Guidelines for the Care and Management of a Patient with a Subcutaneous Syringe Pump for Adult Palliative Care Patients

START DATE:	June 2023	**EXPIRY DATE:**	June 2026
COMMITTEE APPROVAL:	EIC Divisional Quality Board	**DATE:** May 2023	
DISTRIBUTION:	**Trust-wide (except Paediatrics)**		
LOCATION:	Trust Intranet: Clinical Policies, Procedures & Guidance		
RELATED DOCUMENTS:	Administration of Subcutaneous Fluids and Injections with the Saf-T-Intima Device – Exp May 2026 Symptom Management Guidelines for Dying Patients (Adults) – December 2020 Trust IV Administration of Medicines Guide (Adult) – Exp Dec 2025 Trust Medicines Policy – Section: 6. Controlled Drugs – Exp Nov 2024 Trust Medicines Policy – Section: 17. Injectable Medicines Policy – Exp July 2026 Trust Medicines Policy Section 31. Medicines Management Training – Exp March 2027		
AUTHOR/FURTHER INFORMATION:	**Written by:** Natasha Ryan-Davies, Palliative Care CNS **Updated by:** Natasha Ryan-Davies Palliative Care CNS and Shauna McCann Lead Palliative Care/EOL care Nurse **Acknowledgments:** Specialist Palliative Care Team		
STAKEHOLDERS INVOLVED:	Clinicians in all adult in-patient areas, Specialist Palliative Care Team, Clinical Engineering Department & Pharmacy		
PHARMACY APPROVAL:	Maggie Bendle, Lead Clinical Pharmacist - Cancer and Technical Services, 19/06/2023		

DOCUMENT REVIEW HISTORY:

Date	Version	Responsibility	Comments
31/08/2017	1	Specialist Palliative Care Team	
29/08/2019	2	Specialist Palliative Care Team	
20/05/2021	3	Specialist Palliative Care Team	August 2020: Updates made to reflect safety advice from medical device manufacturer's Field Safety Notices. Two editions of CME Medical T34 syringe pump are now available for use in the Trust. Cerner prescribing advice added.
19/06/2023	4	Specialist Palliative Care Team	Guideline updated, approved and extended by 3 years.
09/07/2024	5	Specialist Palliative Care Team	Updated re change of giving set and new OOH contact details.

Index

Section 1: Introduction

1. Scope of the Guidelines

These guidelines are for all trained staff involved in the administration of subcutaneous (SC) infusions for adults in palliative care using a continuous subcutaneous syringe pump.

This guideline covers the following:

- Indications for using the SC route
- Advantages and disadvantages of the SC route
- Training and competency requirements
- How to set up and use the syringe pump
- How to prescribe medications for this medical device
- Discharging patients with a syringe pump
- Care and maintenance of the device
- Documentation, monitoring and safety

This guidance refers to the medical device known as a 'syringe pump', but also known as a 'syringe driver'. The continuous subcutaneous syringe pumps used within the trust are BD Bodyguard T along with CME Medical (formally known the 'McKinley T34' syringe pump).

This guideline is not intended for the use of any other SC infusion medical device.

The administration of medications via other routes is beyond the scope of this guideline.

2. Aims

The aim of the guideline is:

- To promote the safe and effective use of the Continuous Subcutaneous syringe pump in adults for Chelsea and Westminster NHS Foundation Trust Hospital
- To ensure safe practice when using the Saf-T-Intima SC cannula
- To improve the standard of symptom management and care for patients

3. The Continuous Subcutaneous Syringe Pump

The Subcutaneous syringe pump is a portable, battery operated device designed to be used to deliver continuous subcutaneous infusions (CSCI). The device administers medication in millilitres (mls) per hour as a continuous infusion. All Continuous Subcutaneous syringe pumps are programmed to deliver between one to four medicine combinations over a twenty-four-hour period to optimise and control symptoms such as pain, nausea, vomiting, secretions and anxiety.

Please see the subcutaneous syringe pumps that are used within the trust below. (see Figure 1).

Figure 1.


T34 2nd Ed Syringe Pump
Front label has pump name
Key Pad has text
T34 3rd Ed Syringe Pump
Front label has brand
Key pad - Universal Symbols
2nd ed may have battery sticker on rear case
fluid Drain hole
BD Bodyguard Syringe Pump
BD BodyGuard T
Time Remaining 12:45
Rate 1.2ml/h
20 ml BD Plastipak

4. Indications for Use of a Syringe Pump

Syringe pumps can be used for symptom control at any stage of a patient's illness. They are used to administer drugs subcutaneously to control symptoms when the oral route cannot be used or other routes of drug administration are inappropriate. Indications for use include:

- intractable nausea and vomiting
- gastro-intestinal obstruction
- dysphagia
- unable to no longer swallow medication
- malabsorption
- unsatisfactory response to oral medicines (uncommon)
- patient compliance (also consider transdermal route for analgesia).

