



REGIONAL LOCAL HEALTH NETWORKS / RURAL SUPPORT SERVICE

# Work Instruction

## Title: Intravenous Insulin Infusion Preparation and Setup

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RMC LHN Clinical Oversight Governance Committee on: 26/02/2024

Y&N LHN Drug and Therapeutics Committee on: 8/05/2024

**Next review due:** 30/08/2026

**Summary** This work instruction aims to articulate the management of Intravenous (IV) Insulin Infusions in people with diabetes.

**Policy/procedure reference** This work instruction supports the SA Health Digital Health Governance and Investment Framework Policy Directive (2020), the Australian National Diabetes Strategy (2016-2020) and the Rural Support Service Strategic Directions (2020-2021).

**Keywords** Clinical, work instruction, LHN, insulin, infusions, diabetes.

**Document history** Is this a new LHN work instruction? **Y**  
Does this work instruction *amend or update* an existing work instruction? **N**  
Does this work instruction *replace* an existing document? **Y** *Regional LHN Clinical Support Guide Intravenous Insulin Infusion (MR-INF-A and MR-INF-B). Objective Number 2019 – unknown.*

**Applies to** This work instruction applies to all regional LHN Executive, Nursing and Midwifery Directors, Nursing and Midwifery Staff, Credentialed Diabetes Educators, Diabetes Educators, Diabetes Link Nurses and Rural Support Service Diabetes Service Staff.

**Objective file number** New

### Version control and change history

Version	Date	Amendment	Amended by:
1.0	10/08/2023	Original version	Collette Hooper, Nurse Practitioner
1.1	26/02/2024	Links for hand hygiene and aseptic technique	Collette Hooper, Nurse Practitioner

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## 1. Overview/Description

Insulin is a high-risk medication. People with diabetes admitted to hospital and prescribed insulin are at risk of glucose variability, acute medical emergencies (e.g. hypoglycaemia, hyperglycaemia, diabetic ketoacidosis hyperosmolar hyperglycaemia state) and additional adverse outcomes, including death.

Intravenous (IV) Insulin Infusions offer rapid onset and short duration of action and can be titrated frequently to address insulin requirements and/or rapidly changing blood glucose levels.

Accurate monitoring and careful management of inpatients with diabetes prescribed IV insulin infusion will maximise benefit and minimise risk.

This work instruction outlines the requirements for the management of an IV insulin infusion in regional local health network (LHN) hospitals.

## 2. Preparation of IV Insulin Infusions

2.1 Perform Hand Hygiene as per [SA Health Hand Hygiene Clinical Guideline](#)

2.2 Use an Aseptic Technique as per [Lippincott® Solutions.\(oclc.org\)](#)

2.3 Gather the equipment required as per local instructions:

- > Insulin neutral 100units/mL (Actrapid®) 3mL cartridge
- > Syringe driver pump
- > 50unit insulin syringe
- > 50ml leur lock syringe
- > Blunt tip cannula
- > 'Medication added' label
- > Extension tubing
- > IV fluids (usually normal saline at commencement)
- > IV giving set with anti-reflux valve.



2.4 Locate the correct IV insulin infusion chart to be used, either:

- > Intravenous Insulin Infusion Type 1 Diabetes Chart – Adult (MR-INF-T1D) *Appendix A*
- OR**
- > Intravenous Insulin Infusion Type 2 Diabetes Chart – Adult (MR-INF-T2D) *Appendix B.*

2.5 Draw up 50units of insulin neutral 100units/mL (Actrapid®) insulin in a subcutaneous insulin syringe.



2.6 Draw up 49.5mL of 0.9% Sodium chloride (normal saline) in a 50mL leur lock syringe.

2.7 Leave enough space in the saline syringe and inject the insulin into the syringe.  
This will make the solution up to 50mL in total.



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- 2.8 Apply a blunt tip cannula and mix gently.
- 2.9 Attach a 'medication added' label to the syringe stating the quantities added of each medication as above. Concentration = 1unit insulin per 1mL of normal saline (i.e. 50units in 50mL).
- 2.10 Attach extension tubing to the syringe and manually prime the line with the IV insulin/saline solution.



- 2.11 Position the syringe on a syringe driver pump ensuring the flange of the barrel and base of plunger are firmly engaged.



