



PROCEDURE FOR SUBCUTANEOUS INSERTION, REMOVAL, MEDICATION ADMINISTRATION AND FLUID ADMINISTRATION FOR PALLIATIVE CARE PATIENTS IN THE COMMUNITY

- PART I:** Establishing a Subcutaneous Site
PART II: Intermittent Subcutaneous Medication Administration
PART III: Continuous Subcutaneous Administration of Medications or Fluids
PART IV: Discontinuation of a Continuous Subcutaneous Administration of Medications or Fluids
PART V: Removal of a Subcutaneous Device
PART VI: Special Note Regarding Pediatric Patients and Insuflon™ Catheters

PURPOSE To provide an evidence-based, standard approach to establishing a subcutaneous (SQ) route for medication administration and/ or fluid replacement in non-emergent situations in the home (when other routes of administration are contraindicated or unavailable).

PREAMBLE For many palliative patients, continued use of the oral route for medication administration will not be possible at some point during the course of illness. Medication administration will require use of another route. Intramuscular routes of administration are not appropriate as they are painful and may be unreliable in terms of absorption.

The SQ route is the preferred route of administration for palliative care patients, for the following reasons:

1. Complications of use of this route (including redness, tenderness or inflammation at the insertion site, leaking needles and catheter malfunction) are rarely reported (Letizia, Shenk & Jones, 2000).
2. A small-gauge needle is only required at the time the SQ site is established, reducing the risk of needle-stick injuries, particularly with intermittent administration of SQ medications (Dawkins, Britton, Johnson, Higgins & Dean, 2000).
3. Infusions can be started and stopped with little risk to the patient of thrombosis or major bleeding (Steiner & Bruera, 1998).
4. The SQ route is relatively easy to manage in the home setting (Steiner & Bruera, 1998).
5. Infusions can be safely administered by gravity, thereby avoiding the need for infusion pumps (Steiner & Bruera, 1998).



Preferred injection sites include:

- Upper arms
- Abdomen
- Anterior aspect of thighs
- Above scapula
- Subclavicular chest wall

Site should be:

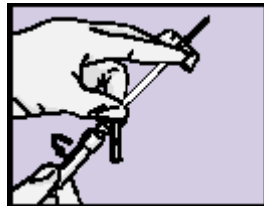
- easily accessible
- free of lesions
- away from large vessels, joints and bones
- away from edematous tissue that may alter medication/ fluid absorption

5. Don clean gloves.

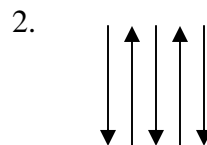
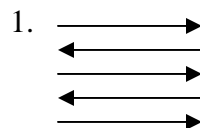
6. Attach Interlink syringe cannula to syringe prefilled with saline.

[Note: This syringe will be reserved to later flush the tubing. Priming the SQ infusion device prior to insertion is not required]

7. Holding the catheter as illustrated, rotate the safety barrel as shown to loosen needle inside catheter.



8. Cleanse selected insertion site with the first side of the chlorhexidine 2% with alcohol swabstick in a right to left manner (see diagram 1) for 15 seconds. Flip chlorhexidine 2% with alcohol swabstick over and cleanse the insertion site for 15 seconds in an up and down manner (see diagram 2). Allow the cleansed area of skin to dry for one minute before proceeding.



9. Remove protective shield from needle.

10. Using thumb and index finger to create a roll of tissue of approximately 2.5 cm, bunch skin around selected insertion site.

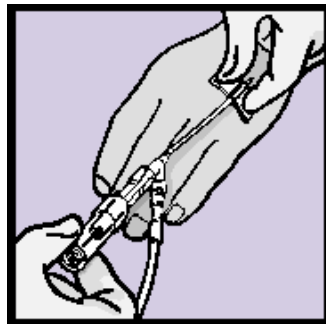


11. Grasping and holding pebbled side of the device's wings as illustrated with bevel up and at a 45-degree angle to skin, insert the entire length of the needle into the skin.



12. If blood appears in the tubing behind wings, remove and discard the device, select new injection site and start over with new device.

13. Stabilize catheter wings as illustrated, grasp safety barrel and pulling in a straight continuous motion, remove needle. Safety barrel will come off, exposing the injection cap.



14. Immediately dispose of the safety barrel containing the contaminated needle into an appropriate sharps container.

15. Remove the existing injection cap with a gentle twisting motion and attach an Interlink needle-less injection cap.

16. Insert the 3ml syringe with Interlink cannula into the injection cap and gently draw plunger back to assess for blood return.

