**TRUST WIDE/DIVISIONAL DOCUMENT**

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<th>Policy/Standard Operating Procedure/ Clinical Guideline</th>
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<tr>
<td><strong>DOCUMENT TITLE:</strong></td>
<td>Policy and Procedure for the T34 Ambulatory Syringe Pump in adults (Palliative Care)</td>
</tr>
<tr>
<td><strong>DOCUMENT NUMBER:</strong></td>
<td>ELHT/CP22 Version 5.1</td>
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<tr>
<td><strong>DOCUMENT REPLACES Which Version</strong></td>
<td>ELHT/CP22 Version 4.1</td>
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<tr>
<td><strong>LEAD EXECUTIVE DIRECTOR DGM</strong></td>
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<tr>
<td><strong>AUTHOR(S): Note should not include names</strong></td>
<td>Syringe pump policy task and finish group chaired by Palliative Medicine Consultant</td>
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<thead>
<tr>
<th><strong>TARGET AUDIENCE:</strong></th>
<th>Medical and Nursing Staff</th>
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| **DOCUMENT PURPOSE:** | 1 To provide a clear governance framework to ensure a safe and consistent approach to the use of the T34 Ambulatory Syringe Pump  
2 To provide details of how to set up and administer medication by a T34 Ambulatory Syringe Pump  
3 To provide easily accessible information about the common medicines used in a Syringe Pump |

| To be read in conjunction with (identify which internal documents) | Clinical Practice Summary. Guidance on consensus approaches to managing palliative care symptoms. Lancashire and South Cumbria consensus guidance – August 2017  
C064 V5 Medicines Management Policy  
IC24 V4 Aseptic non touch technique (ANTT) policy |
### SUPPORTING REFERENCES

- Nursing and Midwifery Council - Standards for Medicines Management 2015
- The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013

### CONSULTATION

<table>
<thead>
<tr>
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<tr>
<td>Consultation</td>
<td>11.5.18</td>
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**Ratification date at Policy Council:**  
June 2018

**NEXT REVIEW DATE:**  
June 2020

**AMENDMENTS:**

1. Extensive amendments and reconfiguration – changes submitted as versions with changes tracked
2. Changes in medicines information section to be submitted to ELMMB for information
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1. Introduction

1.1 A Syringe Pump is a portable battery operated device that is used to deliver a continuous subcutaneous infusion of medicines.
1.2 The Syringe Pump is a minimally invasive route of medicine administration commonly used in palliative care.
1.3 The T34 Ambulatory Syringe Pump is the mode recommended for use in Palliative Care. This policy applies only to the T34 Ambulatory Syringe Pump in adults.
1.4 A Syringe Pump can pose serious risk to human life if used incorrectly.

2. Purpose

2.1 To provide a clear governance framework to ensure a safe and consistent approach to the use of the T34 Ambulatory Syringe Pump in adults.
2.2 To provide details of how to set up and administer medication via a T34 Ambulatory Syringe Pump.
2.3 To provide easily accessible information about the common medicines used in a Syringe Pump.

3. Scope

3.1 All healthcare professionals in ELHT prescribing, setting up, administering or monitoring medicines being given by a T34 Ambulatory Syringe Pump to adults.
3.2 This policy can be used by other healthcare providers across Pennine Lancashire but each organisation is responsible for ensuring they have appropriate training and governance processes in place.
3.3 ELHT will not accept any liability or responsibility for care delivered by non-ELHT staff.
3.4 Information provided about individual medicines is for guidance purposes. It is not fully comprehensive and is subject to change.
3.5 Individual prescribers are responsible for ensuring that they prescribe in line with the most up to date guidance available and have appropriate knowledge and understanding of the medicines they prescribe.
4. Roles and responsibilities (ELHT specific)

4.1 The Trust recognises that the T34 Ambulatory Syringe Pump is commonly used to deliver medicines to palliative care patients and that all staff using these Syringe Pumps need to have adequate knowledge and training to do so safely.

4.2 The Chief Executive and Trust Board

4.2.1 The Chief Executive is responsible for:
- Ensuring that this policy adheres to professional guidance.
- Ensuring this policy and supporting documentation is reviewed every two years.
- Ensuring appropriate leadership and governance arrangements are in place to enable staff to comply with this policy.
- Ensuring this policy is agreed and monitored by the organisation’s governance process.

4.2.2 The Trust Board will receive a report at least once a year including audit results related to end of life care.

4.3 Divisional General Managers, Divisional Directors and Divisional directors of Nursing and other Managers of services

4.3.1 Directors and Managers are responsible for the care provided within their services.

4.3.2 They must ensure that:
- Staff are aware of the policy and how to access it.
- Staff are required and enabled to acquire and maintain necessary competencies to safely use a T34 Ambulatory Syringe Pump.
- Appropriate leadership and governance arrangements are in place to implement the policy and to monitor the safe use of the T34 Ambulatory Syringe Pump.
- Incidents that occur involving the T34 Ambulatory Syringe Pump are reported using the Datix incident reporting system.
4.4 All Health Care Staff setting up, administering or monitoring the delivery of medication using a T34 Ambulatory Syringe Pump

4.4.1 The responsibility for the safe and effective use of a T34 Ambulatory Syringe Pump lies with the ward staff for patients in hospital, the GP and community staff for patients in community settings.

4.5 All Health Care staff prescribing medicines to be given by a T34 Ambulatory Syringe Pump

4.5.1 Must prescribe within their competence and experience.
4.5.2 Must seek advice from pharmacy or the Specialist Palliative Care Team if required. A 24 hour Specialist Palliative Care Advice Line is available for professionals; see 4.7.2.
4.5.3 All information provided around medication in this document is for guidance purposes only. The prescriber is responsible for ensuring prescribing is carried out in line with the most up to date guidance.
4.5.4 Whilst every effort has been made to ensure accuracy in this document responsibility remains with the prescriber.
4.5.5 Should understand that the majority of medicines in this document do not have a produce licence for administration via the Syringe Pump (i.e. their use is ‘off-label’). See C064 Medicines Management Policy section on unlicensed and ‘off-label’ medicines.
   - The use of medicines without a product licence in palliative care is both necessary and common practice and s part of clinical practice within the organisation to ensure palliative care patients receive effective treatment.
   - Health Care Professionals prescribing ‘off-label’ should ensure the medicines offer the best balance of benefit against harm for any given patient. Prescribers should use the resources available to ensure prescribing is evidence based.
   - Patients should be offered accurate, clear, specific and appropriate information that meets their needs about the use of the ‘off-label’ medicines. It is sometimes considered unnecessary to take additional steps when recommending medicines ‘off-label’ in palliative care (reference Palliative Care Formulary, Twycross R et al, 5th Edition, UK).
4.6 Pharmacy Team

4.6.1 The core service provided by the pharmacy team includes clinical pharmacy, medicines procurement, medicines information and counselling.

4.6.2 Pharmacy will advise on the prescription writing and compatibility of medicines in the Syringe Pump.

4.6.3 Ward pharmacists will carry out clinical checks for stability and compatibility of Syringe Pumps. This includes drug, diluent and final dose concentration checks.

4.6.4 Pharmacy will advise on the ordering, storage, administration, disposal and record keeping of medicines.

4.6.5 Pharmacy will ensure timely provision of medicine and help in assessing appropriateness of medicine orders.

4.6.6 Pharmacy offer a limited, centrally delivered aseptic additive service and emergency on-call service via hospital switchboard.

4.6.7 Contact details for pharmacy:

<table>
<thead>
<tr>
<th>Medicines Information</th>
<th>Mon-Fri 8.30am-5.00pm</th>
<th>Telephone: 01282 803004/ Ext 13004</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacy Aseptic Unit</td>
<td>Mon-Fri 8.00am-4.30pm;</td>
<td>Telephone: 01254 734680/ Ext 84680</td>
</tr>
<tr>
<td></td>
<td>Sat/Sun 9.00-1.00pm</td>
<td></td>
</tr>
<tr>
<td>Pharmacy Dispensary RBH</td>
<td>Mon-Fri 8.30am-5.00pm;</td>
<td>Telephone: 01254 732252/ Ext 82252</td>
</tr>
<tr>
<td></td>
<td>Sat/Sun 9.00-4.00pm</td>
<td></td>
</tr>
<tr>
<td>Pharmacy Dispensary BGH</td>
<td>Mon-Fri 9.00am – 5.00pm</td>
<td>Telephone: 01282 804338/ Ext 14338</td>
</tr>
</tbody>
</table>
4.7 Specialist Palliative Care Team

4.7.1 The Specialist Palliative Care Team supports hospital and community staff with the use of Syringe Pumps in palliative care. Health Care Staff should refer to the Specialist Palliative Care Team if:

- Advice is needed about symptom management in palliative care patients or when initial measures have failed to provide adequate relief within 24 hours.
- Advice is needed regarding the prescription of medicines to be given in a Syringe Pump.
- Advice is needed about the set up or monitoring of a Syringe Pump.

4.7.2 The Specialist Palliative Care Team works Mon-Fri, excluding bank holidays and weekends. Specialist Palliative Care telephone advice is available 24 hours per day, 7 days per week.

**Contact details for Specialist Palliative Care advice:**

Hospital: Mon-Fri 8.30-16.30 Ext 82316/82652
Community: Mon-Fri 9.00-17.00 Ext 86326
Out of Hours: 07730 639399 (advice line based at East Lancashire Hospice).

5. Training and Education

5.1 Staff using Syringe Pumps are responsible for ensuring that they develop and maintain the skills and knowledge required to fulfil their professional role.

5.2 All staff setting up and monitoring the administration of medicines by a Syringe pump must have attended an initial training session.

5.3 All staff using Syringe Pumps must attend an annual update thereafter.

5.4 Training needs should be identified and met as part of personal development review/appraisal processes.

5.5 All Trust Divisions will enable and support staff to acquire and maintain necessary skills and competencies to ensure safe use of the T34 Ambulatory Syringe Pump.

5.6 The Trust provides Syringe Pump training and education sessions for nursing staff.
5.7 Training can be requested and organised for other groups, such as medical staff, by contacting the Specialist Palliative Care Team.

6. Monitoring and Audit

6.1 Audit of the safe and effective use of the T34 Ambulatory Syringe Pump will be undertaken at least biennially within the Trust. Results will be fed back to the ELHT End of Life Care Strategy Group and the nominated Trust Board members.
Appendix 1

Indications for use of a Syringe Pump in palliative care

Palliative care patients often experience multiple symptoms that require the use of more than one medicine. If a patient’s condition changes so that the oral route is no longer available, the Syringe Pump can be used to support continued symptom control.

A Syringe Pump is the chosen method for the administration of medicines when other routes are inappropriate due to:

- Nausea and vomiting
- Dysphagia
- Severe weakness/cachexia
- Unconsciousness
- Gastrointestinal problems e.g. diarrhoea, bowel obstruction
- Inability to administer medication via oral route i.e. Head/neck cancers
- Malabsorption
- Care in the last days and hours of life – A syringe pump should only be started in the last hours or days of life if it is indicated for symptom management. Not all dying patients will require a syringe pump.

Many palliative care patients will require administration of ‘as required’ (prn) subcutaneous medication for symptom management.

If more than 2 or 3 doses of any ‘as required’ (prn) subcutaneous medication are required for symptom control over 24 hours, consider using a Syringe Pump.

In a patient with a Syringe Pump in place consider increasing the doses if more than 2 or 3 doses of any ‘as required’ (prn) medication is required for symptom control over 24 hours.
Appendix 1

Advantages in the use of a subcutaneous Syringe Pump

- Increased patient comfort when oral route not available
- Avoids repeated injections
- Plasma concentration levels of medicines remain constant
- Maintains patient’s independence and mobility as pump is lightweight and portable
- Ability to control multiple symptoms by infusing a combination of medicines
- Accurate absorption

Disadvantages in the use of a Syringe Pump

- Irritation, erythema or swelling can occur at the infusion site which may interfere with rate and absorption.
- Once daily loading of medicines may limit flexibility.
- Precipitation of medicines can occur. There is a lack of compatibility data for some mixtures.
- May be perceived as a ‘terminal’ event by patients and carers.
Appendix 2

Guidance on prescribing opioid doses for a syringe pump and as required (prn)

Opioids given subcutaneously via a syringe pump are more potent than opioids administered orally. The dose of the opioid prescribed must therefore be adjusted when switching from oral to subcutaneous administration.

