

REGIONAL LOCAL HEALTH NETWORKS

Protocol (clinical)

Title: Perioperative diabetes management in adults

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Summary: This protocol outlines responsibilities and actions required by medical practitioners, nurses and midwives to ensure the safety and quality of inpatient care

Policy 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.

Risk Rating: [Choose an item.](#)

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 Does this protocol *replace* an existing document? No

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1. Overview/description

Diabetes is a chronic metabolic condition marked by high levels of glucose in the blood. Diabetes and the associated multisystemic complications need to be considered in the perioperative setting.

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

Suboptimal glycaemia is associated with:

- increased post-operative infection risk
- poor wound healing after surgery
- hypoglycaemia
- increased length of stay and
- increased mortality.

This Protocol has been adapted from the Australian Diabetes Society (ADS) and the Australian and New Zealand College of Anaesthetists & Faculty of Pain Medicine (ANZCA) Perioperative Diabetes and Hyperglycaemia Guidelines (Adults).

This document outlines the requirements for perioperative management in regional local health network (LHN) hospitals and is supported by the regional LHN Work Instruction '*Perioperative Diabetes Management*' and nine consumer fact sheets.

2. Protocol details

2.1 Indications

This protocol addresses perioperative diabetes management for adult elective surgery.

Obstetrics. The general principles contained in this protocol apply to pregnant women with diabetes. However, consultation with specialist obstetrician, specialist physician and/or endocrinologist is recommended.

Paediatrics. The general principles contained in this protocol may apply to children and young adults with diabetes. However, consultation with paediatrician, specialist physician and/or endocrinologist is recommended.

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 '*Diabetic Ketoacidosis Management in Adults*' and '*Hyperglycaemic Hyperosmolar State Management Type 2 Adults*'.

2.2 Referral

The primary referrer (medical practitioner) is required to complete all referrals for surgery.

The referral letter should include details of any diabetes-related complications, medications and relevant laboratory measurements.

Figure 1 identifies the responsibilities of the primary referrer in the initial perioperative assessment and optimisation of the glycaemic control. Perioperative screening for diabetes includes:

- HbA1c: measured within the preceding 3 months (preferably within 4-6 weeks prior).
- referral to a diabetes specialist: when HbA1c is greater than or equal to 8.5% (70mmol/mol or when there is hypoglycaemic unawareness).
- target HbA1c less than 9% (75mmol/mol): should ideally be achieved prior to elective surgery.
- capability of patient or carer to measure and record finger prick blood glucose (BG).

