

INSULIN DEXTROSE INFUSION for pregnancy



INSULIN IS A HIGH-RISK MEDICINE

USE WITH CAUTION AND ENSURE THE DIRECTIONS WITHIN THIS PROTOCOL ARE FOLLOWED CAREFULLY

Areas where Protocol/Guideline applicable	Royal Hospital for Women
Authorised Prescribers:	Supervision/advice from the on-call endocrinology/obstetric medicine team is mandatory when considering an insulin/dextrose infusion
Important Safety Considerations	<p>The half-life of IV insulin is only a few minutes, and a woman with type 1 Diabetes Mellitus (T1DM) needs to always have some insulin in her system - otherwise she is at risk of diabetic ketoacidosis.</p> <p>Most women will be receiving long-acting insulin (Protaphane®, Lantus® or Levemir®) which reduces these risks. Long-acting insulin should be given concurrently as a dosage prescribed by the endocrinology/obstetric medicine team.</p>
	Care must be taken not to accidentally disconnect the insulin or dextrose infusions. Where possible, the insulin should be given through a dedicated cannula, and the capillary Blood Glucose Level (BGL) should be collected from the opposite hand.
Indication for use	<p>Women with type 1 diabetes mellitus during pregnancy, birth, and the immediate postpartum period who require tighter blood glucose level (BGL) control and is not eating, when their usual subcutaneous insulin regime is not appropriate.</p> <p><i>An insulin/dextrose infusion is only used in exceptional circumstances for woman with Type 2 Diabetes Mellitus (T2DM) or gestational diabetes mellitus (GDM). In that instance, this protocol may be used with consultation with the endocrinology/obstetric medicine team.</i></p> <p>THIS PROTOCOL IS NOT FOR A WOMAN WITH DIABETIC KETOACIDOSIS.</p>
Proposed Place in Therapy	When usual subcutaneous insulin regime is not appropriate.
Adjunctive Therapy	Long-acting insulin should be given concurrently as a dosage prescribed by the endocrinology/obstetric medicine team.

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Dosage	Insulin is administered intravenously at a variable rate. Glucose (Dextrose) is infused intravenously at a fixed rate. Confirm rates with Obstetrics Medicine / Endocrinology Team		
Insulin	Determine the initial insulin infusion rate using the table below.		
	Commencement Rate for Insulin Infusion		
	Capillary BGL (mmol/L)	mL/hour (= units insulin/hour)	Comments
	<4.0	No insulin.	Refer to Management of Hypoglycaemia . Call a clinical review / rapid response. Check BGL every 15 minutes.
	4.0-5.0	Nil	
	5.1-7.0	1	
	7.1-9.0	2	
	9.1-11.0	3	
	11.1-13.0	4	
	≥ 13.1	Escalate	Call endocrinology/obstetric medicine team
Glucose / Dextrose	Dextrose 5% intravenous infusion rate 75 – 125 mL/hr		
Duration of therapy	Cease infusion as soon as possible after birth i.e., when the woman can eat and take her normal insulin.		
	Liaise with endocrinology/obstetric medicine team to create an individualised plan about when and how to cease infusion		

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Prescribing Instructions

Prescribe in eFluids. Search and Select:

Enter name to create sequence:

Search: Type:

Folder: Search within:

Actrapid
 Actrapid units, Subcut, Solution-Inj, morning (with breakfast), BGL lower limit (mmol/L): 4
 Actrapid units, Subcut, Solution-Inj, midday (with lunch), BGL lower limit (mmol/L): 4
 Actrapid units, Subcut, Solution-Inj, evening (with dinner), BGL lower limit (mmol/L): 4
 Actrapid units, Subcut, Solution-Inj, TDS (with breakfast, lunch and dinner), BGL lower limit (mmol/L): 4
 Actrapid units, Subcut, Solution-Inj, ONCE only, BGL lower limit (mmol/L): 4
 Actrapid units, Subcut, Solution-Inj, morning (with breakfast), BGL lower limit (mmol/L): 3.5, Indication: Gestational diabetes
 Actrapid units, Subcut, Solution-Inj, midday (with lunch), BGL lower limit (mmol/L): 3.5, Indication: Gestational diabetes
 Actrapid units, Subcut, Solution-Inj, evening (with dinner), BGL lower limit (mmol/L): 3.5, Indication: Gestational diabetes
 Actrapid units, Subcut, Solution-Inj, TDS (with breakfast, lunch and dinner), BGL lower limit (mmol/L): 3.5, Indication: Gestational diabetes
 Actrapid units, Subcut, Solution-Inj, ONCE only, BGL lower limit (mmol/L): 3.5, Indication: Gestational diabetes
 Actrapid 10 units in glucose 50% 50 mL [Hyperkalaemia], IV infusion, over 30 minutes
 Actrapid 50 units in sodium chloride 0.9% 50 mL [Labour Type 1 Diabetes], IV infusion
 Actrapid Penfill