Different opioids also vary in their potency and therefore the dose prescribed must be adjusted when switching between different opioid medicines. For information on equivalent doses when changing the route of administration or the opioid given please refer to page 12 of the Lancashire and South Cumbria Consensus Guidance – Clinical Practice summary August 2017. For doses or drugs out with this guidance please contact the specialist palliative care team see Appendix 8 for contact details.

Additional ‘as required’ (prn) medication

In addition to the medication prescribed in a syringe pump it is often necessary to prescribe other subcutaneous medicines for symptom management that are available if required.

For breakthrough pain
- It is best practice to prescribe additional subcutaneous doses of opioid analgesia equal to 1/6th of the total daily dose of opioid for breakthrough pain. Refer to opioid conversion charts on page 12 of the Lancashire and South Cumbria Consensus Guidance – Clinical Practice summary for further details of recommended doses.

Other symptoms
- Please refer to the Lancashire and South Cumbria Consensus Guidance – Clinical Practice summary for the management of symptoms in the last days of life for guidance on appropriate doses of other medicines
  - East Lancashire Health Economy Medicines Management Board Website
    - Guidelines Palliative Care & Syringe Pump Guidelines (http://www.elmmmb.nhs.uk/guidelines/palliative-care/)
  - ELHT Intranet Clinical Information Palliative Care/EoLC Care Symptom Control and Prescribing or Syringe Pump Folder
Appendix 2

Switching Between Other Analgesic Preparations And The Syringe Pump

1. Changing from twice daily modified release oral opioids to the Syringe Pump

The Syringe Pump can be started when the next dose of oral modified release opioid is due. However, additional subcutaneous doses may be needed for pain control (i.e. one sixth of the 24 hour dose).

2. Concomitant use of Fentanyl or Buprenorphine Patches with opioids in a syringe pump

- If a patient has a fentanyl or buprenorphine patch in situ and additional analgesia is required by a syringe pump the patch should be left in situ
- Maintain the current patch strength
- Continue to change the patch at the recommended interval
- When calculating the 'as required' (prn) dose for patients on a Syringe Pump and a fentanyl or buprenorphine patch take into account both methods of opioid delivery.
- Calculate the breakthrough dose of ‘as required’ (prn) subcutaneous analgesia by ADDING the amount required for the fentanyl or buprenorphine patch to the amount required for the opioid dose in the syringe pump.

For example:

Patient on a 25 microgram/hour fentanyl patch and receiving 30mg morphine by syringe pump over 24hrs.

To calculate breakthrough dose of subcutaneous morphine:

For 25microgram/hour fentanyl patch:
  - Breakthrough dose from conversion charts = 10mg oral morphine.
  - Divide by 2 to calculate subcutaneous dose = 5mg subcutaneous morphine
Appendix 2

For 30mg morphine in syringe pump:
- Breakthrough dose = 1/6 of total dose in syringe pump = 30mg
- Divided by 6 = 5mg subcutaneous morphine

Total dose for subcutaneous breakthrough morphine
= 5mg + 5mg
= 10mg subcutaneous morphine, as required.
Appendix 3

SYRINGE PUMP PRESCRIBING AND MEDICINES INFORMATION (ALPHABETICAL)

All information provided on medicines in this document is for guidance purposes only. The prescriber is responsible for prescribing in line with the most up to date guidance. Please ensure you have read sections 4.4 and 4.5 of the policy.

Prescribing a syringe pump

In community:

- An FP10 prescription needs to be issued for all medication prescribed.
- A T34 ambulatory Syringe Pump prescription form with all required medicines must be completed.

In hospital:

- A Syringe Pump must be prescribed on the patient's inpatient prescription chart or electronic prescription as subcutaneous Syringe Pump over 24hrs. Individual medicines and doses for the Syringe Pump must be prescribed separately on the T34 ambulatory Syringe Pump prescription form.
- A Syringe Pump prescription form with all required medicines must be completed.

In community and hospital:

- Each medicine, dose, diluent and final volume must be clearly written on the prescription chart by the prescriber and signed.
- All medicines should be mixed with sterile water for injection unless known incompatibility or otherwise stated in drug monographs below. The final volume includes all prescribed medicines and diluent.
- The prescriber must complete the prescription in full and must indicate the time that the Syringe Pump needs to be commenced.
Appendix 3

- If medicines are changed for any reason the previous prescription and authorisation must be discontinued by the prescriber and a new one written.
- No more than 3 medicines are to be used in a single Syringe Pump.
- In exceptional circumstances, if more than 3 medicines are required, advice MUST be sought from the Specialist Palliative Care Team or Pharmacy.
- Medicine combinations should be reviewed on a regular basis to check efficacy and appropriateness of medicine and dose prescribed.

Mixing of medicines in a Syringe Pump and compatibility

In palliative care the administration of medication by continuous subcutaneous infusion using a Syringe Pump is common. Situations routinely arise that require combinations of two or more medicines in the same syringe, however evidence for this practice is lacking. Most combinations used in palliative care are clear, colourless and free from precipitation. However, this does not confer stability because unrecognised chemical reactions may occur. For example, dexamethasone and glycopyrronium mix to form a clear, colourless solution that is free from precipitation. However, at the molecular level, the dexamethasone is reacting with and therefore deactivating the glycopyrronium.

Compatibility of medicines in a syringe pump

Prescribers must ensure that any drug combinations prescribed are recognised to be compatible. Information is included on 2 drug compatibility in the drug monographs that follow. Information on 3 drug combinations for those drugs used commonly in the last days of life: morphine, oxycodone, glycopyrronium, levomepromazine, midazolam is included below.
Appendix 3

Further information on drug combinations not included in the information below, including other 3 drug compatibilities is available from:

- The specialist palliative care team or hospital based pharmacists (see appendix 8 for contact details).
- The syringe driver - Dickman et al. 4th edition 2016, Oxford University Press
  www.palliativedrugs.com >> SDSD section (free registration with the site is required to access this area)

Compatibilities must be checked for all drug combinations. If unfamiliar combinations or doses are involved advice MUST be sought from a hospital based pharmacist or the specialist palliative care team.

No more than 3 medicines should be routinely administered in a single Syringe Pump. If more than 3 medicines are required specialist advice MUST be sought from Specialist Palliative Care Team or Pharmacy. If more than 3 medicines are required consider the use of a second Syringe Pump.

**3 drug compatibility information for medicines commonly used in the last hours to days of life**

Only the medicines recommended for first line use in the last hours to days of life in the clinical practice summary guidance are considered below.
These include: Morphine (or oxycodone if morphine not suitable/tolerated), Midazolam, Levomepromazine, Glycopyrronium.

**Morphine sulfate combinations**

<table>
<thead>
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<th>Drug 2</th>
<th>Drug 3</th>
<th>Compatibility in water for injection</th>
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</thead>
<tbody>
<tr>
<td>Morphine sulfate</td>
<td>Midazolam</td>
<td>Levomepromazine</td>
<td>Compatible</td>
</tr>
<tr>
<td>Morphine sulfate</td>
<td>Midazolam</td>
<td>Glycopyrronium</td>
<td>Compatible</td>
</tr>
<tr>
<td>Morphine sulfate</td>
<td>Levomepromazine</td>
<td>Glycopyrronium</td>
<td>Limited data, watch for crystallisation*</td>
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**Appendix 3**

**Oxycodone hydrochloride (10mg/ml) combinations**

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<th>Drug 2</th>
<th>Drug 3</th>
<th>Compatibility in water for injection</th>
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</thead>
<tbody>
<tr>
<td>Oxycodone</td>
<td>Midazolam</td>
<td>Levomepromazine</td>
<td>Compatible</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>Midazolam</td>
<td>Glycopyrronium</td>
<td>Compatible</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>Levomepromazine</td>
<td>Glycopyrronium</td>
<td>Limited data, watch for crystallisation*</td>
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**Combination with no opioid**

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<th>Drug 3</th>
<th>Compatibility in water for injection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midazolam</td>
<td>Levomepromazine</td>
<td>Glycopyrronium</td>
<td>Compatible</td>
</tr>
</tbody>
</table>

* If crystallisation occurs:
  - Stop infusion
  - Seek immediate advice from specialist palliative care team, pharmacy or 24hr advice line (appendix 8)
  - Contact specialist palliative care team to alert them to allow reporting and recording of the incompatibility

**Resources accessed to update the drug monographs:**

1) PCF online, June 2018
2) The Syringe Driver, Andrew Dickman and Jennifer Schneider, 4th Edition,
3) BNF online, June 2018
**Alfentanil**

**Usual dose:** Starting dose will depend on previous opioid requirements (see table below) and patient factors, for example renal function – seek specialist advice.

There is no maximum dose of alfentanil providing it is carefully titrated.

**BE AWARE:** It is 30 times more potent than oral morphine.

Alfentanil must only be prescribed after discussion with a consultant in palliative medicine or, if a consultant is unavailable out of hours, then with a senior hospice physician.

**Special Instructions**
- Dilute with water for injection
- Sodium chloride 0.9% may also be used
- Use an alternative opioid for breakthrough analgesia

**Indications for Use**
- Pain in patients with renal failure or intolerable side effects from other opioids. It is an alternative to other opioids such as morphine, oxycodone and diamorphine, particularly in patients with renal failure. It should only be used as a continuous subcutaneous infusion.

**Mechanism of Action**
Alfentanil is a strong opioid analgesic. It is a synthetic opioid with strong activity at mu and kappa opioid receptors. It has a rapid onset of action and a short duration of action.

**Side Effects**
Refer to manufacturers SPC for a detailed list of adverse effects.

Side effects are as for other strong opioids: nausea and vomiting, constipation, drowsiness, cognitive impairment, myoclonus, pruritus and many others (see BNF).

Opoid withdrawal symptoms can occur when switching from morphine to alfentanil, prn doses of the original opioid should help relieve symptoms.

**Caution**
- Renal impairment – dose adjustments not usually required
- Hepatic impairment – a dose reduction may be needed – seek further advice
- Accumulation can occur in elderly or obese patients
- Drug interactions: alfentanil is metabolised by CYP3A4 and CYP3A5 – its effect may be reduced or enhanced by drugs that inhibit or induce these.
- Do not administer concurrently with MAOI’s or within 2 weeks of their use.
Appendix 3

**Compatibilities** There are 2-drug compatibility data for clonazepam, dexamethasone, glycopyrronium, haloperidol, hyoscine butylbromide, levomepromazine, metoclopramide, midazolam, ondansetron

**Incompatibilities:** Possible concentration dependent incompatibility with cyclizine, no data on hyoscine hydrobromide

**Preparations**
Alfentanil 1mg/2ml, 5mg/10ml, 5mg/ml ampoules.
5mg/ml strength may have restricted availability to reduce risk of errors being made. **Dose conversion between s/c morphine, s/c oxycodone and alfentanil**

<table>
<thead>
<tr>
<th>Morphine syringe pump s/c in 24 hours</th>
<th>4 hourly s/c morphine*</th>
<th>Oxycodone syringe pump s/c in 24 hours</th>
<th>4 hourly s/c oxycodone*</th>
<th>Alfentanil syringe pump s/c in 24 hours</th>
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<tbody>
<tr>
<td>7.5mg</td>
<td>2.5mg</td>
<td>5mg</td>
<td>1.25mg</td>
<td>500 micrograms</td>
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<tr>
<td>15mg</td>
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<td>10mg</td>
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<tr>
<td>180mg</td>
<td>30mg</td>
<td>120mg</td>
<td>20mg</td>
<td>12mg</td>
</tr>
</tbody>
</table>

* **Please note:** The most common reason for a patient requiring alfentanil is severe renal impairment. In this instance the dose and frequency of administration of prn/breakthrough opioids may need to be adjusted to reduce the risk of accumulation and side effects. Seek further advice if needed.
Clonazepam

Usual dose: 500 micrograms to 4mg over 24hrs

Special Instructions
Dilute with Water for Injections

Indications for Use
- Terminal restlessness
- Neuropathic pain

Clonazepam is an alternative to Midazolam, but it is recommended to be reserved for the treatment of terminal restlessness associated with a previous history of neuropathic pain. Although there are no randomised trials supporting the use of Clonazepam in neuropathic pain, it is an accepted treatment in several centres.