- If blood appears in the tubing, remove and discard the SQ injection device, select a new injection site and start over.

- If no blood appears in the tubing, instill 0.5 ml Normal Saline to flush the tubing.

17. Remove the syringe from the injection cap and discard.

18. Cover the insertion site, hub and wings with a transparent moisture-responsive dressing.



19. Loop excess tubing and secure with a transparent moisture-responsive dressing to prevent tension and possible dislodgement of the infusion device.
20. Nurse who established the SQ site writes the date of insertion, their name and signature on the green SQ line label.

PART II: Intermittent Subcutaneous Medication Administration:

A physician's order is required prior to establishing a SQ route and prior to administering medication/ fluids via the SQ line.

Note: More than one SQ site is required for multiple medications that are not compatible (see Appendix A). Ensure that each site is clearly labeled as to which medication is being administered through the site.

1. Determine whether there is an existing SQ site, or whether one must be established. If a SQ site needs to be established, refer to Part I of these procedures.
2. Obtain necessary equipment and supplies including:
 - a. 3 – alcohol swabs
 - b. Medication as ordered
 - c. Syringe(s) for drawing medication(s)
 - d. 2 – Interlink syringe cannulas (one for medication syringe and one saline flush syringe)
 - e. 0.9% Sodium Chloride (Normal Saline) for injection (prefilled)
3. Wash hands thoroughly for 30 seconds
4. Explain procedure and expected outcomes to patient.
5. Following the physician's orders, draw up medication in a syringe and attach an interlink cannula.
6. Assess the SQ insertion site pre- and post-medication administration for signs and symptoms of possible difficulties including: pain/ tenderness, inflammation, bruising, edema, hardness, heat, exudates/ leaking, discharge, itching, burning, unresolved blanching, necrosis and cannula displacement. Change the injection site immediately if any of these signs and symptoms are present.
7. Cleanse the interlink injection cap using 2 – 3 alcohol for a total of 30 seconds.
8. Insert the medication syringe into the injection cap and gently draw back on the plunger.



- If blood appears in the tubing, remove and discard the subcutaneous injection device, select a new injection site and establish a new SQ site (to minimize patient discomfort, if a new SQ site is required, aspiration is done on first injection, when the SQ line is re-inserted only)
- If no blood appears in the tubing, instill the medication, being certain to not exceed the maximum 2 ml (excluding flush) per administration.

To help optimize medication absorption and patient comfort, the maximum amount of medication to be administered at one time (excluding flush) is 2 ml.

To ensure that the 2 ml limit is not exceeded:

Attempt to obtain a more concentrated preparation of the ordered medication to ensure that the maximum amount of medication administered does not exceed 2 ml. If this is not possible, then:

Administer 2 ml of the ordered medication, wait 15-20 minutes. If the medication has not absorbed after this time (i.e. presence of palpable “bump” indicating incomplete absorption), decide if a second site is required for future doses and / or wait another 15-20 min and then administer the remainder of the medication (no more than 2 ml at one time).

9. Instill the 0.5 ml Normal Saline flush.

10. Complete required documentation, including any adverse effects or difficulties encountered.

PART III: Continuous Subcutaneous Administration of Medications or Fluids

A physician’s order is required prior to establishing the SQ route and prior to administering medication/ fluids via the SQ route.

The IV tubing with cassette and the medication bag must be changed every 7 days or sooner, if necessary.

1. Determine whether there is an existing SQ site, or whether one must be established.
 - If a SQ site needs to be established, refer to Part I of these procedures.
 - Ensure proper placement and patency of an existing SQ site prior to use.
 - To check a previously established SQ site:
 - i. Attach the Interlink syringe cannula to a 3 cc syringe.
 - ii. Cleanse the Interlink injection site at the end of the SQ line using 2-3 alcohol swabs for a total of 30 seconds.



- iii. Insert the interlink cannula of the syringe into the Interlink injection site and gently pull back on the plunger.
 - If blood appears in the tubing, remove and discard the SQ injection device, select a new injection site and establish a new SQ site (to minimize patient discomfort, if a new SQ site is required, aspiration is done on first injection, when the SQ line is re-established only)
 - If no blood appears in the tubing, instill the medication, being certain to not exceed the maximum 2 ml (excluding flush) per administration.

2. Obtain necessary equipment and supplies to initiate the infusion including:
 - a. 6 – alcohol swabs
 - b. 1 - Interlink threaded lock cannula (connector)
 - c. IV tubing with “cassette” for use with GemStar Pump
 - d. IV bag of ordered medication/ fluid
 - e. 1 syringe prefilled with 0.9% Sodium Chloride (Normal Saline)
 - f. 1 – Interlink syringe cannula
 - g. Abbott GemStar Pump
3. Wash hands thoroughly for 30 seconds.
4. Explain procedure and expected outcomes to patient.
5. Ensure that air is expelled from the IV medication/ fluid bag and that no air bubbles remain.

