

# Subcutaneous Butterfly Catheter: Insertion, Maintenance, and Medication Administration

## Site Applicability

All PHC Acute Care and Residential Sites

## Practice Level

*Basic:* RN, RPN, LPN, Employed Student Nurse (ESN)

## Requirements

- site used for *intermittent* medication administration is changed every 4 days and PRN
- site used for *continuous* infusion is changed every 48 to 72 hours and PRN
- If the subcutaneous butterfly catheter is being used for a *continuous* infusion, change the infusion set tubing every 96 hours

## Need to Know

- Consider the activity level of the patient when choosing the site – it may dislodge in a restless patient
- Use one site for each medication and strength (concentration)
- Ensure each site is accurately labelled with date, medication name, and concentration
- The maximum rate of infusion via subcutaneous route is 1 mL/ minute
- The maximum volume of medication is 2 mL. Volumes greater than 2 mL may be associated with increased pain at the site and leakage of the medication. If greater volume is required, two sites can be used to deliver the required amount or a different route can be considered
- Max Zero needleless connector volume (0.19 mL) plus Catheter/needle volume (0.22 mL) equals a total volume of **0.41 mL**
- DO NOT FLUSH with NS at any time (e.g. before or after the procedure)
- Do not aspirate after injecting medication
- The subcutaneous butterfly catheter should be removed at completion of therapy or when no longer indicated.

Patients should be assessed to determine suitability for subcutaneous butterfly catheter insertion. A subcutaneous butterfly may be indicated for the following reasons:

- Frequent subcutaneous medication doses required; avoids multiple injections
- Required rapid absorption
- Symptoms unresponsive to oral medication

- Inability to swallow
- Altered GI absorption of oral medication / persistent nausea / vomiting
- Alternative to IM injections
- Medication administration for pain and symptom management for patients receiving palliative care, particularly in last days to hours of life.

Recommended sites:

- Anterior upper chest (avoid the breast and axilla)
- Abdomen, at least 2.5 cm away from the umbilicus (tissue perfusion is increased in the central portion of the body versus the periphery)
- Thighs
- Lateral (outer) aspect of upper arm (deltoid region)
- Scapular area (recommended site in the restless / agitated patient – more difficult for patient to pull catheter out)

## Equipment and Supplies

1. 24 gauge / 0.75 inch BD Saf-T-Intima™ catheter
2. BD Max Zero™ Needleless Connector (NC) or cap ([Appendix B](#))
3. Luer Lock TB syringe (1 mL)
4. Transparent dressing, e.g. 3M Tegaderm™ with label (add drug, concentration & date)
5. Alcohol swabs
6. Non-sterile gloves
7. Medication for injection / priming – see section on “[Priming the Tubing](#)” for detailed steps

## Procedure

See [Appendix A](#) for step by step instruction with pictures

## Insertion of Subcutaneous Butterfly Catheter

Step	Rationale
<ul style="list-style-type: none"> <li>Check prescriber's orders, confirm patient identification, and explain the procedure to the patient /family.</li> </ul>	
<ul style="list-style-type: none"> <li>Perform hand hygiene</li> </ul>	
<ul style="list-style-type: none"> <li><b>Do not attempt to prime needle prior to insertion</b></li> </ul>	<ul style="list-style-type: none"> <li>There is no way to prime equipment until the stylet is removed</li> </ul>
<ul style="list-style-type: none"> <li>Select appropriate site (see <a href="#">Need to Know</a> for recommended sites)</li> <li>Select skin free of infection, bruising, and scar tissue</li> <li>Clip hair if necessary and perform hand hygiene again</li> </ul>	<ul style="list-style-type: none"> <li>Clipping versus shaving reduces the chance of infection, as shaving can cause nicks in the skin, serving as a portal of entry for bacteria</li> </ul>
<ul style="list-style-type: none"> <li>Clean site with alcohol swab for at least one minute: use a circular motion, beginning in the centre of the site</li> <li>Do not touch cleansed site</li> <li>Allow the site to air dry for one minute</li> </ul>	
<ul style="list-style-type: none"> <li>Label the transparent dressing with medication name, <b>concentration (strength)</b>, and date prior to insertion (while skin is air drying)</li> <li>Apply non-sterile gloves</li> </ul>	<ul style="list-style-type: none"> <li>A properly labelled dressing ensures catheter is changed within recommended time frame, and adheres to one-medication-per-catheter recommendation. <b>It is important to label with the correct information</b> to avoid potential under/over dosing with incorrect drug /concentration.</li> </ul>
<ul style="list-style-type: none"> <li>Open cover of Saf-T-Intima package by pulling it all the way to the end, to expose the entire product</li> <li>Grasp product by the (yellow) butterfly wings</li> </ul>	<ul style="list-style-type: none"> <li>Removing product by pulling white pebbled tube may manipulate the position of the needle, affecting the product</li> </ul>
<ul style="list-style-type: none"> <li>Remove white clamp</li> </ul>	<ul style="list-style-type: none"> <li>Not required and may irritate patient's skin</li> </ul>
<ul style="list-style-type: none"> <li>Remove transparent needle cover and inspect the product</li> </ul>	