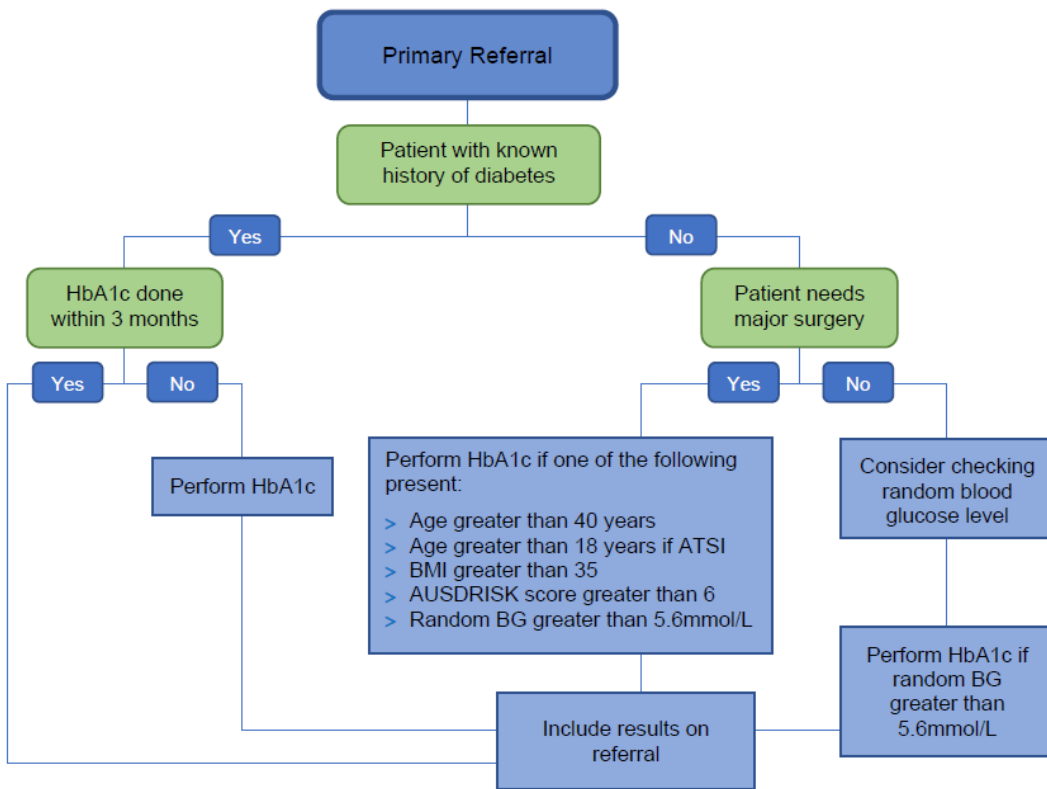


Figure 1. ADS Recommendations for the pre-operative screening for diabetes mellitus

2.3 Pre-operative Management

Pre-admission

A written perioperative management plan should be provided to all people with diabetes. Refer to regional LHN 'Perioperative Diabetes Management Work Instruction' and nine (9) Consumer Fact Sheets tilted:

- Surgery and type 1 diabetes (insulin pump)
- Surgery and type 1 diabetes (insulin injections)
- Surgery and type 2 diabetes
- Colonoscopy and type 1 diabetes (insulin pump)
- Colonoscopy and type 1 diabetes (insulin injections)
- Colonoscopy and type 2 diabetes
- Endoscopy and type 1 diabetes (insulin pump)
- Endoscopy and type 1 diabetes (insulin injections)
- Endoscopy and type 2 diabetes.

Clear instructions should be provided for people with diabetes regarding:

Blood Glucose (BG) or Continuous Glucose Monitoring (CGM): people with diabetes able to monitor their own BG should be advised to do so 1-2hourly from the time they wake on the day of their procedure until when they arrive at the hospital.

People with diabetes are to be encouraged to bring their BG meter, CGM system and a printed BG record and/or CGM system report.

Diabetes medications: people with diabetes are recommended to bring a printed medication list and a record of their latest continuous subcutaneous insulin infusion (CSII or insulin pump therapy reports and insulin delivery settings). The suggested management is outlined in the three (3) tables below.