Mechanism of Action
Clonazepam is a long acting

Side Effects
Refer to manufacturers SPC for a detailed list of adverse effects
- Dose-dependent adverse effects commonly reported include dizziness, drowsiness, fatigue and muscle weakness.
- Increased risk of falls and fracture in the elderly with benzodiazepines

Caution
- Use with caution in patients with chronic respiratory disease, renal impairment and hepatic impairment. If possible, avoid in severe hepatic impairment.
- Clonazepam is metabolised by CYP3A4 and is susceptible to drug interactions:
  - Clonazepam effect may be reduced by co-administration of enzyme inducers, such as Carbamazepine, Phenobarbitone and high dose Dexamethasone
  - Clonazepam effect may be enhanced by co-administration of enzyme inhibitors, such as Bicalutamide, Erythromycin, high-dose Fluconazole and Haloperidol
  - Effect on Clonazepam metabolism may persist for several days after cessation of these drugs
- Use non-PVC giving sets as absorption into PVC Infusion sets may occur

Compatibilities
There are 2-drug compatibility data for clonazepam in water for injection with alfentanil, diamorphine, glycopyrronium, haloperidol, hyoscine butylbromide, hyoscine hydrobromide, morphine sulfate, and oxycodone.

Preparations
Clonazepam 1mg/1mL in solvent ampoule, with 1mL Water for Injection ampoule.
Cyclizine

Usual dose: 150mg over 24hrs

**Special Instructions**
Dilute with Water for Injection

**Indications for Use**
- Nausea and vomiting due to:
  - Raised intracranial pressure (in conjunction with dexamethasone)
  - Bowel obstruction
- Vertigo due to vestibular cause (should be avoided long-term as they may inhibit compensatory mechanisms)

**Mechanism of Action**
Cyclizine has antihistamine and antimuscarinic activity

**Side Effects**
Refer to manufacturers SPC for a detailed list of adverse effects
Anti-muscarinic effects:
- CNS - Drowsiness, cognitive impairment, delirium, restlessness, agitation
- Visual – mydriasis, loss of accommodation causing blurred vision
- Cardiovascular – tachycardia, palpitations, arrhythmias
- Gastro-intestinal – dry mouth, heartburn (due to relaxation of lower oesophageal sphincter), constipation
- Urinary tract – hesitancy of micturition, retention of urine
- The elderly are more susceptible to sedative and antimuscarinic effects
May occasionally cause irritation at the injection site.

**Contra-indications**
Narrow-angle glaucoma, acute porphyria

**Caution**
Severe heart failure, acute myocardial infarction, prostatic hypertrophy, renal or hepatic impairment

**Compatibilities**
Cyclizine is implicated in many compatibility problems. To reduce the precipitation risk, dilute Cyclizine with Water for Injections before mixing.

There are 2-drug compatibility data for cyclizine in water for injection with haloperidol, hyoscine hydrobromide, and morphine sulfate.

**Incompatibilities**
Concentration-dependent incompatibility occurs with alfentanil and diamorphine.

Incompatibility has been reported with clonazepam, hyoscine butylbromide, ketorolac, midazolam, oxycodone and octreotide.

**Preparations**
Cyclizine 50mg/1mL ampoule
**Appendix 3**

**Dexamethasone**

| Usual dose: | 4mg to 16mg over 24hrs |

**Special Instructions**

Dexamethasone should be diluted with Water for Injections. Also compatible with 0.9% sodium chloride as diluent if necessary

If Dexamethasone is effective, consider reducing the dose after 5-7 days.

**Indications for Use**

- Nausea and vomiting (especially due to intestinal obstruction, raised intracranial pressure or associated with chemotherapy or radiotherapy). Dexamethasone is usually used in addition to other antiemetic for nausea and vomiting rather than used alone.
- For obstructive symptoms e.g. bowel obstruction, upper airway obstruction causing dyspnoea, superior vena cava obstruction.
- For symptoms relating to increased intracranial pressure (usually due to brain tumour/metastases)
- For patients established on long term Dexamethasone who need to continue this for symptomatic reasons
- Pain (particularly if caused by nerve compression, liver capsule pain or bone pain)
- Metastatic spinal cord compression

**Consider Prescribing**

Consider prescribing gastroprotective medicines if the patient is able to take oral medication (e.g. oral Omeprazole 20 mg. od.) especially if high doses of steroids are being used, if an NSAID is co-prescribed or if there other risk factors for gastric irritation.

**Mechanism of Action**

The main benefits of steroids in palliative care are due to their anti-inflammatory effects which are mediated by several different mechanisms. These anti-inflammatory effects can reduce peri-tumour oedema and so relieve compression and associated symptoms. There may also be other direct anti-emetic effects. These various mechanisms make steroids very effective drugs, but also cause wide-ranging side effects, especially if used long-term.

Compared with other steroid drugs, dexamethasone has high anti-inflammatory effects (due to being a highly potent glucocorticoid), with less fluid retention (due to having negligible mineralocorticoid effects). It is especially useful when high doses of steroids are needed and has a long duration of action, so once daily dosing is effective.

**Side Effects**

Refer to manufacturers SPC for a detailed list of adverse effects

Steroids have wide-ranging side effects, particularly if used long-term

Common short-term side effects include:

- insomnia – prescribe steroids to be given before 2pm to minimise this
- psychiatric effects including restlessness, depression, mania, psychosis and delirium
- peptic ulceration, especially if given with an NSAID
- hyperglycaemia (especially in the evening) and deterioration in diabetic control
Appendix 3

Contra-indications and cautions
In general, if the patient is in the last days or weeks of life, there are no absolute contra-indications. Potential benefits need to be weighed up against risks. Caution in diabetes mellitus (risk of hyperglycaemia), psychotic illness (symptoms can emerge within a few days of starting steroids), other risk factors for gastric irritation (e.g. concurrent NSAID administration), hypokalaemia, can increase susceptibility to serious infections and mask their symptoms. prescribe cautiously if recent surgery Usually contra-indicated if systemic infection is present (unless treatment not possible or appropriate and benefit of steroid outweighs risk).

Interactions
Refer to the BNF and the manufacturer’s SPC for a detailed list of interactions. Steroids reduce effect of insulin, oral hypoglycaemics, anti-hypertensives and diuretics. Steroids can increase the INR of patients on warfarin.
CYP3A4 is involved in metabolising dexamethasone, so it is susceptible to drug interactions:
- Effect of Dexamethasone can be increased by enzyme inhibitors e.g. Itraconazole, bicalutamide, erythromycin
- Effect of Dexamethasone can be reduced by enzyme inhibitors e.g. Carbamazepine, Phenobarbital, Phenytoin. Larger doses of dexamethasone may be needed.

Compatibilities
Dexamethasone often causes compatibility problems therefore, if it is to be mixed with other medicines, as much diluent as possible should be added before the addition of Dexamethasone. Dexamethasone should be the last constituent added. If precipitate remains in the mixture, it is incompatible.
Some centres always use a separate Syringe Pump for Dexamethasone, due to its liability to precipitate with other medicines.
Consider a once or twice daily dose, no later than 2pm, rather than syringe pump administration if possible.

There are 2-drug compatibility data for dexamethasone in water for injection with morphine, oxycodone, ketamine, ranitidine, hyoscine butylbromide and metoclopramide.

Incompatibilities
Glycopyrronium may be inactivated by Dexamethasone, but no precipitate forms. Therefore avoid combination.
Incompatibility has been reported with midazolam
There is concentration-dependent incompatibility with Ondansetron, Haloperidol, Levomepromazine and Cyclizine. Use these combinations with caution and seek advice from the Specialist Palliative Care Team or pharmacy.

Preparations
Dexamethasone 3.3mg/mL vials (as 4.3mg dexamethasone sodium phosphate). This is equivalent to roughly 4mg of oral dexamethasone.
Also available as 6.6mg/2mL vials and 3.8mg/ml vials.
Diamorphine

**Usual dose:** Starting dose of diamorphine is dependent on the patient’s present opioid requirements (see table below) and patient factors, for example renal function – seek specialist advice if needed.

There is no maximum dose of diamorphine providing it is carefully titrated

**Special Instructions**
Dilute with Water for Injections. Concentration dependent incompatibility can occur with 0.9% sodium chloride at higher doses or in combination with certain other drugs

**Usual dosage**
A suitable starting dose for an opioid naïve patient would be 5mg to 10mg Diamorphine over 24 hours. For patients with uncontrolled opioid-responsive pain, who are tolerating diamorphine, the diamorphine should be increased by 30-50%. Rescue doses for breakthrough pain should be prescribed and are calculated to be one sixth of the total daily dose.

Although there is no maximum dose of diamorphine, dosing should be titrated based upon a balance of analgesic effect versus undesirable effects.

**Indications for Use**
- Morphine is a similar drug and is usually used rather than diamorphine. Diamorphine is useful if large doses of morphine are needed, as it has better solubility and needs less volume for administration.
- Pain control
- Breathlessness

**Mechanism of Action**
Diamorphine is a derivative of Morphine. When given by subcutaneous injection it is rapidly absorbed and converted to the active metabolite, 6- monoacetylmorphine. This is then slowly converted to Morphine.

**Side Effects**
Refer to manufacturers SPC for a detailed list of adverse effects

Opioids tend to cause similar side effects.

Common side effects include nausea and vomiting, constipation, drowsiness, cognitive impairment, myoclonus, pruritus.

Additional adverse effects that can develop with deteriorating renal function and accumulation of metabolites include delirium, hallucinations, myoclonic jerks and nightmares. Consider switching opiates, e.g. to alfentanil or oxycodone if occurs. Seek specialist advice.

For all patients prescribed regular diamorphine, consider also prescribing a regular laxative (if able to take) and an antiemetic, regularly/ prn

**Caution**
The same considerations as for morphine apply to the use of diamorphine in patients with renal or hepatic impairment, i.e. metabolites are likely to accumulate and so alternatives may be needed. Seek specialist advice.
Appendix 3

**Compatibilities**
There are 2-drug compatibility data for diamorphine in water for injection with glycopyrronium, hyoscine butylbromide, hyoscine hydrobromide, ketorolac, levomepromazine, metoclopramide, midazolam, octreotide and ondansetron.

**Incompatibilities**
Concentration-dependent incompatibility occurs with Cyclizine and Haloperidol at higher concentrations.

**Preparations**
Diamorphine 5mg, 10mg, 30mg, 100mg, and 500mg ampoules containing powder.

**Dose conversion between s/c morphine and diamorphine**

<table>
<thead>
<tr>
<th>Morphine syringe pump s/c in 24 hours</th>
<th>PRN s/c morphine</th>
<th>Diamorphine syringe pump s/c in 24 hours</th>
<th>PRN s/c diamorphine</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5mg</td>
<td>1.25mg</td>
<td>5mg</td>
<td>1mg</td>
</tr>
<tr>
<td>15mg</td>
<td>2.5mg</td>
<td>10mg</td>
<td>2mg</td>
</tr>
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<td>5mg</td>
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<tr>
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</tr>
<tr>
<td>60mg</td>
<td>10mg</td>
<td>40mg</td>
<td>7.5mg</td>
</tr>
<tr>
<td>90mg</td>
<td>15mg</td>
<td>60mg</td>
<td>10mg</td>
</tr>
<tr>
<td>120mg</td>
<td>20mg</td>
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<td>17.5mg</td>
</tr>
<tr>
<td>180mg</td>
<td>30mg</td>
<td>120mg</td>
<td>20mg</td>
</tr>
</tbody>
</table>
Appendix 3

Glycopyrronium

**Usual dose:** 600micrograms to 1200micrograms over 24hrs

**Special Instructions**
Glycopyrronium should be diluted with Water for Injections
Can be diluted with sodium chloride

**Indications for Use**
- Excessive respiratory secretions. However, the development of terminal secretions must be anticipated because Glycopyrronium will not clear existing secretions.
- Bowel colic.
- May be of benefit in the treatment of large volume vomiting associated with bowel obstruction, possibly in combination with Octreotide.

**Mechanism of Action**
Glycopyrronium is a powerful anticholinergic causing inhibition of the parasympathetic autonomic system. It does not cross the blood brain barrier so is devoid of CNS effects such as paradoxical agitation, and has less of an effect on the ocular and cardiovascular systems, at normal doses, than Hyoscine Hydrobromide.

**Side Effects**
Refer to the manufacturer’s SPC for a detailed list of adverse effect
The side effects of Glycopyrronium are dose related and are associated with its pharmacology. They include dry mouth, constipation and urinary retention.
Glycopyrronium may precipitate tachycardia.

**Caution**
The effect of Glycopyrronium accumulates in renal impairment and so dose adjustments may be necessary - check with medicines information for dosing.
Glycopyrronium should be avoided in patients with closed-angle glaucoma or paralytic ileus.
However, this is not a contraindication for patients with advanced disease.
Glycopyrronium may antagonise the prokinetic effects of metoclopramide.