Step	Rationale
<ul style="list-style-type: none"> <li>Ensure pebbled surface of butterfly wings is facing down and bevel is facing up</li> <li>If the bevel is not facing up, turn the needle by keeping hold of the wings and turning the pebbled end of the white plastic tube until the bevel is facing up</li> </ul>	<ul style="list-style-type: none"> <li>The pebbled surface against the skin allows air to circulate</li> <li>Ensuring the bevel is up is more likely to result in the medication being delivered into the subcutaneous versus intramuscular tissue</li> </ul>
<ul style="list-style-type: none"> <li>Grasp pebbled surface of wings and hold firmly</li> <li>Lift a skin fold with the thumb and the index finger, insert the catheter, bevel up, at a <b>30 to 45 degree angle</b> [20 to 30 degree angle if patient is emaciated &amp; 45 to 60 degrees if patient is obese] into subcutaneous tissue</li> <li>Insert the entire catheter <i>right up to wings</i></li> <li>Release the skin fold</li> <li>Press the wings firmly against the skin</li> <li>Apply a transparent dressing, centering over the wings (<a href="#">see image</a>).</li> <li>Remove the stylet by pulling the <b>pebbled end</b> of the white plastic tube with a firm, straight, continuous motion until the stylet is completely removed</li> </ul>	<ul style="list-style-type: none"> <li>Transparent dressing allows for visualization of the insertion site</li> <li>To prevent needle stick injuries the needle is withdrawn into a protective housing, leaving a vialon catheter inside of the patient</li> <li>If stylet is not removed in this fashion, the safety feature will not engage, resulting in a potential needle stick injury</li> </ul>
<ul style="list-style-type: none"> <li>Coil the tubing over the butterfly wings – see picture below- and secure with a piece of tape</li> </ul>	<ul style="list-style-type: none"> <li>Prevents the tubing from getting caught up in linen, preventing accidental removal</li> </ul>
<ul style="list-style-type: none"> <li>Remove the injection cap from the port and replace with a Max Zero™ cap.</li> </ul>	<ul style="list-style-type: none"> <li>The manufacturer's supplied cap is not compatible with our needle-less, closed system.</li> </ul>
<ul style="list-style-type: none"> <li>Dispose of the stylet (white and yellow plastic casing) into the sharps container.</li> </ul>	<ul style="list-style-type: none"> <li>Reduces the risk of needle stick injury if needle accidentally uncovered.</li> </ul>

Step	Rationale
<ul style="list-style-type: none"> <li>Assess the site after medication administration, every shift and PRN for: redness, pain, bruising, leaking, firmness, edema, weeping, bleeding, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Meticulous and routine site inspection is integral to early identification and prevention of site related complications.</li> <li>Hard and painful lumps might indicate a collection of medication, causing a sterile abscess.</li> </ul>

### Priming the Tubing [done post insertion]

Step	Rationale
<ul style="list-style-type: none"> <li>Follow the rights of medication administration</li> </ul>	<ul style="list-style-type: none"> <li>Ensures patient safety</li> </ul>
<ul style="list-style-type: none"> <li>If <b>using the site immediately</b>: Draw up the appropriate dose and concentration of the medication in one syringe and using a second syringe, draw up <b>0.41 mL for the priming volume</b></li> </ul>	<ul style="list-style-type: none"> <li>Catheter cannot be primed prior to insertion, thus, needs to be primed immediately after insertion. This way, tubing and cap will always have <b>0.41 mL</b> of medication ready for next dose.</li> <li>One syringe is dedicated to the patient dose and the other is dedicated for priming</li> </ul>
<ul style="list-style-type: none"> <li>If <b>not using the site immediately</b>: Draw up <b>0.41 mL</b> of the medication the site will be used for, and prime the tubing.</li> </ul>	<ul style="list-style-type: none"> <li>In order to prime both the cap and the catheter <b>0.41 mL</b> is required</li> </ul>