5. Advantages & Disadvantages of Using a Syringe Pump

Symptom control is improved by administering drugs at a constant rate, which ensures that plasma concentrations remain at a stable therapeutic level, avoiding fluctuations associated with intermittent drug therapy.

Up to four different drugs, plus diluent, can be combined in the syringe pump for concurrent administration (see section 6.4 - Drug Compatibility). The syringe is required to be re-filled every 24 hours and can decrease the need for regular injections, although additional PRN doses may be needed.

As these are portable devices, mobility and independence of the individual is enhanced. If patients are ambulant then the syringe pump ideally should be placed in a holster/bag as the pump should not be in direct sunlight (CME, 2015).

Disadvantages include:

- Potential source of infection
- Skin site reactions
- Drug incompatibility causing irritation
- Emaciated patients or those on long term infusions, skin site availability may become an issue.

6. Prescribing Medication for Continuous Subcutaneous Syringe Pump

Medicines that are commonly prescribed for use in syringe pumps:

- analgesics (e.g. morphine, oxycodone, alfentanil)
- anti-emetics (e.g. metoclopramide, cyclizine, haloperidol, levomepromazine)
- relaxant/anxiolytic (e.g. midazolam, levomepromazine)
- anti-secretory drugs (e.g. hyoscine butylbromide, glycopyrronium).

> An example of a typical prescription would be:
> *Morphine Sulphate* ***Dose*** *10mg* ***Route*** *S/C* ***Frequency*** *24 hours*
> *Levomepromazine* ***Dose*** *6.25mg* ***Route*** *S/C* ***Frequency*** *24 hours*

6.1 – Prescribing Advice on Cerner

The prescription is written as an 'Order' in Cerner using 'Continuous Subcutaneous Syringe Pump' with medications as additives – see **Appendix A** for prescribing advice.

Select the first option: '17ml syringe pump' – unless total volume of drugs exceeds this, in which case select 22ml or 32 ml. Higher doses of multiple medications in combination may cause larger volumes to be needed for the syringe – check the ward stock of the required medications and their concentrations and discuss with pharmacy and/or the Specialist Palliative Care (SPC) team if further advice needed.

Review syringe pump prescription daily and consider adjusting doses following a patient review. Advice should be sought from the SPC team.

6.2 - Opioids

When a patient is commenced on an opioid infusion via a syringe pump, the appropriate dose is calculated from their previous opiate requirements. Refer to information resources listed below if necessary.

As required (PRN) analgesia should be prescribed for breakthrough pain equivalent to four hourly requirements - eg. divide twenty-four hour requirement by six.

6.3 - Drug Compatibility

Some drugs (e.g. chlorpromazine, diazepam, prochlorperazine) act as an irritant when used subcutaneously and should be avoided.

Currently the diluent used is normal saline. There are a limited number of drugs that may require water for injection as a diluent (please contact the SPC team for advice or refer to 'Medusa' on ICHT Injectable Guide tab on Cerner).

Additionally, the concentration of one drug may affect its compatibility with other drugs. For advice on mixing drugs, refer to the information resources listed below.

Avoid mixing medicines in one syringe if compatibility data is not available; do not mix more than three medicines unless on the advice of the SPC team.

All solutions should be discarded and replaced after twenty-four hours to minimise risk of infection or precipitation.

Resources

Palliative Adult Network Guidelines. (4th ed., 2016) Retrieved from: https://book.pallcare.info

British National Formulary. Retrieved from: https://bnf.nice.org.uk/

Cross site Trust Drug Information Service 020 3315 8398 or 020 3315 8390

Specialist Palliative Care Team:

C&W:

- Specialist Palliative Care Nurses (Bleep 4026)
  Mon-Fri 0900-1700 & Sat/Sun/BH 0800-1600
- Specialist Registrar in Palliative Medicine (Bleep 0175)
  Mon-Fri 0900-1700 (except BH)
- Out of Hours: On Call SpR at Trinity Hospice 020 7787 1000

WMUH:

- Specialist Palliative Care Nurses (Bleep 018)
  Mon-Fri 0900-170 & Sat/Sun/BH 0800-1600
  Out of Hours: SCUK 020 7666 3413

7. Management of the Subcutaneous Syringe Pump

Subcutaneous syringe pumps should be managed by Registered Nurses who are employed by Chelsea and Westminster Hospital NHS Foundation Trust (this includes Chelsea and Westminster Nurse Bank Trained Nursing Staff).

Registered nurses are accountable for ensuring their practice is evidence based and taking appropriate action to ensure they are competent when using the syringe pump for palliative care in accordance with the Nursing and Midwifery Council (2015).

Registered Nurses must be trained, confident and competent in the administration of drugs via a syringe pump. They should have undertaken and passed their medication assessment and IV administration competencies.

All staff who operate a syringe pump must have attended medical devices training in the use of the subcutaneous syringe pumps used within the Trust – eg. Trust Induction. Staff should be observed and supervised with practice a number of times as per the Competency Assessment of Medical Devices Record.