**Compatibilities**
There are 2-drug compatibility data for glycopyrronium in water for injection with alfentanil, haloperidol, levomepromazine, metoclopramide, midazolam, morphine sulfate, oxycodone.

Limited 3 drug compatibility information can be found on page 3.

**Incompatibilities**
Dexamethasone. There may be a concentration-dependant incompatibility with Cyclizine.

**Preparations**
Glycopyrronium 200mcg/1mL ampoules
Glycopyrronium 600mcg/3mL ampoules
Haloperidol

Usual dose: 500micrograms to 5mg over 24hrs (antiemetic)

500micrograms to 10mg over 24hrs (agitation)

Special Instructions
Dilute with Water for Injections

Indications for Use
- Nausea and vomiting due to chemical causes i.e. medicines, biochemical disturbance. Sedation is minimal at the low doses used for nausea and vomiting.
- Agitation and Confusion. Higher doses are sedating and it can be used for agitation and confusion. However higher doses may produce extrapyramidal side effects therefore Levomepromazine should be used if sedation is required.
- Hiccups.

Mechanism of Action
Haloperidol is a central dopamine D2 receptor antagonist with sedating properties
When prescribing haloperidol the subcutaneous dose should be lower than the corresponding oral dose (which undergoes significant first-pass metabolism).

Side Effects
Refer to manufacturers SPC for a detailed list of adverse effects
Extrapyramidal symptoms, especially if combined with other D2 antagonists eg. Metoclopramide, levomepromazine
Anticholinergic effects such as drowsiness/apathy, dry mouth, constipation, difficulty with micturition

Cautions
Refer to the manufacturer's SPC for a detailed list of contraindications and precautions.
Use with caution with concurrent use of CYP2D6 and/or CYP3A4 inhibitors/inducers (eg carbamazepine, phenobarbital, phenytoin, rifampicin, itraconazole, fluoxetine), Exacerbates Parkinson's disease so use alternatives where possible.
No specific guidance available in hepatic impairment, however, since haloperidol undergoes extensive metabolism, the lowest effective dose should be used in hepatic impairment.
The active metabolites of haloperidol may accumulate in renal failure - check with medicines information for dosing

Compatibilities
There are 2-drug compatibility data for haloperidol in water for injection with alfentanil, cyclizine, glycopyrronium, hyoscine butylbromide, hyoscine hydrobromide, metoclopramide, midazolam and oxycodone.

Incompatibilities
Incompatible with Dexamethasone and Ketorolac.
Concentration dependent incompatibility occurs with morphine sulfate.

Preparations
Haloperidol 5mg/mL ampoules.
Appendix 3

Hyoscine butylbromide (Buscopan)

Usual dose: 20mg to 120mg over 24hrs

Special Instructions
Dilute with Water for Injections.

Indications for Use
- Intestinal colic associated with bowel obstruction
- Large volume vomiting associated with bowel obstruction (by reducing gastrointestinal secretions). Note: the maximum benefit may be seen only after three days.
- Spasm of the genito-urinary tract.
- Respiratory tract secretions

Mechanism of Action
Hyoscine Butylbromide is an antimuscarinic.
Does not readily cross the blood brain barrier and so unlikely to cause sedation.
50% of the drug is excreted renally, unchanged.

Side Effects
Refer to manufacturers SPC for a detailed list of adverse effects
Anticholinergic effects including dry mouth, constipation, urinary retention, tachycardia, palpitations, heartburn, mydriasis.

Cautions
Avoid in closed angle glaucoma and paralytic ileus unless patient has advanced disease.
Use with caution in patients with congestive cardiac failure or those with renal impairment. (Use the lowest effective dose).
The anticholinergic effects of hyoscine butylbromide can be additive with other drugs and may precipitate delirium or cognitive impairment in susceptible patients.
May antagonise the prokinetic effects of metoclopramide.

Compatibilities
There are 2-drug compatibility data for hyoscine butylbromide in water for injection with alfentanil, haloperidol, levomepromazine, midazolam, morphine sulfate and oxycodone.

Incompatibilities
Not compatible with Cyclizine.

Preparations
Hyoscine Butylbromide 20mg/1mL ampoules.
Hyoscine hydrobromide

Usual dose: 400micrograms to 2400micrograms over 24hrs

Special Instructions
To be diluted with Water for Injections

Indications for Use
- Excessive respiratory tract secretions. However, the development of terminal secretions must be anticipated because hyoscine hydrobromide will not clear existing secretions.

Mechanism of Action
Hyoscine hydrobromide is an antimuscarinic drug.

Side Effects
Refer to manufacturers SPC for a detailed list of adverse effects
Dry mouth, constipation, urinary retention, blurred vision, drowsiness, paradoxical agitation. It crosses the blood brain barrier and as such can result in possible sedation and delirium.

Cautions
Bradycardia
Tachycardia
Congestive cardiac failure
Hepatic impairment
Myasthenia gravis
Paralytic ileus
Renal impairment
Increased risk of seizures in epileptic patients
Avoid in closed angle glaucoma and paralytic ileus. However this is not a contra-indication with advanced disease.
May block the prokinetic effects of metoclopramide.

Compatibilities
There are 2-drug compatibility data for hyoscine hydrobromide in water for injection with cyclizine, diamorphine, haloperidol, levomepromazine, midazolam, morphine sulfate and oxycodone.

Preparations
Hyoscine Hydrobromide 400mcg/1mL ampoules
Appendix 3

Ketamine

**Usual dose:**

Starting Dose – 50-100mg/ over 24hours

Increase by 50mg every 24hours until benefit achieved;

Usual maximum 500mg/24hr

To be used only on the recommendation of a palliative care specialist for patients who have failed to obtain adequate relief from standard non-drug and drug treatments.

**Special Instructions**

As ketamine is irritant it must be diluted with Sodium Chloride 0.9% w/v to the largest volume possible.

Ketamine can have an opioid sparing effect. If used concurrently with an opioid, consider a dose reduction of the opioid prior to initiating the ketamine.

**Indications for Use**

- Pain unresponsive to standard analgesic treatments (including neuropathic, inflammatory, ischaemic limb and cancer related bone pain).

**Concurrent Medicines**

Consider the use of:
- Haloperidol (eg. 2mg to 5mg / 24hours) or Midazolam (eg. 5-10mg / 24hours) to treat dysphoria or hallucinations
- Dexamethasone (500 micrograms to 1mg / 24hours) to reduce site toxicity

**Mechanism of Action**

It is believed to produce an analgesic effect through antagonism of the N-methyl-D-aspartate (NMDA) receptor.

**Side Effects**

Refer to manufacturers SPC for a detailed list of adverse effects

The main side effects are:
- Psychotomimetic phenomena (including hallucinations, dysphoria, and vivid dreams).
- Tachycardia, hypertension, raised intracranial pressure.
- Erythema and pain at the injection site.
- Urinary tract toxicity. Prescribers should consider discontinuing the ketamine and seeking urology advice if patient develops urinary tract symptoms with no evidence of bacterial infection.

**Caution**

Cardiac failure, cerebrovascular disease, ischaemic heart disease, raised intra-ocular pressure (glaucoma), epilepsy, current or past history of a psychiatric disorder. Concurrent opioid use may lead to opioid toxicity.

**Contra-indications**

- Raised intracranial pressure, uncontrolled hypertension, severe cardiac disease, cerebrovascular accident or cerebral trauma.
**Compatibilities**

There is 2-drug compatibility data for: Haloperidol, Midazolam, low dose Dexamethasone, Diamorphine, Levomepromazine, Metoclopramide, Morphine and Oxycodone.

Use a separate Syringe Pump from the opioids unless advised by a palliative medicine consultant.

**Preparations**
- Ketamine 10 mg/mL – 20 mL vial
- Ketamine 50 mg/mL – 10 mL vial
- Ketamine 100 mg/mL – 10 mL vial (longstanding unavailability due to manufacturing issues).
# Appendix 3

## Ketorolac

<table>
<thead>
<tr>
<th>Usual dose:</th>
<th>60mg to 90mg over 24 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increase by 15mg/24 hour if necessary</td>
</tr>
<tr>
<td></td>
<td>(60mg/ 24 hours is the recommended maximum dose in those&gt;65 years and/or &lt;50kg)</td>
</tr>
</tbody>
</table>

**To be used only on the recommendation of a palliative care specialist**

**Special Instructions**
- Dilute maximally with Sodium Chloride 0.9% w/v (preferred diluent) to avoid irritation at the infusion site.
- (Also compatible with water for injections)
- Concurrent opioid dose reduction should be considered, and other NSAID's (if any) must be discontinued.

**Indications for Use**
- Short term management of cancer pain when the use of other NSAID's has been exhausted or is impractical. Use the minimum effective dose for the shortest duration necessary in order to reduce risk of serious and undesirable side effects.

**Concurrent medicines**
- High potential to cause upper gastrointestinal bleeds/ perforation. The concurrent use of a gastro-protective drug e.g. a proton pump inhibitor must be considered to minimise this risk to the patient.

**Mechanism of Action**
- NSAID with anti-inflammatory, analgesic and antipyretic activity.

**Side Effects**
- Refer to manufacturers SPC for a detailed list of adverse effects
- Gastro-intestinal tract (ulceration; haemorrhage, perforation) and renal function (hypercalcaemia, uraemia, acute renal failure).
- Of all Non-steroidal anti-inflammatory drugs (NSAIDS) ketorolac has the highest risk for gastritis, duodenitis and upper gastrointestinal complications.
- Anaphylaxis, drowsiness, dizziness, headache, thrombocytopenia, skin reactions.

**Caution**
- Hypovolaemia from any cause (including those taking diuretics or the elderly). History of cardiac failure, left ventricular dysfunction or hypertension. Renal, cardiac or hepatic impairment. Risk of bleeding increased if co-prescribed with antiplatelet drugs, anticoagulants, corticosteroids or SSRI's.

**Contra-indications**
- History of hypersensitivity to aspirin or NSAID. Asthma. Active peptic ulceration (or history of gastrointestinal bleeding, ulceration or perforation). Renal impairment, dehydration, pregnancy. Severe heart failure. Severe hepatic impairment. Coagulation/bleeding disorders or cerebrovascular bleeds
- Concurrent treatment with aspirin, NSAIDS, probenecid, lithium salts.

**Compatibilities**
- 2-drug compatibility data are available in sodium chloride 0.9% w/v for diamorphine (dependent upon concentration), oxycodone and ranitidine.

**Preparations**
- Ketorolac 30 mg/mL 1 mL ampoules
## Appendix 3

### Levetiracetam

<table>
<thead>
<tr>
<th>Usual dose:</th>
<th>As per oral dosing – will depend on previous oral requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use 1:1 oral to subcutaneous conversion ratio</td>
</tr>
<tr>
<td></td>
<td>Max 2g/24hrs in one syringe due to volume constraints</td>
</tr>
</tbody>
</table>

Levetiracetam must only be prescribed as a subcutaneous infusion after discussion with a consultant in palliative medicine or, if a consultant is unavailable out of hours, then with a senior hospice physician.

**Special Instructions**
- Dilute with water for injection. Sodium chloride may also be used.
- Dilute to maximum volume ie 22mls
- Administer in a separate syringe pump
- Higher doses may require 2 syringe pumps

**Indications for Use**
- Levetiracetam is an antiepileptic which can be used to treat focal or generalised seizures. It’s use subcutaneously offers the possibility of maintaining seizure control when oral or intravenous routes of administration are not possible and when increased sedation (from alternatives such as midazolam) is undesirable.

**Mechanism of Action**
Levetiracetam binds to a synaptic vesicle protein and is presumed to interfere with the release of the neurotransmitter stored within the vesicle. It readily crosses the blood-brain barrier. It is effective for a broad range of seizure types.