Oral and/or injectable diabetes medications (e.g. not prescribed insulin therapy):
<ul style="list-style-type: none"> • cease Sodium Glucose Co-Transporter 2 (SGLT2) inhibitors on the two days prior to surgery and the day of surgery. Supplementary alternative anti-hyperglycaemic medications may need to be given to avoid excessive hyperglycaemia.
<ul style="list-style-type: none"> • for colonoscopy, cease SGLT2 inhibitors on the two days prior to the procedure and the day of colonoscopy. Usually supplementary alternative anti-hyperglycaemic medications will not be needed given fluids only on the 2nd day.
<ul style="list-style-type: none"> • for day-stay procedures (including gastroscopy), SGLT2 inhibitors can be stopped just for the day of procedure. However, duration of fasting before and after the procedure should be minimised.
<ul style="list-style-type: none"> • continue all other anti-hyperglycaemic medications up to and including the night before surgery.
<ul style="list-style-type: none"> • withhold all oral anti-hyperglycaemic and non-insulin medications on the day of surgery.
Insulin and oral and/or injectable diabetes medications:
<ul style="list-style-type: none"> • continue the usual insulin regimen up to and including the night before surgery.
<ul style="list-style-type: none"> • if basal insulin, continue at usual dose(s) and time(s). Exception: Reduce basal insulin dose by 20% if recent overnight hypoglycaemia (<i>refer to Appendix A</i>).
<ul style="list-style-type: none"> • if pre-mixed insulin, continue usual evening meal dose the evening prior to surgery. Exception: Reduce evening insulin dose by 20% if recent overnight hypoglycaemia. Reduce morning dose by 50% on the day of surgery, omit lunchtime dose (if any) and resume usual insulin regimen from the evening after surgery if eating (<i>refer to Appendix A</i>).
<ul style="list-style-type: none"> • if co-formulated insulin, continue usual evening meal dose the evening prior to surgery. Exception: Reduce evening insulin dose by 20% if recent overnight hypoglycaemia. If morning procedure delay any morning dose to lunchtime (if able to eat by then) or delay till evening if not usually on evening dose. If usually lunchtime co-formulated insulin continue usual dose after morning surgery if eating or delay till evening if not usually on evening dose. If usually lunchtime co-formulated insulin and afternoon surgery, delay till evening (if eating) if not usually on evening dose. If usually evening co-formulated insulin continue usual dose after surgery if eating. If not eating (<i>refer to Appendix A</i>).
Continuous subcutaneous insulin infusion (CSII or insulin pump therapy) and oral and/or injectable diabetes medications:
<ul style="list-style-type: none"> • perform a line and set change 24 hours before surgery to ensure the pump is functioning normally.
<ul style="list-style-type: none"> • set a temporary basal rate of 80% (or 20% less than usual basal) if HbA1c less than 6.5% (48mmol/mol) or if fasting glucose is less than 5.0mmol/L on the day of the procedure.
<ul style="list-style-type: none"> • if auto-mode pump individualised advice from diabetes physician required regarding appropriate BG to be set perioperatively. Consider higher than usual BG target 6.7mmol/L or exercise type target of 8.3mmol/L.
<ul style="list-style-type: none"> • continue basal insulin infusion via pump throughout surgery, except where the person is to remain nil by mouth post-surgery in which case an intravenous insulin-glucose infusion is recommended.

Refer to the regional LHN Protocol ‘*Continuous Subcutaneous Insulin Infusion (CSII) in People with Diabetes in the Inpatient Setting*’ and ‘*Inpatient Rate Record (MR-CIR)*’.

Bowel Preparation: insulin regimens should be changed, and written instructions provided (*refer to Appendix B*).

Oral fluids: if oral fluids are to continue, drink:

- only water for hydration.
- water until 2 hours prior to surgery.
- clear (not cloudy) fluids (e.g. apple juice) for the treatment of hypoglycaemia.

Hypoglycaemia (e.g. BG less than 4.0mmol/L irrespective of symptoms): must be avoided. The person with diabetes is to refer to their Hypoglycaemia Action Plan. Clear apple juice and sugar-containing cordial (not artificial sweeteners) or jelly (not red, blue or orange in colour) should be used for avoidance of, and correction of, hypoglycaemia.

Hyperglycaemia (e.g. BG greater than 12.0mmol/L): should be corrected. The person with diabetes is to refer to their Hyperglycaemia or Sick Day Action Plan. If used, a correction dose of rapid acting insulin can be used based on their individual's insulin sensitivity factor (ISF). Repeat correction insulin doses based on ISF should not usually be administered within 3 hours of each other.

Driving: do not drive on the morning of surgery, or for 24 hours after sedation or anaesthetic.

2.4 On Admission

Blood Glucose (BG) or Continuous Glucose Monitoring (CGM): BG monitoring should be attended hourly while fasting and during the procedure, except for people with type 2 diabetes with a pre-operative HbA1c of less than 7% (less than 53mmol/mol) who are managed with Metformin alone. In this instance, 2 hourly BG monitoring is adequate.

