescription Charts (Section 5)

Controlled Drug Stock Balance Chart (Section 5)

Specimen letter to General Practitioner (Section 5)

Information for Patients and their Carers (Section 7)

Patient/Carer Equipment Receipt (Section 7)

London Standing Conference for Nurses: Syringe Driver Standards (Section 8)

CIRCULATION LIST

Dr Steven Luttrell, Medical Director, Camden Primary Care Trust
Dr Jane Roberts, Medical Director, Islington Primary Care Trust
Sarah Andrews, Director of Nursing and Life Long Learning, Camden Primary Care Trust
Lallita Carballo, Nurse Director, North London Cancer Network
Dr Rob George, Medical Director, Camden & Islington Palliative Care Centre
Dr Chris Farnham, Consultant, Camden & Islington Palliative Care Centre
Maggie Bisset, Nurse Consultant, Camden & Islington Palliative Care Centre
Dr Adrian Tookman, Consultant in Palliative Medicine, Royal Free Hospital
Dr Anna Kurowska, Consultant in Palliative Medicine, Whittington Hospital
Katherine Hopkins, Nurse Consultant, Palliative Care Team, Royal Free Hospital
Jill Ireland, Nurse Consultant, Oncology/Palliative Care Unit, Whittington Hospital
Diane Farrington, Team Leader, Palliative Care Team, Whittington Hospital
Dr Philip Jones, Medical Director, St John's Hospice
Alison Roberts, Regional Nurse Manager, Marie Curie
Janet Walton, Lead Nurse, Marie Curie Centre, Edenhall
Dr Jonathan Martin, Macmillan GP Facilitator, Camden & Islington Primary Care Trusts
Kay Eaton, Nurse Consultant, Supportive Cancer Care UCL Hospitals
Neale Hanvey, Modern Matron for Cancer Hospitals UCL Hospitals
Marcia Richards, Manager, British Nursing Agency, Camden & Islington
Nancy Rasool, Person in Charge, Ash Court Nursing Home
Colin Owen, Senior Nurse Manager, St Pancras' Hospital
Maureen Browne, Senior Nurse, Clinical Neurosciences, National Hospital for Neurology and Neurosurgery
Sue Maynard, Senior Practitioner for Camden
Jan Joseph, Nurse Clinical Workforce Development Manager, Camden Primary Care Trust
Sue Braddell-Smith, Clinical Services Manager, Islington Primary Care Trust
Pauline Grace, Clinical Governance Manager, Islington Primary Care Trust
Terilla Bernard, Locality Manager, Camden Primary Care Trust
Viv Manning, Locality Manager, Camden Primary Care Trust
Graham McDougall, Camden Primary Care Trust
Sue Simmen, Senior Practitioner for Community Night Nursing
District Nursing Team, Belsize Priory Health Centre
District Nursing Team, Solent Road Health Centre
District Nursing Team, Gospel Oak Health Centre
District Nursing Team, St Albans Health Centre
District Nursing Team, Crowndale Health Centre
District Nursing Team, Somerstown Medical Centre
District Nursing Team, Peckwater Centre
District Nursing Team, Kentish Town Health Centre
District Nursing Team, Hunter Street Health Centre
District Nursing Team, Hornsey Rise Health Centre
District Nursing Team, Northern Health Centre
District Nursing Team, Highbury Grange Health Centre
District Nursing Team, Goodinge Health Centre
District nursing Team, River Place Health Centre
District Nursing Team, City Road Health Centre
District Nursing Team, Killick Street Health Centre
District Nursing Team, Finsbury Health Centre
Michelle Johnson, Team Leader, Children's Community Nursing Team

Steven Jeffery and Maggie Buckell, General Managers, Community Night Nursing, St Charles' Hospital
Tommy Wong, District Nursing Team Leader, Upper Montagu Street Clinic
Dawn Ashmole and Amanda Munt, District Nursing Team Leaders, Soho Centre for Health and Care
Chris Morley, Ann Hewison and Shirley Quinn, District Nursing Team Leaders, Lisson Grove Health Centre
Dr Stephen Amiel, Chair, Local Medical Committee
Dr Jonathan Sheldon, Board of Medical Directors for Camidoc
Michael Golding, Manager, Camidoc
Adam Macintosh, Manager, Healthcall
Amalin Dutt, Senior Prescribing Adviser, Camden Primary Care Trust
Paul Reeves, Head of Nursing for the Surgical Board, UCL Hospitals
John Farrell, Head of Pharmacy Services, Camden & Islington Hospital Trusts
Sarla Drayan, Clinical Pharmacy Services Manager, UCL Hospitals
Denise Blake, Lead Pharmacist for North Central London Cancer Network
David Kent, Secretary, Local Pharmaceutical Committee
John Carrier, Chair, Camden Primary Care Trust Partnership Board
Paula Khan, Chair Islington Primary Care Trust Board
Dr Peter Skolar, Chair, Professional Executive Committee, Camden Primary Care Trust
Dr Greg Battle, Chair, Professional Executive Committee, Islington Primary Care Trust

This circulation list has been included in response to the requirements laid out the report of the Serious Incident Panel, following the investigation into an incident involving a Graseby MS 16a Syringe Driver. Report dated 25th October 2001

1: INTRODUCTION

- 1.1 This document sets out the policy for the continuous subcutaneous administration of medicines via the **Graseby MS16A Syringe Driver**. It has been produced in consultation with: local specialist and community services; the Department of Health, The Medicines and Healthcare Products Regulatory Agency (MHRA); The Nursing and Midwifery Council; The Home Office Drugs Unit and the manufacturers of the equipment involved. Wherever possible guidelines have been produced following literature searches to ascertain the most recent evidence base for practice, and these are clearly referenced. Where no such evidence is available, guidelines and local protocols have been drawn up to ensure patient safety and comfort and with a view to promoting consistent practice across Camden and Islington.
- 1.2 Rewriting of the previous policy was seen as necessary to take account of developments in nursing, including the requirement for evidence based practice and to synchronise the practice of the three Palliative Care services operating within Camden and Islington and the primary care services they relate to.
- 1.3 The current document represents a complete revision of the previous policy, which was produced by the Camden & Islington Palliative Care Team, now known as the Camden and Islington Palliative Care Centre in 1997. **Any copies of this procedure and any copies of the previous guidelines for using a syringe driver produced by the Camden & Islington Palliative Care Team, Islington Support Team for Community, the Camden & Islington Community Development Team or any other policies or guidelines in use should now be discarded and the current document substituted.**

Maggie Bisset, Consultant Nurse
Margaret Vincent, Clinical Nurse Specialist

August 2003

2: SCOPE OF THE POLICY

2.1 The policy was developed in 1997 for the use of community nurses working for Camden & Islington Community Health Services NHS Trust (now Camden Primary Care Trust and Islington primary Care Trust) and replaces the previous policy, which is dated May 1994. The current revision took place between 2001 and 2003. It concerns the use of syringe drivers for subcutaneous infusion only. The operational manual (Section 4 of this document) refers specifically to the use of the Graseby MS16A (1 hour) Syringe Driver only, as this is the only model approved for use across both Primary Care Trusts, following the MHRA recommendation that in order to reduce the risk of clinical error, only one type of device be used (MS16A & MS26 Ambulatory syringe drivers: Confusion between these two models MDA Hazard (94) 12 June 1994). **Any other make or type of syringe driver, including any Graseby MS26 (24 hour) Syringe Drivers held by any Camden or Islington Primary Care Trust site or team must be returned to the Medical Physics Department of the Whittington Hospital for decommissioning.**

2.2 Following consultation with the MHRA, the Department of Health and with the manufacturers, it has been decided that syringe drivers of this type should not be used for intravenous drug administration in the community for the following reasons:

- Although The Graseby MS16A is technically capable of delivering a continuous infusion, there is currently no literature that supports this as safe practice.
- The alarm system on the Graseby MS16A syringe driver is rudimentary and non specific for many of the types of technical failure which could occur. In particular, there is no specific alarm for line occlusion.
- The Medical Devices Agency (now the MHRA) issued new guidelines for continuous ambulatory infusion pumps during March 2003 (Device Bulletin: Infusion Systems MDA DB2003(02). Pumps designed specifically for intravenous use are recommended for patients requiring their regular medication to be delivered via a central venous access device, such as a Hickman Line.
- The costs of purchase, maintenance and use of continuous ambulatory infusion pumps suitable for intravenous use are likely to be significantly higher than parallel costs for syringe drivers. Community teams wishing to purchase such equipment should consult the Medical Physics Department at the Whittington Hospital about the most suitable device.

3: INDICATIONS FOR USE OF A SYRINGE DRIVER

3.1 Therapeutic Advantages:

- It is possible to achieve plasma concentrations of drugs that are stable over time, thus facilitating symptom control.
- Therapies can be planned and delivered at a regular rate for periods of up to 24 hours, avoiding the need for 4 hourly injections.
- Mixtures of drugs can be given in the same syringe (Pritchard A P & Mallett J, 1992).