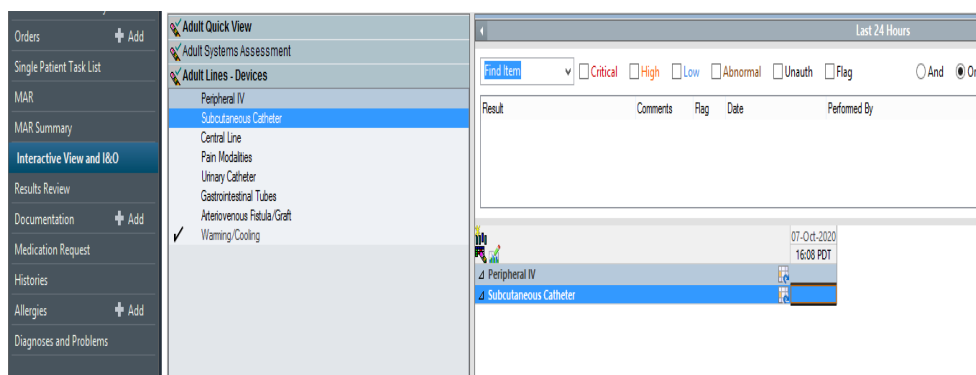
## Administering a Medication

Step	Rationale
<ul style="list-style-type: none"> <li>Select appropriate concentration of medication. Use higher concentration of drug to limit volume of drug injected. Draw up the exact dose of the medication, as per the prescribed order.</li> </ul>	<ul style="list-style-type: none"> <li><b>Ensure priming step has been done first with the same concentration of drug – see above.</b></li> </ul>
<ul style="list-style-type: none"> <li>Follow the rights of medication administration.</li> </ul>	<ul style="list-style-type: none"> <li>Ensures patient safety.</li> </ul>
<ul style="list-style-type: none"> <li>Clean Max Zero™ NC with an alcohol swab.</li> <li>Allow to air dry for one minute.</li> </ul>	<ul style="list-style-type: none"> <li>Maintains aseptic technique.</li> </ul>
<ul style="list-style-type: none"> <li>Attach the syringe directly (luer lock) to the Max Zero™ NC and slowly inject the ordered dose of the medication</li> </ul>	<ul style="list-style-type: none"> <li>No needles or blunt catheter to be used; closed system.</li> <li>Slower injection rates reduce risk of tissue irritation.</li> </ul>
<ul style="list-style-type: none"> <li>Do not flush with NS at any time (e.g. before or after the procedure).</li> </ul>	<ul style="list-style-type: none"> <li>Not needed for subcutaneous method.</li> </ul>
<ul style="list-style-type: none"> <li>Do not aspirate after injecting medication.</li> </ul>	<ul style="list-style-type: none"> <li>There is minimal risk of entering a blood vessel in subcutaneous tissue.</li> </ul>

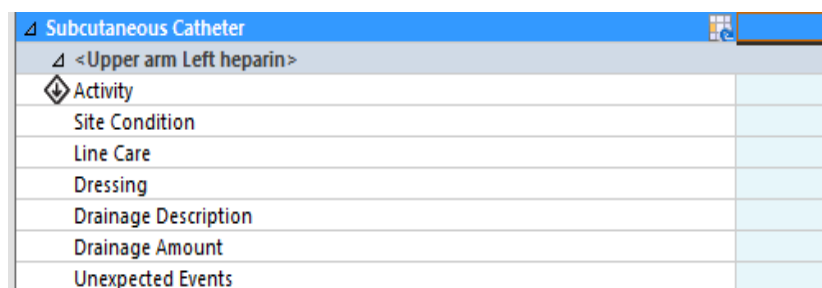
## Documentation

After insertion of a subcutaneous butterfly catheter, document the following information in Power chart:

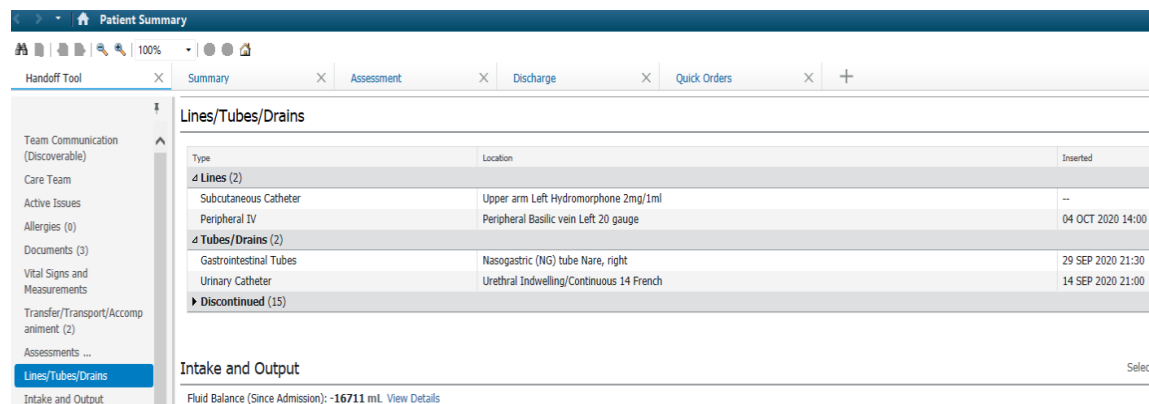
- Under Interactive view, under Adult Lines-Devices band select Subcutaneous Catheter.
- Add a dynamic group for each Subcutaneous Catheter. This includes:
  - Location of the catheter site
  - Medication name and concentration
  - Catheter size