The target range BG for an adult with diabetes in a general ward is 5.0 – 10.0mmol/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, emergency surgery, known hypoglycaemia unawareness). *Refer to the regional LHN Protocol 'Inpatient blood glucose and blood ketone monitoring in the hospital setting'.*

Clinical decisions are to be based on BG results, NOT by continuous glucose monitoring devices even if worn. Refer to the regional LHN Protocol '*Continuous Glucose Monitoring (CGM) in the inpatient setting*'.

Blood Ketone (BK) Monitoring: is performed through capillary ketone testing with a fingerstick, test strip and meter.

The target range BK for an adult with diabetes in a general ward is 0.0 – 0.6mmol/L. Refer to the regional LHN Protocol '*Inpatient blood glucose and blood ketone monitoring in the hospital setting*'.

Fluid replacement:

- Glucose containing fluid needs to be used only for treatment of hypoglycaemia or when using an insulin infusion (e.g. extended procedure or when the person needs to remain fasting following the procedure)
- Isotonic solutions such as 0.9% Saline, Hartmann's or Plasmalyte can be used for hydration.

Sodium and potassium level should be monitored at least daily and especially when on insulin infusions.

Diabetes Medications: if the SGLT2 inhibitor has not been omitted for 3 days (e.g., 2 days prior to surgery and the day of surgery) OR if the SGLT2 inhibitor has been taken on the day of surgery / procedure, the suggested management for clinically WELL person with diabetes who has NOT ceased SGLT2 inhibitor is outlined in the table below. If patient has administered SGLT2 inhibitor within 72 hours and is clinically UNWELL, a blood gas and blood ketones should be measured to check for possible ketoacidosis regardless of BG result.

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Blood ketones	Standard base excess (SBE)	Comments
less than 1.0mmol/L	greater than 5.0mmol/L	<p>No ketosis and no metabolic acidosis. Consider proceeding with day surgery: hourly monitoring of blood ketones during the procedure, and 2nd hourly following the procedure until eating and drinking normally or discharged. Where blood gas analysis is not available proceed only if added risk is consistent with goals of care. More extensive surgery: consider goals of care and collaboration with endocrinology and critical care. Perioperative insulin and glucose infusion may reduce risk.</p>
greater than 1.0mmol/L	greater than 5.0mmol/L	<p>Ketosis without metabolic acidosis. Seek endocrinology or general medicine advice. Ketosis without acidosis may reflect starvation, particularly in individuals with HbA1c less than 9% (less than 75 mmol/mol). Consider proceeding, but with perioperative insulin and glucose infusion to reduce risk of ketoacidosis.</p>
greater than 1.0mmol/L	less than 5.0mmol/L	<p>Ketosis with metabolic acidosis. Postpone non-urgent surgery. Urgent surgery to proceed with insulin and glucose infusion and ketone monitoring. Seek urgent advice from MedStar on 137 827. Recommend transfer to an appropriate HDU or ICU.</p>

Hypoglycaemia (e.g. BG less than 4.0mmol/L irrespective of symptoms): is a potentially life threatening emergency that requires immediate and appropriate treatment. Refer to the regional LHN Protocol '*Treatment of hypoglycaemia in people with diabetes in the hospital setting*'. All preventative strategies should be actioned to minimise the risk of hypoglycaemia.

Hyperglycaemia (e.g. BG greater than 12.0mmol/L): should be corrected. The person with diabetes is to refer to their Hyperglycaemia or Sick Day Action Plan. If used, a correction dose of rapid acting insulin can be used based on their individual's insulin sensitivity factor (ISF). Repeat correction insulin doses based on ISF should not usually be administered within 3 hours of each other.

2.5 Intra-operative Management

Blood Glucose (BG) or Continuous Glucose Monitoring (CGM): BG monitoring should be attended hourly during the procedure except for people with type 2 diabetes with a pre-pre-operative HbA1c of less than 7.0% (less than 53mmol/mol) and who are managed on Metformin alone. In this instance, 2 hourly BG monitoring is adequate.