Medications have been cooled, can “outgas” as they heat up to room temperature, causing air bubbles in the IV bag. Should there be air in the bag, it will need to be removed.

To remove air: Cleanse the IV medication / fluid bag access port with 2-3 alcohol swabs for a total of 30 seconds. Being careful not to puncture the sides of the access port, use a needle and syringe to withdraw air from the IV bag. If you inadvertently puncture the med/fluid bag discard all equipment used and start over. Contact the pharmacy that has supplied the medication.

Maintaining the sterility of all connections:

6. Connect the Interlink threaded lock cannula to the IV tubing.
7. Connect the IV tubing to the IV medication/ fluid bag.
8. Insert the cassette on the IV tubing into the pump, and prime the pump.
9. Program the pump to deliver the medication/ fluid as ordered



10. Connect the Interlink threaded lock cannula from the IV tubing to the Interlink injection cap on the SQ device, and start the infusion.
10. Ensure the green SQ line label is located next to the SQ site.
11. Complete required documentation, including medication/ fluid being administered, time infusion initiated, rate of infusion, bolus dose information (if included in the physician order) and any adverse effects or difficulties encountered.

Additional Nursing Responsibilities Regarding Continuous Infusions of Medications/ Fluids:

It is the responsibility of the visiting Registered Palliative Care Nurse to routinely assess the SQ site and to ensure that the medication/ fluid infusion is in accordance with the medical orders. Teach the family and/or significant others to monitor the subcutaneous site in the absence of the nurse.

The Registered Palliative Care Nurse is responsible for insuring the necessary amounts of the prescribed medication/ fluid are available.

Specific information regarding the Abbott GemStar Pump is provided in the GemStar Pump Clinician Reference Guide, available in the Palliative Care Program Coordination Centre.

In the event of a problem with a continuous infusion (including the pump, tubing or other questions about the infusion), the visiting Palliative Care Visiting Nurse is to contact the following individuals in the order listed below:

- During office hours – the Palliative Care Coordinator or Palliative Care Clinical Nurse Specialist
- On Weekends, holidays and evenings - the Evening Palliative Primary (EPP) nurse and Day Palliative Primary (DPP) nurse
- The Abbott GemStar 24-hour Clinical Support Line @ 1-800-338-7867 (extension 333) – this telephone number is also on the back of the GemStar Pump Clinician Reference Guide
- Pharmacy that provided the GemStar Pump to the patient



PART IV: Discontinuation of a Continuous Subcutaneous Administration of Medications or Fluids

1. Unless the infusion is being temporarily discontinued to allow for a change in SQ site, a medical order is required prior to discontinuing a continuous SQ infusion.
2. Obtain necessary equipment and supplies including:
 - a. 3 – alcohol swabs
 - b. Clean gloves
 - c. 1 prefilled syringe with 0.9% Sodium Chloride (normal saline for saline flush), if SQ injection device remaining in situ
 - d. 1 – Interlink syringe cannula, if SQ injection device remaining in situ
3. Wash hands thoroughly for 30 seconds.
4. Explain procedure and expected outcomes to patient and family.
5. Stop infusion.
6. If leaving SQ injection device in situ for intermittent administration of medications, remove the Interlink threaded lock cannula from SQ injection device. Utilize pre-filled syringe (normal saline) and attach Interlink cannula to syringe. Cleanse Interlink injection cap using 2 – 3 alcohol swabs for a total of 30 seconds. Insert Interlink cannula into injection cap and instill 0.5 ml of Normal Saline. Ensure the green SQ line label is located next to the SQ site.
7. Discard used equipment and complete required documentation in patient's medical record.
8. If SQ injection device to be removed, refer to next section entitled "Removal of a Subcutaneous Injection Device".

PART V: Removal of a Subcutaneous Injection Device

1. Obtain necessary equipment and supplies including:
 - a. Clean gloves
 - b. 1 – 2x2 gauze pad
 - c. Adhesive bandage prn
2. Wash hands thoroughly for 30 seconds.
3. Explain procedure and expected outcomes to patient and family.
4. Don clean gloves



5. Remove green SQ label and transparent dressings from existing SQ site.
6. Having 2x2 gauze dressing readily accessible, pull SQ injection device out.
7. Using 2x2 gauze, apply gentle pressure over insertion site.
8. Former SQ insertion site may be left open to air or covered by an adhesive bandage, if required.
9. Complete required documentation in patient's medical record.