- Once the dynamic group is created, document the insertion, assessment of the site, and the care and management of the subcutaneous catheter as shown below:



- Under situational awareness & planning in Power chart, document the presence of the subcutaneous line and the date for changing the site.
- To view the lines in place, follow the Lines/Tubes/Drains under Handoff Tool in the Patient Summary section as shown below.



6. Ongoing documentation includes:
  - Any assessments related to the medication administration e.g. pain scale, POSS
  - Condition of the site
  - Condition of the dressing
  - Any pain / discomfort / irritation to the site
  - Rationale for changing the site and creation of a new dynamic group if the site is changed.
  - Response to the medication administered
  - Any patient / family teaching provided
7. Documentation on the Medication Administration Record:
  - Date and time the medication is given
8. Discontinuation:
  - When the subcutaneous catheter is no longer required for medication administration, it should be removed as early as possible. After discontinuing the catheter and documenting in the Power chart that it is removed, the dynamic group also needs to be inactivated.

### Patient and Family Education

Teach patient and/or family about the treatment and plan of care including, but not limited to, purpose and expected outcomes and to recognize the signs of possible complications of subcutaneous butterfly and when to alert staff (e.g. signs of infection or pain).

### Related Documents

- Adult [Parenteral Drug Therapy Manual](#)

### References

1. Gabriel, J. (2019). A guide to subcutaneous infusion. British Journal of Nursing, 28(sup14c), 1-7. <https://doi.org/10.12968/bjon.2019.28.Sup14c.1>
2. Elsevier Skills (2021) Medication Administration: Continuous and Intermittent Subcutaneous Infusion. Retrieved 16 December 2021. St. Louis, MO. www. [Elsevier](https://www.elsevier.com/skills)skills.com.
3. Elsevier Skills (2021) Medication Administration: Subcutaneous Injection. Retrieved 16 December 2021. St. Louis, MO. www. [Elsevier](https://www.elsevier.com/skills)skills.com.
4. Vancouver Coastal Health. (2016). Medication Administration, Subcutaneous (intermittent and Continuous). Patient care guidelines PCG M-100, retrieved December 16, 2021.
5. Provincial Health Services Authority. (ND). Continuous Subcutaneous (SC or SUB-Q) Medication or Fluid Infusion, retrieved December 16, 2021 from <http://shop.healthcarebc.ca/phsa/BCWH>



## Appendix A

### Subcutaneous Butterfly Catheter: Insertion and Maintenance

(Saf-T-Intima™ Needle-less System)

#### EQUIPMENT LIST:

- |  |   |
|--|---|
| 1. 24 gauge / 0.75 inch BD Saf-T-Intima™ catheter      | 5. Syringe with blunt plastic cannula or TB syringe / blunt cannula – depends on volume of medication |
| 2. Max Zero Needleless Connector (blue) (NC)           | 6. Transparent dressing: e.g. 3M Tegaderm™, with label (add drug, concentration & date)               |
| 3. Medication for injection                            | 7. Alcohol swabs  |
| 4. Additional <b>0.41</b> mL of medication for priming | 8. Gloves (non-sterile)   |

#### Step 1

- Select site \*\* (see below)
- Clip hair if necessary
- Swab site using circular motion, beginning in the centre
- Allow 1 minute drying time



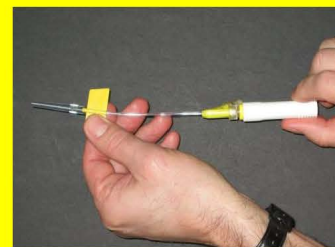
#### Step 2

- Label dressing
- Open cover of Saf-T-Intima by pulling it all the way to the end
- Grasp product by butterfly wings
- Remove white clamp



#### Step 3

- Remove needle's protective cap
- Ensure pebbled surface of butterfly is facing down and bevel is facing up (turn bevel up by rotating end of pebbled white plastic tube)