The target range BG for an adult with diabetes in a general ward is 5.0 – 10.0mmol/L. Refer to the regional LHN Protocol '*Inpatient blood glucose and blood ketone monitoring in the hospital setting*'.

Clinical decisions are to be based on BG results, NOT by continuous glucose monitoring devices even if worn. Refer to the regional LHN '*Protocol Continuous Glucose Monitoring (CGM) in the inpatient setting*'.

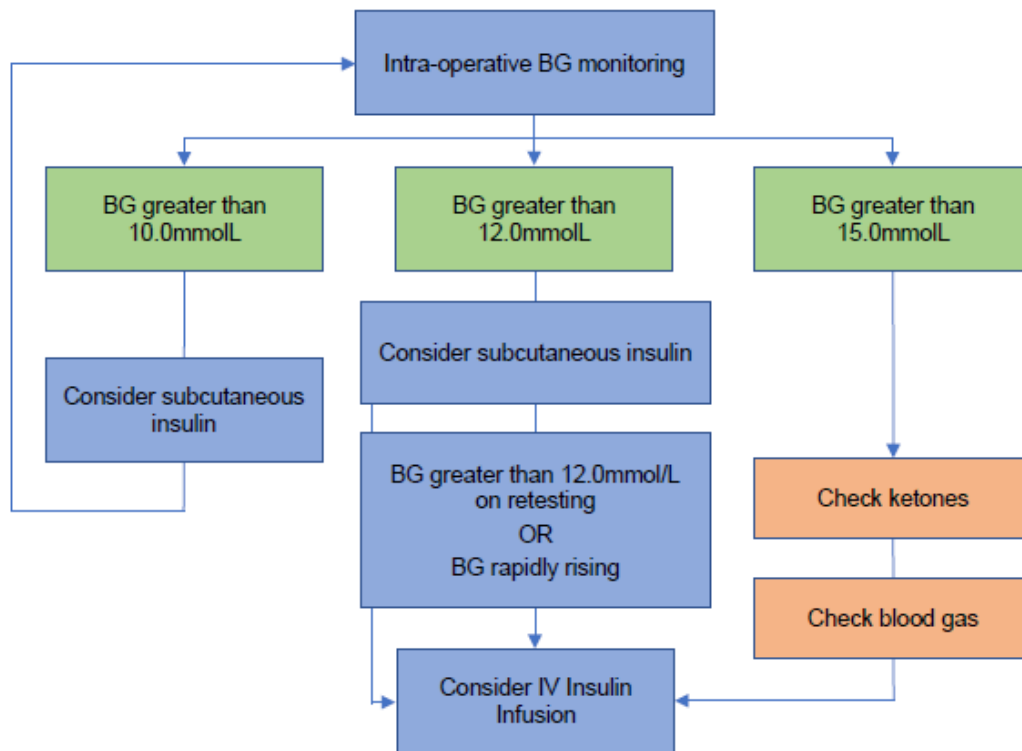
Blood Ketone (BK) Monitoring: the target range BK for an adult with diabetes is 0.0 – 0.6mmol/L. Refer to the regional LHN Protocol '*Inpatient blood glucose and blood ketone monitoring in the hospital setting*'.

Nausea and Vomiting: Dexamethasone is useful for prevention but not treatment of nausea and vomiting. Due to the associated glucocorticoid-induced hyperglycaemia, use of other anti-emetics in people with diabetes is recommended.

OFFICIAL

Hypoglycaemia: is a potentially life-threatening emergency that requires immediate and appropriate treatment. Refer to the regional LHN Protocol Treatment of hypoglycaemia in people with diabetes in the hospital setting. All preventative strategies should be actioned to minimise the risk of hypoglycaemia.

Hyperglycaemia: Figure 2 (below) which identifies the suggested ADS algorithm for intra-operative hyperglycaemia.