PART VI: Special Note Regarding Pediatric Patients and Insuflon Catheters

For pediatric patients (and other special patient circumstances approved by the Palliative Care Program Director, Medical Director or their delegates), an Insuflon cannula must be used for the subcutaneous administration of medication.

Rationale for using the Insuflon cannula in pediatric and other special circumstances include:

- the cannula is flush with the skin;
- the length of the soft flexible cannula is short and is only 25 G in diameter;
- the self-sealing membrane can be used to access the device for at least 75 injections;
- the cannula is easy to insert,
- the Insuflon does not require flushing after insertion or following medication administration (as a result however, only medications that are known to be compatible may be instilled through a single Insuflon otherwise another site must be initiated).

Procedure for Insertion of Insuflon Catheter:

A physician's order is required prior to establishing a SQ route and prior to administering medication/ fluids via the Insuflon.

1. Obtain necessary equipment and supplies including:
 - a. 1-Insuflon Catheter with accompanying adhesive
 - b. 1-Chlorhexidine 2% **with** alcohol swabstick
 - c. Clean, disposable gloves
 - d. Sharps Disposal Container
2. Wash hands thoroughly for 30 seconds.
3. Explain procedure and expected outcomes to patient and/ or family.



4. Select an appropriate SQ insertion site (see Appendix A):

Preferred injection sites include:

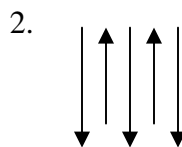
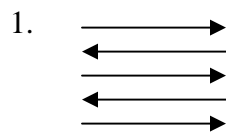
- Upper arms
- Abdomen
- Anterior aspect of thighs

Site should be:

- easily accessible
- free of lesions
- away from large vessels, joints and bones
- away from edematous tissue that may alter medication/ fluid absorption

5. Don clean gloves.

6. Cleanse selected insertion site with the first side of the chlorhexidine 2% with alcohol swabstick in a right to left manner (see diagram 1.) for 15 seconds. Flip chlorhexidine 2% with alcohol swabstick over and cleanse the insertion site for 15 seconds in an up and down manner (see diagram 2). Allow the cleansed area of skin to dry for one minute before proceeding.



7. Remove protective shield from needle.

8. Using thumb and index finger to create a roll of tissue of approximately 2.5 cm, bunch skin around selected insertion site.

9. Grasping and holding pebbled side of the device's wings as illustrated with bevel up and at a 45-degree angle to skin, insert the entire length of the needle into the skin.

10. Once inserted, remove the steel needle and immediately discard into an approved sharps container.

11. Apply the accompanying adhesive. Insure that the self-sealing membrane for injections is accessible and left uncovered (see Appendix C)

Procedure for Administering Medication into an Insuflon:



1. Determine whether there is an existing SQ site, or whether one must be established. If a SQ site needs to be established, refer to Part I of these procedures.
2. Obtain necessary equipment and supplies including:
 - a. 3 – alcohol swabs
 - b. Medication as ordered (in syringe with needle attached)
3. Wash hands thoroughly for 30 seconds
4. Explain procedure and expected outcomes to patient.
5. Following the physician's orders, draw up medication in a syringe and insure there is a needle.
6. Assess the SQ insertion site pre- and post-medication administration for signs and symptoms of possible difficulties including: pain/ tenderness, inflammation, bruising, edema, hardness, heat, exudates/ leaking, discharge, itching, burning, unresolved blanching, necrosis and cannula displacement. Change the injection site immediately if any of these signs and symptoms are present.
7. Cleanse the self-sealing membrane with 2 to 3 alcohol swabs for a total of 30 seconds.
8. Access the self-sealing membrane by inserting the needle and rotating gently as you advance it. Insert the needle to a maximum of half way (the needle must penetrate the membrane by at least 1/8" (3mm) and not more than 3/8" (10mm). **DO NOT USE EXCESSIVE FORCE.**
10. Complete required documentation, including any adverse effects or difficulties encountered.

Removal of Insuflon Catheter:

When removing an Insuflon begin peeling at catheter end of the foam pad. If there is remaining adhesive please use appropriate remover for same.



REFERENCES

Dawkins, L., Britton, D., Johnson, I., Higgins, B., & Dean, T. (2000). A randomized trial of winged Vialon cannulae and metal butterfly needles. *International Journal of Palliative Nursing*, 6(3), 110-116.