Prescribe initial rate of insulin infusion.

Orders for Signature				
	Order Name	Status	Start	Details
✓	Birthing Unit RHW; -: OV07 Admit: 10/12/2023 13:00			
✓	IV Solutions			
	Actrapid additive 50 units + Sodium Chloride 0.9% 50 mL	Order	21/06/2024 16:26	50 mL, IV Continuous Infusion, mL/hr, Indication: Labour Type 1 Diabetes, 1 bag(s)

Details for Actrapid additive 50 units + Sodium Chloride 0.9% intravenous solution 50 mL

Details Continuous Details Diagnoses

Base Solution	Bag Volume	Rate	Infuse Over
Sodium Chloride 0.9% intravenous solution 50 mL	50 mL	mL/hr	hr(s)
Additive	Additive Dose	Normalized Rate	Delivers
Actrapid additive	50 units		EB
Total Bag Volume	50 mL		

Weight: kg Weight Type: Result dt/tm: BSA:

Infusion instructions

The order will appear on MAR as:

Continuous Infusions		21/06/2024 16:26
Actrapid additive 50 units		Pending
Sodium Chloride 0.9% intravenous solution 50 mL		Not given within 5 days.
50 mL, IV Continuous Infusion, 25 mL/hr, Indication: Labour Type 1 Diabetes, 1 bag(s)		
Administration Information		
insulin neutral		
Sodium Chloride 0.9% intravenous solution		

Each order in eFluids corresponds to **ONE Syringe** only. Prescribers must ensure that new infusion orders are available in a timely manner, enabling nursing staff to continuously administer the drug infusion, where required. The number of syringes prescribed at any one time should be considered in the context of:

- Stability of dose at the time of prescribing
- Predicted duration of one bag

Note: Insulin infusions must be recharted and replaced at least every 24 hours.

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Administration Instructions	<p>MUST be administered by a category 1 or 3 accredited registered nurse (RN) or registered midwife (RM)</p> <p>Preparing infusions</p> <ul style="list-style-type: none"> Determine the initial insulin infusion rate using Table <i>Commencement rate for Insulin Infusion</i> e.g. if the BGL is 5.2mmol/L, start the infusion at 1mL/hr (= 1 unit/hr). <p>Administration</p> <ul style="list-style-type: none"> Requires one dedicated intravenous (IV) cannula to administer both infusions concurrently through an infusion pump. Connect to the IV cannula with a 3-way tap.
Insulin	<p>Load 50 units insulin in sodium chloride 0.9% made up to 50 mL total volume (1 unit of insulin/ mL) in a syringe driver</p>
Glucose / Dextrose	<p>Prepare bag of 5% dextrose solution to be run concurrently at a fixed rate of 75-125mL/hr as prescribed by the endocrinology/obstetric medicine team.</p> <p>Occasionally 10% dextrose will be substituted if fluid restriction is required.</p>
Monitoring requirements	<p>Provide 1:1 nursing/midwifery care</p> <p>Nursing staff are responsible for:</p> <ol style="list-style-type: none"> checking capillary ketones fourth-hourly using finger prick KetoStix®. Notify endocrinology/obstetric medicine team if ketones > 0.6 monitoring capillary BGL one hour after infusion commenced and then as frequency recommended below. Nursing staff MUST request a medical officer review if > 2 consecutive BGL levels > 8.0 mmol/L or BGL ≥ 15.1 mmol/L. reviewing the insulin infusion rate every hour and adjusting accordingly. All infusion rate changes are to be checked by two RN/RMs. <p>If the woman's blood glucose levels are not responding to increasing the insulin infusion, consider errors relating to:</p> <ul style="list-style-type: none"> the insulin infusion preparation IV tubing IV cannula blood glucose monitor <p>Contact the endocrinology/obstetric medicine team if this occurs.</p> <p>Nursing staff MUST document the administration of rate changes in MAR. If no adjustments are required, document this and other details relevant for the infusion in the progress notes. See Quick Reference Guide: Rate Change Documentation via MAR (Nurse Led Titration)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Notify endocrinology/obstetric medicine team immediately if the insulin infusion needs to be turned off for any reason.</p> </div> <p>Be aware insulin requirements decrease after the birth of the placenta, and the woman is at increased risk of hypoglycaemia postpartum. Target BGL of 5-10 mmol/L are adequate.</p> <p>Check BGL every 30 minutes for the first two hours postpartum, and then hourly as usual.</p>