3.2 Clinical Criteria for use:

Major Indications: The inability of the patient to swallow or absorb drugs e.g.:

- during intestinal obstruction
- persistent vomiting
- mouth, throat and oesophageal lesions
- where oral drugs are contra-indicated or are therapeutically unsatisfactory
- unconsciousness
- malabsorption
- where it is necessary to achieve continuous sedation

Other Potential Indications:

- an unsatisfactory response to oral drugs, together with unsuitability of rectal, sublingual or transdermal routes
- where oral doses of morphine would exceed 150mg/4 hours
- During the last 24 to 48 hours of life (Pritchard AP & Mallett J, 1992).

3.3 Social and Psychological Criteria:

- Where patients receiving polypharmacy have expressed a preference for avoiding regular oral medications or injections, particularly where the preference is accompanied by chronic fatigue.

NB It has been noted that patients may become psychologically dependent on the device, and the continuing appropriateness of syringe driver use for each patient should always be considered (Radstone DJ & Crowther AGO, 1989).

- Where several daily visits from community nurses primarily to administer medication would be difficult to organise and/or disruptive or intrusive for the patient and his or her carers.
 - Rare occasions when, with the patient's consent, systemic administration of medication would achieve compliance and thus improve symptom control.
- When considering Social and Psychological Criteria, it should be noted that the MHRA has issued the following caution in the MDA Device Bulletin: Infusion Systems MDA

DB2003 (02): 1.2.5 Adequate staff numbers and skill levels: **“Staff numbers and skill levels must at all times be adequate for the management of any infusion systems in use, which in turn reflect clinical need”.**

The decision to use an infusion device must be made on clinical grounds. Management should not see it as a substitute for an appropriate staff/patient ratio within a given area.

3.4 Therapies suitable for continuous subcutaneous administration in the Community

- Strong analgesics and other drugs used for symptom control in Palliative Care.
- Apomorphine hydrochloride administration.
- Desferrioxamine administration in children.
- Terbutaline sulphate administration

3.5 Circumstances when a syringe driver should not be used

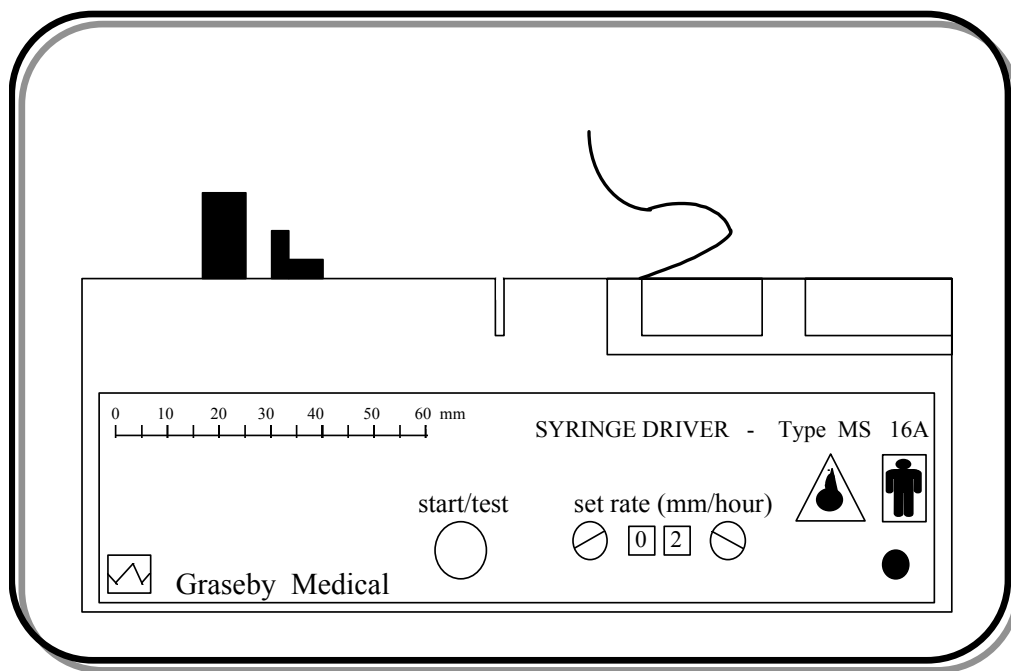
- Neonatal care (Medical Devices Agency recommendation).
- When the drugs prescribed for the patient have a short half-life and are unsuited to continuous infusion (Medical Devices Agency recommendation).

NB It should be noted that, in many cases where continuous treatment is required for chronic illnesses, shared care guidelines are available from the initiating hospital or specialist centre. These should be made available to community nurses responsible for administering therapies via continuous subcutaneous infusion, ideally as part of discharge planning.

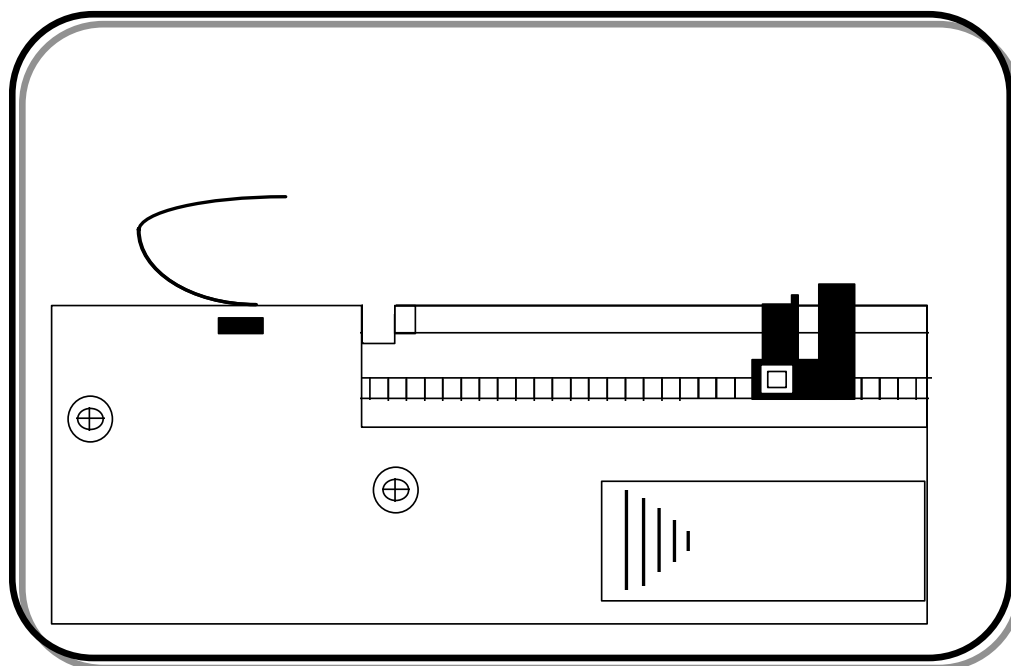
**4: MANUAL FOR USE IN THE COMMUNITY
(REPLACES MANUFACTURER'S INSTRUCTIONS)**

USING A SYRINGE DRIVER

FRONT



BACK



INSTRUCTIONS ARE FOR THE GRISEBY MS 16A

- It is a requirement of the MDA Device Bulletin: Infusion Systems MDA DB2003(02) that the manufacturer's instructions for any infusion device be readily available for the use of any clinical practitioner setting up an infusion. This section replaces the manufacturer's guidelines for local use. The Safe Use of Syringe Pumps is outlined in Sections 5.2 and 6.7 of the Device Bulletin
- MDA Device Bulletin requires that anyone administering medication via an infusion device must be adequately trained for the purpose (Section 3: Training) Training in the Community takes place within the "Foundations in Palliative Care" programme and can be arranged for individual staff, as the need arises. The Primary Care Trusts are also committed to the training standard for syringe drivers produced by the London Standing Conference for nurses and available from the Cancer Section of their website: www.london.nhs.uk/lscn and in Section 8 of this Policy. Nurses who have undertaken training will be supplied with documentation to this effect, which they can use as evidence of continuing professional development.

4.1 PRINCIPLES OF DRUG ADMINISTRATION VIA A SYRINGE DRIVER

- The Griseby MS16a Syringe Driver works by pushing fluid contained in a syringe into an administration set and thence into the subcutaneous tissue of a patient. This model is a 1 hour type, designed to move the plunger of the syringe a specific length (in millimetres) each hour. **It should not be confused with other infusion devices, which deliver a set volume of fluid in a given period of time.** See Section 4.3 below: Setting the Rate.