**Side Effects**
Refer to manufacturers SPC for a detailed list of adverse effects

- **Common or very common:** Abdominal pain; aggression; anorexia; anxiety; ataxia; convulsion; cough; depression; diarrhoea; dizziness; drowsiness; dyspepsia; headache; insomnia; irritability; malaise; nasopharyngitis; nausea; rash; tremor; vertigo; vomiting

- **Uncommon:** Agitation; alopecia; amnesia; blurred vision; confusion; diplopia; eczema; impaired attention; leucopenia; myalgia; paraesthesia; pruritus; psychosis; suicidal ideation; thrombocytopenia; weight changes

- **Rare:** Agranulocytosis; choreoathetosis; drug reaction with eosinophilia and systemic symptoms (DRESS); dyskinesia; erythema multiforme; hepatic failure; hyponatraemia; neutropenia; pancreatitis; pancytopenia; Stevens-Johnson syndrome; toxic epidermal necrolysis

- **Frequency not known:** Completed suicide; pancytopenia

**Caution**
- Renal impairment – dose needs to be reduced – seek further advice
- Hepatic impairment – dose needs to be reduced in severe hepatic impairment – seek further advice
- Stopping levetiracetam – do not stop abruptly; reduce by maximum of 500mg bd every 2-4 weeks to avoid rebound seizures

**Compatibilities**
Data not available – use a separate syringe pump

**Preparations**
Levetiracetam 100mg/mL 5 ml ampoules.
Appendix 3

Levomepromazine

<table>
<thead>
<tr>
<th>Usual dose:</th>
<th>5mg to 25mg /24 hours (antiemetic)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.5mg to 200mg/24 hours (agitation)</td>
</tr>
</tbody>
</table>

**Special Instructions**
Dilute with water for injections or sodium chloride 0.9% w/v.
Protect infusions from light

**Indications for Use**
- Levomepromazine is a broad spectrum antiemetic usually used as a second or third line drug for patients who do not respond to more specific antiemetics. Levomepromazine is used in low doses to treat intractable nausea and vomiting.
- At higher doses it is a powerful sedative and can be used to treat terminal restlessness.

**Mechanism of Action**
Levomepromazine is a phenothiazine with a half-life of 15-30 hours. It acts on the main receptor sites involved in the vomiting pathway.

**Side Effects**
Refer to manufacturers SPC for a detailed list of adverse effects
Sedation, skin irritation at infusion site, dry mouth, postural hypotension, extra-pyramidal reactions, rarely hallucinations. May also rarely cause prolongation of QT interval in cardiac disease and hypokalaemia.

**Caution**
Use with caution (i.e. low initial doses) especially in ambulatory patients with: concurrent antihypertensive medication, diabetes, epilepsy (lowers seizure threshold), liver dysfunction, Parkinson’s disease or postural hypotension.
Avoid in patients with dementia unless patient at immediate risk of harm or severely distressed (increased mortality reported). Use lowest possible dose for shortest possible duration.

Irritation at infusion site may occur. For lower doses, a bolus subcutaneous injection can be given to overcome this problem (usually at night).

**Compatibilities**
There are 2-drug compatibility data for Morphine, Oxycodone, Diamorphine, Glycopyrronium, Hyoscine butylbromide, Hyoscine hydrobromide, Ketamine, Metoclopramide, Midazolam, Octreotide and Ondansetron

Limited 3 drug compatibility information can be found on page 3.

**Incompatibilities**
Incompatibilities reported with Dexamethasone (concentration dependent), Ketorolac and Ranitidine.

**Preparations**
Levomepromazine 25mg/1mL ampoules.
Metoclopramide

**Usual dose:** 30mg to 60mg over 24 hours

**Special Instructions**
Dilute with Water for Injections or 0.9% saline.
Must not be used if complete intestinal obstruction is present or if there is gastrointestinal perforation or haemorrhage. Should not be used within 4 days of gastrointestinal surgery.

**Indications for Use**
- Nausea and vomiting caused by medicines,
- Gastric stasis
- Partial outflow obstruction
- Hiccups

**Mechanism of Action**
Metoclopramide is a central dopamine D₂ receptor antagonist with non-sedating anti-emetic and prokinetic properties

**Side Effects**
Refer to manufacturer’s SPC for a detailed list of adverse effects.
Extrapyramidal reactions may occur especially if used concurrently with another D₂ antagonist, particularly in children and young adults.
Drowsiness
Diarhoea
Serotonin toxicity when combined with SSRI antidepressants

**Caution**
Avoid concurrent IV ondansetron use as this can cause cardiac arrhythmias.
Can cause irritation at the site of injection.
Anticholinergic medicines can directly interfere with the prokinetic action of Metoclopramide
Metoclopramide antagonises the treatment of Parkinson’s disease
Dose reduction of up to 75% may be necessary in moderate to severe renal impairment (refer to manufacturers SPC for further details).
- Dose reduction of up to 50% may be necessary in patients with a significant degree of hepatic impairment.
Epilepsy – lowers seizure threshold

**Compatibilities**
There are 2-drug compatibility data for metoclopramide in water for injection with alfentanil, diamorphine, glycopyrronium, haloperidol, hydromorphone, ketamine, midazolam, morphine sulfate, octreotide and oxycodone. The injection should be discarded if it discolours. Sometimes compatible with Dexamethasone but may precipitate.

**Incompatibilities**
Metoclopramide may crystallise with cyclizine. This combination should not be used routinely

**Preparations**
Metoclopramide 10mg/2mL ampoules
**Midazolam**

| Usual dose: | 10mg to 60mg over 24 hours |

**Special Instructions**
Dilate with Water for Injections or 0.9% saline
Initial starting dose of Midazolam should be no more than 10mg per 24 hours. Higher doses may be used if required for seizure control. Specialist palliative care advice should be sought in this situation.

**Indications for Use**
- Terminal agitation
- Anticonvulsant
- Anxiety
- Myoclonus

**Mechanism of Action**
Midazolam is a benzodiazepine.

**Side effects**
Refer to manufacturers SPC for a detailed list of adverse effects
Drowsiness, confusion, ataxia, amnesia, cognitive impairment.
In <10% of people it can contribute to increased agitation.

**Caution**
Dose reduction may be necessary in liver disease (main site of metabolism) and renal disease (accumulation of metabolite).
Elderly

**Compatibilities**
There are 2-drug compatibility data for midazolam in water for injection with alfentanil, diamorphine, glycopyrronium, haloperidol, hyoscine butylbromide, hyoscine hydrobromide, levomepromazine, metoclopramide, morphine sulfate and oxycodone.

Limited 3 drug compatibility information can be found on page 3.

**Incompatibilities**
Likely to cause precipitation if mixed with Dexamethasone or Ketorolac

**Preparations**
Midazolam 10mg/2mL ampoules
Morphine

**Usual dose:** Starting dose of morphine is dependent on the patient’s present opioid requirements and patient factors, for example renal function – seek advice if needed.

There is no maximum dose of morphine providing it is carefully titrated

**Special instructions**
Dilute with water for injections, sodium chloride 0.9% w/v or dextrose 5%

**Usual Dosage**
Morphine is the first line opioid of choice.
Although there is no maximum dose of morphine, dosing should be titrated based upon a balance of analgesic effect versus undesirable effects.
The initial dose of morphine is dependent on the patient’s present opioid requirements. A suitable starting dose for an opioid naïve patient would be 10 mg to 20 mg morphine over 24 hours. For patients with uncontrolled pain, the morphine should be increased by 30-50%.
Additional ‘as required’ doses for breakthrough pain should be prescribed at a dose of one sixth of the total daily dose of the regular morphine prescription.

- Conversion ratio for oral to subcutaneous morphine = 2:1
  i.e. 60 mg oral morphine daily = 30 mg subcutaneous morphine in 24 hours

**Indications for use**
- Pain control
- Breathlessness
- Cough

**Mechanism of Action**
Morphine is a strong opioid and acts primarily via μ-opioid receptor.

**Side Effects**
Refer to manufacturer’s SPC for a detailed list of adverse effects
Adverse effects commonly include nausea and vomiting, constipation, drowsiness, cognitive impairment, myoclonus and pruritus.

**Caution**
The metabolites of morphine are renally excreted; therefore patients with renal impairment are at risk of toxicity and may need a reduced dose of morphine of between 30-50% or an alternative drug e.g. alfentanil. Seek specialist advice in these circumstances.

**Compatibilities**
There are 2-drug compatibility data for morphine sulfate in water for injection with clonazepam, cyclizine, glycopyrronium, hyoscine butylbromide, hyoscine hydrobromide, ketamine, levomepromazine, metoclopramide and octreotide.

Limited 3 drug compatibility information can be found on page 3.

**Additional medicines**
A regular laxative, or as required, laxative and/or antiemetic may be necessary.
Appendix 3

Preparations
Morphine 10mg/1mL ampoules
Morphine 15mg/1mL ampoules
Morphine 30 mg/1mL ampoules
Morphine 60 mg/2mL ampoules
Octreotide

**Usual dose:** 200micrograms to 600micrograms over 24 hours

**Special Instructions**
- Not to be used first line.
- To be used only on the recommendation of a palliative care specialist.
- Dilute with Sodium Chloride 0.9% to the largest possible volume to reduce the likelihood of inflammatory reactions at the skin site.
- Avoid abrupt withdrawal after long-term treatment as this may precipitate biliary colic from gallstones or biliary sludge.

**Indications for Use**
- Anti-secretory effect:
- Ascites, bronchorrhea, excessive diarrhoea, malignant fistulae, large volume vomiting associated with bowel obstruction, rectal discharge.
- Once control of symptoms is achieved it may be possible to reduce to a lower maintenance dose, maintaining control whilst minimising dose-dependent undesirable effects.

**Mechanism of Action**
Octreotide has various actions as a somatostatin analogue. For the anti-secretory effect it acts by reducing intestinal secretions of water and sodium, in addition to stimulating absorption of water and electrolytes from the gastrointestinal tract. It may also improve gastrointestinal motility.

**Side Effects**
Refer to manufacturer’s SPC for a detailed list of adverse effects.
Commonly observed effects include: Constipation/diarrhoea at the beginning of therapy, dry mouth, flatulence (reduce dose and increase slowly), anorexia, abdominal pain, abdominal bloating, nausea, steatorrhoea (>500 microgram daily), gallstones (10-20% of patients on long term treatment), pancreatitis associated with gallstones, hypoglycaemia shortly after starting treatment and hyperglycaemia (with chronic administration), hyperkalaemia, dizziness, hair loss.

**Caution**
- In type 1 diabetes insulin requirements may be reduced by up to 50%. For type 2 diabetes insulin and oral/parenteral hypoglycaemic agents may need adjusting. Close blood glucose monitoring should guide these adjustments. Hepatic impairment. Monitor thyroid function (risk of hypothyroidism on long term treatment)

**Compatibilities**
There are 2-drug compatibility data for octreotide in 0.9% sodium chloride with diamorphine, haloperidol, hyoscine butylbromide, hyoscine hydrobromide, midazolam, morphine sulfate, ondansetron and oxycodone.

**Incompatibilities**
Cyclizine, Dexamethasone, Levomepromazine.
Appendix 3

**Presentations**
- Octreotide 50 microgram/mL 1mL ampoule
- Octreotide 100 microgram/mL 1mL ampoule
- Octreotide 500 microgram/mL 1mL ampoule
Ondansetron

**Usual dose:** 8mg to 24mg over 24 hours

To be used only on the recommendation of a palliative care specialist

**Special Instructions**
Dilute with Sodium Chloride 0.9% or water for injection.

**Indications for Use**
Use of ondansetron use in palliative care remains limited to intractable or challenging cases of nausea and vomiting when the situation suggests that Serotonin release is the cause of the nausea and vomiting, such as:
- Chemotherapy
- Radiation-induced damage of the GI mucosa
- Intestinal distension
- Leaky platelets in severe renal impairment

**Mechanism of Action**
Ondansetron is a selective 5HT₃ serotonin.

**Side Effects**
Refer to manufacturers SPC for a detailed list of adverse effects
Common: Headache, constipation, flushing, injection site reactions.

**Caution/Drug interactions**
Dose should be reduced in moderate or severe hepatic impairment (max. 8 mg daily).

Additive effect with other drugs that cause QT interval prolongation, for example Citalopram, Erythromycin, Haloperidol, Domperidone, Levomepromazine, Methadone
Additive effect with other drugs that cause serotonin toxicity, for example SSRIs, Fentanyl, Tramadol, Metoclopramide, Tricyclic Antidepressants, Venlafaxine, Duloxetine.
Contraindicated with apomorphine – risk of severe hypotension

**Compatibilities**
Ondansetron is reportedly compatible in 2-drug combination using Sodium Chloride 0.9% as diluent with Morphine, Oxycodone Diamorphine, Haloperidol, Hyoscine butylbromide, Hyoscine hydrobromide, Midazolam.

**Preparations**
Ondansetron 2mg/mL 2mL ampoule (4mg/2mL ampoule)
Ondansetron 2mg/mL 4mL ampoule (8mg/4mL ampoule)
Appendix 3

Oxycodone

**Usual dose:** The initial dose of Oxycodone is dependent on the patient’s present opioid requirements and patient factors, for example renal function – seek advice if needed.