Managers should ensure that relevant refresher training takes place (with support of the SPC team, if needed). A record of staff who are trained and competent to use such devices should be maintained at ward level.

8. Cleaning and Decontamination of the Subcutaneous Syringe Pump

Always turn the syringe pump off and remove the battery before cleaning.

Before connecting the pump to the patient, clean the syringe pump and lockbox with a Clinell Universal Wipe (green packet) as per the Trust Decontamination Policy (2022). Leave to dry for at least 30 seconds.

Inspect the lead screw during cleaning prior to use. If there is white plastic debris on the lead screw, this is an indication of wear on the syringe mechanism which means the pump should not be used and sent for service with the Clinical Engineering Department (BD/CME, 2020a).

The syringe pump must never be immersed in water, and if it is accidentally dropped in water, it must be withdrawn from use immediately and sent to the Clinical Engineering Department (CME, 2019b).

Do not use chemicals such as Xylene, acetone or similar solvents as this will damage components and labels. Extended use of incorrect chemicals can cause the lockbox to become more brittle (CME, 2019b).

If decontamination from bodily fluids or deeper cleaning is required the syringe pump will need to be sent to the Clinical Engineering Department.

9. Incident Reporting

In the event of an incident when using a subcutaneous syringe pump, in order to be fully investigated an incident form should be completed on the Trust's Datix system found on the Intranet.

Specific (but not exhaustive) examples of incidents related to syringe pumps include:

- administration of incorrect medication, dose and/or diluent
- infusions completing ahead of intended time (finishing > 1 hour early, assuming a 24-hour infusion, that is approximately 5% or more early)
- infusions carrying on beyond intended time of completion (carrying on for > 1 hour late, assuming a 24-hour infusion, that is approximately 5% or more late or alternatively > 5% of the prescribed medication remaining in the pump at the end of the prescribed infusion period)

- syringe pump not alarming during an alarm condition (see Operator Manuals for full lists of alarm conditions).
- incorrect battery used
- syringe pump record chart not maintained.

Where there is a known reason for the infusion not completing on time (e.g. the pump was stopped to enable the patient to bathe; changing the infusion set) then allowance should be given for this delay in deciding whether to report this as an incident.

When a syringe pump is involved in an incident it should be preserved intact with syringe and extension set, providing all relevant information to the Clinical Engineering Department such as operation of the pump that caused harm (adverse event) or could have caused harm (near miss) to the patient or carer.

Section 2: Management of the Syringe Pump

10. Preparing the Syringe

All medications should be checked and administered as per the Trust IV Administration Guide

10.1 - Equipment Needed

- 20, 30 or 50ml BD Plastipak Luer lock Syringe
- Syringes, blunt fill filter and non-filter needles to draw up medication
- Codan extension set 150cm, bore 0.9mm
- White bung to cap off extension set line to ensure key part is protected
- Prescribed drugs and diluent should be obtained from ward stocks
- Drug additive label
- Clean tray or surface for preparation
- Computer to check prescription with counter-signing nurse

Please note that if the above lines are not available, other suitable extension sets can be used but this will likely have an effect on the rate/hour. You will need to ensure that this is documented and handed over to staff looking after the patient.

10.2 - Selecting the Syringe Size and Diluent Volumes

The choice of syringe and the volume of the diluent must be based on the total volume of drugs to be administered. See table and examples below:

BD Plastipak Luer lock Syringe Size	Volume to be drawn up to (visually)	Rate/Hour - Rates should fall between	Lock Box can be used
20ml	17ml	0.67ml - 0.73ml/hr	Yes
30ml	22ml	0.88ml - 0.94ml/hr	No
50ml	32ml	1.30ml – 1.35ml/hr	No

.

Examples of syringe selection:

Patient A requires 30mg *Morphine Sulphate*, 10mg *Midazolam* and12.5mg *Levomepromazine*. Added together the volume of the drugs comes to 3.5mls (if using 30mg/ml *Morphine Sulphate* ampoules). This means that a 20ml syringe is needed. The 3.5mls of the drugs needs to be drawn up with 13.5mls of the diluent to total 17mls.

10.3 – Labeling the Syringe

Label additive label with the following information:

Patient name
Hospital number
Drug, dosage and diluent names

Total volume of fluid in syringe
Date and time of preparation
Name and signature of two nurses preparing the syringe

Ensure label is positioned so that measurement marks on the syringe are clearly seen, and the label is positioned so that it does not interfere with the sensors on the syringe pump.

Remember if the prescription is changed, you must prepare a new syringe. NEVER add an additional medicine to the syringe after the infusion has commenced.

10.4 – Connecting the Infusion Line to the Syringe

The following three situations may occur when considering the SC infusion line;

1) The patient starts an infusion for the first time; therefore a new infusion line is needed.
2) The patient's prescribed medication has been changed; therefore a new infusion line is needed.

