

Peri Operative Management Of Adult Diabetes Mellitus

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Purpose

The aim of this protocol for peri operative management of diabetes mellitus is to avoid hypoglycaemia, excessive hyperglycaemia (>12 mmol/L), prevent protein catabolism, lipolysis and electrolyte disorders while the patient is fasting.

Scope

- Nurse/Midwife
- Level 1 IV Certificated Nurse/Midwife (for IV administration)
- RMO

Associated documents

- Adult Type 1 Diabetes Peri-Procedure Insulin Infusion Form C160011 Ref 1083
- Adult Type 2 Diabetes Peri-Procedure Insulin Infusion Form C260110 Ref 1084
- Adult Nephrology Peri-operative Insulin/Dextrose Infusion Protocol Form C260082 Ref 2962

Important information

- Normal Capillary blood glucose is 3.5 - 8.0 mmol/L.
- There are two groups of adult diabetic patients - Type 1 Diabetes and Type 2 Diabetes.
- Nephrology distinguish between insulin dependent and non insulin dependent Type 2 diabetics in the following instructions.
- A modified peri operative insulin/dextrose infusion management regime is required for dialysis, oliguric and or Fluid Restricted patients - see Nephrology section of the table for management of these patients.
- For other Adult patients if you are in doubt of their Type default to the Type 1 Insulin Infusion Protocol.
- Peri operative diabetes management depends on the type of anaesthetic and whether the surgery is minor or major.

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1 Type of anaesthetic

1.1 Local anaesthesia without sedation

- Surgery performed with local anaesthetic infiltration only, e.g. plastic surgery procedures at the Burwood Outpatient Procedure Unit (BOPU) and ophthalmic surgery with an eye block.
- These patients are not routinely made nil by mouth, they should have their usual food and medications on the day of surgery.

1.2 Local anaesthesia with sedation / regional anaesthesia / general anaesthesia

- Regional anaesthesia includes arm blocks and spinal anaesthesia.
- These patients need to be nil by mouth and should be managed according to the guidelines below.
- If in doubt, patients should be kept nil by mouth. The exact management plan will be determined by the Anaesthetist and surgical team.

2 Surgery

2.1 Minor

- The patient is expected to resume normal oral intake on the day of surgery. No more than one missed meal.
- See post operative management section below

2.2 Major

- The patient is expected to resume oral intake on the day after surgery or later.
- See Post operative management section below

Please note: The following sections are divided into the **Adult Patient** Diabetic Management in **Section 3** and the **Adult Nephrology Patient** Diabetic Management in **Section 4**.

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3 Adult peri operative diabetic management

3.1 Type I Diabetes Mellitus (ABSOLUTE deficiency)

3.1.1. Minor surgery

Morning surgery

- Glargine (Lantus) should be continued at the usual time and dose
- Base line capillary blood glucose
- **Omit morning insulin**
- Establish IV (intravenous) access
- Monitor capillary blood glucose every 2 hours
- Consult medical staff if capillary blood glucose <4 mmol/L or > 12 mmol/L

Afternoon surgery

- Glargine should be continued at the usual time and dose
- Base line capillary blood glucose
- **Administer half the morning dose of meal time insulin**
- Give a light breakfast before 0730 hours
- Establish IV access
- Monitor capillary blood glucose 2 hourly
- Consult medical staff if capillary blood glucose <4 mmol/L or > 12 mmol/L
- If = or above 12 mmol/L consult medical staff to consider commencement of the Adult Insulin Infusion Protocol

3.1.2. Major surgery

Morning surgery

- Glargine should be continued at the usual time and dose
- Baseline capillary blood glucose
- **Omit morning insulin**
- **Start IV Insulin Infusion Protocol** on morning of surgery
- Monitor capillary blood glucose 2 hourly and adjust rate according to Insulin Infusion Protocol prescription

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Afternoon surgery

- Glargine should be continued at the usual time and dose
- Baseline capillary blood glucose
- **Administer half the morning meal time insulin**
- Give a light breakfast before 0730 hours
- Establish IV access
- **Start IV Insulin Infusion Protocol at mid-day** on the day of surgery
- Monitor capillary blood glucose 2 hourly and adjust rate according to Insulin Infusion Protocol prescription

3.2 Type 2 diabetes peri operative diabetic management

These patients often have some residual insulin secretion and are less prone to ketoacidosis.