4.2 EQUIPMENT NEEDED

- Griseby MS16A syringe driver
- Luer Lock Syringe 10ml normally, or 20ml occasionally (Mitten, T 2001)
- Duracell 9 Volt MN1604 6LR61 rectangular battery, or its equivalent prescribed drug(s) and diluent(s)
- 21 gauge needles
- Butterfly needle with 100cm tubing attached or hypoallergenic alternative
- Alcohol swabs
- Opsite/Tegaderm transparent dressing
- Micropore tape
- Sharps box

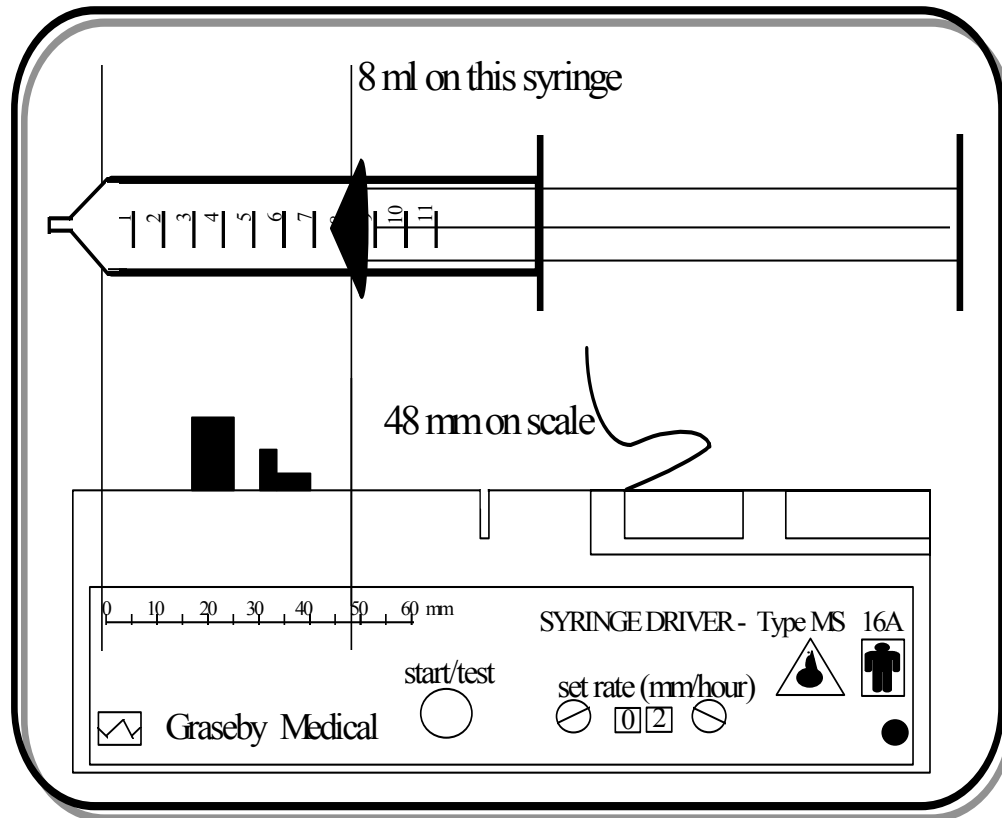
4.3 HOW THE RATE IS SET

$$\frac{\text{Length of fluid in mm}}{\text{Delivery time}} = \text{Rate in mm/hr}$$

For normal use the rate is always set at 02mm/hour

02mm x 24 (hours of delivery time) = 48mm (length of fluid in syringe)

- **Following the recommendations of the report into the serious incident outlined earlier, exceptions to the above rate setting can be made on the advice of one of the Specialist Palliative Care services only.**



4.4 PREPARE SYRINGE DRIVER

- Insert the battery in the back. The syringe driver will make a shrill sound.
- Press the white round button on the front to stop the sound.
- The indicator light on the front will start to flash.
- Check rate on digital display is **02mm/hour**.

4.5 CHOOSING THE CORRECT SYRINGE

Before drawing up the medication a decision must be made as to whether a 10ml or 20ml syringe will be needed. For normal use, where up to 3 drugs with a total diluted volume of 8ml or less are prescribed, a 10ml syringe will be adequate. The most common circumstances in which a 20ml syringe should be used are listed below:

- When the total volume of the medication prescribed exceeds 8ml in a 10ml syringe, or 48mm in length.
- When more than cyclizine 50mg is used in combination with diamorphine, since there should be at least 5ml of liquid in the syringe for each 1ml of cyclizine 50mg/1ml added to the diamorphine solution. This is to avoid a high concentration of Cyclizine in

combination with Diamorphine, which is likely to cause crystal formation and/or precipitation.

4.6 DRAW UP MEDICATION

- If Diamorphine is prescribed in combination with other compatible drugs, dissolve it initially in water for injections, draw it into the syringe to be used in the syringe driver and add the other liquid components of the prescription last e.g. Cyclizine; Haloperidol; Midazolam. If necessary, add water for injections until the total volume of liquid in the syringe = **48mm in length**.
- If Diamorphine only is prescribed, dissolve in water for injection and draw up into the syringe. Add water for injection until the total volume of liquid in the syringe = **48mm in length**.

NB The length of fluid in the syringe can be checked using the metric ruler on the front of the syringe driver. **48mm in length** is likely to equal around 8ml **volume** in a 10ml syringe and 13ml **volume** in a 20ml syringe, depending on the manufacturer.

4.7 CHECK THE SOLUTION IN THE SYRINGE

- The solution in the syringe should be clear and free from precipitation and/or crystallisation. It should remain clear and free from precipitation and/or crystallisation for the 24 hours over which the drug is to be delivered.
- If there is any sign of cloudiness or precipitation when the prescribed drugs are drawn up, the syringe containing them must be discarded immediately and the prescriber and/or appropriate Palliative Care Service should be contacted for the prescription to be reviewed

4.8 PRIME THE TUBING AND BUTTERFLY NEEDLE

Once the medication has been drawn up, the tubing with its butterfly needle should be attached to the nozzle of the syringe. To prime the tubing, the plunger of the syringe should be depressed carefully until a drop of fluid is seen on the end of the butterfly needle.

4.9 SELECT BUTTERFLY NEEDLE SITE

The drugs are to be delivered subcutaneously in a site with as much subcutaneous fat as possible. So far as it is possible the patient should be consulted over site selection.

Preferred Sites:

- Anterior chest wall
- Anterior aspect of thighs
- Anterior aspect of upper arms
- Anterior abdominal wall

Contra-indicated Sites:

- Any active radiotherapy site
- Any area of broken skin
- Lymphoedematous limbs
- Area over a bony prominence
- Site near a joint

N.B. Using the upper arm or leg in bed bound patients, who require turning at regular intervals, may result in the butterfly needle being dislodged. Care should be taken to check the site after the patient has been turned.

Skin Reactions

- For patients who have previously suffered skin irritation or a previous allergic skin reaction to the metal butterfly needle, there are hypoallergenic alternatives. These may be supplied from the patient's Palliative Care Centre on an individual basis for short term use.
- For longer term use, these hypoallergenic alternative may be supplied directly to the community team providing the patient's care, by ordering via the Trust Supplies Department, as with other clinical supplies.

Alternative hypoallergenic cannulae

- Wallace intravenous Y-can cannula, supplied by Sims Medical. Manufacturer's ref: YC23SY. This can be obtained from NHS Supplies. Catalogue code: FSP041. This item is approved by the manufacturer for subcutaneous use. The cost is around £0.96 per item. The manufacturer recommends that the cannula can be used for up to 48 hours.
- Minimed Sof-set infusion set. Manufacturer's ref: MMT-111. This is unavailable from NHS Supplies, but can be obtained from the Trust Supplies Department as a non stock item. The UK supplier is Schuco International London Ltd., Woodhouse Road, Friern Barnet. Telephone Number: 020 8368 1642; Fax: 020 8361 3761. The cost is around £5 per item.
- BD Saf-T-Intima. Manufacturer's Ref: 383313. This can be obtained from the Trust Supplies Department, as a non-stock item. It need to be used in conjunction with a 1 metre extension set. This system has a Y adapter, which should not be used in conjunction with syringe drivers. The cost is around £2.00 per item. The manufacturer recommends that the cannula can be used for up to 5 days.

Needle Stick Injury

- All of the hypoallergenic cannulae listed above may also be used where there is a risk of needle stick injury, for example, where a patient may be agitated and likely to pull the cannula out, placing him or herself, or others at risk. It is noted that some Palliative Care Services and Community Nursing Teams have started using needle free systems for every patient that is using a syringe driver, in order to avoid needle stick injury. As there is no known record or anecdotal evidence of needlestick injury associated with butterfly

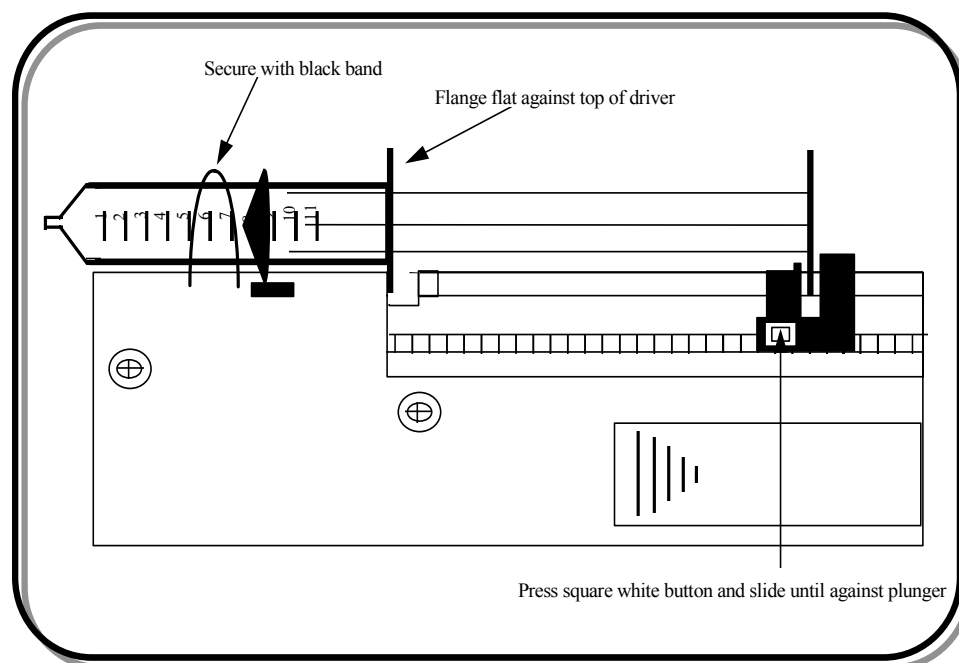
cannulae and syringe drivers within the Camden and Islington Primary Care Trusts, the Specialist Palliative Care Services locally have decided to make such use discretionary, pending the availability of clear evidence supporting the use of a needle free system for every patient.