In both of these situations, attach the new infusion line to the syringe and ensure the Luer lock is fully screwed onto the thread of the syringe tip. Prime the tubing with the syringe pump contents until the fluid just shows at the needle tip. This will mean the syringe now holds a smaller volume and so may result in a slightly slower rate being automatically calculated. The medication is still accounted for, but in the tubing, and the patient will still receive all of the medication over a 24-hour period so the infusion can commence

3) The patient already has an infusion line and the prescription has not changed.

In this situation, the existing infusion line can be connected to the syringe once the pump has been prepared.

In all three situations, a white bung must be placed on the end of the infusion line to protect the key part until it is ready to be attached to the syringe pump or the patient.

11. Preparing the Patient

11.1 – Equipment Needed

- BD Saf-T-Intima 24 GA yellow Y adapter (single lumen) cannula
- Semi-permeable adhesive transparent film dressing (e.g. large Tegaderm)
- 2% chlorhexidine in 70% isopropyl alcohol wipe

11.2 - Selection of Suitable Infusion Sites

Where possible, involve the patient in the choice of a suitable site. Ensure the area chosen has loose SC tissue. The most suitable sites for inserting the SC cannula are:

- outer arms – avoid in bedbound patients who need frequent turning
- outer thighs
- anterior abdominal wall
- chest – avoid in cachectic patients
- upper back – recommended for confused or delirious patients

Areas which should not be used:

- *Oedematous limbs*: the SC tissues are 'waterlogged' and the rate of drug absorption is adversely affected. A breach in skin integrity also increases the risk of infection in an area already susceptible.
- *Abdomen distended by ascites*

- *Bony prominences*: the amount of SC tissue is diminished, resulting in discomfort and possible poor drug absorption.
- *Previously irradiated skin:* radiotherapy can cause sclerosis of capillaries, thus reducing skin perfusion and adversely affecting drug absorption.
- *Any site near a joint:* movement of the joint may cause needle displacement and discomfort for the individual.
- *Any areas of broken skin:* the cannula and drugs may cause further irritation.

11.3- Inserting the Subcutaneous Cannula

For the manufacturers advice on how to insert the Saf-T-Intima cannula, see Appendix B.

For further information on this clinical skill, see the approved Trust resource: https://www.clinicalskills.net/node/158.

The Saf-T-Intima cannula does not need to be primed prior to being inserted subcutaneously into the patient as the priming volume is only 0.2ml.

Place the dressing directly on top of the inserted cannula to secure its position and to reduce bacterial burden of the site. Ensure to write the insertion date on the dressing that holds the cannula in place.

The life of the infusion site depends upon the individual and the drug(s) being infused, varying from hours to seven days. The Saf-T-Intima device only needs to be changed when there is evidence of inflammation, discomfort or hypertrophy (a hard SC swelling) or after seven days. It is important to rotate the site if long term use of a syringe pump is anticipated.

11.4 – Symptom Assessment

It will take approximately 4 hours before the infused medication from the syringe pump to reach maximum strength. If the patient is symptomatic at the start of the infusion, a PRN dose of medication should be given at the same time as commencing the syringe pump.

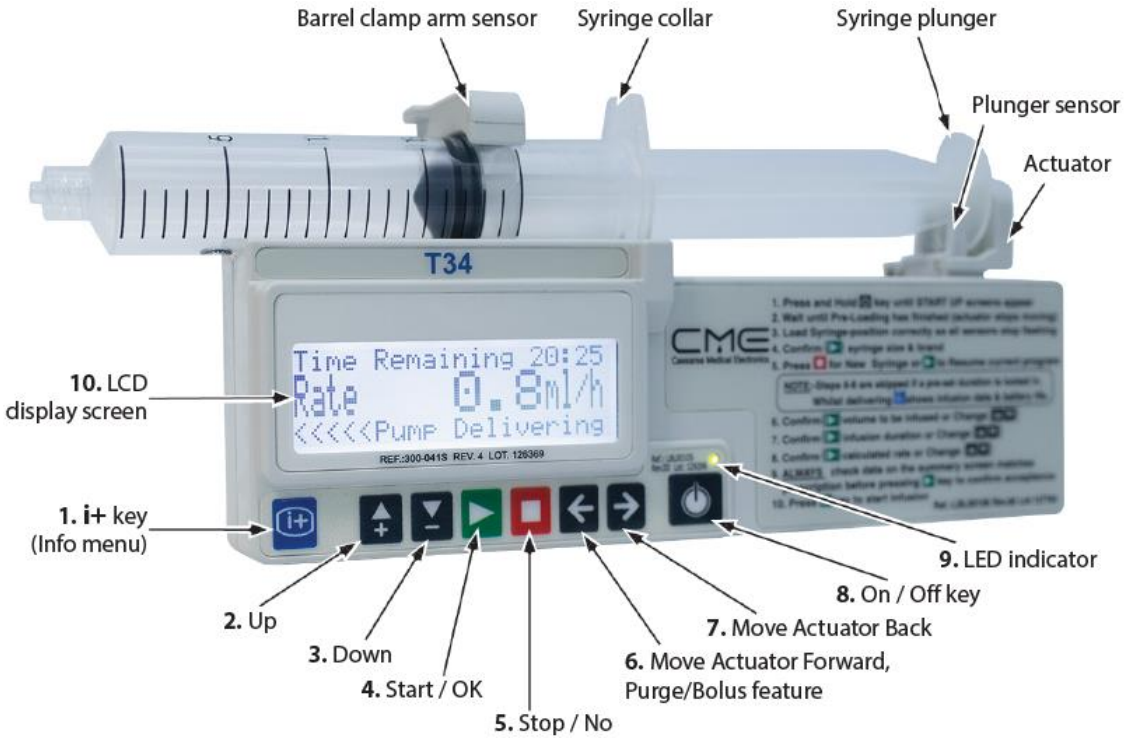
12. Preparing the Subcutaneous T34 Syringe Pump