There is no maximum dose of oxycodone providing it is carefully titrated

**Special Instructions**
Dilute with water for injection.

**Indications for use**
- Moderate to severe cancer and non-cancer pain. An alternative to other strong opioids in case of intolerance

**Mechanism of Action**
Oxycodone is a strong opioid and acts primarily via μ-opioid receptor.

**Side effects**
Refer to manufacturers SPC for a detailed list of adverse effects
Common: nausea and vomiting, constipation, drowsiness, dry mouth
Less common: pruritus, sweating
Neurotoxicity: hyperalgesia, allodynia, delirium, hallucinations, myoclonus - can develop with deteriorating renal function

**Caution**
Dose reduction may be needed in patients with hepatic and/or renal impairment.
- Mild to moderate renal impairment – start with lower dose and titrate cautiously/slowly
- Severe renal impairment – increased risk of toxic side effects due to drug and metabolite accumulation. Use with caution and monitor on a regular basis, especially for symptoms of neurotoxicity (see above). Alternative opioid, such as Alfentanil, might be a better option depending on circumstances. Please discuss with specialist palliative care team.
- Moderate to severe hepatic impairment – avoid if possible

**Compatibility**
Two strengths of injection are available, 10mg/mL and high-strength 50mg/mL. The latter may be useful in situations where high doses cause volume difficulties for CSCI.

**CSCI with oxycodone 10mg/mL**
There is 2-drug compatibility data using Water for injection as diluent with Glycopyrronium, Haloperidol, Hyoscine butylbromide, Hyoscine hydrobromide, Levomepromazine, Metoclopramide, Midazolam.

Limited 3 drug compatibility information can be found on page 3.

**CSCI with oxycodone 50mg/mL**
Differences in compatibility with other drugs for the 10mg/mL and 50mg/mL formulations of Oxycodone have been reported. It is important not to extrapolate compatibility information from one formulation to the other. Please seek advice for specialist palliative care or pharmacy.
Appendix 3

**Incompatibilities**
Concentration-dependent incompatibility may occur when mixed with Cyclizine.

**Preparations**
10mg/mL 1mL and 2mL ampoules
50mg/1mL ampoule
Appendix 3

Ranitidine

**Usual dose:** 100mg to 200mg over 24 hours

**Special Instructions**
Ranitidine can be diluted with water for injection or 0.9% sodium chloride. Ranitidine should be the last drug added to an already diluted combination of drugs.

**Indications for Use**
- Inoperable bowel obstruction to reduce volume of gastric secretions

**Mechanism of Action**
H2- receptor antagonist, inhibits gastric acid secretion and reduces volume of gastric secretions.

**Side Effects**
Refer to the manufacturer’s SPC for a detailed list of adverse effects
- Usually well tolerated.
- Constipation, nausea.

**Caution**
Dose reduction required in renal and hepatic impairment – seek advice.
Dose reduction may be required in the elderly.
Avoid in patients with acute intermittent porphyria.

**Compatibilities**
Seek specialist advice

**Incompatibilities**
Seek specialist advice

**Preparations**
Ranitidine 50mg/2mL ampoules
### Appendix 4

**DIVISIONAL DOCUMENT**

<table>
<thead>
<tr>
<th>DOCUMENT TITLE:</th>
<th>Procedure for setting up and using a T34 ambulatory syringe pump</th>
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<td></td>
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<tr>
<td>DOCUMENT REPLACES Which Version</td>
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<td>LEAD DIVISIONAL DIRECTOR DGM</td>
<td></td>
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<tr>
<td>AUTHOR(S): Note should not include names</td>
<td>Syringe pump policy task and finish group, chaired by palliative medicine consultant.</td>
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</table>

<table>
<thead>
<tr>
<th>TARGET AUDIENCE:</th>
<th>All healthcare professionals in ELHT prescribing, setting up, administering or monitoring medicines being given by a T34 Ambulatory syringe Pump to adults.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOCUMENT PURPOSE:</td>
<td>To provide a framework for safe practice and guidance for Registered Nurses on the setting up and use of the T34 syringe pump</td>
</tr>
<tr>
<td></td>
<td>This is applicable to adult palliative patients in all ELHT settings.</td>
</tr>
<tr>
<td>To be read in conjunction with (identify which internal documents)</td>
<td>ELHT/CP22 Version – Policy and Procedure for the T34 Ambulatory Syringe Pump (Palliative Care)</td>
</tr>
<tr>
<td></td>
<td>C064 Medicine Management Policy</td>
</tr>
<tr>
<td></td>
<td>SOP for procedure for the administration of subcutaneous PRN medication using a prescribed range of doses for symptoms in the last days of life (awaiting verification)</td>
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<tr>
<td><strong>CONSULTATION</strong></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td></td>
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<td><strong>Committee/Group</strong></td>
<td><strong>Date</strong></td>
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<td>Consultation</td>
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<td>June 2020</td>
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**AMENDMENTS**

IC24 Aseptic nontouch technique policy (ANTT)

**SUPPORTING REFERENCES**

Lancashire and South Cumbria Strategic Clinical Network “Clinical Practice Summary: guidance on consensus approaches to managing Palliative Care Symptoms” August 2017

NICE Guideline NG31 “Care of dying adults in the last days of life” Dec 2015


Nursing and Midwifery Council (NMC) The Code: standards of conduct, performance and ethics for nurses and midwives (2015)

Nursing and Midwifery Council (NMC) Standards for Medicines Management (2007)

1. THE CLINICAL PROCEDURE

GUIDELINES FOR THE USE OF T34 AMBULATORY SYRINGE PUMP

FOR PALLIATIVE CARE PATIENTS

Materials & Equipment

- Dressing pack/blue tray
- T34 Ambulatory Syringe Pump with lock box and key
- Alkaline battery 9V must be PP3 6LR61 (to mitigate risk of unintended shutdown see reference to alert on page 47)
- 18G x1.5in Blunt Fill Needle with 5 micron filter – only to be used for drawing up medication
- 18G x1.5in Blunt Fill Needle
- BD Saf-T-Intima with “Y” Adaptor
- Luer-Lok Syringe 20ml/30ml, where possible use BD Plastipak.
- Closed Luer Access Device
- Extension Line
- Transparent adhesive film dressing
- Sterile alcohol wipes
- Medicines and diluents
- Syringe Pump label
• Syringe Pump documentation
• Patient information leaflet

Syringes & Final Volume
• A Luer-lok syringe must always be used
• No less than a 20ml Luer-lok syringe should be used
• A 20ml or 30ml, Luer-lok syringe can be used
• The prescriber must prescribe the final volume
• Whichever brand of syringe used
  o 20ml syringes should be made up to a final volume of 17ml
  o 30ml syringes should be made up to a final volume of 22ml

If the final volume exceeds these amounts seek specialist advice from Specialist Palliative Care Team/Pharmacy. The final volume includes all prescribed medicines and diluent.

Batteries
• Always use a new battery every time a Syringe Pump is commenced.
• A 9V PP3 6LR61 Duracell alkaline battery MUST be used. No other battery type should be used.
• The average battery life starting at 100% is approx. 3-4 days.
• Due to the short battery life, always ensure spares are readily available.
• Check battery life at each syringe change. Discard battery if life remaining is 40% (community) 10% (hospital).
• Used batteries must be discarded.

Procedure
• Please refer to aseptic non-touch technique policy.
• It is essential that there are two registered nurses available to set up a Syringe Pump.
• All ampoules/vial bungs must be swabbed with sterile alcohol and left to dry, before opening/piercing.
• Calculate how many millilitres of volume medicines require e.g.
<table>
<thead>
<tr>
<th>Medication</th>
<th>Amount</th>
<th>Final Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metoclopramide 30mg</td>
<td>3 x 10mg/2ml ampoules = 6ml</td>
<td>= Total 7ml</td>
</tr>
<tr>
<td>Morphine 30mg</td>
<td>1 x 30mg/1ml ampoule = 1ml</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syringe Size</th>
<th>Medicine</th>
<th>Diluent</th>
<th>Total Volume</th>
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<tbody>
<tr>
<td>20ml</td>
<td>7ml</td>
<td>10ml</td>
<td>17ml</td>
</tr>
<tr>
<td>30ml</td>
<td>7ml</td>
<td>15ml</td>
<td>22ml</td>
</tr>
</tbody>
</table>

- Draw up prescribed diluent using a 18G x 1.5in Blunt Fill Needle with 5 micron filter into a 20 or 30ml Luer Lock Syringe.
- Draw medicine one into separate syringe, using 18G x 1.5in Blunt Fill Needle with 5 micron filter wasting any excess, add to the administration syringe using an 18G x1.5in Blunt Fill Needle. Repeat this step until all medicines are added to the syringe.
- Fit a blind hub to the administration syringe and invert several times to mix contents.
- Check the solution for cloudiness, crystallisation, if present destroy solution in usual way, discard syringe and check compatibilities. Re-prepare the syringe with prescribed medication and diluent.
- Complete syringe label, with details of additives, date and time. Attach to the syringe. Ensure syringe calibration markings are not obscured. Ensure that the label does not interfere with the mechanisms of the Syringe Pump.
- Attach Extension Line to BD Saf-T-Intima
Administration and monitoring of T34 Ambulatory Syringe Pump

- 2 registered nurses are required to check medicines and set up a Syringe Pump (standard 8 NMC) and must be present for the whole procedure. If 2 registered nurses are not available a risk assessment must be made and an incident report completed.
- A T34 Ambulatory Syringe Pump administration and monitoring form is required for each Syringe Pump prescribed.
- Each administration and monitoring form can be used for 48hrs and then a new form must be commenced.
- One registered nurse should return within 4 hours of initially starting a Syringe Pump to ensure good symptom control.
- In hospital the Syringe Pump must be checked a minimum of 4hrly.
- In community the Syringe Pump must be checked a minimum of twice daily.

Any variance to this must be documented in the patient’s notes.
- It is the responsibility of the person completing the administration and monitoring form to ensure the pump is working correctly and running to time.
- If the pump does not appear to be working or running correctly the person who identifies this must either replace the syringe pump or ask for advice.
- Serial number of Syringe Pump used must be documented on the T34 Ambulatory Syringe Pump administration and monitoring form.
- The syringe must be changed every 24 hours because chemical stability of the medicines cannot be guaranteed after this time.
- When the patient’s prescribed medicines are changed the changes should be commenced on the same day.
- It is considered good practice to change the giving set and use a fresh site when there is a change in prescribed medicines.
Appendix 4

- Syringe Pumps must not be placed at a level higher than the infusion site, to prevent siphoning of the syringe contents from the pump.
- Protect Syringe Pumps from direct sunlight, especially mixtures containing levomepromazine. Levomepromazine can develop purple discolouration when exposed to light and should be discarded if this occurs.

Priming Lines

- The line should be primed prior to loading the syringe onto the device.
- When a site needs changing part way through a 24 hour infusion, unlock Syringe Pump panel press NO/STOP button do not switch off.
- Remove syringe, prime the new line, re-align the syringe using the FF/BACK button, replace syringe onto the pump.
- When changing the site part way through a 24 hour infusion it is only necessary to change the Saf-T Intima and not the extension line.
- Confirm the make of syringe, re-check prescription, and attach line to the patient.
- The display will ask YES/START TO RESUME; do not press NO as this will re-set the 24 hour clock as for a new infusion.
Preparring the T34 Ambulatory Syringe Pump

Appendix 4

T34 Feature Recognition Syringe Loading

- Barrel clamp arm sensor - (detects syringe size/width of barrel, secures)
- Syringe ear/collar sensor (detects secure loading of syringe collar)
- Plunger sensor (detects secure loading of syringe plunger)
- Actuator

T34 Feature Recognition Keypad

- "INFO" key – access event log/set up (code protected)/battery status
- "Up/Down" arrow keys – increase/decrease parameters.scroll options.
- "YES/START" key – confirms selection/starts infusion.
- "NO/STOP" key – step back a screen/stops infusion.
- "FF" (forward) key – moves actuator forward/purge facility.
- "BACK" key – moves actuator back.
- "ON/OFF" KEY – power on/off.
Appendix 4

- Install battery

- Before placing the syringe onto the T34 Ambulatory Syringe Pump. Ensure the barrel clamp arm is down, press and hold the "ON/OFF" key until the "SELF TEST" screen appears.

- The LCD display will show "Pre-loading" and the actuator will start to move. Wait until it stops moving and the syringe sensor detection screen appears.

- During Pre-Loading the actuator always returns to the start position of the last infusion programmed.

