

REGIONAL LOCAL HEALTH NETWORKS

Protocol (clinical)

Title: Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have hyperglycaemia

Author: Collette Hooper, Nurse Practitioner, Rural Support Service – Diabetes Service

Owner: Julianne O'Connor, Chief Clinical Advisor, Rural Support Service

Sponsor: Executive Director, Rural Support Service

Approved by: RSS Policy & Procedure Committee on: 29/11/2023

BHF LHN Drugs and Therapeutics Committee on: 22/02/2024

EFN LHN Acute and Specialist Services Committee on: 20/12/2023

FUN LHN Operational Clinical Governance Committee on: 7/12/2023

LC LHN Safety Quality and Clinical Effectiveness Committee on: 19/1/2024

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 protocol outlines responsibilities and actions required by medical practitioners, nurses and midwives to ensure the safety and quality of inpatient care.
Policy/procedure reference	This protocol supports the SA Health Recognising and Responding to Clinical Deterioration Policy Directive and Guideline, Diabetes Service Plan and Diabetes Inpatient Model of Care.
Keywords	Clinical, protocol, medical, nursing, midwifery, emergency, safety, quality, standards, diabetes, insulin, infusion.
Document history	Is this a new LHN protocol? Y
	Does this protocol <i>amend or update</i> an existing protocol? N Does this protocol <i>replace</i> an existing document? N
Applies to	This protocol applies to all hospital medical practitioners, nursing and midwifery staff.
Objective file number	

Version control and change history

Version	Date	Amendment	Amended by:
1.0	10/08/2023	Original version	Collette Hooper, Nurse Practitioner

Department of Health, Government of South Australia. All rights reserved

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have hyperglycaemia

Table of contents

			page											
1.	Intro	Introduction												
	1.1	Indication for an IV Insulin Infusion	3											
	1.2	Prescribing an IV Insulin Infusion	3											
	1.3	Preparation of an IV Insulin Infusion	5											
	1.4	Maintaining an IV Insulin Infusion	6											
	1.5	Documentation	7											
	1.6 Escalation													
	1.7 Cessation of IV insulin infusion and transition to alternative insulin or medication administration													
	1.8	Appendix A - regional LHN Intravenous Insulin Infusion Type 1 Diabetes Chart – Adult (MR-INF-T1D)	10											
	1.9	Appendix B - regional LHN Intravenous Insulin Infusion Type 2 Diabetes Chart – Adult (MR-INF-T2D)	12											
2.	Linke	ed Documents	14											
3.	Refe	rences	14											
4.	Accr	editation Standards	14											
5.	Con	sultation	15											

1. Introduction

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.

In the hospital setting, Intravenous (IV) insulin infusion is the preferred route of insulin delivery in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have hyperglycaemia.

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 Protocol outlines the requirements for the management of an IV insulin infusion in regional local health network (LHN) hospitals and is supported by the regional LHN Work Instruction Intravenous Insulin Infusion Preparation and Setup.

This protocol is not intended for:

- > use in medical emergencies (e.g. diabetic ketoacidosis or hyperglycaemic hyperosmolar state management). Refer to the regional LHN Protocols for Diabetic Ketoacidosis Management in Adults and Hyperglycaemic Hyperosmolar State Management Type 2 Adults.
- > use for children or young people under 18 years of age. Consultation must be sought from the paediatrician, specialist physician and/or endocrinologist.

1.1 Indications for IV Insulin Infusion

This protocol is indicated for use in the inpatient management of hyperglycaemia in the adult with diabetes who is:

- > fasting
- > perioperative
- > pregnant and receiving intrapartum care

OR

> as part of the FeSS Sugar Protocol (Stroke management procedures and protocols clinical guideline).

This protocol is used in conjunction with the Intravenous Insulin Infusion Preparation and Setup Work Instruction and the:

- > 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.

1.2 Prescribing an IV Insulin Infusion

The Medical Practitioner is to:

- 1. Identify the correct IV insulin infusion chart to be used, either:
 - > Intravenous Insulin Infusion Type 1 Diabetes Chart Adult (MR-INF-T1D) Appendix A: new diagnosis or pre-existing type 1 diabetes



INTRAVENOUS INSULIN INFUSION TYPE 1 DIABETES **CHART - ADULT** MR-INF-T1D

OR

> Intravenous Insulin Infusion Type 2 Diabetes Chart – Adult (MR-INF-T2D) Appendix B: new diagnosis or pre-existing type 2 diabetes.



INFORMAL COPY WHEN PRINTED – check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

Prescribe the IV insulin infusion by signing the top of the medication chart. For regional LHN hospitals
using electronic medical records (EMR) order sets, further information is available at <u>Ordering Adult Insulin
Infusions</u>. EMR example provided below:

Warning						_					_			
This order set contains information for three IV insulin	infusion protocols. E	insure the appropr	nate protocol is se	slected:			In Difference							
 The Diabetic Ketoacidosis (UKA) Management in Ad The Hunamhicaemic Hyperosmolar State (HHS) Man 	uits protocol is to be accement in Adults w	th Type 2 Diabet	with LNabetic meto	acidosis (DRA) inclu retients w	ding eugyc eb HHS	aemic UKA in p	atients pre	scribed so	dum-gluco	se co tra	nsporter a	2 innibitors	
The Intravenous Insulin Infusion in adults with diabe	tes who are fasting.	receiving perioper	rative or intraparts	um care or	who have	hyperglyca	emia protocol is	to be use	d in conjur	ction with	ether: T	ype 1 Dial	betes - Cha	at MR-INF-T1D OR Type 2 Diabetes - Chart - MR-INF
											1. A	New Constant		
Start Date OSta	rt Time													
			9	1										
				a										
TRAVENOUS INSULIN INFUSIONS														
Order	Special/Titra	ation Instructions				Dose	UOM	Amount	NOU	Final	UOM	Conce	MOU Int	Diluent
DPA / Turn 1 Protocole - 1 dem(s)						Plate		10 Ulius	e	Volume		13000	1	
DRA/ type i Protocols - i nemps)	Use the Tup	e 1 Diabetes Cha	ert - Adult (MR-IN	(F-T1D) to	o initiate a	of here	Lunite/hour	50	[Linit(e)]	50	ml	11	Lunits/m	a landium chloride () 9%
HHS / Type 2 Protocols - 1 item/s)	Lose are . M.	C I brocker and	and the second second second	ter server a	V horses.	10-10	Landor Autor	1.00	Constant and	100	ing.	1	1 de la Carrier	ic sooren chiorade e.e.a
insulin neutral continuous infusion	Use the Typ	e 2 Diabetes Cha	art - Adult (MR-IN	(F-T2D) ti	o initiate a	and0	units/hour	50	Unit(s)	50	mL	1	units/m	nL sodium chloride 0.9%
(ma)						19		100	- and	Lion				
TRAVENOUS FLUIDS AND OTHER MEDICATIO	VS													
Order		Instructions												
No Glucose Infusion Required - 1 item(s)														
Communication Order		Glucose Infusio	on omission orde	sr - docum	ent reaso	n in progres	ss note (eating	regular m	eals/ other	1				
Order		Frequency	Beg # Volume	NOU	Bolus	Duration	UOM Rat	e luc	DM Rou	te	Spec	cial Instru	ctions	
alucose 5% infusion (.)		ONCE ONLY_	1000	mL			50	mi	hr intra	VENOUS	-			
DKA Protocol - 8 item(s)			ALC: NO.	10000										
sodium chloride 0.9% infusion (.)		ONCE ONLY_	1000	mL				ml	Jhr intra	VENOUS	Char	nge to the	s bag whe	n BGL is 15mmol/L or greater as per DKA.
sodium chloride 0.9% infusion (.)		ONCE ONLY_	1000	mL				ml	/hr intra	VENOUS.	Char	nge to this	s bag whe	n BGL is 15mmol/L or greater as per DKA
sodium chloride 0.9% infusion (.)		ONCE ONLY_	1000	mL				mL	Jhr intra	VENOUS	Char	nge to the	s bag whe	n BGL is 15mmol/L or greater as per DKA.
glucose - sodium chloride 4%-0.18% infusio	n (.)	ONCE ONLY_	1000	mL				ml	the intra	VENOUS	Char	nge to the	s bag whe	n BGL is less than 15mmol/L as per DKA.
glucose - sodium chloride 4%-0.18% infusio	n (,)	ONCE ONLY_	1000	mL				ml	/hr intra	VENOUS.	Char	nge to this	s bag whe	n BGL is less than 15mmol/L as per DKA.
glucose 10% infusion (.)	1.0.001	ONCE ONLT.	1000	mL			125	m	the intra	VENOUS	Com	mence th	his bag wh	en BGL is less than 15mmol/L. Continue sodium
potassium chloride 10mmol in socium chlori	ide 0.29%	ONCE ONLY	100	mL	1			m	hr intra	VENOUS	-			
US Destrond - 7 item(s)	DE DIZIS HINDRIVES	TOHOE ONE	1000	11%	1			Turk	Age Trues	VENUES.	*			
Section chloride 0.9% infusion (.)		TONCE ONLY.	1000	mL	TOI	1		ml	the intra	VENOUS	Com	wence in	mediately	as per HHS in Adults with T2DM Protocol
Sodium chloride 0.9% infusion (.)		ONCE ONLY.	1000	mL	1 D			ml	the intra	VENOUS	Cont	tinue this	bag as per	r HHS in Adults with T2DM Protocol
sodium chloride 0.9% infusion (.)		ONCE ONLY.	1000	mL				ml	the intra	VENOUS	Cont	tinue this	bag as per	r HHS in Adults with T2DM Protocol
sodium chloride 0.45% infusion (.)		ONCE ONLY_	1000	mL				ml	the intra	VENOUS	Add	this bag	when BGL	is less than 15mmol/L as per HHS in Adults with
glucose 5% infusion (.)		ONCE ONLY_	1000	mL			125	ml	Jhr intra	VENOUS	_ Add	this bag	when BGL	is less than 15mmol/L as per HHS in Adults with
potassium chloride 10mmol in sodium chlor	ide 0.29%	ONCE ONLY_	100	mL				mi	/hr intra	VENOUS	-			
potassium chloride 30mmol in sodium chlor	ide 0.9% infusion	ONCE ONLY_	1000	mL				ml	Jhr. intra	VENOUS.	-			
Sand Carlot Carl														
Order	Dose	LUOM	Route	Erec	quency	PRN	PRN Reason	Max	Daily Do	e Dura	ation		Spe	ecial Instructions
Ancillary Medications - 1 item(s)	10000	1000	110000	1110	quonoy		TTRI TRODUCIT	11100	bully bu		20011		Tob	
glucagon injection (.)	1	mg	intraMUSCULA	R ON	CE ONLY		hypoglycaemia							
HER ORDERS														
Order Order Na	me	Schedule	Frequency	r	Instructio	ns						F	Reason for	Consult
Pathology - 1 item(s)														
Electrolytes Level (.)		Unit Collec	:t											
Consults - 1 item(s)														
Consult - Diabetes Education												c	ommence	d on long term insulin post insulin infusion
Communication - 1 item(s)			0.005		100011									
U Notify MO			ONCE		if BGL les	is than 4 mi	mol/L							
UNA/ Type I Protocols - 2 Item(s)		Unit Collect	the select				_				_			
L beaside i est (- Ketone, Blood)		Unit Collec	a hourly		if RGL ter	natie net -	chieved after f	our hours	in colume	3 of ineul	in infusi	00		
HHS / Type 2 Protocole - 2 item(e)			TONCE		n bac tar	gor is not a	icineveu aiter i	our nours	in coumr	5 ULINSUI	m must	un.		
Bedside Test (- Ketone Blood)		Unit Collec	4	-										
		Office Conce	ONCE	_	if BGL tar	net is not a	chieved after f	our hours	in columr	3 of insul	in infusi	on		
			ONCE		Pore tai	get is not a	and a determined and a	out noul o	conditi	e or mau				

3. Identify target blood glucose (BG) range. The target BG range for an adult with diabetes during an IV insulin infusion is 7.0 – 10.0mmol/L.

Blood Glucose (BG)	Blood Ketone (BK)	Dr's Name: Jamer Mc Adam	Target BG Range:
Frequency Hourly 2 Hourly	Frequency Hourty 2 Hourty	Signature Adams Phone No: #321	Adult Inpatient 7.0 - 10.0mmol/L
*(refer to instruc	tions on back)	Review need for IV Insulin Infusion daily before 12:00 pm. If continuing, rewrite on a new page.	Obstetric Inpatient mmol/L

The Medical Practitioner is responsible for confirming if this target BG range is to be used or if a modified target BG range is required (e.g. for women with pre-existing diabetes in pregnancy, the BG target is generally 6.0 - 10.0mmol/L).

If a modified target BG range is to be used, the range must be documented.