**Prime after  
insertion**

#### Step 4

- Lift a skin fold
- Grasp pebbled surface of wings and hold firmly



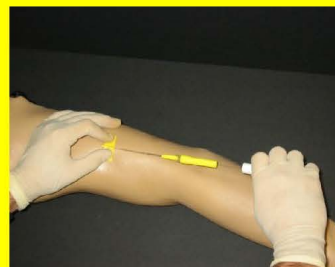
#### Step 5

- With bevel up, completely insert butterfly catheter into S/C tissue at **30 to 45 degree angle** (insert entire catheter right up to wings)



#### Step 6

- Release skin fold
- Press butterfly wings down against skin



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### Step 7

- Remove stylet by pulling end of pebbled white plastic tube with a firm, straight, continuous motion until completely removed



### Step 8

- Coil tubing over butterfly wings
- Apply transparent dressing (e.g. 3M Tegaderm) over the insertion site and butterfly wings – leave end exposed
- Remove the supplied injection cap from the port and replace with Max Zero cap (keeps system closed)

*See picture to the right*

- Dispose of stylet into sharps container



### Step 9 Priming

- Total priming volume **0.41 mL**
- If **using the site immediately**, draw up the appropriate dose and concentration of the medication in one syringe **and** using a second syringe, draw up **0.41 mL** for priming.
- If **not using immediately**: draw up **0.41 mL** of medication and prime the system

Do NOT use a needle or blunt cannula to access the Max Zero NC cap, just attach syringe directly.

**Tip:** a leuer lock tuberculin (TB) syringe will allow you to accurately measure a priming volume of **0.41 mL**

### Administering Medication

- Draw up medication dose
- Administer medication by attaching syringe directly to Max Zero NC cap (direct, luer lock access – no blunt cannula, no needles) – rate of administration should not exceed 1 mL/minute
- Do not aspirate or flush with normal saline (pre or post)

### Documentation – Initial

- Date and time of insertion
- Location of site
- Medication name and strength
- Patient's tolerance of procedure
- Patient / family teaching done

### Documentation – Ongoing

- Condition of site
- Intact dressing
- Any pain / discomfort / irritation
- Response to medication administered

### Documentation – eMAR

- Date and time medication is given and site used

### \*\*Recommended Sites

- Abdomen (at least 2.5 cm from umbilicus)
- Thighs
- Scapular area (good location if patient is confused)
- Outer upper arm (deltoid area)
- Anterior upper chest (avoid breast and axilla)

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## Appendix B

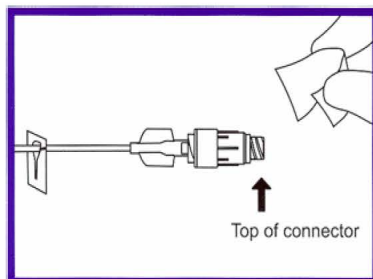


### Max Zero Needleless Connector (NC) Cap For Subcutaneous Butterfly (Saf T Intima)

- ❖ Attach Max Zero NC to end of SC Butterfly (Saf T Intima)
- ❖ Direct luer Lock access – no needles, no blunt cannulas
- ❖ Prime Max Zero NC and Saf T Intima with **0.41 mL**
- ❖ Same cap for central lines, PICCs and peripheral IVs

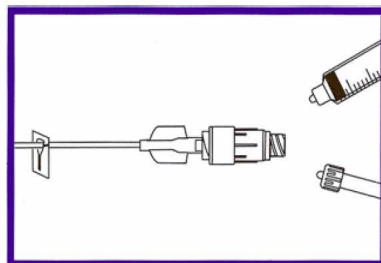


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#### Quick Tips for the Max Zero NC:

- ❖ Always clean the top of the Max Zero NC with an alcohol swab prior to use
- ❖ Do **not** use needles or blunt cannulas to access the NC
- ❖ The Max Zero NC is only accessed with **luer-lock, direct** connections
- ❖ Twist ON the syringe or IV tubing end to secure to Max Zero NC
- ❖ Twist OFF the syringe or IV tubing end to unhook from Max Zero NC



#### **REMEMBER:**

Prime volume for SC butterfly set + cap = **0.41mL**

**No needles, blunt cannulas to access cap**

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<b>First Released Date:</b>	30-JUN-1994
<b>Posted Date:</b>	16-DEC-2021
<b>Last Revised:</b>	16-DEC-2021
<b>Last Reviewed:</b>	
<b>Approved By:</b>	PHC
	Professional Practice Standards Committee
<b>Owners:</b>	PHC
	Medicine/Professional Practice