If BG greater than 10.0mmol/L, a correction dose of rapid acting insulin delivered subcutaneously. A correction dose can be based on person with diabetes' known insulin sensitivity factor (ISF).

If ISF is unknown, it can be estimated using the equation:

$$\text{Insulin sensitivity factor (ISF)} = 100 \text{ divided by } (\div) \text{ total daily dose (TDD)}$$

For example:

Total of 50units of insulin per day, the ISF is calculated as $100/\text{TDD}$

$$100/50 = 2$$

The ISF is 1unit of rapid acting correction insulin is anticipated to lower the BG by **2.0mmol/L**.

The ISF is then used to estimate a correction dose of subcutaneous rapid acting insulin.

If the person with diabetes (with an ISF of 2) has a target BG of 8.0mmol/L, but has a current BG of 14.0mmol/L, prescribing 3units of rapid acting correction insulin is anticipated to lower the BG by 6.0mmol/L and correct the BG back to target.

$$14.0\text{mmol/L} - 6.0\text{mmol/L} = 8.0\text{mmol/L} \text{ (target BG).}$$

If BG is rapidly rising and/or greater than 12.0mmol/L, consider commencing an Intravenous (IV) Insulin Infusion. Refer to regional LHN Protocol '*Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have hyperglycaemia*'.

For individuals on a continuous subcutaneous insulin infusion (CSII or insulin pump therapy), any rapid increase in BG should prompt consideration for IV Insulin Infusion and cessation of the insulin pump intra-operative.

In patients with type 1 diabetes, blood gas and blood ketones should be measured to check for possible ketoacidosis if BG greater than 15.0mmol/L.

2.6 Post-operative Management

Blood Glucose (BG) or Continuous Glucose Monitoring (CGM): BG monitoring should be attended hourly until the patient leaves the recovery area, except for people with type 2 diabetes with a pre pre-operative HbA1c of less than 7.0% (less than 53mmol/mol) and who are managed on Metformin alone. In this instance, 2 hourly BG monitoring is adequate.

The target range BG for an adult with diabetes in a general ward is 5.0 – 10.0mmol/L. Refer to the regional LHN Protocol '*Inpatient blood glucose and blood ketone monitoring in the hospital setting*'.

Clinical decisions are to be based on BG results, NOT by continuous glucose monitoring devices even if worn. Refer to the regional LHN Protocol '*Continuous Glucose Monitoring (CGM) in the inpatient setting*'.

Blood Ketone (BK) Monitoring: the target range BK for an adult with diabetes is 0.0 – 0.6mmol/L. Refer to the regional LHN Protocol '*Inpatient blood glucose and blood ketone monitoring in the hospital setting*'.

If the BG has been stable (within target range), frequency of BG monitoring can be decreased to 2 hourly for patients with type 1 diabetes, or 2-4 hourly for patients with type 2 diabetes.

Nausea and Vomiting: Dexamethasone is useful for prevention but not treatment of nausea and vomiting. Due to the associated glucocorticoid-induced hyperglycaemia, use of other anti-emetics in people with diabetes is recommended.

IV Insulin Infusion: in cardio-thoracic surgery patients or in patients admitted to the intensive care unit, it is recommended a IV Insulin Infusion be commenced if two post-operative BG results greater than 10.0mmol/L are recorded.

The IV Insulin Infusion can be ceased if ALL of the following are met:

- there is no evidence of diabetic ketoacidosis.
- the patient is eating well (tolerating 50% of normal oral intake/has commenced enteral feeds) or is on Total Parenteral Nutrition (TPN).
- the patient's usual diabetes therapies (insulin and non-insulin) have been resumed – in particular basal insulin for insulin treated patients.

Ideally, the IV Insulin Infusion should be ceased after breakfast, with a dose of subcutaneous insulin (or oral anti hyperglycaemic medication-AHG) having been given before breakfast or four (4) hours prior. Refer to regional LHN Protocol '*Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have hyperglycaemia*', transition to alternative insulin therapy or oral and/or injectable medication administration.