12.1 - Equipment Needed

- Subcutaneous syringe pump (approved by the trust) and lockbox can be obtained from the Medical Equipment Library.
- Duracell Plus 9V/6LR61 (MN1604 PP3) alkaline battery - as per local procurement.
- Keys to the subcutaneous syringe pump lockboxes are usually held on each ward's CD Keys. Replacement keys can be requested from the Clinical Engineering Department or SPC team.

12.2 – Component Parts of the CME Medical T34 Syringe Pump

Example of 3rd edition syringe pump:



12.3– Battery Power

To avoid the risk of unintended pump shutdown and delay to treatment, always check the battery power before commencing the infusion by pressing the 'INFO' key.

If the battery power has less than 30% life remaining at the start of an infusion then you should consider discarding the battery and installing a new one. The only brand and model of battery that should be used is a Duracell Plus 9V/6LR61 alkaline battery (BD/CME, 2020b).

Check that the batteries have adequate connection within the battery housing – some syringe pumps feature a foam pad to ensure good connectivity of the battery and its' housing (CME, 2019a).

The battery should be removed from the syringe pump when not in use.

12.4 – Fitting the Syringe to the Syringe Pump

Inspect the lead screw of the syringe pump prior to use. If there is white plastic debris on the lead screw, this is an indication of wear on the syringe mechanism which means the pump should not be used and sent for service (BD/CME, 2020a).

To avoid an inadvertent administration of a bolus dose, the syringe must be attached to the pump before being connected to the patient.

Before placing the syringe into the pump, ensure the barrel clamp arm is down then press and hold the 'ON/OFF' key.

The LCD display will indicate 'Pre-Loading' and the actuator will start to move. It will stop at the start position of the last infusion but can be manually moved using the left and 'FF' and 'BACK' keys. Care must be taken to ensure the actuator of the machine is moved back to accommodate the filled syringe.

Lift the barrel clamp arm and fit the syringe to the pump, ensuring each part of the syringe is correctly fitted into the plunger sensor and collar sensor. This may require some pressure.

Lower the barrel clamp arm. Once the syringe is correctly seated in each of the three sensor points (barrel clamp, plunger and collar), the graphic on the screen will change to display the syringe brand and size.

The screen will ask for confirmation of the make of the syringe and size. All pumps used in the Trust are pre-set to use BD Plastipak syringes – if anything different shows then send the device back to the Clinical Engineering Department. If the wrong syringe is confirmed this may affect the rate and volume of the drug given to the patient.

12.5 - Starting the Infusion

After confirming the syringe type, the next screen message that appears is displayed below:

The volume to be infused, duration of time and rate per hour will be calculated and displayed automatically for a 24-hour period. Make a visual check of volume to be infused against the volume in the syringe. The rate per hour should fall within the rates given in section 10.2.

If the rate/hour falls much below the recommended rate above, the machine should be turned off, the syringe removed and a decision should be made (with a Senior Nurse) to add either additional diluent to bring up to the total volume, or if a sufficient volume of drug has been lost, to discard the infusion and draw up a new syringe.

Once the figures on the screen have been checked, press 'YES' to confirm and the screen will change to ask 'Start Infusion?'. Check the primed line is connected to the pump and the patient and press 'YES' to start the infusion. When the syringe pump is running, the below screen will show as default for the duration of the infusion.

12.6 – Keypad Lock

The syringe pump allows users to lock the operation of the keypad during infusion. The function must be used to minimize tampering with the device. To activate the keypad lock, 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 pump can then be locked into the plastic lockbox provided (the box will only allow locking of the machine using a 20ml Luer lock syringe).

12.7 – Sunlight

Protect the syringe from direct sunlight whenever possible (CME, 2015). If the patient is bed-bound, ensure the syringe pump is out of direct sunlight and placed under the pillow or bed clothes.