- If the actuator is not in the correct position to accommodate the syringe, leave the barrel clamp arm down and use the "FF" or "BACK" buttons on the keypad to move the actuator. Forward movement of the actuator is limited for safety; therefore repeated presses of the "FF" key may be required when moving the actuator forward. Backwards movement is not restricted.

- Check the battery by pressing the "INFO" key repeatedly until the battery level appears on the screen and press "YES" to confirm. Verify there is sufficient battery power. Discard the battery if there is less than 40% power remaining in community and 10% in hospital. Replace with a new battery to ensure the Syringe Pump will deliver for 24 hours.
• Ensure the giving set is not connected to the patient at this point as an accidental bolus of medication could be delivered.

• Wait for the screen to go back to load the syringe screen.

  ![Load Syringe]

• Lift the barrel clamp arm.

• Seat the filled syringe collar/flange and plunger so the back of the collar/flange sits against the back of the central slot (ensure correct placement). The syringe collar/flange should be vertical.

• Lower the barrel clamp arm.

  ![134 Syringe Pump]

• Ensure the syringe label does not interfere with the mechanism of the infusion device e.g. if there is contact with the barrel clamp arm and sensor. The syringe graphic on the screen ceases to flash at each point as the syringe is correctly seated.

• Confirm that the syringe size and brand match the screen message. Press the "YES" key to confirm or scroll up (+) or down (-) keys to view the other syringe sizes, select correct syringe and size and press the "YES" key to confirm

  ![20 ml BD Plastipak]

• After the Syringe Confirmation Display the first screen that appears is displayed below
Appendix 4

- The T34 Ambulatory Syringe Pump calculates and displays the deliverable volume, the duration of the infusion (24 hours) and the rate of the infusion (ml per hour). Press the "YES" key to confirm the details. The display screen prompts "Start Infusion?"

- Cleanse the area of skin and allow to dry.
- Grasp skin firmly and insert infusion set at a 45° angle. Release the skin and lie the yellow wings against the skin securing with a sterile transparent dressing.
- Start the infusion by pressing the “YES” key.
- When the T34 Ambulatory Syringe Pump is running the screen displays
  - time remaining for current infusion
  - the infusion rate displayed in mLs/hour
  - alternates between syringe size and brand and also displays pump delivering «"Pump Delivering”
  - The light status indicator flashes green
Appendix 4

- The T34 Ambulatory Syringe Pump allows all users to lock the operation of the keypad during infusion. This function should be routinely used to prevent tampering with the device.

![Image of lock mode]

- To activate the keypad lock when the pump is infusing press and hold the "INFO" key until a chart is displayed showing a 'progress' bar moving from left to right.
- Hold the key until the bar has moved completely across the screen and a beep is heard to confirm the lock has been activated.
- The "STOP/NO" and "START/YES" and "INFO" keys are still active.
- To turn off the lock, repeat the above procedure. The bar will now move from right (lock) to left (lock) and a beep will be heard.
- Complete all relevant documentation.
- The following should be observed at each visit.
  - Site viability
  - Volume in syringe reducing
  - Any crystallisation/precipitation present
  - Light is flashing (approximately every 30 seconds)

Discontinuing a Syringe Pump

- To avoid accidental bolus dose of medicines the infusion line must be disconnected from the syringe before it is removed from the Syringe Pump.
Appendix 4

Temporary interruption of infusion

- Press “STOP”, press and hold “OFF” button until a beep is heard. The screen will go blank.
- Do not remove syringe from the Syringe Pump.
- Disconnect the line from the syringe and cap the end of the line and syringe tip.
- Record on the monitoring chart, the length of time the infusion is stopped for.

Resuming the infusion

- Check that the prescription, syringe label and patient details match, to ensure that this is the correct syringe for this patient.
- Remove the cap and reconnect the line to the syringe on the Syringe Pump.
- Press and hold the "ON" button until a beep is heard. The screen will request confirmation of syringe size and syringe brand.
- Press "YES" to resume. The screen will display "Remaining volume, duration and rate of infusion". Press "YES" to confirm.
- Do not press NO for new programme as this will reset the pump to deliver the existing syringe over the next twenty four hours.

When a patient dies

- Press "INFO" and record the date, time and amount of solution remaining to be infused (in mLs).
- Stop the Syringe Pump and switch off
- Do not remove Syringe Pump until death has been verified.
Appendix 4

Trouble Shooting

Syringe becomes dislodged

- The alarm will sound & the infusion light will turn red.
- “Check Syringe Loaded Correctly” window will be displayed.
- Replace syringe onto the Syringe Pump,

- The next screen will request confirmation of syringe size and syringe brand.
- Press “YES” if correct.
- The screen will display:
- Press “YES” to resume
- previous programme.

WARNING – If you press “NO”, the pump interprets this as a completely new 24 hour period and the remaining contents of the syringe would be delivered over the next 24 hours from confirming “Start Infusion”. The patient would not therefore receive the prescribed dose. If “NO” has been pressed in error, discard the remainder of the syringe contents, and prepare and set up a new syringe.

- The screen will display: “Remaining volume, duration and rate of infusion”.
- Press “YES” to confirm if this is correct prescription.
- Screen will display: “Start Infusion”.
- Press “YES” to confirm.
T34 Ambulatory Syringe Pump Alarm Conditions

When the Syringe Pump detects a problem four things occur:

- The infusion stops.
- An audible alarm is activated.
- A message appears on the display screen indicating the cause of the alarm.
- The Infusion Light Status Indicator turns red.

The pump will not start

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
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</thead>
<tbody>
<tr>
<td>No battery present</td>
<td>Fit a battery</td>
</tr>
<tr>
<td>Battery inserted incorrectly</td>
<td>Re-align battery terminals</td>
</tr>
<tr>
<td>Battery is depleted/very low</td>
<td>Fit a new battery</td>
</tr>
<tr>
<td>Pump is faulty</td>
<td>Service required</td>
</tr>
</tbody>
</table>

Infusion Running Too Fast

- If over-infusion occurs, stop infusion, check condition of patient and seek medical advice.
- Check rate setting for accuracy.
- Check for disconnection of line or needle.
- Check syringe securely attached to pump.
- Check box is locked & no tampering has occurred.
- Check no air present in syringe.

If Syringe Pump could be faulty, return to Electronics & Biomedical Engineering Department. (EBME)

- If safe to do so (following advice) begin process of setting up a new syringe pump, using alternative site
- Complete IR1
Appendix 4

Infusion Running Too Slow

- Check Patient, seek medical advice if required. Has symptom control been lost, does patient require PRN medication?
- Check the Syringe Pump light is GREEN and flashing.
- Check the battery level.
- Check the rate setting is correct.
- Check the correct syringe brand or size has been programmed.
- Check that syringe is inserted correctly into Syringe Pump.
- Check if Syringe Pump has been stopped and re-started for any reason.
- Check contents of syringe/line is there any evidence of crystallisation/kinking of tubing?
- Check needle site if necessary.
- Consider further dilution of medicines to minimise irritation by setting up a fresh syringe.
- If Syringe Pump continues to run through too slowly, change entire pump and return to Electronics & Biomedical Engineering Department. (EBME)
- Check rate of infusion at regular intervals.
- Complete IR1

The Pump has stopped before emptying the syringe

- Check battery has not exhausted. Fit a new battery, turn pump on, confirm syringe size and brand, select “Resume” to continue infusion.

**WARNING** – If you press “NO”, the pump interprets this as a completely new 24 hour period and the remaining contents of the syringe would be delivered over the next 24 hours from confirming “Start Infusion”. The patient would not therefore receive the prescribed dose. If “NO” has been pressed in error, discard the remainder of the syringe contents, and prepare and set up a new syringe.

- Trapped/kinked infusion line. Free line or kink & resume infusion if appropriate.
**Siting the Infusion**

If possible discuss with the patient the preferred infusion site.

Sites of choice include:

- Anterior aspect of upper arms & thighs (2)
- Anterior Abdominal Wall (3)
- Area over scapula (in confused or disorientated patients) (4)
- Anterior Chest Wall (1)

**Sites not to be used**

- Areas of inflammation
- Areas of any broken skin
- Bony prominences
- Irradiated areas
- Sites of tumour
- Sites of infection
- Skin folds or lymphoedema.

Avoid anterior chest wall in cachexic patients.
Appendix 4

Guidelines for subcutaneous siting of the Saf-T Intima

(Adapted from the North Cumbria Palliative Care guidelines)

Fig 1.

Fig 2.

Remove white plastic clamp from device.
Remove small clear plastic cap from the “Y” junction of device (Fig 2.)

Fig 3. & 4.

Attach leur lock end of extension line to the device (Fig 3. Fig 4.)
Attach syringe to extension line, prime the line, connect syringe to the pump.
Grip ridged yellow wings of the cannula between thumb and index finger so that the bobbled surface is as shown (Fig 5.)

Remove the plastic needle cover (Fig 6.) and insert needle into the chosen site at an angle of 45 degrees and secure site with a clear dressing.

Hold wings of cannula firmly (Fig 8.) and pull back on the introducer (Fig 9.) until you see four distinct parts (Fig 10.)
Appendix 4

Grip “Y” connection with one hand and the yellow needle encasement with the other hand (Fig 11.)

With gentle pulling action, pull the needle encasement away from the “Y” connection. (fig 12.)

Dispose of needle encasement in the sharps bin.
Appendix 4

If site irritation occurs

- Change site, using a new infusion set, at least 3cm away from original site.
- Review medication in syringe (cyclizine & levomepromazine commonest causes).
- Use a larger syringe therefore increasing volume of diluent.
- For problematic site reactions, contact Specialist Palliative Care Team for advice.
- Sites may need to be changed every 3-4 days. Frequency of re-siting will in many cases be dictated by the onset of site reactions.
- To detect problems with the infusion site it should be checked a minimum of twice daily, any variance to this practice must be recorded in the patient’s records.
<table>
<thead>
<tr>
<th>LCD DISPLAY</th>
<th>ALERT/ALARM TYPE</th>
<th>POSSIBLE CAUSE</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occlusion/Syringe Empty</td>
<td>Alarm Audible and visual alarm</td>
<td>- Occlusion</td>
<td>- New syringe &amp; line required</td>
</tr>
<tr>
<td>Check Line &amp; Syringe</td>
<td></td>
<td>- Precipitation</td>
<td>- New syringe &amp; line required</td>
</tr>
<tr>
<td>Press YES to Confirm</td>
<td></td>
<td>- Line kinked</td>
<td>- Unkink consider renewing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Actuator has reached minimum travel position</td>
<td>- End of programme, turn pump OFF</td>
</tr>
<tr>
<td>Press YES to Resume NO for New Syringe</td>
<td>Alarm Audible and visual alarm</td>
<td>Something has occurred which has</td>
<td>Pressing YES: will continue current, interrupted infusion.</td>
</tr>
<tr>
<td></td>
<td>Intermittent bleep</td>
<td>interrupted the current programme (e.g. syringe</td>
<td>Check /confirm infusion summary screens &amp; press YES to resume the current infusion.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>displaced/power failure) so the device is</td>
<td>Pressing NO: will programme a new infusion, e.g. new Syringe &amp; or new patient. The pump</td>
</tr>
<tr>
<td></td>
<td></td>
<td>prompting the user to</td>
<td>will calculate the volume of the syringe &amp; based on duration required will start a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>their attention</td>
<td>new programme.</td>
</tr>
<tr>
<td>Pump paused too long</td>
<td>Audible and visual alarm.</td>
<td>Pump left in stop mode (on hold) for 2 minutes</td>
<td>Either start infusion, continue programming or switch off</td>
</tr>
<tr>
<td>Confirm, Press YES</td>
<td>Intermittent bleep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syringe nearly empty</td>
<td>Alert Audible and visual alarm</td>
<td>15 minutes from end of infusion</td>
<td>Prepare to change syringe or switch off</td>
</tr>
<tr>
<td></td>
<td>Intermittent bleep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End Programme</td>
<td>Alarm Audible and visual alarm</td>
<td>Infusion Complete</td>
<td>Pump will alarm. Press YES to confirm end of programme and OFF to switch pump off</td>
</tr>
<tr>
<td>Press YES to confirm</td>
<td>Intermittent bleep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Battery</td>
<td>Alert Visual alarm</td>
<td>Battery is almost depleted (15 minutes left)</td>
<td>Prepare to change battery and resume infusion</td>
</tr>
<tr>
<td>Battery End</td>
<td>Alarm Visual alarm</td>
<td>Battery is depleted</td>
<td>Change battery and resume infusion</td>
</tr>
<tr>
<td>System Error. Press &amp; Hold INFO for details. If problem persists send</td>
<td>Alarm: System error</td>
<td>Error has occurred</td>
<td>Pressing INFO key will display the reason for the alarm &amp; give advice for correction, if</td>
</tr>
<tr>
<td>pump for service.</td>
<td></td>
<td></td>
<td>applicable:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If correction not possible:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Remove pump from use &amp; turn power off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Return to Pharmacy, who will send to</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Medical Physics for pump interrogation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Complete medical equipment “Work Request Form”.</td>
</tr>
</tbody>
</table>
Appendix 4