Blood Glucose (BG) Frequency	Blood Ketone (BK) Frequency	Dr's Name: James Mc Adams	Target BG Range:	
Hourly 2 Hourly	Houriy 2 Hourly	Signature: Surganne Phone No: 7321	Adult-Inpatient 7.0 10.0mmot/L	
(refer to instruc	tions on back)	Review need for IV Insulin Infusion daily before 12:00 pm. If continuing, rewrite on a new page.	$\frac{6.0 - 10.0}{\text{mmol/L}}$	

INFORMAL COPY WHEN PRINTED – check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

For regional LHN hospitals using electronic medical records (EMR) order sets, further information is available at the <u>BGL and Insulin Chart Window</u> EMR example below:



- 4. Maintain previously prescribed basal insulin dose/s.
- 5. Cease previously prescribed rapid acting meal related doses and/or correction bolus insulin doses.
- 6. Review previously prescribed oral and/or non-insulin injectable medications and withhold if potential to worsen clinical state. Cease sodium-glucose co-transporter-2 (SGLT2) inhibitors immediately.
- 7. Plan daily review of the ongoing requirement for IV insulin infusion.
- 8. Assess preadmission HbA1c, refer to diabetes specialist nurse and consider previously prescribed diabetes medications in preparation of cessation of IV insulin infusion and for discharge planning.

1.3 Preparation of an IV Insulin Infusion

There is a need for a 1:1 or 1:2 nurse:patient ratio if an IV insulin infusion is used.

Nursing/midwifery observations include:

- > 2 intravenous lines setup plus syringe pump for IV insulin infusion
- > capillary blood glucose (BG) and blood ketone (BK) monitoring
- > fluid balance record (e.g. catheterisation and hourly measures may be required) to calculate and report deficit or positive fluid balance.

Nursing/midwifery staff are to prepare the IV Insulin and Glucose Infusion:

- > 50units insulin neutral 100units/mL (Actrapid[®]) in 49.5mL 0.9% Sodium chloride: concentration of 1 unit/mL via infuser pump. Refer to *IV Insulin Infusion Set Up Work Instruction*.
- > Run IV Glucose Infusion as ordered.

Any additional IV fluids will depend on the patient's health status and will need to be assessed and ordered by the medical practitioner.

Nursing/midwifery staff are to start the IV insulin infusion rate according to COLUMN 1 (green).

Intravenous Insulin Hourly Rate Algorithm TYPE 1 DIABETES												
Colu	mn 1		Colu	mn 2		Colu	mn 3					
BG mmol/L	Unit/houx		BG mmol/L	Unit/hour		BG mmol/L	Unit/hour					
B G less than 4.0mm	ol/L is hypoglycaemia		BG less than 4.0mm	ol/L is hypoglycaemia		BG less than 4.0mmol/L is hypoglycaemia						
less than 5.0	Off		less than 5.0	Off		less than 5.0	Off					
5.0 - 6.4	0.5		5.0 - 6.4	1.0		5.0 - 6.4	2.0					
6.5 - 9.9	1.0		6.5 - 9.9	2.0		6.5 - 9.9	4.0					
10.0 - 11.4	1.5		10.0 - 11.4	3.0		10.0 - 11.4	5.0					
11.5 - 12.9	2.0		11.5 - 12.9	4.0		11.5 - 12.9	6.0					
13.0 - 14.9	3.0		13.0 - 14.9	5.0		13.0 - 14.9	8.0					
15.0 - 16.4	3.0		15.0 - 16.4	6.0		15.0 - 16.4	10.0					
16.5 - 17.9	4.0		16.5 - 17.9	7.0		16.5 - 17.9	12.0					
18.0 - 20.0	5.0		18.0 - 20.0	8.0		18.0 - 20.0	14.0					
greater than 20.0	6.0		greater than 20.0	12.0		greater than 20.0	16.0					

INFORMAL COPY WHEN PRINTED – check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

At commencement of the IV insulin infusion and with EACH syringe change, two (2) nurses/midwives to check and sign the nursing administration record as per example below:

NURSING ADM	INISTRATION R	ECORD (IV Ins	ulin Infusion)	and the second	
Insulin (units) and Sodium Chloride 0.9% (mL)	Date/time commenced	Nurse 1	Nurse 2	Time stopped	Volume infused (mL)
50units Insulin Neutral (Actrapid®) + 49.5mL Sodium Chloride 0.9%	17/01/23	ten	Kfer		
50units Insulin Neutral (Actrapid®) + 49.5mL Sodium Chloride 0.9%					
50units Insulin Neutral (Actrapid®) + 49.5mL Sodium Chloride 0.9%					

1.4 Maintaining an IV Insulin Infusion

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.

When the BG test result is identified, consider if the test result is 'in' or 'outside' (e.g. above or below) target BG range.

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). Refer to instructions below and *Flow Chart*.

Moving up a Column is required if:

- > the BG is greater than 10.0mmol/L AND
- > the current BG test result did not drop by 2.9 4.9mmol/L within the last hour.

Moving down a Column is required if:

- > the BG is less than 4.0mmol/L OR the IV insulin infusion has been suspended for one hour
- > the BG is 15.0mmol/L or less OR BG falling at a rapid rate of 5.0mmol/L or more in past hour.

Continue IV Glucose infusion. Treat hypoglycaemia (less than 4.0mmol/L irrespective of symptoms) as per regional LHN Protocol *Treatment of hypoglycaemia in people with diabetes in the hospital*. If hypoglycaemia occurs while on Column 1, 2 OR 3, contact medical practitioner.

Flow Chart Instructions



If the BG is within target range for 4-6 hours, monitoring may be reduced to 2 hourly. However, if IV insulin infusion rate is changed, resume hourly monitoring.

INFORMAL COPY WHEN PRINTED – check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

or who have or who have hyperglycaemia

1.5 Documentation

Nursing/midwifery staff are to document the:

- > date and time in the appropriate column.
- > blood glucose (BG) is to be graphed with a dot (·) in the centre of the square which coincides with the BG level. For example, 16.1mmol/L or 16.8mmol/L is a dot in the middle of the box that corresponds to 16mmol/L. Connect to the previous dot with a straight line.
- > numerical value of the BG in the designated row below the graph.
- > IV insulin infusion rate. Please note: always begin in the green column (column 1).
- > column being used to titrate the IV insulin infusion at that point in time (e.g. column 1, 2 or 3).
- > initials of both nurses/midwives who checked the hourly rate independently.
- > blood ketone (BK) if applicable.
- > initiation of the regional LHN Protocol Treatment of hypoglycaemia in people with diabetes in the hospital.
- > contact with the medical practitioner as per Rapid Detection and Response Instructions below.



1.6 Escalation

In the event of an out of target range blood glucose (BG) result, nursing/midwifery staff are to consult the **Rapid Detection and Response Instructions** and action recommendations.