13. Monitoring the Syringe Pump

When the infusion has started the frequency of checking by a registered nurse, should be as follows:

- 15 minutes after commencement of infusion
- Then after one hour
- Then four hourly until completion

13.1 – Monitoring Checks and Cerner Documentation

The following monitoring checks should be carried out and documented by a registered nurse on the syringe pump record chart (Currently on Cerner under T34 Pump Infusion Record Chart) found in 'Obs & Assessments' on Cerner.

- Pump Type
- Pump Serial number
- Pump infusion site
- Laterality
- Site Appearance – Any signs of redness/swelling/discomfort or leakage?
- Syringe Content Appearance – any evidence of crystallization, precipitation, cloudiness or change in consistency?
- Pump volume infused – is the rate still correct?
- Pump volume remaining
- Pump battery Level > 25%
- Program Lock on
- Pump running

If any checks indicate a problem, the appropriate action must be taken and documented in the notes section. If an infusion is discontinued before it is complete, document the amount of solution remaining and destroyed alongside the associated time and date.

A guide to subcutaneous syringe pump problem solving can be found in **APPENDIX C.**

13.2 - Monitoring Symptoms

It is important to remember that the patient's symptoms should continue to be assessed after the continuous SC infusion of medication is commenced. Patients may continue to require additional PRN medication to help control symptoms such as pain, nausea and vomiting or restlessness. If they are requiring multiple extra doses it may be necessary to review the syringe pump prescription and adjust this accordingly.

13.3 - Giving PRN medication via the Saf-T-Intima cannula

The SC route can be used in preference to intramuscular and intravenous routes in palliative and end of life care patients.

The Saf-T-Intima cannula can be used In the event that a patient is requiring PRN SC medication (e.g. morphine).

However, incidents can occur when a syringe pump is stopped and disconnected from the SC cannula in order to give PRN medications.

It is best practice for an additional Saf-T-Intima cannula to be inserted and left in situ (without the extension line) in the event that a patient is requiring multiple PRN SC medication.

14. Discontinuing the Syringe Pump

The following situations may indicate a patient no longer requires a continuous SC infusion:

1) Symptoms resolve and a patient can tolerate oral medications.
2) Patient requests for removal of device.

These two situations require further advice with symptom control from the SPC team.

3) Patient dies.

The syringe pump should be stopped. If the death is unexpected the SC cannula, infusion line and syringe should remain intact and in situ, only removing the subcutaneous syringe pump.

In all of the above events, the syringe pump should be removed from the patient and cleaned as per section 8. The device should be returned promptly to the Medical Equipment Library where the continued record and maintenance of syringe pumps is carried out.

15. Discharging Patients with a Continuous Subcutaneous Syringe Pump

There may be times when the patient with a syringe pump can be discharged home or to another care setting. Discontinuing the infusion is not recommended as this will lead to instability in the patient's symptom control.

The SPC team should be contacted prior to discharge, with as much notice as possible, so that liaison with the appropriate District Nurse service, hospital, hospice or nursing home in order to arrange the return of the syringe pump.

A syringe pump prescription cannot be added as a TTA in Cerner – the medications should be prescribed individually with an accompanying note that they are intended for use in a syringe pump. Please refer to the Trust Symptom Management Guidelines for Dying Patients (Adults) for further advice on prescribing and dispensing medications for patients being discharged at the end of life.

The following advice is suggested depending on discharge destination:

- **Discharge Home**

  If the patient is to be discharged home, district nurses should be contacted, giving as much notice as possible, and advised that the patient will be discharged with a syringe pump. Arrangements should be made between the ward nurse and district nurse as to the time of the discharge so that the district nurse can visit the patient at home and change the infusion as appropriate.

  Prior to discharge the syringe pump should be renewed and checked by two nurses and the volume remaining should be recorded on the checking sheet. An authorisation chart (Medications Authorisation and Administration Record (MAAR) chart) should be sent home with the patient for the district nurses information – this can be found on the End of Life Care Intranet page or can be requested from the SPC team.

  The patient should not be discharged through the discharge lounge.

- **Discharging to another hospital, hospice or care home**

  If the patient is to be discharged to another care setting, the ward nurse should contact the ward/care home, and inform the staff that the patient has a syringe pump. It should be confirmed that the nursing staff at the discharge destination are able to manage a continuous subcutaneous syringe pump.

  Prior to discharge the syringe pump should be renewed and checked by two nurses and the volume remaining should be recorded on the checking sheet. An authorisation chart (Medications Authorisation and Administration Record (MAAR) chart) should be sent home with the patient for the district nurses information – this can be found on the End of Life Care Intranet page or can be requested from the SPC team.

  The patient should not be discharged through the discharge lounge.

References

BD/CME (2020a). Field Safety Notice – MMS-19-1572.

BD/CME (2020b). Field Safety Notice – MMS-20-3887.

CME (2015). Field Safety Notice – FSN2015-002.

CME (2019a). Field Safety Notice Update – FSN2018-001.