4.10 INSERT AND SECURE THE BUTTERFLY NEEDLE

- Lift a fold of subcutaneous tissue between thumb and forefinger to make insertion easier.
- Insert the butterfly needle at an angle of 45 degrees, or less if the patient has little subcutaneous tissue available. Ensure that the eye of the needle is facing downwards into the deeper tissue.

NB. Follow manufacturer's instructions for other hypoallergenic/needle free systems.

- Loop part of the tubing over the wings of the needle, so that any tension is absorbed by the wings and not the needle.
- Cover the needle entry site and both the wings with the transparent dressing.
- Connect the syringe to the syringe driver, as illustrated in the diagram below.



4.11 MAINTAINING CORRECT FLOW

The syringe driver must be placed in a safe position, no more than 45cm above the butterfly needle site. (Section 6.7 MDA DB2003(2) March 2003). The syringe driver may be placed in a manufacturer's cover or a sock and pinned to the bedding with a safety pin, if the patient is restless and liable to dislodge it.

4.12 ENSURE SAFETY AND PATIENT COMFORT

- Check that the syringe driver is working i.e. the light is flashing. It should flash at a rate of once per second
- Secure the syringe driver in a safe place, no higher than 80cm above the butterfly needle entry site.
- Complete and affix a drug added label to the 100cm delivery tubing each time a new syringe is drawn up.
- **Recheck the delivery rate is 02mm/hour**

4.13 THE SYRINGE DRIVER CHECK LIST

Following the recommendations of the report into the serious incident outlined earlier, the completion of a Syringe Driver Check List is now mandatory.

Basic checks must be carried out regularly to ensure that the syringe driver is running correctly and that the drugs infused are fit for use and are being delivered at a rate of **02mm/hour**. Syringe drivers used for in-patients must be checked every 4 hours. Syringe drivers used in the Community must be checked during every clinical visit by a Registered Nurse. The Syringe Driver Check List (Section 4) must be completed on each occasion that the syringe driver is checked:

- **Date** Record the date that the check is undertaken
- **Label checked** Check that the drug added label is correctly filled in and dated
- **Time** Record the time that the syringe driver is checked
- **Starting volume** Record the starting volume in mm in the syringe, after the line has been primed
- **Predicted volume remaining**

Calculate this (in length in mm) by working out:

- How many hours the solution has been in progress
- Multiply this by the rate the syringe driver is set to run at (in mm)
- Deduct this number from the amount of fluid (in mm) in the syringe when the infusion was started or restarted

i.e. For an infusion that has been running 6 hours the calculation is as follows:

48 mm - (6 hours x 02 mm) = 36 mm left in the syringe

- It should be noted that when the giving set has been primed, the starting volume in the syringe would be less than 48mm
- **Actual volume remaining**
Measure and calculate the actual volume remaining in the syringe. Check whether this is the same as the predicted volume remaining. If there is any difference between the two amounts do the following:
 - Check with the patient and/or the family carers and other professionals involved in delivering care to the patient, since the syringe driver was set up or restarted, that no one has used the Start/Test button on the syringe driver to deliver a booster dose of medication. **This is not recommended practice and any such use of a syringe driver must be documented. The person or persons using the Start/Test button of the syringe driver in this way must be told not to do it again, as to do so is to infringe the administration of medicine guidelines and will compromise patient safety.** (Evans and Palmer 1998)
 - Due to publicised cases of syringe drivers being used by relatives or carers to delivering additional medication in order to hasten death, the advice of the UKCC is that the Police should be contacted **immediately** in the event of any suspected tampering for this purpose.
 - Any unexplained discrepancy between the amount of controlled drugs recorded as being in the home and the actual amount of that drug must be investigated and reported to the Clinical Services Manager, initially, and then to the Police, if no satisfactory explanation is forthcoming.
 - In the absence of any human action, which has caused the discrepancy, it must be assumed that the syringe driver is faulty. The syringe driver must be removed and replaced with one known to be working correctly. The faulty syringe driver must be sent for repair and servicing. It must not be used for another patient.
 - Any adverse incident relating to a syringe driver must be reported, using a regular Adverse Incident Reporting Form. This will ensure that the incident is passed to the Medical Devices Agency Liaison Officer for investigation.
 - **Solution** - Check and record the condition of the solution in the syringe, according to the following table:

1	Solution clear
2	Solution cloudy an/or with precipitate
3	Solution showing evidence of crystallisation

If the solution is anything other than clear syringe drive must be stopped and the butterfly needle removed from the patient's body. The prescribing doctor or responsible Palliative Care service must be contacted for advice.

- **Position** - Document the position of the butterfly needle e. g. left upper arm; right chest wall

- **Site Condition** – Check the condition of the needle entry site

If any of the symptoms listed below found, resite the butterfly needle. If this reaction occurs again, consider using one of the alternative hypoallergic cannulae available. See **Section 4.9** above.

- Discolouration or redness
 - Raising of skin
 - Oozing
 - Backflow of blood
 - Discomfort
- **Battery Indicator Working** Check that the light on the front of the syringe driver is flashing regularly.

4.15 WHEN TO CHANGE THE BUTTERFLY NEEDLE

There is no evidence to suggest that re-siting the butterfly needle is necessary, unless there are problems with it. However waiting for the site to become indurated or inflamed risks inflicting unnecessary pain or distress on the patient. It is therefore proposed that a new needle should be used every 7 days, unless there are indications that it should be changed more frequently. (David J, 1992).

- It should be noted that the Wallace Y-can intravenous cannula, if used, must be changed every 48 hours, following the manufacturer's recommendation

The following factors should be taken into account when deciding on whether to re-site the butterfly needle and where it should be positioned:

- Re-siting should occur when the existing site is inflamed, when it is painful or if there are signs of infection. If this occurs more than once, or if it occurs within two days of siting the butterfly, consider switching to the Wallace Y-can intravenous cannula, in the first instance. If skin reaction is still a problem, consider using the Minimed sof-set infusion set.
- The butterfly may be primed with dexamethasone 0.5mg for injection in order to reduce inflammation at the injection site. (Robert Twycross 1998). Alternatively, Dexamethasone 1mg may be added to the syringe, together with the therapeutic drugs, providing that there are no compatibility problems between dexamethasone and the therapeutic drugs used (such as glycopyrronium). (Andrew Dickman, Clare Littlewood et al 2002)
- The addition of 1500 International Units of hyaluronidase per site of may prevent a local reaction at the injection site. This can be done every time a new site is used. Hyaluronidase can be delivered to a new site, via the butterfly needle, prior to the attachment of the syringe containing the therapeutic drugs. It should not be injected into an

already inflamed site. It should not be mixed with the therapeutic drugs in the syringe, as degradation may occur over 24 hours. (Andrew Dickman, Clare Littlewood et al 2002)

- Occasionally, especially when higher concentrations of diamorphine have been used, there can be a small area of redness, induration and swelling at the injection site. In these circumstances, Hyaluronidase (Hyalase) can be used to make the tissues more easily permeable to injectable fluids. (Twycross 1994)
NB See previous point concerning inflamed sites.
- Higher concentrations of drugs, especially Cyclizine, may necessitate more frequent site changes, usually every 2-3 days.
- When it is necessary to re-site in the same area, the new site should be at least 5cm from the old site.
- Re-siting should be considered when there are major changes to the drug prescription.
- A new butterfly needle and tubing must be used for each re-siting.
- A new butterfly needle and tubing may be primed from a syringe in current use, providing that there is no obvious back flow at any point in the system, and the drug regime has not changed.

4.16 PROBLEMS WITH SYRINGE DRIVERS

- It is normal for the syringe driver to make a “whirring” noise every few minutes.
- When the syringe driver is working normally the yellow light should always flash once per second.

When the yellow light is not flashing:

- Check that the battery has been inserted correctly.
- Exchange the battery for a new one if the syringe driver still fails to work and re-start the syringe driver by pressing the round white button. (Duracell 9 Volt MN1604 6LR61 batteries will last for approximately 50days).

When the alarm is making a constant piercing sound:

- Take the battery out to stop the noise.
- Check that there are no kinks in the tubing.
- Check that the syringe is correctly attached to the syringe driver.
- Check the butterfly needle insertion site for signs of inflammation or induration
- Make any adjustments needed following the above checking procedure.