Rapid Detection and Response Instruc	tions
 Senior registered nurse (RN) review when: BG not returning to target at anticipated rate of 2.5 – 4.9mmol/L in last hour & column escalation is pending. BG is greater than 20.0mmol/L in any column. BG is less than 4.0mmol/L. When IV Insulin Infusion has been switched off and when it is resumed. 	 Multi-disciplinary team (MDT) review when: BK not decreasing at anticipated rate of 0.5mmol/L per hour. BG is 15.0mmol/L or less, commence IV Glucose Infusion. Moving up one column. BG not decreasing at anticipated rate of 2.5 – 4.9mmol/L in last hour despite moving up one column or being in Column 3. 12units/hour is being used in Column 3. BG decreasing too fast (e.g. 5.0mmol/L or more in last hour). Consult MedStar as may require transfer to HDU or ICU
Medical emergency response (MER) review w BG is less than 4.0mmol/L and has not res Drowsy, confused, unsafe to swallow, unre	hen: ponded to the Hypoglycaemia Protocol oral treatment in 45 minutes. sponsive or unconscious.

Breathing rapidly or having difficulty breathing or complaining of severe abdominal pain.

Consult MedStar as may require transfer to HDU or ICU

INFORMAL COPY WHEN PRINTED – check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

or who have or who have hyperglycaemia

1.7 Cessation of IV Insulin Infusion and transition to alternative insulin or medication administration

The Medical Practitioner is responsible for determining when it is safe to transition off the IV insulin infusion to either:

- > the regional LHN Hyperglycaemia and Basal Bolus Insulin Chart (MR62A) Protocol.
- > pre-mixed insulin
- > co-formulation insulin
- > continuous subcutaneous insulin infusion (CSII) or insulin pump OR
- > other diabetes medications.

Cessation of the IV insulin infusion is considered in the patient who:

- > has no evidence of diabetic ketoacidosis and
- > is able to eat or has commenced enteral feeds or total parenteral nutrition.

Preadmission HbA1c, referral to the diabetes specialist nurse and previously prescribed diabetes medications are to be considered for this transition and in preparation for discharge.

Ideally, the IV insulin infusion should be ceased after breakfast, with a dose of subcutaneous insulin (or other diabetes medications) given before breakfast. The following instructions are offered as a guide.

1. Switching from IV Insulin Infusion to the regional LHN *Hyperglycaemia Protocol: Basal Bolus Insulin Chart (MR62A)*.

Subcutaneous long acting insulin must be on board for at least 4 hours before discontinuing IV insulin infusion.

To commence subcutaneous insulin in a patient who was not previously known to have type 1 diabetes, calculate total daily insulin requirements (four times IV insulin infusion used in last 6 hours = Total Daily Dose (TDD).

- i. 50% of TDD is prescribed as the basal insulin (long acting insulin) dose
- ii. 50% of TDD is prescribed in three equally divided doses with meals (rapid-acting insulin).

For example

A total of 9units of IV insulin infusion used in the past 6 hours. $9 \times 4 = TDD$ 36units 50% as subcutaneous basal insulin is 18units 50% as subcutaneous rapid acting insulin is 18units \div 3 = 6units TDS with meals.

Titrate to target BG range based on capillary BG.

2. Switching from IV Insulin Infusion to pre-mixed insulin

If pre-mixed insulin (twice/day) is chosen, two thirds (2/3) of the TDD is prescribed at breakfast and one third (1/3) of the TDD is prescribed with the evening meal.

If pre-mix insulin (once/day) is chosen, two thirds (2/3) of the TDD is prescribed at breakfast.

For example if BD is required

A total of 9units of IV insulin infusion used in the past 6 hours. $9 \times 4 = TDD$ 36units 2/3rd as subcutaneous pre-mix insulin is 24units prescribed with breakfast 1/3rd as subcutaneous pre-mix insulin is 12units prescribed with the evening meal.

For example if once a day is required

A total of 9units of IV insulin infusion used in the past 6 hours. $9 \times 4 = TDD$ 36units $2/3^{rd}$ as subcutaneous pre-mix insulin is 24units prescribed with breakfast.

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

3. Switching from IV Insulin Infusion to co-formulation insulin

50% of TDD and one third (1/3) of 50% of TDD and prescribed with largest carbohydrate meal.

For example

A total of 9units of IV insulin infusion used in the past 6 hours. $9 \times 4 = TDD$ 36units $2/3^{rd}$ as subcutaneous co-formulation insulin is 24units prescribed with the largest carbohydrate meal.

4. Switching from IV Insulin Infusion to Continuous Subcutaneous Insulin Infusion (CSII) or insulin pump

An endocrinologist could be consulted for advice on transitioning to insulin pump therapy. However, in most instances, insulin pump therapy is recommended to be recommenced at the previous basal rate settings with the IV insulin infusion running concurrently.

IV insulin infusion rate will be titrated down based on BG levels.

If a meal is due during the 4 hours of transition, the insulin pump's advanced settings are to be used to calculate the meal-related bolus and correction bolus. The insulin pumps' advanced settings consider the pre meal BG test result, the BG target, insulin sensitivity factor, insulin:carbohydrate ratio and insulin action time (also known as 'insulin on board') to suggest a meal-related bolus dose to be delivered.

The suggested meal-related bolus dose can be self-administered or the suggested dose can be reduced and administered if concerns about postprandial hypoglycaemia.

The rregional LHN Protocol *Continuous Subcutaneous Insulin Infusion (CSII) in People with Diabetes in the Inpatient Setting* and *CSII Inpatient Rate Record (MR-CIR)* is to be used by the person with diabetes to document the meal-related bolus and correction bolus administered.

After at least 4 hours of subcutaneous basal insulin via the insulin pump **AND** if the person has tolerated food and fluid **AND** if the BK remains less than 0.6mmol/L, the IV insulin infusion can be discontinued.

After the IV insulin infusion is discontinued, maintain insulin pump therapy (using both basal and advanced settings at main meal times). Continue hourly BG monitoring for 2-4 hours then if stable, reduce BG monitoring frequency to QID. The BK should be rechecked in 1 hour and then as instructed by the medical officer.

5. Transitioning to other diabetes medications

The Medical Practitioner is to identify alternative diabetes medications (e.g. oral and glucagon-like peptide-1 (GLP-1) receptor agonists non-insulin injectables) that are safe for re-commencement.

SGLT2 inhibitors are not recommended to be recommenced in people with diabetes who have frequent bacterial or genitourinary yeast infections, low bone density and high risk for falls and fractures, foot ulceration, and factors predisposing to euglycaemic diabetic ketoacidosis (e.g. history of pancreatic insufficiency, drug or alcohol abuse or ketogenic diets).