Continuous Subcutaneous Insulin Infusion (CSII or insulin pump therapy): 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. The IV Insulin Infusion rate is then to be titrated down based on BG levels.

Refer to the regional LHN Protocol '*Continuous Subcutaneous Insulin Infusion (CSII) in People with Diabetes in the Inpatient Setting*' and '*CSII Inpatient Rate Record (MR-CIR)*' 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.

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Basal Bolus Insulin: subcutaneous long-acting insulin must be on board for at least 4 hours before discontinuing IV Insulin Infusion. Refer to the regional LHN *'Hyperglycaemia Protocol: Basal Bolus Insulin Chart (MR62A)'*.

Premixed insulin, co-formulation insulin, non-insulin injectables and oral medications: people with diabetes with preoperatively impaired renal function should have serum creatinine levels checked postoperatively. Usual oral medication and/or injectables including insulin can be recommenced if the person with diabetes is eating and drinking, with the following exceptions:

- **Metformin** should be withheld in people with renal impairment [CKD stage 3B or below/eGFR less than 45 mL/min/1.73 m²] and should only be recommenced once renal function has returned to their baseline level. For people with diabetes who can eat and drink immediately after their procedure metformin can be restarted without measuring renal function.
- **Sodium glucose co-transporter 2 (SGLT2) inhibitors** should not be recommenced for at least 2 days after major surgery, and even then, only after the patient has returned to eating a full diet.

In the setting of minor surgery, SGLT2 inhibitor may be recommenced the day after surgery.

2.7 Discharge Planning

All people with diabetes need to be provided with information on discharge with regard to their usual diabetes care.

The surgical team and anaesthetists are to ensure that all relevant in-hospital tests and issues with regard to glycaemic control are conveyed to the person with diabetes, GP and diabetes physician including:

- any HbA1c performed
- new onset hyperglycaemia during hospital admission
- any glycaemic related complications such as DKA/HHS
- changes made to diabetic medications during hospital stay
- planned reintroduction of therapies temporarily ceased perioperatively
- changes to medications that may impair glycaemic control such as corticosteroids
- concerns regarding administration of diabetes medications or self-management of diabetes.

The person with diabetes should be provided with written discharge documentation which should include sick day management plans and details of who to contact for advice regarding post-discharge management of diabetes.

3. Linked documents

- [Regional LHN Intravenous Insulin Infusion in adults with diabetes who are fasting, receiving perioperative or intrapartum care or who have hyperglycaemia - Protocol](#)
- [Regional LHN Diabetic Ketoacidosis Management in Adults - Protocol](#)
- [Regional LHN Hyperglycaemic Hyperosmolar State Management Type 2 Adults - Protocol](#)
- [Regional LHN Continuous Subcutaneous Insulin Infusion \(CSII\) in People with Diabetes in the Inpatient Setting – Protocol](#)
- [Regional LHN CSII \(Insulin Pump\) Inpatient Rate Record \(MR-CIR\) - Example](#)
- [Regional LHN CSII \(Insulin Pump\) Outpatient Rate Record \(MR-COR\) - Example](#)
- [Regional LHN Treatment of hypoglycaemia in people with diabetes in the hospital and community setting – Protocol](#)

4. References

- Australian Diabetes Society (ADS) and the Australian and New Zealand College of Anaesthetists & Faculty of Pain Medicine (ANZCA) (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.