3.2.1 Minor surgery

Morning surgery

- Document base line capillary blood glucose
- **Omit morning insulin and oral hypoglycaemics on day of surgery**
- Establish IV access
- Monitor capillary blood glucose every 2 hours
- Consult medical staff if capillary blood glucose <4 mmol/L or > 12 mmol/L
- If = or above 12 mmol/L consult medical staff to consider commencement of the Adult Insulin Infusion Protocol

Afternoon surgery

- **Omit morning and lunchtime oral hypoglycaemias on day of surgery**
- **Administer half of morning dose of insulin**
- Give a light breakfast before 0730 hours
- Establish IV access
- Monitor capillary blood glucose 2 hourly
- Consult medical staff if capillary blood glucose <4 mmol/L or > 12 mmol/L

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- If = or above 12 mmol/L consult medical staff to consider commencement of the Adult Insulin Infusion Protocol

3.2.2. Major surgery

Morning

- Document baseline capillary blood glucose on admission
- **Omit morning insulin, morning and afternoon oral hypoglycaemics on day of surgery**
- If the capillary blood glucose is = or above 12 mmol/L consult medical staff to consider commencement of the Adult Insulin Infusion Protocol
- Monitor capillary blood glucose 2 hourly and adjust rate according to protocol prescription

Afternoon

- Document baseline capillary blood glucose on admission
- Omit morning insulin, morning and afternoon oral hypoglycaemics on day of surgery
- Give a light breakfast before 0730 hours
- Establish IV access
- Monitor capillary blood glucose 2 hourly and adjust rate according to prescription
- If the capillary blood glucose is above 12 mmol/L consult medical staff to consider commencement of the Adult Insulin Infusion Protocol

4 Dialysis/Oliguric and/or fluid restricted adult nephrology patient

4.1 Type I Diabetes Mellitus (ABSOLUTE deficiency)

4.1.1 Minor surgery

Morning surgery

- Base line capillary blood glucose
- Omit morning insulin
- Establish IV access

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- Monitor capillary blood glucose 2 hourly from NBM
- Consult Nephrology Registrar on call if capillary blood glucose <4 mmol/L or > 10 mmol/L
- If above 10 mmol/L consult medical staff to consider commencement of the Adult Nephrology Insulin/Dextrose Infusion Protocol as per prescription

Afternoon Surgery

- Base line capillary blood glucose
- Administer half the morning dose of insulin
- Give a light breakfast before 0730 hours
- Establish IV access
- Monitor capillary blood glucose two hourly
- Consult Nephrology Registrar on call if capillary blood glucose <4 mmol/L or > 10 mmol/L
- If above 10 mmol/L consult medical staff to consider commencement of the Adult Nephrology Insulin/Dextrose Infusion Protocol as per prescription

4.1.2 Major Surgery

Morning Surgery

- Baseline capillary blood glucose
- Omit morning insulin
- Start Adult Nephrology Insulin/Dextrose Infusion Protocol on morning of surgery
- Monitor capillary blood glucose hourly and adjust rate according to prescription

Afternoon Surgery

- Baseline capillary blood glucose
- **Administer half of morning insulin**
- Give a light breakfast before 0730hrs
- Establish IV access
- Start Adult Nephrology Insulin/Dextrose Infusion Protocol on morning of surgery
- Monitor capillary blood glucose hourly and adjust rate according to prescription

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4.2 Type 2 Diabetes Mellitus Peri operative Diabetic Management – REQUIRING INSULIN

4.2.1 Minor Surgery

Morning Surgery

- Document base line capillary blood glucose
- Omit morning insulin and oral hypoglycaemic on day of surgery
- Establish IV access
- Monitor capillary blood glucose hourly
- Consult medical staff if capillary blood glucose <4 mmol/L or > 10 mmol/L
- If above 10 mmol/L consult medical staff to consider commencement of the Adult Nephrology Insulin/Dextrose Infusion Protocol as per prescription

Afternoon Surgery

- Omit all oral hypoglycaemias that day
- Administer half the morning dose of insulin
- Give a light breakfast before 0730 hrs
- Establish IV access
- Monitor capillary blood glucose hourly
- Consult medical staff if capillary blood glucose <4 mmol/L or > 10 mmol/L
- If above 10 mmol/L consult medical staff to consider the commencement of the Adult Nephrology Insulin/Dextrose protocol infusion as per prescription

4.2.2 Major surgery

Morning Surgery

- Document baseline capillary blood glucose on admission
- **Administer half of morning insulin**
- **Omit oral hypoglycaemics** on day of surgery
- Give a light breakfast before 0730 hrs
- Establish IV access
- Start Adult Nephrology Insulin/Dextrose Infusion Protocol on the morning of surgery

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- Monitor capillary blood glucose **hourly** and adjust the rate according to prescription

Afternoon Surgery

- Document baseline capillary blood glucose on admission
- Omit oral hypoglycaemics on day of surgery
- Establish IV access
- Start Adult Nephrology Insulin/Dextrose Infusion Protocol on the morning of surgery
- Monitor capillary blood glucose hourly and adjust the rate according to prescription

4.3 Type 2 Diabetes Mellitus Peri operative Diabetic Management – NOT REQUIRING INSULIN

4.3.1 Minor surgery

Morning Surgery

- Document Baseline capillary blood glucose
- **Omit oral hypoglycaemic** on day of surgery
- Monitor capillary blood glucose **hourly**
- Consult medical staff if capillary blood glucose <4 mmol/L or > 10 mmol/L
- If below 4 mmol/L notify medical staff, commence 50% dextrose infusion at 10ml/hr as per prescription, and monitor capillary blood glucose hourly
- If > 10 mmol/L consult medical staff to consider commencement of Adult Nephrology Insulin/Dextrose Infusion Protocol as per prescription