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

1.8 Appendix A

SA He Revise May 2023

For regional LHN hospitals using electronic medical records (EMR) order sets, further information is available at <u>Ordering Adult Insulin Infusions</u>

Type 1 Diabetes Chart – Adult (MR-INF-T1D)

Government of South Australia SA Health Site/Facility:								ENOUS NFUSION IABETES - ADULT IF-T1D					U.R. Number:												
Blood Glucose (BG) B	Dr	Dr's Name:													Tar	rget	BG F	Rang) 0 :						
rrequency r ⊡Hourlv ⊡2Hourlv* ⊓	Si	Signature:						Pho	me N	o:				Adu	itt inpa	atient	7.	.0 - 10	.0mn	101/L					
"Iteler to instructions on back)						Rev	lew r	need	for N	/ Insi	ulin li	ntusio	on da	ily bi	efore	12:0	0 pr	۱.	Obs	stetric	Inpat	lent			
20 Dav/Month			_	_	L	_		IT C	ontir	luing	, rew	inte o	nar	new p	bage.				I	_		_		_mn	10VL
Time				-		-		-		-		-		-		-				-		-		-	
	_																								
BG Record (mmol/L)	20																								
For out of terrort																									
results, refer to rapid	15																								
detection and response instructions.																									
	10																								
	ł																								
	5																								
	3																								
	2																								
BG mmol/L																									
insulin Infusion Rate (Units/h	our)																								
Column 1, 2, 3																									
Nurse(s) initials			/		/		/		/		/	\vee	/		/		/		/		/		/		/
BK mmol/L Hypo Intervention	2																								
MO notified (/)																									
Colu	100-02	Intr	ave	nou	s Ina	sulin	Ho	urty	Rate	e Alg	gorit	thm 2	Т	YPE	1 D	IAB	ETE	S	-	io lur					_
BG mmol/L	mn	Un	h/ho	our		-	B	G mn	noVL	-		∠ Uni	t/ho	ur		-	BG	mm	ol/L	J	nn s	, Unh	t/hou	Ir	_
BG less than 4.0mm	oVL i	s hyp	ogly	caen	nia	B	G les	s tha	in 4.0	Dmmo	oVLi	s hy p	oglyd	aem	ia	B	G lesi	s thar	1 4. 01	mmol	VL is	hype	oglyc	aemi	а
less than 5.0			Off				les	is tha	in 5.	0			mo				less	s than	n 5.0			(on		
5.0 - 6.4			0.5					5.0 -	6.4				1.0				5	0-6	.4			-	2.0		
10.0 - 11.4			1.5				1	0.0 -	11.4				3.0		_		10	.0 - 1	1.4				5.0		-
11.5 - 12.9			2.0				1	1.5 -	12.9)			4.0				11	.5 - 1	2.9			(6.0		
13.0 - 14.9			3.0				1	3.0 -	14.9				5.0				13	.0 - 1	4.9			1	8.0		
15.0 - 16.4			3.0				1	5.0 - 6.5 -	16.4				6.0 7.0				15	.0 - 1 .5 - 1	6.4			1	0.0		
18.0 - 20.0			5.0				1	8.0 -	20.0)			8.0				18	.0 - 2	20.0			1	4.0		
greater than 20.0			6.0				grea	ter ti	nan 3	20.0			12.0			9	reat	er tha	an 20	0.0		1	6.0		
Patients always begin <u>Moving up</u> At e • It • It If th If th	i In ti each s the Did ti he ar he ar	he gr BG 1 BG 1 BG 1 he BC 1swe	reen mea 10.0 G dro r to (colur surer immo op by eithe both	mn - ment oVL o (2.5) er que ques	Colu ask r les mmo estlo stlon	mn 1 the fo s? VL - A n Is 1 s Is I	4.9m YES - NO -	ing to mol/ - rem mov	woq Lint nains esup	uest he la in th	ions: Ist ho Ie cur e coli	ur? rent Jmn.	colur	nn.										
Cal Moving Down If B 5.0	i MC G le mmo	o If Bi ss th oVL o	G fal an 4 xr mo	ling a .0mr pre in	at a r noVL 1 pas	apid OR I t hou	rate nsuli r - m	of 5.0 In sur Ioves	omm spen dow	ol/L (ded (/n on	or ma DR B ie co	ore in 3G is 1umr	pasi 15.0r	t hou nmoi	r. VL or	less	OR	BG fa	alling	at a	rapid	i rate	e of		
	NURSING						IG ADMINISTRATION RECO				Nur	Nurse 1 Nurse 2 Time					Ime stopped Volume Infused (mL)					sed			
Insulin (units) and S	odit	ani C	anor	NGC C		commenced														(п	пц)				
Insulin (units) and S Dunits Insulin Neutral (Actrapi	dB) 4	+ 49.5r	mL So	ide t	Chlori	de 0.9	8	con	nmer	ncea	+							+					(П	1L)	

INFORMAL COPY WHEN PRINTED - check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

or who have or who have hyperglycaemia

OFFICIAL: Sensitive//Medical in confidence



Page 2 of 2

INFORMAL COPY WHEN PRINTED – check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

1.9 Appendix B

For regional LHN hospitals using electronic medical records (EMR) order sets, further information is available at <u>Ordering Adult Insulin Infusions</u>

Type 2 Diabetes Chart – Adult (MR-INF-T2D)