- Replace the battery and re-start the syringe driver by pressing the round white button.

For further help or advice please contact the responsible Palliative Care Service. The Camden and Islington Palliative Care Team operates a 24 hour on-call service and is pleased to offer assistance to all Camden and Islington Community Nurses outside of normal working hours.

4.17 WHEN THE SYRINGE DRIVER IS NO LONGER REQUIRED

- Disposal of unused controlled drugs is, at present, the responsibility of the patient or of their representative (if the patient is incapable or has died). Ideally unused controlled drugs should be returned to the pharmacy from which they were dispensed. The current arrangements are thought to be unsatisfactory and new guidelines for the safe disposal of unused controlled drugs are to be issued.
- All syringe drivers must be returned to the Palliative Care Service or other team or practice responsible for their care and maintenance.

5 DOCUMENTATION AND LEGAL REQUIREMENTS FOR USE

5.1 The Prescription:

- As with all medication, it is a legal requirement that there must be a prescription for the drugs to be dispensed by a pharmacist, which an Independent Prescriber (a Doctor or an accredited Nurse Prescriber) has signed and which is specific to the patient in question.
- The rules relating to Controlled Drugs in the Misuse of Drugs Regulations 2001 state that Schedule 2 and Schedule 3 Controlled Drugs can only be supplied on a requisition or a prescription that has been signed by a doctor. Under current regulations it is only doctors that are empowered to prescribe or requisition Controlled Drugs. This may change with the development of nurse prescribing.

5.2 Documentation:

- Medication prescribed for administration via a syringe driver will be written on a medication chart specific to the purpose, the “PALLIATIVE CARE SYRINGE DRIVER PRESCRIPTION CHART”, signed by the Independent Prescriber and left in the patient’s home.
- If the Independent Prescriber changes the directions for administering the drug, after the prescription has been dispensed, he or she should leave written amended directions in the patient’s home on the Palliative Care Syringe Driver Prescription Chart and sign to confirm the amended directions.

5.3 Variable Dose Prescribing

- A variable dose prescription is one in which the Independent Prescriber specifies a range, from which the nurse responsible for administering the medication can choose an appropriate dose. In Palliative Care, prescriptions for both twenty four hour continuous subcutaneous injections and “as required” medication are written as ranges in order to ensure adequate pain control and the relief of other distressing symptoms. When a 24 hour dose requirement for a given patient changes, the “as required” dose for breakthrough symptoms will necessarily change. When nurses are able to administer medication from a prescribed range, they have greater flexibility in responding to patients’ immediate needs, without recourse to the Independent Prescriber, who may not be available, or to a locum doctor, who does not know the patient. It is important to recognise that local community nurses have already developed the skills safely to administer drugs from variable dose prescriptions.

5.4 Documentation

- The guidelines are accompanied by the charts which are to be used as both a legal prescription to be left in the home and as an administration record. The first chart is the Syringe Driver Prescription and has the Prescription and the Administration record for “as required” medication on the reverse side. With some minor modification the Syringe Driver Prescription Chart would be equally appropriate for any type of administration pump. If the medicine is for a child, particular attention will be needed to specify any

restrictions on the age, size and maturity of that child. The main indications for “as required” medication are as follows:

-
- Analgesics
- Antiemetics
- Sedation/Anticonvulsants
- Secretions
- The Independent Prescriber is required to specify both the frequency within which a particular drug can be given and the maximum 24 hour dose, together with the pharmaceutical form, strength and the indication for which it will be used. This will minimise the risk of clinical error and enhance patient safety. Additionally, these requirements will provide a level of protection for nursing staff should they need to respond to requests from patients’ relatives to administer repeat “as required” medication.
- The second chart is designed as a 7 day administration record for the syringe driver. After 7 days (or 7 changes), the patient’s medication will need to be reviewed by a Palliative Care Clinical Nurse Specialist or a Community Nurse and the authorisation sought from the Independent Prescriber to continue with the prescription, if required. The reverse side of this chart is the Syringe Driver Check List, which must be completed at every clinical visit, or every 4 hours, for in-patients.

5.5 Dealing with the prescription

- Prescriptions for patients who are starting to have their medication administered via a syringe driver are often initiated from within one of the local Palliative Care Centres and the drugs to be used are dispensed from a hospital outpatient prescription by a hospital pharmacy. When this happens, the Palliative Care Service should inform the General Practitioner, so that he or she is made aware of what has been prescribed and can resume responsibility for prescribing once the initial supplies of the drugs are starting to run out.
- Specialist Palliative Care Services should inform the Community Nurses or, occasionally, the Practice Nurses of the change from oral to syringe driver medication.

5.6 Responsibilities of the Independent Prescriber

- Ideally, as a best practice standard, the Independent Prescriber should have seen and assessed the patient in the 48 hours prior to issuing the variable dose prescription. Alternatively, or he or she should have reasonable knowledge of the condition of the patient and of their likely disease progression (i.e. now needing systemic medication due to diminished consciousness or inability to swallow). This may be based on a contemporary conversation with the Palliative Care Clinical Nurse Specialist or other Community Nurse responsible for the patient’s care.

5.7 Responsibilities of the General Practitioner

- When syringe driver medication is initiated by a General Practitioner, either following their own decision to proceed, or at the request of a Specialist Palliative Care or Community Nurse, the usual FP10 prescription for dispensing the drugs via a retail pharmacist is issued. The Syringe Driver prescription/administration chart and the “as

required” medication chart must be completed and signed by the General Practitioner and left in the patient’s home.

- **It is imperative that the Syringe Driver and “As Required” Prescription Charts are signed by the General Practitioner or other Independent Prescriber, prior to their use as they represent legal authority to administer drugs. The authorised charts must be used in addition to a hospital prescription or an FP10.**

5.8 Nurses’ Responsibilities for Documentation

- The authorised administration records must be completed in full every time that a syringe driver is reloaded and every time that “as required” medication is administered.
- After 7 days nurses must ensure that authorisation to continue with the prescription is sought from the Independent Prescriber. If necessary the prescription must be rewritten and signed by the Independent Prescriber.
- Nurses must express any concerns they have about the syringe driver prescription to the GP or other Independent Prescriber, or to a Specialist Palliative Care Service. Caution must be taken in responding to requests from families and carers with respect to titration of drug doses or additional injections. Titration, reduction or omission of drugs prescribed on a variable dose prescription must always be based on clear clinical evidence. Assistance must be sought from a GP or the appropriate Palliative Care Service if there are any concerns at all or if there is any pressure for change brought to bear by any interested party, in the absence or lack of clarity about such clinical evidence.

5.9 ADVERSE INCIDENT REPORTING

An adverse incident related to the use of a syringe driver may be caused by any of the following:

- Shortcomings of the syringe driver itself
- Inadequate instructions for use
- Insufficient servicing and maintenance
- Locally initiated modifications and adjustments
- Inappropriate user practices, including inadequate training
- Inappropriate management procedures
- The environment in which pumps are used and stored
- Incorrect prescription
- Conditions, including environment, location and positioning

Adverse incidents related to the use of a syringe driver must be reported immediately to the appropriate Palliative Care Service and to the Medicines and Healthcare products Regulatory Agency (MHRA), either directly or via the Medical Device Liaison Officer for the Trust. (Section 7.1 MDA DB2003 (02) March 2003)

In addition, adverse incidents which relate to drugs that have been prescribed, including combinations of drugs, must be reported to the appropriate Palliative Care

Service and also to the MHRA, as outlined on the British National Formulary.

subcutaneous drugs via a syringe driver.

STAGE ONE – Decision to treat

or Palliative
Care Doctor

Need for
treatment with
subcutaneous
drugs
recognised

Valid consent
obtained from
patient or next
of kin if
available

Liaison with
GP and
Consultant in
Palliative
Care.

STAGE TWO – Generation of a valid prescription.

If GP or Palliative
Doctor not present at
time of assessment: 1.
CNS /DN speaks to
the Doctor by t/c
followed by a
standard fax detailing
the recommendations.
2. Out of hours. The
CNS/ NN liases
directly with the GP
directly, Camidoc or
the Palliative Care
Doctor on call.

The GP,
Palliative
Care Doctor
or Nurse
Prescriber
prescribes
drugs in own
handwriting

rescription is obtained
from UCLH pharmacy.*

STAGE THREE – Administration of drugs at home. Drugs should be available within 4 hours of the initial need being recognised.

DN /CNS draws up and administers the drug according to the syringe driver prescription chart. Practice should follow *the C+I Syringe driver Policy 2002*.

Patient condition and efficacy of drug regime monitored by all staff involved with the patient. Information to the family on the management is reinforced.

Changes in the patients' condition and drug regime efficacy reported to the GP/ PCC. Regime is adjusted according to the guidelines.

Adjusted drug regime started within 4 hours or if no change indicated regime is re-authorised after 7 days.

STAGE FOUR – Record Keeping

1. A record of care given is entered into the Syringe Driver Record Charts in the patient's nursing notes @ home.
2. Records are also updated at the DN/NN base and the Palliative Care Record accordingly.