Afternoon Surgery

- Baseline capillary blood glucose
- **Omit oral hypoglycaemic on day of surgery**
- Monitor capillary blood glucose every 4 hours
- Consult medical staff if capillary blood glucose <4 mmol/L or > 10 mmol/L
- If below 4 mmol/L commence 50% dextrose infusion at 10 ml/hr as per prescription, and monitor capillary blood glucose hourly

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- If > 10 mmol/L consult medical staff to consider commencement of Adult Nephrology Insulin/Dextrose Infusion Protocol as per prescription

4.3.2 Major

Morning surgery

- Document baseline capillary blood glucose
- **Omit oral hypoglycaemic on day of surgery**
- Establish IV access
- Start Adult Nephrology Insulin/Dextrose Infusion Protocol on morning of surgery
- Monitor capillary blood glucose hourly and adjust rate according to prescription
- Consult Medical Staff if capillary blood glucose <4 mmol/L or > 10 mmol/L

Afternoon surgery

- Baseline capillary blood glucose
- **Omit oral hypoglycaemic on day of surgery**
- Establish IV access
- Start Adult Nephrology Insulin/Dextrose Infusion Protocol on morning of surgery
- Monitor capillary blood glucose hourly and adjust rate according to Insulin/Dextrose protocol
- Consult medical staff if capillary blood glucose <4 mmol/L or > 10mmol/L
- Monitor capillary blood glucose hourly and adjust rate according to Insulin/Dextrose protocol
- Consult medical staff if capillary blood glucose <4 mmol/L or > 10 mmol/L

5 Post Operative Management of Diabetes Mellitus

5.1 Post Operative Management for Minor Surgery

Type 1 Diabetes Mellitus

Adult Patient or Dialysis/Oliguric and or Fluid Restricted Adult Nephrology Patient

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- Continue monitoring capillary blood glucose until patient resumes normal diet.
- Once eating, administer subcutaneous insulin
- Stop insulin/dextrose infusion two hours after administration of subcutaneous insulin
- Resume normal diabetic regime in discussion with patient.
- Restart glargine (Lantus) on evening of day of surgery.

Type 2 Diabetes Mellitus REQUIRING INSULIN

Adult Patients or Dialysis/Oliguric and or Fluid Restricted Adult Nephrology Patient

- Continue monitoring capillary blood glucose until patient resumes normal diet.
- When tolerating a light diet, administer subcutaneous insulin
- If used, stop infusion two hours after administration of Glargine or 30 minutes after all other sub-cutaneous insulin.
- Resume normal diabetic regime in discussion with patient.
- Restart glargine (Lantus) on evening of day of surgery.

Type 2 Diabetes Mellitus NOT REQUIRING INSULIN

Adult Patients or Dialysis/Oliguric and or Fluid Restricted Adult Nephrology Patient

- Continue monitoring capillary blood glucose until patient resumes normal diet.
- Once eating give oral hypoglycaemic
- If used, stop infusion two hours after oral hypoglycaemic
- Resume normal diabetic regime in discussion with patient.

5.2 Post Operative Management Major Surgery

Type 1 Diabetes Mellitus

Adult Patient or Dialysis/Oliguric and or Fluid Restricted Adult Nephrology Patient

- Continue monitoring capillary blood glucose until patient resumes normal diet.
- If a patient is usually on glargine (Lantus), aim to restart early.
- When tolerating a light diet, administer subcutaneous insulin

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- Stop insulin/dextrose infusion two hours after administration of Glargine or 30 minutes after all other sub-cutaneous insulin.
- Patients on prolonged insulin infusions need plasma sodium and potassium levels monitored, as they may become hyponatraemic and/or hypokalaemic.

Type 2 Diabetes Mellitus REQUIRING INSULIN

Adult Patients and Dialysis/Oliguric and or Fluid Restricted Adult Nephrology Patient

- Continue monitoring capillary blood glucose until patient resumes normal diet.
- If a patient is usually on glargine (Lantus), aim to restart early.
- When tolerating a light diet, administer subcutaneous insulin
- Stop insulin/dextrose infusion two hours after administration of Glargine or 30 minutes after all other sub-cutaneous insulin.
- Patients on prolonged insulin infusions need plasma sodium and potassium levels monitored, as they may become hyponatraemic and/or hypokalaemic.
- If patient usually on an oral hypoglycaemic - restart when patient resumes normal diet

Type 2 Diabetes Mellitus NOT REQUIRING INSULIN

Adult Patients and Dialysis/Oliguric and or Fluid Restricted Adult Nephrology Patient

- Continue monitoring capillary blood glucose until patient resumes normal diet.
- If used, stop insulin/dextrose protocol when they resume normal diet
- Restart oral hypoglycaemic when patient resumes normal diet.
- Resume normal diabetic regime in discussion with patient.

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