Government of South Australia SA Health	INTI INSUL TYPE CHA MF	RAVEN IN INF 2 DIAB RT - AE RT - AE	U.R. Num Surname Given Na Second C D.O.B.: Visit No. (Affix patient identification label in this box U.R. Number: Surname: Given Name: D.O.B.: D.O.B.: Visit No. (if applicable):									
Blood Glucose (BG) B Frequency Fr Hourly 2 Hourly	Blood Ketone (BK) Trequency Hourly 2 Hourl	Dr's Nam v Signature	e:	Phone	No:	Adult Inpatien	Range: t 7.0 - 10.0mmol tient						
veller to instruction	ns on back)	nevier	If continuing,	rewrite on a new	page.		mmol/						
20 Day/Month													
Time													
BG Record	20												
(mmol/L)													
For out of target results, refer to rapid	45												
detection and response	10												
man uctions.													
	10												
	5												
	4												
	2												
BG mmol/L													
Insulin Infusion Rate (Units/ho	our)												
Column 1, 2, 3													
Nurse(s) initials	1//		////	1///		////							
BK mmol/L Hypo intervention	10						FFFF						
MO notified (/)													
	Intraveno	us Insulin H	lourly Rate Alg	orithm TYP	E 2 DIABETES		- 17 - 17 - 18						
			Colu			Column	3						
Colu	mn 1		Colu	nn 2			Linit/bour						
Colu BG mmol/L	mn 1 Unit/hour	DO DO	BG mmol/L	nn 2 Unit/hour	BG	nmol/L	Onit/Hour						
Colu BG mmol/L BG less than 4.0mmo	mn 1 Unit/hour bl/L is hypoglycae	emia BG	BG mmol/L less than 4.0mmo	nn 2 Unit/hour /L is hypoglycae	mia BG less	nmol/L than 4.0mmol/L is than 6.4	s hypoglycaemia						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9	mn 1 Unit/hour ol/L is hypoglycae Off 0.5	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9	nn 2 Unit/hour /L is hypoglycae Off 1.0	BG r mia BG less less 6.1	han 4.0mmol/L is than 6.4 5 - 7.9	off 2.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9	mn 1 Unit/hour ol/L is hypoglycad Off 0.5 1.0	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9	nn 2 Unit/hour /L is hypoglycael Off 1.0 2.0	BG less less 6.1 8.0	nmol/L than 4.0mmol/L is than 6.4 5 - 7.9 0 - 9.9	s hypoglycaemia Off 2.0 4.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4	mn 1 Unit/hour ol/L is hypoglycae Off 0.5 1.0 1.5	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4	nn 2 Unit/hour /L is hypoglycaer Off 1.0 2.0 3.0	BG I mia BG less 6.1 8.0 10.0	nmol/L than 4.0mmol/L is than 6.4 5 - 7.9 0 - 9.9 0 - 11.4	s hypoglycaemia Off 2.0 4.0 5.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9	mn 1 Unit/hour ol/L is hypoglycad Off 0.5 1.0 1.5 2.0	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9	nn 2 Unit/hour /L is hypoglycaer Off 1.0 2.0 3.0 4.0	BG I mia BG less 6.1 8.0 10.0 11.1	http://linearcolling.com/linea	s hypoglycaemia Off 2.0 4.0 5.0 6.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4	mn 1 Unit/hour off 0.5 1.0 1.5 2.0 3.0 2.0	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4	nn 2 Unit/hour /L is hypoglycaet Off 1.0 2.0 3.0 4.0 5.0 6.0	BG I BG less less 6.1 8.0 10.0 11.1 13.0 5.0	nmol/L than 4.0mmol/L is than 6.4 5 - 7.9 9 - 9.9 9 - 11.4 5 - 12.9 9 - 14.9 16 4	5 hypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10 0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9	mn 1 Unit/hour ol/L is hypoglycav Off 0.5 1.0 1.5 2.0 3.0 3.0 4.0	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9	nn 2 Unit/hour /L is hypoglycaet Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0	BG I BG less less 6.1 8.0 10.0 11.1 13.0 15.0 16.1	nmol/L than 6.4 5 - 7.9 0 - 9.9 0 - 11.4 5 - 12.9 0 - 14.9 0 - 14.9 0 - 16.4 5 - 17.9	s hypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10.0 12.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0	mn 1 Unit/hour Off 0.5 1.0 1.5 2.0 3.0 3.0 4.0 5.0	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0	Inn 2 Unit/hour /L is hypoglycaei Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0	BG I BG less less 6.1 8.0 10.0 11.1 13.0 15.4 16.5 18.0	nmol/L than 4.0mmol/L it is a 6.4 is - 7.9 is - 9.9 is - 11.4 is - 12.9 is - 14.9 is - 14.9 is - 16.4 is - 17.9 is - 17.9 is - 20.0	s hypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10.0 12.0 14.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 greater than 20.0	mn 1 Unit/hour J/L is hypoglycar 0.5 1.0 1.5 2.0 3.0 3.0 4.0 5.0 6.0	emia BG	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 eater than 20.0	nn 2 Unit/hour /L is hypoglycaet 0ff 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 12.0	BG I mia BG less less 6.1 0.0 10.0 11.1 13.0 15.0 15.0 18.0 greater	nmol/L than 4.0mmol/L is than 6.4 5 - 7.9 0 - 11.4 5 - 12.9 0 - 16.4 5 - 17.9 0 - 20.0 than 20.0	s hypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10.0 12.0 14.0 16.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 greater than 20.0 Patients always begin Moving up At e	mn 1 Unit/hour 0/L is hypoglycas Off 0.5 1.0 1.5 2.0 3.0 3.0 5.0 6.0 in the green col sach BG measur s the BG 10.0mn bid BG drop by 2 e answer to eithte enswer to eithte MOI fBG failing G less than 4.0m G less than 4.0m	mia BG gr umn - Colum ement ask the hol/L or less? Smmol/L - 4 her questions i h questions i a t a rapid ra mol/L OR ins in past hour -	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 eater than 20.0 eater than 20.0 eater than 20.0 n 1. e following two qu .9mmol/L in the la is YES - remains i is NO - moves up te of 5.0mmol/L o sulin suspended C moves down one	nn 2 Unit/hour /L is hypoglycae Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 12.0 estions: st hour? n the current col one column. r more in past ho R BG is 15.0mm o column.	BG i mia BG less less less 6.1 8.0 10.0 11.1 13.0 15.0 18.0 greated umn.	