5. Accreditation standards

5.1 [National Safety and Quality Health Service Standards](#) (2nd edition)



1. Clinical Governance



2. Partnering with Consumers



3. Preventing and Controlling Healthcare Associated Infections



4. Medication Safety



5. Comprehensive Care



6. Communicating for Safety



7. Blood Management



8. Recognising and Responding to Acute Deterioration



6. Risk Assessment

[SA Health Risk Assessment Criteria](#)

Category	Clinical - S&Q of Consumers	Financial	Workforce - Our People / WH&S	Legislative & Compliance	Service Delivery	Reputation & Image
Consequence	Minor	Minor	Minor	Minor	Minor	Minor
Likelihood	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Risk Rating	LOW	Low	Low	Low	Low	Low
Description	Consumer dissatisfaction / frustration. Reduced quality of person-centred experience.	Loss impact of less than 5% of the cost centre expenditure budget.	Staff dissatisfaction / frustration. Insignificant impact on service delivery.	Undesirable occurrence but little to no impact to code of ethics / conduct or accepted practices.	Localised or intermittent interruptions in service delivery.	Stakeholder dissatisfaction / frustration. No notable effect on brand.
Overall Risk rating:	Low					

7. 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.

Appendix A: ADS Guide to Pre-operative Insulin Management

Insulin regimen	Morning procedure	Afternoon procedure
Evening basal insulin only	No dose change.	No dose change.
Morning basal insulin only	No dose change.	No dose change.
Basal bolus regimen	Omit the morning and lunch time rapid/short-acting insulin. Keep the basal dose unchanged.	Advise half the morning rapid/short-acting insulin with light breakfast. Omit the lunch dose(fasting). Keep the basal and evening meal dose unchanged if eating.
Pre-mixed insulin	Halve the usual morning dose. Omit lunchtime dose (if any) if not eating. Leave the evening meal dose unchanged.	Advise half the usual morning dose with light breakfast. Omit lunchtime dose (if any). Leave the evening meal dose unchanged if eating.
Co-formulated insulin eg Ryzodeg	Omit on morning of surgery for morning procedure. Give usual morning dose at lunchtime if able to eat by then. If usually lunchtime dose give as usual if able to eat by then. If patient is on morning or lunchtime only dose, give usual dose with evening meal if not able to eat before then.	Advise half of usual morning dose with light breakfast. Omit if usually lunchtime dose. If usually lunchtime dose only give usual dose with evening meal if able to eat by then. If usually evening dose, give usual dose with evening meal if eating. If unable to eat post op by evening recommend insulin infusion or switch to basal bolus insulin.
Intermediate acting insulin with 2-3 rapid-acting or short-acting insulin doses for meals	Calculate the total dose of all insulins for the morning and lunch. Half of the total insulin dose should be given as an intermediate acting insulin only in the morning. Leave evening meal and pre-bed doses unchanged.	Calculate the total dose of all insulins for the morning and lunch. Half of the total insulin should be given as an intermediate acting insulin only in the morning. Half the morning rapid-acting insulin can be given with a light-breakfast. Leave evening meal (if eating) and pre-bed doses unchanged.
Subcutaneous insulin pump	Continue basal infusion at usual rates - or: Use temporary basal of 80% if fasting BG <5 mmol/L or HbA1c <48 mmol/mol (6.5%). If automode pump, set exercise blood glucose target.	Half calculated bolus at breakfast; Continue basal infusion at usual rates- or use temporary basal of 80% if fasting BG <5 mmol/L. If automode pump, set exercise blood glucose target.

Appendix B: Management of Bowel Preparation

Insulin Management when having a Bowel Preparation		
Usual Insulin Regimen	Morning	Evening
Basal bolus regimens	Withhold rapid-acting insulin. Continue long-acting as usual.	Withhold rapid-acting insulin. Give half of long-acting insulin at the usual time.
Regimen consisting of separate injections of rapid-acting and intermediate acting insulin	Withhold rapid-acting insulin. Calculate morning and lunch doses of all rapid-acting insulin (do not include dinner doses). Give half of this as intermediate acting insulin.	Withhold rapid-acting insulin. Give half of intermediate acting insulin at usual time in the evening.
Pre-mixed insulin regimens	Give half of the usual dose at the usual time.	Give half of insulin dose at usual time in the evening.
Co-formulated insulin eg Ryzodeg	Give half of the usual dose at the usual time.	Give half of insulin dose at usual time in the evening.