5.10 Facsimile Transmission of Prescriptions

- Current guidelines within the Camden and Islington Primary Care Trusts forbid the use of faxed prescriptions where Controlled Drugs are involved. This clearly presents problems where palliative care patients are involved, as they are the group most likely to require opiates for symptom relief. Due to their propensity to suffer severe and rapidly escalating symptoms they are also highly likely to require immediate changes to their medication, including to the administration route.
- As stated earlier, a faxed prescription is not a legal prescription, but it is proof that such a legal prescription exists. Chief Pharmacist for the Primary Care Trusts has agreed that for palliative care patients whose condition or whose symptoms require immediate changes to their medication, or to its route of administration, faxed copies of the new prescription/administration charts that have been signed by a doctor charts will be accepted by all registered nurses authorised to administer drugs in the community as legal authority to administer that medication, provided that the original prescription/administration chart with the prescribing doctor's signature is placed in the patient's home within the next 24 hours.

5.11 Use of Verbal Orders

- The Misuse of Drugs Regulations 2001 state that Schedule 2, 3 and 4 Controlled Drugs can be administered in accordance with the directions of a doctor or dentist: The directions do not have to be in writing. The guidelines for the use of Verbal Orders set out below comply with these regulations and with Article 8 of the Prescription Only Medicines (Human Use) Order 1997. In addition, section 58 (2)(b) of the Medicines Act 1968 (which relates to Prescription Only Medicines, rather than Controlled Drugs), states that a POM can be administered to a patient “in accordance with the directions of an appropriate practitioner”: There is no requirement in such cases for a prescription to be issued.
- Where medication is administered from a variable dose prescription, it is to be expected that the ranges of medication prescribed will render verbal orders for any increase in the amount of a given drug in a syringe driver or for “as required” injections unnecessary. However, there may be circumstances in which a patient's symptoms escalate and an existing variable dose prescription is no longer adequate to their needs. The Nursing and Midwifery Council supports the use of verbal orders in such exceptional circumstances:

In exceptional circumstances, where the medication has been previously prescribed and the prescriber is unable to issue a new prescription, but where changes to the dose are considered necessary, the use of information technology (such as fax or e-mail) is the preferred method. This should be followed up by a new prescription confirming the changes within a given time period The NMC suggests a maximum of 24 hours. In any event, the changes must have been authorised before a new dose is administered.

Criteria for verbal orders

The NMC recognises that there may be certain situations where the taking of a verbal order is the only possible way forward. However, this should be for an emergency one-off situation and should never be common practice. The following are examples of emergencies for which the issuing of a verbal order would be acceptable:

- The patient has intractable pain requiring an immediate response and the patient's pain is known to be responsive to the prescribed medication, but the dose required now exceeds the dose anticipated and prescribed for the current 24 hours.
- The patient is distressed and/or agitated and has an immediate need for sedation over and above what has been anticipated and prescribed for the current 24 hours.
- The patient has intractable vomiting, which has previously responded to some or all of the prescribed medication and has an immediate need for this symptom to be controlled, in order to prevent dehydration and possible admission to hospital for intravenous fluids.
- The patient has excessive secretions and has an immediate need for a drying agent, such as hyoscine hydrobromide, over and above what has been anticipated and prescribed for the current 24 hours.
- The patient has a combination of one or more of the above symptoms requiring immediate action.
- The patient has an immediate need for one or more drugs to be removed from the combination delivered via a syringe driver, for example, if there was evidence of excessive sedation.

Procedure for taking a verbal order

- If a registrant makes the decision, either autonomously or within written local policies, to take a verbal instruction, it is vital that this instruction is clearly given. The doctor or other independent prescriber giving the verbal instruction must satisfy himself or herself that the registrant has properly understood and recorded the instruction.
- It may be appropriate for a second person to take the instruction, directly from the Prescriber, and then for both persons to compare to ensure complete understanding of the instruction. If, for whatever reason, this is not possible, registrants must do their best to ensure accuracy and to demonstrate their actions. When and if such actions are taken, it is required [by the NMC] that the whole episode is fully documented within the patient's medical records.

Specialist advice taken for the purposes of writing this policy from Mr Tony Milam, Information Officer, Professional Advisory Service, Nursing and Midwifery Council and from Mr Naim Siddiqui of the Home Office Drugs Unit.

- In emergencies, as described above, a verbal order to administer additional amounts of prescribed medication or withhold existing medication may be sought from the general practitioner, or from a specialist palliative care doctor for the following:
- A "once only" intramuscular, subcutaneous or intravenous injection of one or more drugs.
- An increase in the amount of one or more drugs in a syringe driver. This will require a new syringe to be drawn up, unless the doctor authorises the addition of the drugs to the existing syringe.
- Reloading of a syringe driver without one or more of one of the drugs prescribed for use in conjunction with it.

Whenever verbal orders are used, there is a mandatory order of preference for Acting according to best practice:

- It is always preferable that the written confirmation of the verbal order be faxed to the nurse receiving the order.
- If it is impracticable for the prescriber to send faxed confirmation of the verbal order at the time, whenever possible, two registered nurses should be available to take the verbal order: one must listen to the prescriber's instructions and take down the verbal order in writing. The second registered nurse must read the verbal order back to the prescriber. The prescriber must then verify that the verbal order has been taken down correctly.
- In circumstances where only one registered nurse is available, the nurse must take down the verbal order in writing and then read the instructions back to the prescriber. The prescriber must verify that the verbal order has been taken down correctly.
- The nurse administering the medication, following a verbal order must provide clear and adequate written documentation of what has been administered, both on the prescription/administration chart and in the nursing notes, which are kept in the patient's home.
- The Independent Prescriber must ensure that a copy of the new prescription/administration chart is faxed to the named Community Nurse as soon as possible and that the original is delivered to the patient's home within 24 hours (or added to the homecare notes if the patient has died and these have been removed from the home).
- Further requests for prescribers to issue verbal orders must not be sought: In circumstances where an additional adjustment to a variable dose prescription is needed, the patient must be assessed and a new prescription issued.

5.12 Recording Administration:

- Where controlled drugs have been administered, they must be recorded on the appropriate form, which has been authorised for the purpose by the Trust.
- Controlled drugs, together with all other medication added to the syringe driver must be recorded on the Syringe Driver drug administration sheet and inserted into the Community Nurses' patient held record.
- **Every time the syringe driver is re-loaded a drug additive label must be completed in full and affixed to the delivery tubing. This should be done irrespective of whether the prescription or drugs to be administered have been changed or remain the same.**

5.13 Licensed Medicines used outside of their product licence (See Table 1)

- In Palliative Care it is not uncommon for drugs to be prescribed and administered outside of dose, route or purpose for which they have a product licence. Attention must be drawn to the UKCC document: "Standards for the Administration of Medicines" October 2000 in respect of this.

5.14 Unlicensed medicines

- An unlicensed medicine is the term used to refer to a medicine that has no product licence. If an unlicensed medicine is administered to a patient, the manufacturer has no liability for any harm that ensues. The person who prescribes the medicine carries the liability. This may have implications for nurses in obtaining informed consent.
- If a medicine is unlicensed, it should only be administered to a patient against a patient-specific prescription. In addition, the nurse must be satisfied that he or she has sufficient information to administer the drug safely and, wherever possible, that there is acceptable evidence for the use of that product for the intended indication (UKCC October 2000)
- Any nurse setting up or re-loading a syringe driver is responsible for ascertaining the safety and appropriateness of the of the prescription, irrespective of whether the drugs have been prescribed for use within their product licence or not.
- It is imperative that the nurse consults the responsible Palliative Care Service or prescribing doctor or, failing this, the dispensing pharmacist if he or she is uncertain of the therapeutic action and/or side effects of the drugs prescribed.
- If the nurse has concerns about whether the prescription and/or dose is safe and appropriate to the patient's needs, he or she must contact the responsible Palliative Care Service or prescribing doctor to discuss her concerns before proceeding to administer the medication or obtaining a new prescription, if necessary.