Inmol/L han 4.0mmol/L is han 6.4 i- 7.9 - 19.9 - 11.4 - 12.9 - 14.9 - 16.4 - 17.9 - 20.0 than 20.0 G falling at a rapi	d rate of						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 greater than 20.0 Patients always begin Moving up At e • Is • D If th If th Call Moving Down If Bi 5.0r	mn 1 Unit/hour 0/L is hypoglycas Off 0.5 1.0 1.5 2.0 3.0 3.0 5.0 6.0 in the green col each BG measur st he BG 10.0mm bid BG drop by 2 eanswer to eithte eanswer to eithte MOI BG alling G less than 4.0m	mia BG gr umn - Colum ement ask the hol/L or less? .5mmd/L - 4 her question i h questions i a ta rapid ra mmd/L OR ins in past hour -	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 eater than 20.0 eater than 20.0 n 1. e following two qu .9mmol/L in the la is YES - remains i is NO - moves up te of 5.0mmol/L o sulin suspended C moves down one	nn 2 Unit/hour /L is hypoglycae Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 12.0 estions: st hour? the current col one column. rmore in past ho R BG is 15.0mm. BECODD (2015)	BG i mia BG less less less 6.1 8.0 10.0 11.1 13.0 15.0 18.0 greated umn.	hmm//L han 4.0mmm//L is han 6.4 i- 7.9 i- 9.9 i- 11.4 i- 12.9 i- 14.9 i- 16.4 i- 17.9 i- 20.0 than 20.0 G falling at a rapi	d rate of						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 greater than 20.0 Patients always begin Moving up At e 0.11 ft 16 ft 17 ft 18 or 20.0 greater than 20.0 Patients always begin Moving up At e 0 0 16 ft 17 ft 18 or 20.0 9 ft 19 ft 10 ft 11 ft 11 ft 11 ft 15 or	mn 1 Unit/hour J/L is hypoglycas Off 0.5 1.0 1.5 2.0 3.0 3.0 4.0 4.0 5.0 6.0 win the green col back BG measur is the BG 10.0mm bid BG drop by 2 te answer to eith the	mia BG gr umn - Colum ement ask the lool/L or less? Sommol/L - 4. her questions in a ta rapid ra mmol/L OR ins mmol/L OR ins mmol/L OR ins SING ADM	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 eater than 20.0 eater than 20.0 n 1. e following two qu .9mmol/L in the la is YES - remains i is NO - moves up te of 5.0mmol/L o sulin suspended C moves down one fINISTRATION	nn 2 Unit/hour /L is hypoglycae Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 12.0 estions: st hour? the current col one column. r more in past he R BG is 15.0mm R EG or 15.0mm.	BG i mia BG less less less 6.1 8.0 10.0 11.1 13.0 15.0 16.1 18.0 greater	hmm//L han 4.0mmm//L is han 6.4 i- 7.9 - 19.9 - 11.4 - 12.9 - 14.9 - 16.4 i- 17.9 - 20.0 than 20.0 G falling at a rapi	s hypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10.0 12.0 14.0 16.0 d rate of						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 greater than 20.0 Patients always begin Moving up At e If th If th If th If th Insulin (units) and Set	mn 1 Unit/hour Unit/hour II. is hypoglycas Off 0.5 1.0 1.5 2.0 3.0 3.0 3.0 4.0 6.0 in the green col each BG measur s the BG 10.0mn Did BG drop by 2 eanswer to eith in MG iBG alling G less than 4.0m NUI odium Chloride	mia BG gr umn - Colume ement ask the lool/L or less? Sommol/L - 4. her questions in a ta rapid ra mon/L OR ints in past hour - RSING ADM 0.9% (mL)	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 eater than 20.0 eater than 20.0 n 1. e following two qu .9mmol/L in the la is YES - remains i is NO - moves up te of 5.0mmol/L o sulin suspended C rmoves down one MINISTRATION Date/time commenced	nn 2 Unit/hour /L is hypoglycae Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 12.0 estions: st hour? the current col one column. r more in past he R BG is 15.0mm RECORD (IV In Nurse 1	BG i mia BG less 6.3 8.4 10.4 10.4 11.1 13.4 15.5 16.5 18.4 16.4 18.4 16.4 18.4 18.4 greater 10.1 umn. 10.1 pur. 101/L or less OR B nsulin Infusion Nurse 2	Inmol/L han 4.0mmol/L is han 6.4 i- 7.9 - 11.4 - 11.4 - 12.9 - 14.9 - 16.4 - 17.9 - 20.0 than 20.0 G falling at a rapi	bypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10.0 12.0 14.0 16.0 d rate of Volume infuse (mL)						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 greater than 20.0 Patients always begin Moving up At et b b ff th ff th Call Moving Down If Bu 5.0r	mn 1 Unit/hour U/L is hypoglycas Off 0.5 1.0 1.5 2.0 3.0 3.0 5.0 6.0 in the green col bach BG measur s the BG 10.0mm Did BG drop by 2 e answer to eith the answer to bot I MO if BG falling G less than 4.0mm mmmol/L or more NUI odium Chloride dtb) + 49.5mL Sodur	mia BG gr umn - Colum ement ask the ol/L or less? .5mmol/L - 4. er question i h questions i a ta rapid ra mmol/L OR ins a ta rapid ra mmol/L OR ins B G SING ADM 0.9% (mL) n Chloride 0.9%	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 eater than 20.0 n 1. e following two qu .9mmol/L in the la is YES - remains i is NO - moves up te of 5.0mmol/L o moves down one fINISTRATION Date/time commenced	nn 2 Unit/hour /L is hypoglycae Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 12.0 estions: st hour? n the current coll one column. rmore in past he R BG is 15.0mm RECORD (IV II Nurse 1	umn.	han 4.0mmol/L is han 4.0mmol/L is han 6.4 i- 7.9 - 11.4 i- 11.4 i- 12.9 i- 14.9 i- 16.4 i- 17.9 i- 16.4 i- 17.9 i- 20.0 i- 16.4 i- 20.0 i- 16.4 i- 20.0 i- 17.9 i- 20.0 i- 20.	bypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10.0 12.0 14.0 16.0 14.0 16.0						
Colu BG mmol/L BG less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 greater than 20.0 Patients always begin Moving up At e • 16 • D If th If th Call Moving Down If Be 5.0r	mn 1 Unit/hour U/L is hypoglycas Off 0.5 1.0 1.5 2.0 3.0 3.0 3.0 5.0 6.0 in the green col aach BG measur s the BG 10.0mm D/d BG drop by 2 e answer to eith ea enswer to bot I MO if BG falling Gless than 4.0mm mmmol/L or more NUI odium Chloride dB) + 49.5mL Sedur dB) + 49.5mL Sedur	mia BG gr umn - Columement ask the ol/L or less? .5mmol/L - 4. er question i h questions i a ta rapid ra mmol/L OR ins a ta rapid ra a ta rapid	BG mmol/L less than 4.0mmo less than 6.4 6.5 - 7.9 8.0 - 9.9 10.0 - 11.4 11.5 - 12.9 13.0 - 14.9 15.0 - 16.4 16.5 - 17.9 18.0 - 20.0 eater than 20.0 n 1. e following two qu .9mmol/L in the la is YES - remains i is NO - moves up te of 5.0mmol/L o moves down one HINISTRATION Date/time commenced	nn 2 Unit/hour // is hypoglycae Off 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 12.0 estions: st hour? n the current coll one column. rmore in past he R BG is 15.0mm RECORD (IV II Nurse 1	umn.	Inmol/L han 4.0mmol/L is han 6.4 i- 7.9 - 19.9 - 11.4 - 12.9 - 14.9 - 14.9 - 16.4 - 17.9 - 20.0 Than 20.0 Time stopped	Shypoglycaemia Off 2.0 4.0 5.0 6.0 8.0 10.0 12.0 14.0 16.0						

