

## DEFINITIONS

Minor Surgery and Procedures: expected to be awake, eating and drinking by the next meal, total period of starvation post-procedure less than 4 hours. e.g. endoscopy, cystoscopy, fasting overnight for radiological procedure, etc.

Major Surgery: not expected to be eating and drinking by next meal, period of starvation greater than 6 hours. e.g. laparotomy, amputation, etc.

## GENERAL GUIDELINES

- All patients undergoing surgery should ideally have urinalysis (and, if indicated, a laboratory blood sugar as undiagnosed diabetes is common)
- If possible, diabetic patients should be placed first on the morning list
- Known diabetics undergoing major surgery should be admitted 24–48 hours pre-operatively for assessment and preparation
- In diabetics, Hartmanns solution should be avoided
- All diabetic patients should have IV access established.

## MANAGEMENT TYPE 1 OF INSULIN DEPENDENT DIABETES

### Minor Surgery

*If morning list:*

- Ensure they are first on the list
- Reduce previous evening intermediate acting (isophane) i.e. Humulin I or Human Insulatard or basal analogue insulin (glargine or detemir) by  $\frac{1}{3}$  (if Mixtard 30/70 reduce total dose by  $\frac{1}{3}$ ). Remember Insulin glargine and detemir have a 24hour action and the previous day's dose may need to be reduced by  $\frac{1}{3}$  to  $\frac{1}{2}$  to avoid hypoglycaemia on the day of the procedure. Discuss with the diabetes team if any uncertainty.
- Omit the morning insulin
- Check capillary blood glucose test (CBGT). If 4–13 proceed (if  $CBGT \leq 4$ , commence 5% dextrose infusion, if  $CBGT \geq 13$  commence sliding scale insulin infusion with dextrose as for major surgery).
- Monitor CBGT 2 hourly
- By lunchtime patient should be eating and drinking. Give  $\frac{1}{2}$  morning dose 20 minutes before lunch and then the normal evening insulin.

*If procedure is later in the day:*

- Give  $\frac{1}{2}$  normal insulin dose with a light breakfast (finishing 6 hours before procedure)
- Check capillary blood glucose test (CBGT) pre-op and proceed as above depending on result
- Monitor capillary blood glucose test 2 hourly
- The patient should be able to eat and drink by evening meal, when they should have their normal insulin.

## Major Surgery

- Admit at least the day prior to surgery
- Check CBGT pre-meal and before bed (4-6 hourly)
- Check U&Es and lab blood sugar on the day prior to surgery
- Make any necessary adjustments to improve control. Contact the diabetes team if advice required.
- Avoid long acting insulin (e.g.Ultratard) and ensure long acting analogues (i.e. glargine/detemir) are reduced on the day before the procedure. Reduction may need to be  $\frac{1}{3}$ –  $\frac{1}{2}$  of the total dose (see previous note).

### *If morning surgery:*

- Reduce isophane glargine (i.e. Lantus or detemir i.e. Levemir) insulin by  $\frac{1}{3}$  to  $\frac{1}{2}$  the night before the operation
- Omit normal am S/C dose of insulin

### Then proceed:

- Insert IV cannula and start infusion at least 1 hour before the procedure (not later than 7.30am) with a 'Y' extension.
- A one-way valve must be used in the limb through which the dextrose is running
- Commence 500 ml of 5% dextrose, with 1 gram (13 mmol) K<sup>+</sup> in each bag, at 100 ml/hr via a volumetric pump, with insulin infusion by sliding scale as below. (For patients with renal failure where restricted fluid input is necessary consideration can be given to the use of smaller volumes of 10% dextrose instead)
- Commence IV insulin infusion (50 units of human actrapid in 50 ml of N/Saline)

Suggested insulin rate: (use green insulin chart) This may vary depending on the overall insulin required for the patient. i.e. in type 2 patients on a larger dose and insulin higher rates may be required.

CBGT up to 4 mmol/l	0.5 units per hour (inform doctor)
CBGT up to 4.1 – 7 mmol/l	1 unit per hour
CBGT up to 7.1 – 9 mmol/l	2 units per hour
CBGT up to 9.1 – 11 mmol/l	3 units per hour
CBGT up to 11.1 – 17 mmol	4 units per hour
CBGT up to >17 mmol/l	6 units per hour (inform doctor)

- Check capillary blood test CBGT post-op and then every 2 hours
- Check U&Es and lab blood sugar daily while on this regime
- Continue infusion until the patient is able to eat and drink
- Continue the infusion until the next meal, give S/C actrapid or short-acting analogue (about  $\frac{1}{3}$  of previous daily dose) 20 minutes before the meal
- Stop IV insulin and dextrose 30 – 60 minutes after S/C injection
- Check the insulin infusion if there is any doubt (e.g. has the IV tissue, etc)

(N.B. A regime in which 10 units soluble insulin and 10 mmol K<sup>+</sup> are added to 500ml 10% dextrose which is then infused at 100ml/hr may be used {modified Alberti regimen}. It is IMPORTANT to note, however, that if the blood glucose is outside a range of 5-10 mmol/l or if the plasma K<sup>+</sup> is outside the normal range the whole infusion needs to be changed for one with adjusted insulin or K<sup>+</sup> content when using this regimen).