TABLE 1

**MEDICATIONS PRESCRIBED OFF LICENCE FOR CONTINUOUS
SUBUTANEOUS INFUSION FOR PALLIATIVE CARE**

Indication	Drug	Outside dose range	Unlicensed Route	Comment
Neuropathic pain	Dexamethasone			Unlicensed use
Neuropathic pain	Lignocaine 2%	10/20ml/24 hours	CSCI	Not licensed for treatment of neuropathic pain
Neuropathic pain	Ketamine	150mg-2.4g/24 hours	CSCI	Unlicensed use
Nausea and vomiting	Cyclizine		Not licensed for SC or CSCI	Unlicensed route
Nausea and vomiting	Dexamethasone			Licensed only for chemotherapy induced nausea and vomiting
Intestinal obstruction	Octreotide		Not licensed for CSCI	Unlicensed use
Intestinal obstruction	Glycopyrrolate		CSCI (Licensed for IM/IV)	Unlicensed use
Intestinal obstruction	Hyoscine hydrobromide		Licensed for SC/IM use	Unlicensed use
Intestinal obstruction	Hyoscine butylbromide		Licensed for IM/IV use	Unlicensed use
Excess secretions	Hyoscine hydrobromide			Unlicensed use/? CSCI route
Excess secretions	Hyoscine hydrochloride			Unlicensed use/? CSCI route

Table 2 Drugs Commonly Used in a Syringe Driver

DRUG	MODE OF ACTION
Diamorphine	Analgesic
Haloperidol	Antiemetic and antipsychotic
Cyclizine	Antiemetic
Levopromazine (Methotrimeprazine)	Antiemetic and sedative
Midazolam	Anxiolytic and sedative
Hyaluronidase	Reduces local skin reactions Increases subcutaneous uptake of other drugs
Dexamethasone	Steroid
Metoclopramide	Antiemetic
Hyoscine butylbromide (Buscopan)	Antispasmodic
Hyoscine hydrobromide	Antiemetic and antisecretory
Glycopyrronium	Antisecretory and antispasmodic

Adapted from David (1992) and Dickman & Littlewood (2000)

Table 3 Drugs Occasionally Used in a Syringe Driver

DRUG	MODE OF ACTION
Ondansetron	Antiemetic
Granisetron	Antiemetic
Octreotide	Antiemetic
Diclofenac	Anti-inflammatory
Ketorolac	Anti-inflammatory

Adapted from David (1992)

Table 4 Drugs best used alone, rather than in Combination

DRUG	MODE OF ACTION	DILUENT
Ketamine	Analgesic	Physiological Saline
Ketorolac	Analgesic (in bone pain)	Physiological Saline

Source: Dickman & Littlewood 2000

Table 5 Drugs unsuitable for use in a Syringe Driver

DRUG	CONTRAINDICATION
Diazepam	Causes skin irritation
Chlorpromazine	Causes skin irritation
Prochlorperazine	Causes skin irritation and breaks down on exposure to light

Source: Dickman & Littlewood 2000

Further information on drug use can be obtained from the Palliative Care Centre involved with the patient, or from the Camden and Islington Palliative Care Centre out of normal working hours.

6.1 Criteria for drugs suitable for a single drug infusion via a syringe driver:

- It must be available in injectable form
- It must be suitable for subcutaneous administration (as defined by product licence or by current best practice)
- It must remain stable for the duration of the infusion in the concentration used. The infusion should not last for more than 24 hours (Pritchard AP & Mallett J, 1992).

6.2 Additional criteria for combinations of drugs infused via a syringe driver:

- All the drugs must be compatible with each other at the concentrations used
- All the diluents must be compatible with each other.
- Each drug must be compatible with the diluents of the other drugs in combination.

6.3 Cautions when using combinations of drugs:

- The syringe should be protected from direct light whenever possible.
- Visual inspection of drug solutions should be made as often as is practicable in the community setting, i.e.: on setting up the syringe driver and on any subsequent visits to the patient during the next 24 hours. The result of this inspection must be recorded in the syringe driver record chart. Any syringe containing signs of drug crystallisation, precipitation or discoloration should be discarded. Precipitation or crystallisation must be reported to the prescribing doctor or Palliative Care Centre responsible for the patient and advice sought as to whether a new prescription or a second syringe driver is required.

7: INFORMATION FOR PATIENTS AND INFORMAL CARERS

7.1 Essential Procedures

- It is essential that informed consent is obtained before a syringe driver is used, if the patient is competent and able to give their consent. In the case of patients who are not competent and are not able to give consent, a clinical decision must be made as to what course of action is in the best interests of the patient.
- It is essential that competent patients, and/or their carers (where they exist) should be taught how to check that the syringe driver is running safely.
- Written information about syringe drivers and details about where to go for help, in the event of problems, must be left in the patient's home (See Attachment-Information for Patients and their Carers).

7.2 Informed consent (Competent Patients):

It is essential that informed consent for the setting up of a syringe driver is obtained, from the patient receiving the treatment or the parent or legal guardian of a patient under the age of 16. . In the case of a patient under the age of 16, explanation must also be given that is appropriate to their age and level of understanding.

The following points should be included:

- Explanation that a syringe driver is a medical device , which is used to deliver a continuous subcutaneous injection over a period of time.
- Advice as to which oral, sublingual, transdermal or rectal medications have been replaced by the injectable drugs in the syringe driver and, if appropriate, which drugs need to be continued.
- Advice as to how to discontinue the infusion, should the patient wish for it to be stopped.

7.3 Written Information

Written information should include the following:

- Advice to use the telephone contact numbers, should the patient's condition change substantially or unexpectedly after the syringe driver has been set up or the prescription is changed.
- Explanation as to how the syringe driver works, what to do if the alarm goes off or the needle or syringe becomes dislodged, together with the appropriate telephone contact numbers, in the event of difficulties.
- Advice as to where to place the syringe driver on the bed, surrounding furniture or patient's clothing.

- Patients and/or their carers should be shown how to check the syringe and tubing for signs of crystallisation or precipitation and how to check the needle entry site.
- Patients and/or their carers should be shown how to make simple checks that the syringe driver is running at the correct rate: i.e. that medication in the syringe it will last for the predicted amount of time.
- The approved document: **Information for Patients and their Carers** must be left in the patient's home, as a reminder of the verbal explanation.

7.4 Administration or administration by a relative or carer:

In the event of a patient, relative or carer wishing to take on the task of reloading the syringe driver or administering "as required" medication, the following procedure must be followed:

- The responsible nurse or doctor must have a discussion with the relative or carer as to why they wish to take on this task. The nurse or doctor making a decision about this will need to satisfy his or herself, so far as is possible, that the patient or carer has no wish to take on the task in order to give unauthorised amounts of medication: ie: for the purposes of sedation, so that the patient can be left alone when it is unsafe to do so, or for euthanasia or assisted suicide.
- Full explanation of the syringe driver, as a piece of equipment, the prescription drugs and how they are drawn up for that patient and care of the needle entry site.
- If the patient, relative or carer is to administer "as required" medication, they will need a full explanation of the prescribed drugs and a written plan for administering each, which includes instructions for each breakthrough symptom. They must be asked to seek advice from the community nurse or specialist palliative care service, should breakthrough medication for any one symptom be required more than twice in 24 hours. They must record what has been given on the medication administration charts.
- For both administration via a syringe driver and "as required" medication given by subcutaneous injection, a period of practice, witnessed and supervised practice by a doctor or a registered nurse, until the relative or carer is both confident and competent in performing the task must take place. This must include the checking and drawing up of the drugs, the administration of the drugs to the patient and the completion of the medication administration charts.
- Review by a registered community nurse, doctor or specialist Palliative Care Nurse must take place whenever there needs to be a change in the prescription, review of the effectiveness of symptom control, or weekly when the needle site is changed, whichever is sooner.
- Documentation in the home care notes that a carer or relative has been trained and assessed as competent to manage the daily reloading of the syringe driver. This must include the full name, address and contact telephone number for that carer or relative.
-

7.5 Euthanasia and assisted suicide

- It is the duty of the person training patients and carers to use the syringe driver to ascertain their motives in wishing to take on this responsibility See Section 7.4). Likewise, it remains responsibility of the community nurse to keep a check on and to document that the amounts of drugs administered correspond with the doctor's prescription and to report any discrepancies to the prescribing doctor and to their line manager. (See also section 4.13 Notes for completion of the Syringe Driver Check List. Any increase in the rate at which the syringe driver is running, which has not been authorised by a specialist Palliative Care Doctor must be documented in the home care notes. This is a serious matter and must be discussed with the relevant line manager and reported to the Police for investigation.

8: MAINTENANCE AND SAFETY OF EQUIPMENT

8.1 Methods of Acquisition

- Syringe drivers may only be bought according to the local procurement policy. Donated syringe drivers must be checked over by the department holding the maintenance and servicing contract, before use. Donated devices without CE marking must not be accepted (MDA DB2003 (02)).

8.2 Annual Servicing

- The Trust's policy on maintenance and safety follows the manufacturer's recommendation that each syringe driver should be serviced annually and that this service should include a routine safety check. It is the responsibility of the palliative care services and community nursing teams holding syringe drivers to arrange for the annual service of each syringe driver, either locally with a hospital department of Medical Physics, or Electrical and Biomedical Engineering Department (EBME) or with the manufacturer.

8.3 Record Keeping

Each service should keep a register of all the medical devices it manages, including syringe drivers. Additionally, a record should be kept for each syringe driver detailing the following information:

- The date of each service
- The whereabouts of each syringe driver
- The date a syringe driver is taken into a patient's home
- The date a syringe driver is returned to base
- Details of when a syringe driver has been cleaned, and by whom
- Any accidental damage to the syringe driver

8.4 Accidental damage

- Syringe drivers should also be serviced following accidental immersion in water or after having been dropped. There is a particular risk that the alarm will fail following either of the above types of accident, although the syringe driver may appear, in other respects, to be working normally.

8.5 Cleaning

- The provision of acceptably clean well maintained equipment is essential to patient safety and comfort. It is the responsibility of the nurse who returns a syringe driver to base to ensure that it is cleaned and made ready for the next time it will be used. The syringe driver should be cleaned by wiping it with a damp cloth (soapy, if necessary). A small toothbrush should be used for removing any dirt from the leadscrew. The syringe driver must be completely dry before it can be reused. Care must be taken to ensure that any syringe driver used for a protracted period by one patient is also cleaned every two weeks, as the build up of dirt and debris on the leadscrew may slow the rate at which the medication is delivered, or stop it entirely (Graseby Medical Ltd).