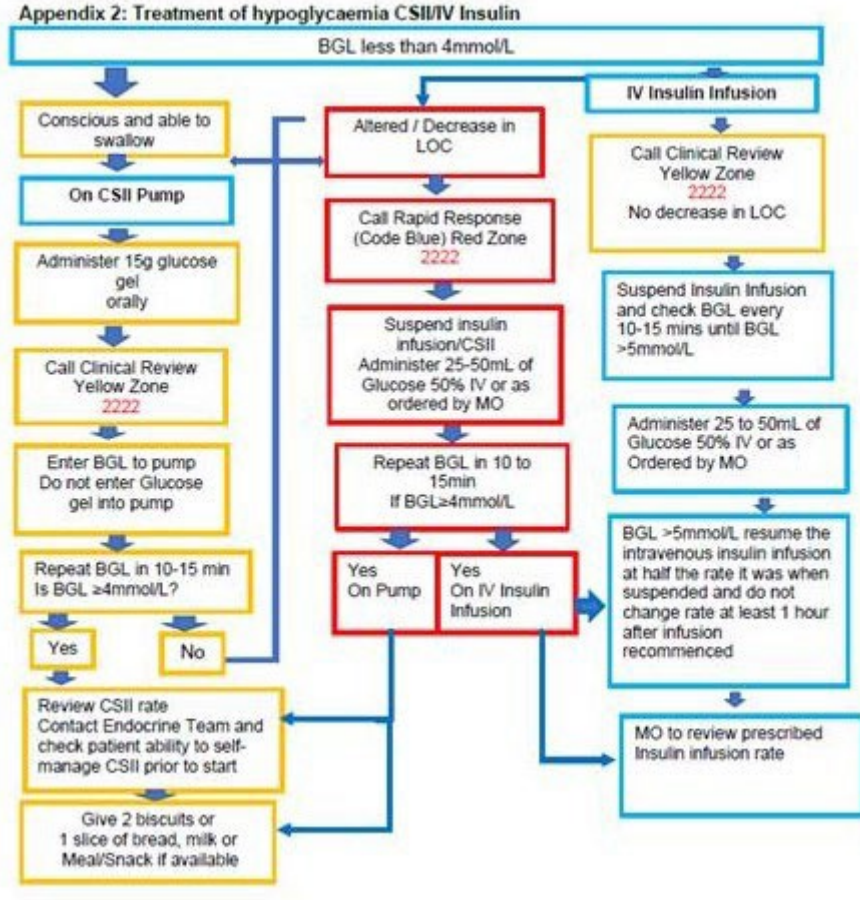
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Adjusting Insulin Infusion