INFORMAL COPY WHEN PRINTED - check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have or who have hyperglycaemia

OFFICIAL: Sensitive//Medical in confidence

	(Selling))	INTRAVEN	IOUS	Affix patien	t identification label in t	this box	
		9	INSULIN INF	USION	U.R. Number:			2
	Governme	ent	TYPE 2 DIA	BETES	Surname:			-
	of South Au	stralia	CHART - A	DULT	Given Name:			
	SA Heartr	n	MR-INF-	T2D	Second Given Name:			
					D.O.B.:	Sex/Gende	er:	
	Site/Facility:				Visit No. (if applicable):			
	Indications	for use						
	 Hyperglyca Surgical m Fasting or Peripartum FeSS Suga 	aemic hyp anageme unable to n manage ar Protoco	perosmolar state (HHS) nt of pre-existing type tolerate food and fluic ment of pre-existing ty ol (Stroke management) in a new diagnosis or 2 diabetes. ds in pre-existing type pe 2 diabetes. t procedure & protocol	in pre-existing type 2 2 diabetes. guideline).	diabetes.		
	 Not for use in Paediatric 	n; patients:	consultation with the N	MedSTAR paediatriciar	n or paediatric service	is recommended	l.	
	Blood gluco	se targe	et & frequency					
	Blood gluc	ose (BG)	target range during an	IV Insulin Infusion is 7	.0 – 10.0mmol/L for ac	ult inpatients.		
	 BG target f HHS: hour 	for obstet lv BG mo	ric patients is determir nitoring is required for	ned by the consulting p the duration of the IV I	ohysician: generally 6.0 Insulin Infusion) – 10.0mmol/L.		
	Fasting: ho	ourly BG r	monitoring is required f	for the duration of the	V Insulin Infusion.			
	 Perioperati 	ive: hourly	y or 2hourly, refer to pe	erioperative instruction	S.			
	Note: ePOC p Neo H blood g level is unknow	ooint of ca glucose n wn is not	are system will read 'H neter will read 'HI' if the recommended without	l' if the BG result is gre e BG is greater than 27 t MedSTAR or diabete	eater than 38.0mmol/L 7.8mmol/L. Reducing a s specialist advice.	and bedside Fre a 'HI' BG level wh	estyle Optium nen exact BG	
ור	Blood ketor	ne monit	oring & frequency					
AD	Hourly bloc	nd ketone	(BK) monitoring while	ketones are present (otherwise monitor OID			
's	 Do not cea 	se IV Insi	ulin Infusion until BK ar	re less than 0.6mmol/L	and acidosis has reso	Ived.		
Ë	Rapid Deter	tion an	d Response Instruc	tions				
BE	Senior registe	red nurse	(RN) review when:	Multi-disciplinary tea	m (MDT) review when:			
DIA	 BG not retuined 	urning to	target at anticipated	BK not decreasing	n at anticipated rate of	0.5mmol/L.per.	hour	
2	rate of 2.5	- 4.9mm	ol/L in last hour &	BG is 15.0mmol/L	or less, commence I	/ Glucose Infusio	on.	
PE	column esc	calation is	pending.	Moving up one co	olumn.			
E	 BG is great any column 	ter than 2 n.	0.0mmol/L in	BG not decreasin	g at anticipated rate of	f 2.5 - 4.9mmol/l	L in last hour	
NO	BG is less t	than 4.0m	umol/L	 12units/hour is be 	p one column or being eing used in Column 3.	in Column 3.		
US	When IV In	sulin Infu	sion has been	BG decreasing to	o fast (e.g. 5.0mmol/L	or more in last h	our).	
L I	switched o	ff and wh	en it is resumed.	Consult Moo	IStar as may roquir	o transfor to H	DUARICU	
Z				Consult Met	istal as may requir			
3	Medical emerg	gency res	ponse (MER) review w	hen:				
INS	BG is less t	than 4.0m	mol/L and has not res	ponded to the Hypogl	ycaemia Protocol oral	treatment in 45 r	ninutes.	
SU	 Breathing r 	apidly or	having difficulty breath	ning or complaining of	severe abdominal pair	1.		
N			Consult Med	Star as may require	transfer to HDU or	ICU		
NE	Reviews							
RA								
IN	Record interve	ention be	ow and note correspo	nding letter in interven	tion row on page 1.	Initial	Designation	
	Α							
	в							
-121	c							
INF.	D							
MR-	E							

Page 2 of 2

INFORMAL COPY WHEN PRINTED – check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care

2. Linked documents

Regional LHN Intravenous Insulin Infusion Preparation and Setup - Work Instruction

Regional LHN Intravenous Insulin Infusion Type 1 Diabetes Chart - Adult (MR-INF-T1D) - Example

Regional LHN Intravenous Insulin Infusion Type 2 Diabetes Chart - Adult (MR-INF-T2D) - Example

Regional LHN Diabetic Ketoacidosis Management in Adults - Protocol

Regional LHN Hyperglycaemic Hyperosmolar State Management Type 2 Adults - Protocol

Regional LHN Treatment of hypoglycaemia in people with diabetes in the hospital and community setting - Protocol

Regional LHN Continuous Subcutaneous Insulin Infusion (CSII) in People with Diabetes in the Inpatient Setting - Protocol

Regional LHN Continuous Subcutaneous Insulin Infusion (CSII) Inpatient Rate Record (MR-CIR) - Example

Regional LHN Treatment in Hyperglycaemia - Protocol and Basal Bolus Insulin Chart (MR62A)

Regional LHN Treatment in Hyperglycaemia Basal Bolus Insulin Chart (MR62A) - Example

3. References

Australian Diabetes Society and Australian and New Zealand College of Anaesthetists & Faculty of Pain Medicine (2022) *Perioperative Diabetes and Hyperglycaemia Guidelines (Adults)*. Available at https://diabetessociety.com.au/downloads/20221113%20ADS%20ANZCA%20Perioperative%20Guideline%20Final%20Nov%202022.pdf

Northern Adelaide Local Health Network (2021) Inpatient insulin management. NALHN, Adelaide.

Southern Adelaide Local Health Network (2021) *Intravenous insulin infusion for the management of hyperglycaemia in non-pregnant adults (not for treatment of diabetic ketoacidosis)*, SALHN, Adelaide.

Southern Adelaide Local Health Network (2022) *Preadmission perioperative medication guidelines*, SALHN, Adelaide.

Central Adelaide Local Health Network (2022) *Hyperglycaemia Management – Actrapid Insulin and Glucose Infusion*, CALHN, Adelaide.

Central Adelaide Local Health Network (2021) Diabetes inpatient management, CALHN, Adelaide.

4. Accreditation standards

National Safety and Quality Health Service Standards (2nd edition)

1	2 □	3	4	5 ⊠	6 ⊠	7	8 ⊠
Clinical Governance	Partnering with Consumers	Preventing & Controlling Healthcare Associated Infection	Medication Safety	Comprehensive Care	Communicating for Safety	Blood Management	Recognising & Responding to Acute Deterioration

INFORMAL COPY WHEN PRINTED - check SharePoint for most current version

Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have or who have hyperglycaemia Pag

5. 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.

Regional Local Health Networks do not accept any responsibility for the use of this material outside the scope for which it has been designed. This information is not intended to replace professional judgement or experience.