Letizia, M., Shenk, J., & Jones, T. D. (2000). Intermittent subcutaneous injections for symptom control in hospice care: A retrospective investigation. *The Hospice Journal*, 15(2): 1-11.

Mitten, T. (2001). Subcutaneous drug infusions: A review of problems and solutions. *International Journal of Palliative Nursing*, 7(2), 75-85.

Steiner, N. & Bruera, E. (1998). Methods of hydration in palliative care patients. *Journal of Palliative Care*, 14(2):6-13



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Appendix A

Subcutaneous Medication Compatibility Information

A compatibility chart for subcutaneous medications is not included as part of this policy. Since changes are continuously made to the compatibility chart, updated compatibility charts will be handed out to the Palliative Care Home Visiting Nursing Team at their monthly meetings. The compatibility chart will contain the date of last revision.

When administering more than one medication, ensure medications to be administered are compatible with one another. If the medications are incompatible, flushing with normal saline between medications is required. Should incompatible medications be administered frequently, the establishment of an additional subcutaneous site should be considered. Each site should be clearly labeled as to which medication is to be administered in that site.

Use the compatibility chart as the guide for determining medication compatibility. Compatible drugs can be given together (one given in the line immediately after the other, with no flush needed between the medications), as long as the total volume does not exceed 2 ml (excluding normal saline flush).



Appendix B Subcutaneous Insertion Sites

Shaded areas are areas that can be used to insert an over-the-needle cannula for a subcutaneous site.

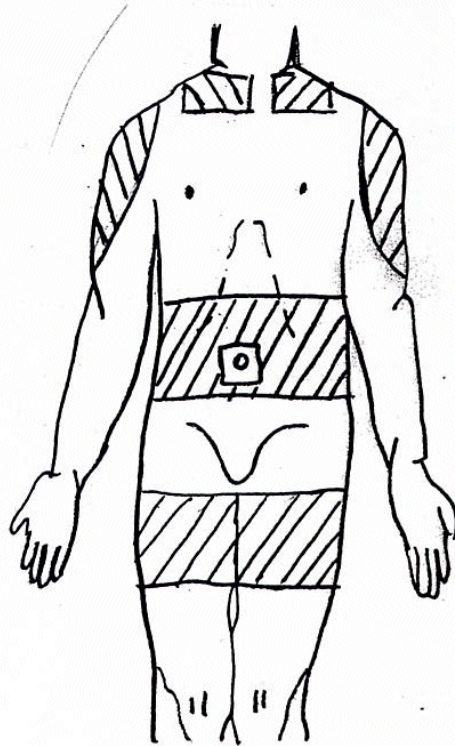
OUTER ARM

Do not use the arm site for hypodermoclysis

ABDOMEN

Avoid in presence of tense abdominal distention

THIGH



SUBCLAVICULAR AREA

Avoid when patient:

- has lung disease
- is active (risk of pneumothorax)

Avoid using bilateral chest sites

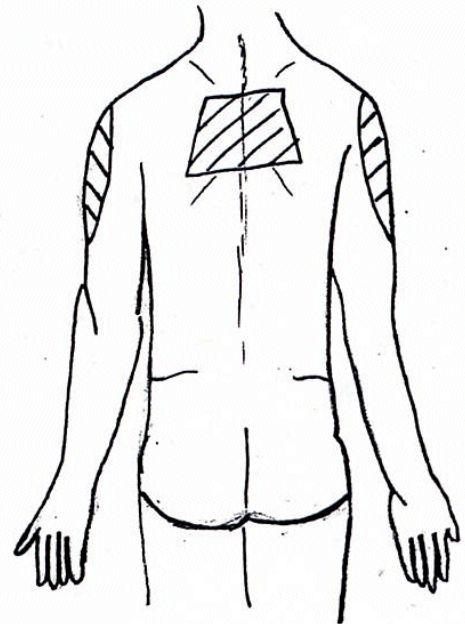
This site should be last choice

Ensure caution is taken when using the subclavicular space as the insertion site. In a cachectic individual there may be a small amount of tissue between the chest wall and the underlying lung, which results in the risk of a pneumothorax. To decrease this risk, pull the skin away from the chest wall and insert the needle at a shallow angle or choose a different site for insertion.

UPPER BACK

Use when:

- other sites are unsuitable
- patient confused



The following areas should be **avoided** when inserting a subcutaneous over-the-needle cannula:

- Areas with lymphodema or edema
- Areas that have too little subcutaneous tissue
- Areas with broken skin
- Skin sites that have recently been irradiated
- Sites with infection or inflammation present
- Area with bony prominences
- Tumor sites
- Skin folds



Appendix C Insuflon Cannula Diagram

