Subcutaneous Access Devices

The subcutaneous (SQ) route of medication administration provides appropriate management of symptoms for patients who are unable to take medications through other routes of administration. The over-the needle catheter (e.g., BD Saf-T-Intima® or Smith's Jelco®) or the winged steel needle (e.g., Terumo Surflo® Winged Infusion Set or BD Safety Lok®) are commonly used to administer medications via the SQ route. Alternately, a button or patch type SQ infusion set may also be available (e.g., Neria® or Thalaset®). Always follow infusion set specific instructions for insertion and maintenance of the SQ site. Basic sample instructions for subcutaneous access device (SAD) procedures are below.

Indications

1. Circumstances that preclude or compromise oral administration:
    a. Dysphagia – due to neuromuscular weakness or mechanical obstruction
    b. Decreased level of consciousness
    c. Intestinal obstruction
    d. Nausea and vomiting
2. Symptom control crisis requiring rapid and reliable medication administration and absorption.
3. Poor or variable compliance:
    a. Dementia
    b. Agitated delirium, with paranoia and non-compliance
    c. Personality issues

Inserting a subcutaneous access device (SAD)

Equipment needed

- Alcohol swabs; antimicrobial solution (e.g., chlorhexidine, povidone-iodine, isopropyl alcohol)
- Skin barrier film (e.g., Skin Prep Protective Barrier Wipe), 25 gauge or 27 gauge SAD
    - Separate SAD for each medication to be injected/infused
- Transparent semipermeable membrane (TSM) dressing
- Needleless connector (also known as end cap, injection cap, or injection port)
- Catheter stabilization device or Tape
- Non-sterile gloves; sharps container

Procedures

1. Wash hands, put on gloves. Explain the procedure to the patient and caregiver.
2. Assemble the equipment at a convenient work area.
3. Assist the patient to a comfortable position.
4. Attach needleless connector (NC) to end of SAD.
5. Draw up approximately 0.25 mL of prescribed medication with syringe.
6. Inject medication into end NC until NC and SAD are filled.
7. Cleanse the selected site with antimicrobial solution. Allow to air dry. If povidone-iodine is used it must remain on skin at least 2 minutes.
8. Apply skin barrier film around area surrounding anticipated insertion site.
9. Insert SAD into subcutaneous space, with the bevel up, using a 45 degree angle.
10. Secure SAD with a catheter stabilizing device. Cover site, with TSM dressing, so that the skin over the needle is visible and the NC is accessible for injections.
11. At the site, write the time, date of insertion, medication and concentration, and your initials.
12. Discard disposable items in a plastic trash bag. Place the used needles and syringes in a sharps container.
13. Document procedure and patient's tolerance of procedure.
14. Before each medication injection, inspect the needle site for redness, or dislodgement of the needle.
15. If needle site is reddened, needle dislodged, or medication leaks around needle, insert new SAD at a different body site.
16. Change SAD site based on clinical indication.

Signs of Infection, Cannula Misplacement, or Overuse of Site
Leaking, redness, exudate, localized heat, localized inflammation, pain, tenderness, hardness, burning, swelling, scarring, itching, bruising, unresolved blanching, or necrosis.

If Administering More than One Medication
Establish an additional SQ site for each new medication or if there is a change in the concentration of the current medication. Label and color code each site as to which medication is to be administered in that site.

Amount of Medication to Be Administered in a Single Injection
The maximum amount of medication to be administered at one time is 3-5 mL. This will allow for optimal absorption and comfort for the patient. *Do not flush the SAD*.

Instilling Medications through SAD (Intermittent Push)

Equipment needed

- 3 mL syringes
- Alcohol swabs
- Medication
- Non-sterile gloves

Procedures

1. Wash hands, put on gloves. Explain procedure to patient and family
2. Cleanse injection cap that is attached to SAD tubing, with alcohol swabs.
3. Insert the syringe needle containing medication into the NC. Gently draw back on the plunger. If blood appears in the tubing, remove the syringe, discard medication, and remove the SAD. Restart the SAD in a different site in order to administer the medication.
4. If no blood appears in the SAD line, instill the medication into the SQ site. Discard used equipment.
5. Document medication given, any adverse effects or difficulties encountered, and patient tolerance of the procedure.

Initiating a Continuous SQ Infusion

Equipment needed

- Alcohol swabs
- Medication in appropriate cassette/IV bag
- Continuous infusion pump
- 3 mL syringe with 1 mL normal saline

Procedures

1. Wash hands, put on gloves.
2. Explain procedure to patient and family
3. Prime the tubing and set the program as ordered by the physician. Insert SQ catheter or use existing site.
4. Cleanse NC with alcohol swabs
5. Insert the syringe containing normal saline (0.5 mL) into the injection cap. Gently draw back on the plunger. If blood appears in the tubing, remove the SAD and discard. Restart the SAD in a different site.
6. If no blood appears in the SQ site extension tubing, attach the primed tubing and start the infusion.
7. Discard the syringe in the appropriate container and discard the other supplies used.
8. Ensure the “SQ Line” identification sticker is located by the SQ site.
9. Document the procedure, medication that is being administered, time of initiation of infusion, rate of infusion, bolus dose information (if included in the physician’s order), and patient tolerance to the procedure.