- 2.12 Assemble IV fluids as ordered (usually 0.9% Sodium chloride preferred) using a giving set with an anti-reflux valve.
- 2.13 Prime the line and attach to the person's IV cannula. The IV insulin infusion line **MUST** be attached via a side-line port below the anti-reflux valve on the giving set.
- 2.14 Commence IV insulin infusions and IV fluid infusions as ordered. For regional LHN hospitals using electronic medical records (EMR) order sets, further information is available at [Ordering Adult Insulin Infusions](#).
- 2.15 Nursing/midwifery staff are to document the:
- 2.15.1 date and time in the appropriate column.
  - 2.15.2 blood glucose (BG) is to be graphed with a dot (·) in the centre of the square which coincides with the BG level and connect to the previous dot with a straight line.
  - 2.15.3 numerical value of the BG in the designated row below the graph.
  - 2.15.4 IV insulin infusion rate. Please note: always begin in the **green column** (column 1).
  - 2.15.5 column being used to titrate the IV insulin infusion at that point in time (e.g. column 1, 2 or 3).
  - 2.15.6 check and sign the nursing administration record and initial the hourly rate. Document in the progress note.
  - 2.15.7 blood ketone (BK) if applicable.
  - 2.15.8 initiation of the regional LHN Protocol *Hypoglycaemia in the hospital and community setting*.
  - 2.15.9 initiation of contact with the medical practitioner.

For regional LHN hospitals using electronic medical records (EMR) order sets, further information is available at the [BGL and Insulin Chart Window](#).

- 2.16 Nursing/midwifery staff are to blood glucose (BG) monitor hourly for the duration of the IV insulin infusion unless otherwise stated by the medical practitioner.
- 2.17 Nursing/midwifery staff to consider BG test result and identify if the test result is 'in' or 'outside' (e.g. above or below) target BG range.

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- 2.18 Nursing/midwifery staff to follow the instructions provided on the *IV Insulin Infusion Chart* to either remain in the same column or take action (e.g. moving up or moving down one column as required).
- 2.19 Nursing/midwifery staff are to consult the *Rapid Detection and Response Instructions* for out of target range BG results and action recommendations.
- 2.20 On order of medical practitioner, nursing/midwifery staff to commence insulin therapy and/or alternative diabetes medication at least 4 hours before discontinuing IV insulin infusion.
- 2.21 Nursing/midwifery staff to document cessation (e.g time stopped and volume infusion) of IV insulin infusion on the IV Insulin Infusion Chart's nursing administration record and in the progress record.
- 2.22 All subsequent BG and BK test results are to be documented on the regional LHN [Blood Glucose and Blood Ketone Monitoring Chart \(MR59H\)](#).

### 3. Linked documents (links pending)

<a href="#">Regional LHN Diabetic Ketoacidosis Management in Adults - Protocol</a>
<a href="#">Regional LHN Hyperglycaemic Hyperosmolar State Management - Protocol</a>
<a href="#">Intravenous Insulin Infusion Type 1 Diabetes Chart – Adult (MR-INF-T1D) - Example</a>
<a href="#">Intravenous Insulin Infusion Type 2 Diabetes Chart – Adult (MR-INF-T2D) - Example</a>

### 4. References

Northern Adelaide Local Health Network (2021) <i>Inpatient insulin management</i> . NALHN, Adelaide.
Southern Adelaide Local Health Network (2021) <i>Intravenous insulin infusion for the management of hyperglycaemia in non-pregnant adults (not for treatment of diabetic ketoacidosis)</i> , SALHN, Adelaide.
Southern Adelaide Local Health Network (2022) <i>Preadmission perioperative medication guidelines</i> , SALHN, Adelaide.
Central Adelaide Local Health Network (2022) <i>Hyperglycaemia Management – Actrapid Insulin and Glucose Infusion</i> , CALHN, Adelaide.
Central Adelaide Local Health Network (2021) <i>Diabetes inpatient management</i> , CALHN, Adelaide.

### 5. Accreditation standards

#### ***National Safety and Quality Health Service Standards (2<sup>nd</sup> edition)***

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Clinical Governance	Partnering with Consumers	Preventing & Controlling Healthcare Associated Infection	Medication Safety	Comprehensive Care	Communicating for Safety	Blood Management	Recognising & Responding to Acute Deterioration

## 6. Consultation

Version	Consultation
1.0	Northern Adelaide Local Health Network, Diabetes and Endocrine Service, LCLHN Division of Medicine, regional LHN Diabetes Specialist Nurses, regional LHN visiting Physicians, regional LHN Clinical Pharmacists, Executive Directors of Medical Services, LCLHN Emergency Nurses.

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