

## Subcutaneous insulin infusion in Newborn Intensive Care Unit (NICU)

### Procedure Responsibilities and Authorisation

<b>Department Responsible for Procedure</b>	Neonatal Intensive Care Unit
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<b>Target Audience</b>	Registered Nurses
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### Procedure Review History

Version	Updated by	Date Updated	Summary of Changes
2	Leanne Baker	March 2013	3 yearly Update
3	Joyce Mok	July 2016	3 yearly update
4	Joyce Mok	Oct 2019	3 yearly review

## Subcutaneous insulin infusion in Newborn Intensive Care Unit (NICU)

### 1 Overview

#### 1.1 Purpose

To outline the procedure on how to deliver continuous insulin infusion subcutaneously for infants requiring insulin and who have compromised central venous or intravenous access

#### 1.2 Scope

Waikato District Health Board (DHB) nursing staff working in NICU

#### 1.3 Patient group

Babies and infants in NICU

#### 1.4 Definitions

<b>Infusion</b>	Delivery of a medication or fluids via continuously running slow and/or prolonged delivery into a vein or subcutaneous layer, using a syringe drive pump.
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### 2 Clinical Management

#### 2.1 Competency required

Registered Nurse with Waikato DHB Generic IV Certificate and NICU specific Advanced CVL/UAC/PAL certification

#### 2.2 Equipment

- 27g butterfly needle extension set
- Non-sterile gloves
- Trolley cleaned with Tuffie wipes
- Sterile guard and gauze swabs
- Tegaderm™ or Opsite™ transparent dressing
- Steristrips™
- Alcohol-Chlorhexidine prep pad for skin preparation or use aqueous chlorhexidine non-alcohol cleansing agent for infants with fragile skin
- Rubbish bag

Note:

- Insulin solution prepared by 2 nurses as per Waikato DHB Medicine Management Policy (Ref 0318) and NICU drug protocol
- Two person procedure, e.g. second nurse as assistant

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### 2.3 Procedure

#### 2.3.1 Preparation

- Perform hand hygiene.
- Check patient label against medication chart with 2nd nurse to ensure correct identification of patient and prescription.
- Collect equipment and place on trolley.
- Open up paper guard onto trolley and place equipment on clean field.
- Ask assistant to position infant slightly lateral with lateral aspect of thigh accessible and hold infant gently.

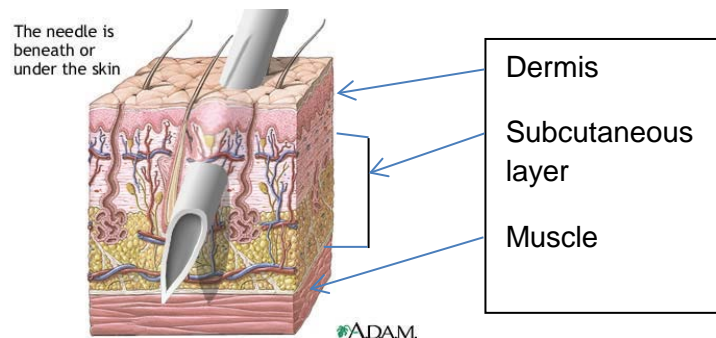
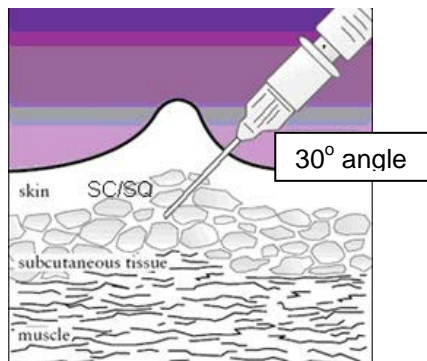


#### 2.3.2 Inserting subcutaneous cannula (butterfly) – refer to diagrams below

- Perform hand hygiene.
- Prime butterfly tubing with labelled pre-prepared insulin solution to ensure no air in tubing.
- Wear clean non-sterile gloves.
- Prepare skin with alcohol-chlorhexidine prep pad or non-alcohol aqueous chlorhexidine cleansing agent for babies with fragile skin, and allow to dry.

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- With your dominant hand, grasp the wings of the catheter and bring them together, pinching firmly.
- Lift skin fold between thumb and forefinger.
- Pinch up the skin between thumb and forefinger so as to lift the adipose tissue and then push the needle in the pinched up tissue at a 30° angle.
- Insert butterfly needle bevel facing upward at a 30° angle running along the lateral aspect of the thigh towards the baby's head, and insert up to the hub.
- Release skin and ensure needle sitting comfortable in place.
- Place the needle with bevel facing up because (1) Preterm babies have little subcutaneous tissue, and (2) to maintain skin integrity and ensure most comfortable placement of needle.
- Draw back gently on syringe to ensure non-venous placement because infusion into a vein could cause blood sugars to drop rapidly.
- Once satisfied with placement, secure the cannula with one Steristrip™ across the hub and cover the insertion site with a transparent dressing to allow good visualisation of whole area.



Transparent dressing

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### 2.3.3 Administering insulin infusion

- Connect infusion to butterfly extension set and place into syringe pump.
- Set delivery rate as prescribed.
- Two nurses to check the correct pump rate prescribed on the General Treatment Sheet to ensure delivery of the correct dose and volume of medication over the correct time.
- Secure extra length of tubing with Duoderm™ base tape and leucoplast thin tape (as done with IV taping) to avoid drag on insertion site and dressing.
- Perform hand hygiene.
- Document insertion date and time on dressing and in infant's medical notes and care plan.
- Subcutaneous butterfly needle set may stay in situ for 72 hours or change earlier if indicated.
- Monitor and document hourly
  - Observations – vital signs
  - Site of insertion: signs of inflammation or infection
  - Volume of insulin infused
- Monitor blood sugar level as prescribed and after dosage change.
- Monitor and record fluid intake and output as per NICU procedures.

### 2.4 Potential complications

- Hypoglycaemia
- Hyperglycaemia
- Extravasation of infusion site

### 2.5 After care

- Dispose of sharps (if replacing a previous cannula) in a designated sharps disposal container.
- Dispose of other rubbish in designated container.
- Perform hand hygiene.

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### 3 Audit

#### 3.1 Indicators\*

- The preparation of the insulin solution follows the requirements in the Medicines Management policy
- The butterfly needle is positioned in accordance with 2.3.2
- Two nurses check the correct pump rate prescribed on the General Treatment Sheet to ensure delivery of the correct dose and volume of medication over the correct time.

### 4 Evidence base

#### 4.1 References

- Wulter Kluwer (2018). *Subcutaneous infusion, continuous (hypodermoclysis)*. Lippincott procedures.

#### 4.2 Associated Waikato DHB Documents

- Waikato DHB Policy: Medicine Management (0138)
- Waikato DHB NICU Drug Guideline: Insulin (2932)

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