Medications Acceptable for SQ Administration

0.9% or 0.45% Saline solution (NS or ½NS)	Glycopyrrolate	Metoclopramide
2.5% or 5% Dextrose solution (D5W)	Haloperidol	Methadone±
Lactated Ringer's solution*	Heparin	Midazolam*
Dexamethasone	Hydromorphone	Morphine
Dexmedetomidine*	Ketamine±	Naloxone
Diphenhydramine	Ketorolac	Octreotide*±
Fentanyl*	Lidocaine*	Ondansetron
Furosemide	Lorazepam	Phenobarbital±

** studied for use in pediatrics; ± possible irritant use cautiously in pediatric patients*

Medications *Not Recommended* for SQ Administration*

Chlorpromazine	Hypertonic solutions
Diazepam	Prochlorperazine
Hydroxyzine	Promethazine

** irritating to SQ tissue, high risk of pain, injection site reaction, and/or tissue damage*

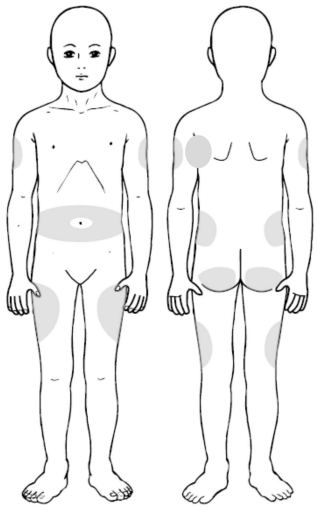
Possible SQ Insertion Sites (Shaded areas below)

- Outer arm (do not use for hypodermoclysis)
- Abdomen (avoid in presence of tense abdominal distention such as ascites)
- Anterior thigh
- Sub-clavicular area (avoid when patient has lung disease or risk of pneumothorax)
- Upper back (use when other sites are unsuitable or when patient is confused)

Areas to AVOID for SQ Insertion

- Areas with lymphedema, edema, or decreased sensation (e.g. CVA)
- Areas with minimal SQ 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

Pediatric SQ Sites



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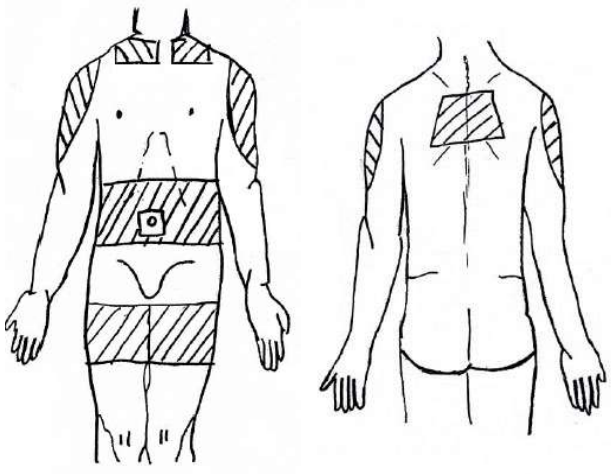
Adult SQ Sites



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Subcutaneous Rehydration Therapy (SCRT, Hypodermoclysis)
Volume of subcutaneous fluid administered is dependent on age, weight, clinical condition of the patient. Maximum daily volume recommended for pediatrics is 25mL/kg/day, not to exceed a flow rate of 2mL/min

Pediatric SCRT Parameters

- Maximum recommended infusion rate: 2 mL/min
- Infants & children < 3 years: maximum 200 mL per infusion
- Children ≥ 3 years & adolescents: rate and volume should not exceed those of IV infusions
- Infusion of more than 3L in 24 hours not recommended in children or adults

If using gravity: Allow flow to freely adjust to gravity and rate of tissue absorption, approximately 1mL/min
Hyaluronidase: recombinant human hyaluronidase (Hylenex®, Vitrase®). If using, 15 units added to each 100mL of replacement fluids, ***or*** 150 units SQ bolus prior to initiation of SCRT isotonic fluids infusion of 1000 mL

Equipment needed

- Alcohol swabs
- Medication in appropriate cassette/IV bag
- Continuous infusion pump, or gravity assist
- 3 mL syringe with 1 mL normal saline

Procedures

1. Wash hands, put on gloves. Explain procedure to patient and family.
2. Prime the tubing and set the program as ordered by the physician. Insert SQ catheter or use existing site.
3. Cleanse injection site cap with alcohol swabs
4. Insert the syringe containing normal saline (0.5 mL) into the injection cap. Gently draw back on the plunger. If blood appears in the tubing, remove the SAD and discard. Restart the SAD in a different site.
5. If no blood appears in the SQ site extension tubing, attach the primed tubing and start the infusion.
6. Discard the syringe in sharps container and discard the other supplies used.
7. Ensure the “SQ Line” identification sticker is located by the SQ site.
8. Gentle massage can be used to enhance absorption of fluid pocketing.
9. Document the procedure, medication that is being administered, time of initiation of infusion, rate of infusion, and patient tolerance to the procedure.

Hypodermoclysis Considerations

Advantages	Disadvantages
• Can prevent hospitalization of patients with dehydration • Procedure is safe, simple, and less expensive than intravenous (IV) hydration • May be performed in patients with collapsed, fragile, or thrombosed veins • Low risk of fluid overload • Patients experience a low incidence of pain or discomfort during administration • Low risk of infection or thrombophlebitis	• Limitation of solutions used (see chart on previous page) • Not recommended for patients with coagulopathies • Will not correct severe electrolyte abnormalities • Amount of fluid to be infused in 24 hours is limited (3L max recommended for adults) • Slight risk of pain and infection at infusion site • Fluid collection at injection site (resolve with gentle massage)

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