Maintenance

- Syringe Pumps should be cleaned after each patient using a disposable cloth, dampened with mild detergent. Do NOT use alcohol wipes.
- Syringe Pumps must be calibrated every 12 months by each service’s engineering department.
- A recording system must be in place which clearly identifies the date, Syringe Pump number and person who calibrated the pump.
- Sticking labels to the actual pump is not recommended as this can cause problems with cleaning. Only maintenance labels are acceptable which clearly identify when last serviced.
- Ensure syringe pump is sent back to the appropriate department following use.
**T34 AMBULATORY SYRINGE PUMP PRESCRIPTION**

<table>
<thead>
<tr>
<th>Patient name:</th>
<th>Date of Birth:</th>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>NHS/RXR no:</th>
<th>Ward/Community Nursing Team</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Consultant/ GP:</th>
<th>Hospital / Community prescription (please circle)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Known allergies/ alerts:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Approved name of medicine (please delete unused lines)</th>
<th>Dose</th>
<th>Route/ Rate</th>
<th>Indication</th>
<th>Pharmacist clinical check (Hospital only)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SC/24hr</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>SC/24hr</td>
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<td>SC/24hr</td>
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<tr>
<td></td>
<td></td>
<td>SC/24hr</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Specialist advice must be sought if 4 drugs to be used**

<table>
<thead>
<tr>
<th>Dose</th>
<th>Route/ Rate</th>
<th>Indication</th>
<th>Pharmacist clinical check (Hospital only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC/24hr</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Diluent required:**

- Water for injection
- Sodium chloride 0.9%

<table>
<thead>
<tr>
<th>Diluent</th>
<th>Final volume</th>
<th>Fentanyl patch in use?</th>
<th>Patch strength</th>
<th>Reason for discontinuing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17mL</td>
<td>Y ✗ N ☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22mL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*If Y please continue & change every 72hrs

The prescriber must ensure start date/ time completed to authorise prescription.

<table>
<thead>
<tr>
<th>Prescriber name (print):</th>
<th>Start immediately ☐</th>
<th>Stop date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Prescriber signature:</th>
<th>Or specify time ..........</th>
<th>Stop time:</th>
</tr>
</thead>
<tbody>
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</table>

<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Reason for discontinuing:</th>
<th>Name:</th>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Instructions for use:**

- Use one prescription chart for each T34 Ambulatory syringe pump
- Commence a new chart where there are changes to the contents of the syringe pump
- It is the responsibility of the prescriber to ensure all prescribed drugs are compatible
- If more than three medicines are required specialist advice **MUST** be sought
- All medication should be mixed with water for injection unless known incompatibility
- Final volume includes all prescribed medication and diluent, if final volume exceeds these amounts seek specialist advice
- **On discharge:** Keep original prescription. Write a new prescription for community.
- **On admission:** Send prescription details with patient
- Patient information leaflet given Y ☐ N ☐

For advice on syringe pumps please contact:

**Specialist Palliative Care Team:**

Hospital: Mon–Fri 8.30–16.30 Tel: 01254 732316
Community: Mon–Fri 9.00–17.00 Tel: 01254 738326
Hospice 24/7 out of hours advice line: 07730 639399

**Pharmacy:**

Medicines information Mon–Fri 8.30–17.00 Tel: 01282 803004. At all other times contact the on call pharmacist via hospital switchboard.

Palliative care syringe pump compatibility ref. [www.pallcare.info](http://www.pallcare.info) [www.palliative drugs.com](http://www.palliative drugs.com)
**T34 AMBULATORY SYRINGE PUMP ADMINISTRATION AND MONITORING RECORD**

<table>
<thead>
<tr>
<th>Patient name</th>
<th>Date of Birth</th>
<th>Patient location</th>
<th>T34 ambulatory pump serial no:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS/RXR number</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Checks to be recorded:**
- Inpatient 4hourly
- Outpatient twice daily

**Syringe pump prescription:**
- Must have all sections completed.
- If any information is missing please speak to medical staff before administration

**Diluent used:**
- Water for injection
- Sodium Chloride 0.9%

**Prescription fully completed?**
- Y
- N

<table>
<thead>
<tr>
<th>Time remaining of infusion</th>
<th>0 Hr</th>
<th>+4 Hrs</th>
<th>+8 Hrs</th>
<th>+12 Hrs</th>
<th>+16 Hrs</th>
<th>+20 Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume in syringe (mL)</td>
<td></td>
<td></td>
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<tr>
<td>Record rate of infusion (mL/hr)</td>
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<tr>
<td>Is the pump running to time? (Y/N)</td>
<td></td>
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<tr>
<td>Remaining battery power (%)</td>
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<tr>
<td>Green LED flashing (Y/N)</td>
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<tr>
<td>Syringe secure in pump (Y/N)</td>
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<tr>
<td>Is the fluid clear (Y/N)</td>
<td></td>
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<tr>
<td>Is keypad lock on (Y/N)</td>
<td></td>
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<td></td>
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<tr>
<td>Site position</td>
<td></td>
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<td>Site inflamed/ red (Y/N)</td>
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**Checked by**
- Name & Signature

---

**Appendix 5b**
### PALLIATIVE CARE COMMUNITY ANTICIPATORY/SUPPLEMENTARY SUBCUTANEOUS MEDICINES AUTHORISATION SHEET

<table>
<thead>
<tr>
<th>Patient name:</th>
<th>Patient location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS/RXR no:</td>
<td>Date of Birth:</td>
</tr>
<tr>
<td>Consultant/ GP:</td>
<td>Ward/ Community nursing team:</td>
</tr>
<tr>
<td>Known allergies/ alerts:</td>
<td>Hospital / Community prescription (please circle)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indication</th>
<th>Medicine</th>
<th>Dose</th>
<th>Frequency</th>
<th>Max 24 hr dose to be given PRN</th>
<th>Route</th>
<th>Prescriber Signature</th>
<th>Date/Time Discontinued (inc. signature)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Prescriber's Signature</td>
<td>Date</td>
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<td></td>
<td>Print Name</td>
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<td>Prescriber's Signature</td>
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<td>Prescriber's Signature</td>
<td>Date</td>
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<td></td>
<td></td>
<td></td>
<td>Print Name</td>
<td>Date</td>
</tr>
</tbody>
</table>

**Appendix 5c**
## PALLIATIVE CARE COMMUNITY RECORD OF ANTICIPATORY/ SUBCUTANEOUS SUPPLEMENTARY MEDICINES AND INJECTABLE MEDICINES STOCK RECORD

**FORM 4**

**ONE MEDICINE PER SHEET – ONESTRENGTH PER SHEET**

<table>
<thead>
<tr>
<th>Date &amp; Time Given</th>
<th>Batch No/Expiry Date</th>
<th>Balance</th>
<th>Medicine</th>
<th>Dose</th>
<th>No. of Ampoules Used</th>
<th>Site - Sub Cut</th>
<th>Site – Syringe Pump</th>
<th>New Stock</th>
<th>Stock Balance</th>
<th>Signature and Print Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**HCP 1**

**HCP 2**

**Appendix 5d**
For further information please contact the following:

Hospital Specialist Palliative Care Team
Tel: 01254 732652
Community Specialist Palliative Care Team
Tel: 01254 736326

If you would like this leaflet translating or in another format please contact:-

East Lancashire Hospitals
NHS Trust

Patient and Carer Information Leaflet for your Syringe Pump

Safe | Personal | Effective

Integrated Care Group
East Lancashire Hospital Trust
Royal Blackburn Hospital
Haslingden Road
Blackburn
BB2 3HH

Produced with the public of East Lancashire

©NHS East Lancashire 2011
Version: 3 Review date: June 2020

Safe | Personal | Effective
What is a Syringe Pump?

A Syringe Pump is a small portable battery operated pump, holding a syringe. It allows medicines to be given steadily under the skin via a small needle over a 24 hour period. The pump will hopefully reduce the need for repeated injections.

Why do I need one?

A Syringe Pump is used to give you your medicines in an alternative way for various reasons – for example:

- You may be struggling to swallow medicines
- You may have nausea/vomiting which can affect the way medicines are absorbed
- To control your symptoms more effectively

Your Nurse or Doctor will discuss the reasons for starting a Syringe Pump with you and your family/carer. A Syringe Pump can be used at any stage of your illness to control your symptoms and if you become able to take oral medicines if may be possible to discontinue the Syringe Pump.

Who looks after the Syringe Pump?

Your nursing team will reload the syringe with your medicines every 24 hours. The device will be checked every time you are seen by a nurse to ensure the pump is operating correctly.

How do I know it is working?

- While the pump is running the indicator light will flash approximately every 30 seconds.
- If the alarm sounds contact the nurses involved in your care immediately to check the device.

Taking care of yourself with a Syringe Pump

- Tell your Nurse if you have any redness or soreness where the needle is placed
- Contact your nurse if the needle comes out or dislodges
- Let your Nurse or Doctor know if your symptoms are not controlled

Some Do’s  

- Check your medicines are stored safely away from children/pets
- Discuss bathing/showering needs with your Nurse
- Contact your Nurse if the medicines change colour or become cloudy
- Seek advice from your Nurse on the safe disposal of any unwanted medicines

Please ensure the Syringe Pump is given to the District Nursing Team when no longer required

Contact Telephone Numbers:

District Nurse/Team: ...........................................

GP/Doctor ..........................................................

Appendix 6
FLOW CHART FOR THE USE OF SYRINGE PUMPS IN COMMUNITY

Request valid authorisation for Syringe Pump and supplementary medicines from GP

Are adequate supplies of medication available at the home?

YES (record all injectable medicine on 'stock record' sheet on 1st visit)

NO (request FP10 from GP and liaise with family/Pharmacy re delivery of prescription)

Check all stock levels and update 'stock record' sheet prior to use of any medicines

Assess condition of patient
Symptoms Present?

YES

Administer appropriate prescribed supplementary medicine. Record details on 'stock record' sheet – proceed with Syringe

NO

Proceed with setting up Syringe Pump

Select medicines authorised for Syringe Pump. Check dose and expiry date and record on 'medicines administration & observation chart' and 'stock record' chart. Make sure stock levels balance and ensure sufficient supplies are available

Sufficient stock

Insufficient stock

Select appropriate size of Syringe and draw up medicines required as per community SOP (CMSOP02). Attach Syringe Pump label

Select a suitable site for Syringe Pump/check existing site, as per East Lancashire Policy (ELHT/CP22)

Set up Syringe Pump as per East Lancashire policy (ELHT/CP22)

Provide patient and carer information leaflet for Syringe Pump. (Available in Policy ELHT/CP22)

Refer to trouble shooting guidelines in ELHT/CP22 if any problems on set up of Pump

Appendix 7

East Lancashire Hospital NHS Trust – Policies & Procedures, Protocols, Guidelines
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Useful Telephone Numbers

Hospital Specialist Palliative Care Team 01254 732652/ 01254 732316  Ext 82652
(Monday-Friday 08.30-16.30)

Community Specialist Palliative Care Team 01254 736326  Ext 86326
(Monday-Friday 09.00-17.00)

Pendleside Hospice 01282 440100

East Lancashire Hospice 01254 287000

Specialist Palliative Care Out of Hours 07730 639399
24 Hour Advice Line
(based at East Lancashire Hospice)

Medical Equipment Library 01254 733660  Ext 83660
(Monday-Friday 08.30-17.00)

Medicines Information 01282 80300  Ext 13004
(Monday-Friday 08.30-17.00)

Pharmacy Aseptic Unit 01254 734680  Ext 84680
(Monday-Friday 08.00-16.30
Saturday-Sunday 09.00-13.00)

Pharmacy Dispensary RBH 01254 732252  Ext 82252
(Mon-Friday 08.30-17.00
Saturday-Sunday 09.00-16.00)

Pharmacy Dispensary BGH 01282 804338  Ext 14338
(Monday-Friday 09.00-17.00)

North West Medicines Information Centre 0151 794 8113
(wmedinfo@nhs.net)

Appendix 8