CME (2019b). T34 Syringe Pump (3rd Edition) – Directions For Use.

Nursing and Midwifery Council (2015). The Code: Standards of Conduct, Performance and Ethics for Nurses and Midwives.

Further Useful Resources

CME (n.d). T34 Syringe Pump System Operator Manual.

Healthcare Improvement Scotland (2019). Guidelines for the Use of the CME T34 Syringe Pump for Adults in Palliative Care.

APPENDIX A

CernerEPR

Prescribing Syringe Pumps

Quick Reference Guide

This QRG covers how to prescribe using the Syringe Pump PowerPlan.

PowerPlan available:

- Continuous Subcutaneous Syringe Pump (CWFT)

With the patient record open on the page at the top of the left Menu:

1. Click on the **New Order Entry** or plus sign on the Clinician Workflow or
2. Locate the **Orders** component in main menu, and then click the component name.

Ordering the PowerPlan

1. Click the + Add button
2. Start typing the first word of the required PowerPlan in the **Search** field
3. If you have difficulty locating the drug, try clicking the drop-down to the right of the **Search** field to change the **Starts with** option to **Contains**.
4. Click on the relevant PowerPlan
5. Click the Done button

Choose the Order

There are several volume options which make up the PowerPlan.

6. Click on the checkbox for the required order depending on the total volume of drugs
7. The **Interaction Checking** window opens.
   Click OK

Completing the PowerPlan

8. Click on the order which has the missing information mandatory icons
9. Complete all relevant fields on the **Details** Order form (yellow fields are mandatory)
10. Click Orders For Signature
11. Click Sign
12. Click the refresh 0 minutes ago button

Adding drugs to an existing PowerPlan

Each PowerPlan only allows for one prescribing event for each drug. If you need to prescribe further doses of the same drug, you will need to set up a new PowerPlan by clicking Add.

You can add further drugs to an existing PowerPlan, but only if the group has not been administered.

To prescribe further medications from the same PowerPlan:

1. Click the **Orders** page on the left-hand menu.
2. Click to select the PowerPlan from the **View** list on the left
3. Click the **View Excluded Components** button
4. Click to tick further medications as required
5. Complete order details as above
   You will not be prompted to initiate the plan again, as it is already initiated.
6. Click Orders For Signature
7. Click Sign
8. Click the refresh 0 minutes ago button

APPENDIX B

Chelsea and Westminster Hospital NHS
NHS Foundation Trust

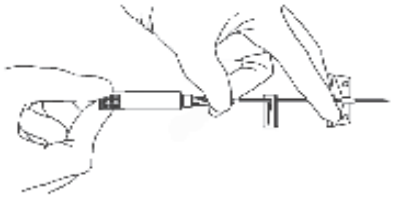
BD Saf-T-Intima™ for Subcutaneous infusion therapy

Points to Practise

Before you start

Wash hands and prep the skin of patient as per local hospital policy & guidelines.

1



Preparation

- Hold as shown (Fig. 1) and rotate the white safety shield to loosen the needle. (Fig. 1).
- Check if the needle bevel is facing up and that the catheter is not over the bevel before insertion.

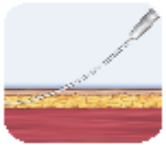
2A

2B

Insertion

- Grasp the textured sides of wings and bring them together, pinching firmly. (Fig. 2A).
- Using thumb and index finger gently pinch the skin around selected site to identify the subcutaneous tissue. (Fig.2B).
- Insert the full length of the catheter and needle through the skin at a 30°-45° angle. (Fig. 2B).

3



Make sure the cannula end is sitting well within the subcutaneous layer – just under the skin – 2mm thick

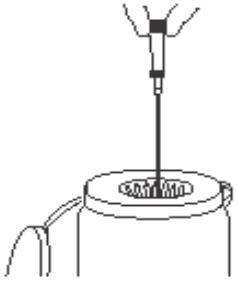
Needle Removal

- Lay the wings flat on the skin surface. Anchor wings with one hand and pull the white safety shield in a straight, continuous motion until the safety shield separates from the safety system with the other hand. (Fig. 3).

4

Disposal

- Discard the needle immediately in a puncture resistant, leak-proof sharps container.



5

Stabilization

- Secure the catheter and apply a sterile dressing per facility protocol.
- The priority areas are the intra-clavicular area and the deltoid, because they are easily accessible, rarely oedematous, and permit easy inspection by the nurse.

6

- Label the line as subcutaneous.
- Document insertion in notes.
- Commence a Continuing Care Record.

BD

APPENDIX C

Subcutaneous Syringe Pump Problem Solving Guide

As far as possible, staff registered to use the approved continuous subcutaneous syringe pumps should attempt to problem solve any potential issues with the following guidance.

Further advice can be sought from the Specialist Palliative Care (SPC) team.

All maintenance and servicing should be undertaken by the Clinical Engineering Department in accordance with both Trust policy and the Syringe Pump Service Operator Manuals.