BGL (mmol/L)	Immediate action	Repeat capillary BGL	Next steps
< 4.0	<ol style="list-style-type: none"> 1. Stop insulin infusion 2. Notify endocrinology/obstetric medicine team 3. Treat hypoglycaemia 	every 15 mins until BGL > 4.0	<p>Once BGL 4.0-6.0, leave insulin infusion off and repeat BGL in 1 hour.</p> <p>Once BGL > 6.0, recommence infusion at HALF the previous rate.</p>
4.0 - 5.0	Halve insulin infusion rate	In 1 hour	
5.1 - 7.9	<i>If NO increase to insulin infusion rate in the last hour:</i> Maintain infusion rate	In 1 hour	
	<i>If recent increase to insulin infusion rate in the last hour:</i> Reduce insulin rate by 1 mL/hr	In 1 hour	
8.0 – 15.0	Increase insulin rate by 1 mL/hr every hour until < 8.0 mmol/L	In 1 hour	Check capillary ketones and notify endocrinology/obstetric medicine team if > 2 consecutive BGL levels > 8.0 mmol/L
≥ 15.1	<ol style="list-style-type: none"> 1. Give 4 mL bolus of insulin stat. 2. Increase insulin infusion rate by 1 mL/ hr 3. Notify endocrinology/obstetric medicine team 	In 1 hour	Check for capillary ketones

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Management of Hypoglycaemia	<p>Appendix 2: Treatment of hypoglycaemia CSII/IV Insulin</p>  <pre> graph TD Start[BGL less than 4mmol/L] --> Conscious[Conscious and able to swallow] Start --> LOC[Altered / Decrease in LOC] Conscious --> OnPump[On CSII Pump] OnPump --> AdminGlucose[Administer 15g glucose gel orally] AdminGlucose --> CallReview1[Call Clinical Review Yellow Zone 2222] CallReview1 --> EnterBGL[Enter BGL to pump Do not enter Glucose gel into pump] EnterBGL --> RepeatBGL1[Repeat BGL in 10-15 min Is BGL ≥4mmol/L?] RepeatBGL1 -- Yes --> ReviewCSII[Review CSII rate Contact Endocrine Team and check patient ability to self-manage CSII prior to start] RepeatBGL1 -- No --> LOC ReviewCSII --> GiveSnack[Give 2 biscuits or 1 slice of bread, milk or Meal/Snack if available] GiveSnack --> Conscious LOC --> CallReview2[Call Rapid Response Code Blue Red Zone 2222] CallReview2 --> SuspendInsulin[Suspend insulin infusion/CSII Administer 25-50mL of Glucose 50% IV or as ordered by MO] SuspendInsulin --> RepeatBGL2[Repeat BGL in 10 to 15min If BGL ≥4mmol/L] RepeatBGL2 -- Yes --> OnPump RepeatBGL2 -- Yes --> OnIV[Yes On IV Insulin Infusion] OnIV --> ResumeInsulin[BGL >5mmol/L resume the intravenous insulin infusion at half the rate it was when suspended and do not change rate at least 1 hour after infusion recommenced] ResumeInsulin --> ReviewRate[MO to review prescribed Insulin infusion rate] LOC --> IVInsulin[IV Insulin Infusion] IVInsulin --> CallReview3[Call Clinical Review Yellow Zone 2222 No decrease in LOC] CallReview3 --> SuspendInsulin2[Suspend Insulin infusion and check BGL every 10-15 mins until BGL >5mmol/L] SuspendInsulin2 --> AdminGlucose2[Administer 25 to 50mL of Glucose 50% IV or as Ordered by MO] AdminGlucose2 --> ResumeInsulin2[BGL >5mmol/L resume the intravenous insulin infusion at half the rate it was when suspended and do not change rate at least 1 hour after infusion recommenced] ResumeInsulin2 --> ReviewRate </pre>
Basis of Protocol/Guideline:	<ul style="list-style-type: none"> • Diabetes - Management of Pre-gestational Diabetes in Pregnancy Policy SESLHDGL/116 • Diabetes - Gestational Diabetes Mellitus (GDM) Screening and Management Policy SESLHDGL/117 • Australian Commission on Safety and Quality in Health Care User guide to the National Subcutaneous Insulin Chart: acute facilities. Sydney: ACSQHC; 2017 Guidelines for Treating Hypoglycaemia
Groups consulted in development of this guideline	<p>Royal Hospital for Women Medication Safety Committee Royal Hospital for Women Maternity Clinical Business Rule Committee</p>

AUTHORISATION

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GOVERNANCE	
Enactment date <i>Reviewed</i> (Version 2) <i>Reviewed</i> (Version 3)	July 2024 May 2025
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