8.6 Modification

- Infusion systems should not be modified, nor used for purposes not intended by the manufacturer. When a device has been modified, the trust or hospital is considered as the manufacturer under the Medical Devices Regulations, and accordingly takes on the manufacturer's responsibilities. There may be safety implications and, if an adverse incident occurs, the original manufacturer's liability is limited and the organisation could be exposed to legal action. (MDA Device Bulletin: Infusion Systems MDA DB2003(02) Section 2.5.4).
- It is dangerous to modify an infusion pump without authorisation. All modifications must be authorised by the (Medical Physics Department) technical supervisor and the (Primary Care Trust) medical devices co-ordinator, together with the manufacturer, to ensure that safety is not compromised. An example of an authorised modification in a Graseby MS16a syringe driver would be an occlusive plate placed over the front of the device to ensure that it can run only at a set rate, normally 2mm/hour.

9: AUDIT AND QUALITY ASSURANCE

9.1 Evidence base

- The purpose of having a policy for the use of syringe drivers in the community is to provide a framework for good clinical practice for both generic and specialist practitioners. The provision of such a policy should ensure consistent and safe evidence based practice across the district, a reduction in time taken to deal with errors and mechanical problems and proper servicing and maintenance of the equipment. The policy should lie well within the overall Community Nursing Policy and within the Administration of Medicines Policy and be consistent with the latest guidelines produced by the UKCC, the Department of Health and the Medical Devices Agency. In the last analysis it should protect the Trust's employees in the event of a complaint or adverse publicity. It is to this end that the following audit programme has been devised.
- Responsibility for auditing the policy and for quality assurance will lie with the Camden and Islington Palliative Care Team.

9.2 Periodic Reviews

The Policy will be subject to a general review, bi-annually from the date at which it was signed off and authorised for use. The review will include the following:

- Literature search
- Inclusion of any new pharmacological information from the UCLH Drug Information Service and Formulary and/or from the Community Pharmacy Service.

The Policy will also be reviewed at other times under the following circumstances:

- At the request of any member of staff who is having difficulty with it.
- Whenever new guidelines on drug administration or the equipment involved have been issued by the NMC, the Department of Health, The Home Office Drugs Unit or the Medical Devices Agency. NB: New Guidelines on continuous ambulatory infusion devices are due to be issued by the Medical Devices Agency in December 2000.
- In the event of a formal complaint or of adverse publicity related to the use of a syringe driver for the administration of medicines by a Trust employee or employees.
- In the event of the Graseby MS16A syringe driver ceasing to be the subcutaneous infusion device recommended for use within the Trust.
- In the event of new recommendations for safe administration of injections being issued by the local Control of Infection nurse specialists, from the Department of Health. Or from the Medical Devices Agency.
- Following any revision of the manufacturers' recommendations or instructions.
- Following a serious incident, or at the instruction of the coroner.

9.3 Specific Audit Measures-Indications For Use

- Primary Health Care teams and Specialist Teams should record and report to their local Palliative Care Team any use of a syringe driver for purposes other than those outlined in Section 3 of the Syringe Driver Policy, including the delivery of drugs by the intravenous route, which is not recommended and is clearly contraindicated in the policy under Section 2: Scope of the Policy. The purpose of this reporting will be to monitor safe practice and to ensure that any additional indications which might be beneficial to patients are carefully considered and added onto the policy, if appropriate.
- With reference to Section 3.2 of the policy, it is necessary to review the long term use of syringe drivers in patients, because of the risk of psychological dependence.
- Patients for whom the long term use of a syringe driver is indicated should have their case reviewed monthly, to assess whether they need to continue with the syringe driver, or whether their prescription should be changed.
- Patients managing their own syringe driver should have their technique assessed monthly to ensure that they continue to use the correct procedure. The result of this assessment should be recorded in the patient's notes.
- To facilitate the review of patients using a syringe driver long term, The each Specialist Palliative Care Team will hold a register of patients using these devices long term and the outcome of decisions made as to whether to continue, or to switch to another route.

9.4 Specific Audit Measures-Manual For Use In The Community

- Representatives of generic community nurses who are involved in using the policy should be appointed to participate in the bi-annual review and in any of the other occasional reviews.

9.5 Specific Audit Measures-Maintenance and Safety

- The each Specialist Palliative Care Team will make an inventory of all the syringe drivers available for use in the community. This will include all syringe drivers held by the specialist Palliative Care Services, specialist Haemoglobinopathy Services, Health Centres and General Practitioners. Each syringe driver will need to be labelled for identification purposes and each will need a date set for its annual service. It is proposed that a "log book" is started to record annual services and services carried out following accidental damage or immersion in water. This log could also record the whereabouts of each syringe driver. Better recording of whereabouts should result in fewer syringe drivers getting lost or being disposed of along with clinical waste.

10 REFERENCES

David J. (1992) A Survey of the use of syringe drivers in Marie Curie Centres, European Journal of Cancer Care 1:4

Dickman A, Littlewood C. The Syringe Driver in Palliative Care Sixth Edition ARD Publications November 1990

Evans N, Palmer A (1998) Controlling breakthrough pain in Palliative Care. Nursing Standard 13(7): 53-54

Graseby Medical Ltd. MS16A/MS26A Instruction Booklet

Mitten T. Subcutaneous drug infusions: a review of problems and solutions. (2001) International Journal of Palliative Nursing. Vol 7 No 2

Pritchard AP & Mallett J (1992). The Royal Marsden Hospital Manual of Clinical Nursing Procedures, Third Edition 435-438

Radstone DJ & Crowther AGO (1989). The appropriate use of syringe drivers. In: The Edinburgh Symposium on Pain Control and Medical Education (Ed. by Twycross). Royal Society of Medicine, London.

Regnard C, Pashley S, & Westrope F (1986). Anti-emetic/Diamorphine mixture compatibility in infusion pumps, British Journal of Pharmaceutical Practice, 8, 218-220.

Twycross, R. Pain relief in advanced cancer, Ch 18 Alternative routes of administration. Churchill Livingstone 1994

Twycross R, Willcock A, Thorp S (1998) Palliative Care Formulary. Radcliffe Medical Press, Abingdon

United Kingdom Central Council for Nursing, Health Visiting and Midwifery (2000) Standards for the Administration of Medicines.

University College London Hospitals Use of Medicine Committee (1995) Formulary

University College London Hospitals Injectable Drug Administration Guide (January 1997)

University College London Hospitals Formulary 2002

11: SPECIALIST SERVICES FOR SUPPORT AND ADVICE FOR PALLIATIVE CARE, MEDICAL DEVICES AND MEDICAL PHYSICS/ BIOMEDICAL ENGINEERING

Camden & Islington Palliative Care Team:

020 7530 6200

020 7530 6220 (Fax)

020 7387 9300 (5pm- 9am Monday - Friday and weekends. Ask for Palliative Care)

The Islington Support Team:

020 7288 5227 (9am - 5pm Monday-Friday)

The Royal Free Palliative Care Team:

020 7794 0500 Ex 3861 (9am - 5pm Monday-Friday)

020 7794 0500 Via Air Call (9am - 5pm Saturday and Sunday)

For Haemoglobinopathy Care:

Service Manager, Haemoglobinopathy Clinic, Tollington Way N7

020 7530 2051 or 020 7530 2050

For Pharmacy Support:

Camden & Islington Community Health Services NHS Trust,

Principal Pharmacists for Primary Care and HIV/GUM/ Palliative Care:

020 8219 1889/8

UCL Hospitals Drug Information Service:

020 7636 8333 Ex 4747 or 4538

The Whittington Hospital Drug Information Service:

020 7288 5021

The Royal Free Hospital Drug Information Service:

020 7830 2983

Medical Devices Leads

Medical Devices Lead for Camden Primary Care Trust:

Vicky Hackett, Clinical Services Manager for Older People and Physiotherapy Lead for Camden & Islington PCTs

3rd Floor, South Wing

St Pancras Hospital

St Pancras Way

London NW1 0PE

Tel: 020 7530 3313

E-mail: vicky.hackett@camdenpct.nhs.uk

Medical Devices Lead for Islington PCT

Pauline Grace, Clinical Governance Manager
Islington Primary Care Trust
Room 111a Insull Wing
110 Hampstead Road
London NW1 2LJ

Tel: 020 7853 5334

E-mail: pauline.grace@nhs.net

Medical Devices Lead for Camden & Islington Mental Health & Social Care Trust:
Marion Judd, Policy & Practice Development Project Officer
Executive Suite
1st Floor, East Wing
St Pancras Hospital
St Pancras Way
London NW1 0PE

Tel: 020 7530 3074

E-mail: marion.judd@candi.nhs.uk

For Medical Physics/Biomedical Engineering Support:

Department of Clinical Engineering and Medical Physics
The Whittington Hospital
Highgate Hill
London N19 5NF
020 7288 5425/5428 (direct lines)
(Service contract holder Camden Primary Care Trust and Islington Primary Care Trust)

Royal Free Hospital Medical Physics Department:
020 7830 2196

Middlesex Hospital Medical Physics Department:
020 7636 8333 ex 4897/9700