Common Problems

Fault	Possible Cause	Action
The pump will not start.	No battery present.	Fit a battery.
	Battery inserted incorrectly.	Re-align battery terminals.
	Cap on battery terminal.	Remove cap.
	Battery is depleted/very low.	Fit a new battery.
	Pump is faulty.	Service is required.
Infusion ended early/late.	Drug incompatibility or site problems.	Assess patient and discuss with healthcare staff. If ended late, check if PRN is needed to control symptoms. If the pump is continuing to infuse beyond the prescribed time – stop infusion. Assess why and resolve cause. Set up a new infusion if required.
	Disconnection of syringe, SC infusion line or cannula.	Check placement of syringe, SC infusion line and cannula.
	Wrong syringe brand confirmed during set up/incorrect volume measured by syringe pump.	Set up a new infusion.
	Syringe pump placed > 75cm above infusion site. This can lead to siphonage if the syringe is not secured.	If user error – seek appropriate training.
	Air is present in the syringe.	Check syringe barrel to see if it is cracked. A cracked syringe can lead to siphonage.
	The syringe pump is faulty.	Send syringe pump for servicing.
Infusion is running slow.	Check if the infusion has stopped at any point.	Assess patient and discuss with healthcare staff. If ended late, check if PRN is needed.
	Cannula site requires to be changed.	Set up a new infusion.
	Pressure/kinking on the SC infusion line or cannula.	Check placement of the syringe, SC infusion line and cannula.

	Disconnection of syringe, line or cannula. The syringe pump is faulty.	If user error – seek appropriate training. Send syringe pump for servicing.
Cannula sites require frequent changes.	Irritation from prescribed medication. Cannula insertion technique.	Use a larger syringe and a more dilute solution of drug. Check diluent and potential alternatives for prescribing with pharmacist/SPC team. User error – seek appropriate training.
The pump has stopped before the syringe has emptied.	Exhausted battery. The syringe pump is faulty.	Fit new battery, turn syringe pump on, confirm syringe size and brand and then resume infusion. Send syringe pump for servicing.
Precipitation, cloudiness or colour change of syringe contents or line.	Incompatible medications. Incompatible diluent. Exposure to sunlight and/or heat.	Stop infusion. Discuss with pharmacy/SPC team. Start new infusion at a different site using a new cannula and SC infusion line.
Syringe running rate per hour out of advised range	Incorrect or different extension line has been used Pump has been stopped and restarted without being reset properly	Check correct equipment has been used and change to this if necessary Stop pump completely and set up again

Alarms and Alerts

The alarm and alert activation systems slightly differ for the 2nd and 3rd editions of the CME Medical T34 syringe. The main difference is the 3rd edition features two levels of priority of alarm that use different length of alarm tones and colour of LED (red and yellow). The 2nd edition features only one kind of alarm and a red LED.

The following advice is consistent for both the 2nd and 3rd edition of the CME Medical T34 syringe pump. For more detailed alarm information please see the Operator Manual of the relevant edition of syringe pump.

When the pump detects a problem, four things occur:

- The infusion stops.
- An audible alarm is activated until either the pump is paused or the problem is rectified.
- A message appears on the display screen indicating the cause of the alarm
- The LED indicator changes colour from green.

Display	**Cause/Action**
Syringe Empty, Remove Syringe	Infusion stops. Check intended time for completion. Prepare to change syringe or discontinue pump use.
End Battery	Battery will fail imminently and infusion stops. Change battery and resume infusion.
Syringe Displaced, Check Syringe	Syringe not correctly fitted/displaced to one or more of the sensors. On screen message identifies which sensor to check.
Occlusion/Empty Syringe, Check Line	Occlusion can be related to drug incompatibility or device factors, for example clamped set, occluded or kinked. Actuator has reached the minimum travel position.

	Check for clamped set or trapping/kinking of the SC infusion line. Check cannula and that the patient is not lying on the cannula insertion site. Check for syringe, SC infusion line and cannula for signs of precipitation or crystallization. When satisfied none of the above, press 'YES'. Check if the pump has been placed lower than cannula site which can increase the risk of alarming. If not resolved re-site cannula. Then if not resolved send pump for servicing.
System Error or ERROR	Infusion will stop. An internal system error has occurred. Follow advice on screen if advice displayed. If this does not resolve the problem then send pump for service.
Pump Paused Too Long	The pump has been stopped/paused for more than 2 minutes without any key presses. When appropriate, start the infusion (checking rate prior to doing so), continue programming or switch pump off.

When the pump detects a lower priority problem, or an alert, four things occur:

- The infusion continues.
- A screen message alternates with the default infusion screen.
- A low priority alarm is activated intermittently.

Display	**Cause/Action**
Program Nearly Complete	Infusion nearly complete. Infusion does not stop. Prepare to change syringe or discontinue pump use.
Low Battery	Change battery and resume infusion.