**REMEMBER:  
WHEN STOPPING INSULIN INFUSION OVERLAP WITH S/C INSULIN BY AT LEAST 30 MINUTES  
(IV INSULIN HAS A VERY SHORT HALF LIFE)**

## MANAGEMENT OF TYPE 2 (NON-INSULIN DEPENDENT) DIABETES

### Minor Surgery

#### *Diet controlled:*

- Avoid glucose-containing solutions
- Do a CBGT pre and post-op and 6 hours later

#### *Tablet controlled:*

- If possible stop biguanide, glitazones (Rosiglitazone and Pioglitazone) and long acting sulphonylurea (e.g. chlorpropamide) 48 hours before the operation
- Omit all oral hypoglycaemic tablets on the day of the procedure
- Do a CBGT pre and post-op and 4 hourly until recovery
- If poorly controlled (e.g. fasting blood sugar >10 or random >15) treat as for Type 1 Diabetes (insulin dependent).

### Major Surgery

#### *Diet controlled:*

- If well controlled, do as above and capillary blood glucose test 4-6 hourly
- If poorly controlled, treat with insulin infusion (modify infusion rate so that if CBGT < 4 no insulin. Remember that obese type 2 (NIDDM) patients may be insulin resistant and the insulin infusion rate may have to be increased if CBGTs remain high)

#### *Tablet controlled:*

- If well controlled, omit tablets as before and treat with insulin infusion and 5% dextrose infusion at least 1 hour pre-op (modify sliding scale so that if CBGT < 4 no insulin). Remember that obese type 2 (NIDDM) patients may be insulin resistant and the insulin infusion rate may have to be scaled up if CBGTs remain high).
- If poorly controlled, convert to S/C actrapid or Novorapid QDS. Adjust dose to achieve CBGT between 4–11 and then manage as for type 1 (insulin dependent) peri-operatively.

## UNIVERSITY HOSPITALS OF LEICESTER

Instructions to patients attending for day surgery or procedures  
(i.e. ultrasounds, Barium Meal or Swallow examinations)  
who are taking insulin for diabetes and are required to attend **Fasting**

*This leaflet tells you what to do about the management of your diabetes.  
Please read it together with any other instructions you have been given.*

### PROCEDURES OR SURGERY IN THE MORNING AS A DAYCASE

#### The day before:

- During the day, eat and drink normally and take your normal doses of insulin
- Do not eat or drink anything from midnight (*but ensure that you have your before-bed snack*)
- Take your normal dose of evening insulin \* (*however, if you take 3 or 4 injections of insulin a day normally and have an injection before bed, reduce the dose of your pre-bed injection by one third, e.g. if you take 12 units normally, reduce it to 8 units*) Or if you take a long acting analogue i.e. Insulin glargine or Insulin detemir you will need to reduce the dose by  $\frac{1}{3}$  –  $\frac{1}{2}$  on the day BEFORE the procedure.

#### The day of the procedure or surgery:

- Do not have your morning insulin
- Measure your blood sugar with a testing stix (if you know how to do so)
- Bring a sugar containing drink (e.g. Lucozade) with you on the way to hospital
- If you feel faint or dizzy and think you are having a “hypo”, **or** if your CBGT is less than 4 mmol/l, drink half a cup of this drink and tell the ward staff you have done so when you arrive
- Bring your own insulin, and any instructions you have for giving it, with you to the hospital.

#### For patients undergoing day surgery:

- A doctor or nurse will see you on the day case unit and explain how your diabetes will be managed during the day you are with us
- If you are not eating normally by 5pm and not having your normal insulin, you will be admitted overnight in order to ensure that your diabetes is stable. Otherwise, you will be allowed home at 5pm.

*If you have any queries about your insulin or diabetes management before the procedure or day surgery, contact the **Department of Diabetes** directly on telephone 0116 258 5545 (Leicester Royal Infirmary) or 0116 258 4369 (Leicester General Hospital). A Diabetes Specialist Nurse will deal with your query directly, or you can leave a message on the 24 hour answer phone and someone will get back to you.*

## **University Hospitals of Leicester**

**Instructions to patients attending for day surgery or procedures who are taking insulin for diabetes and are required to attend Fasting**

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### **PROCEDURES OR SURGERY IN THE AFTERNOON AS A DAYCASE**

#### **The day before:**

- During the day, eat and drink normally and take your normal doses of insulin.
- However if you are on long acting analogue insulin e.g. (Glargine i.e. Lantus or Detemir i.e. Levemir) you may need to reduce the dose by  $\frac{1}{3}$  –  $\frac{1}{2}$  the day BEFORE the procedure and part of the insulin in the evening.

#### **The day of the procedure or surgery:**

- Have half your normal dose of morning insulin (e.g. if your normal dose is 24 units, have 12 units) with breakfast, finishing 6 hours before the planned procedure
- Omit your mid-morning snack
- Measure your blood sugar with testing stix (if you know how to do so)
- Bring a sugar containing drink (e.g. Lucozade) with you on the way to hospital.
- If you feel faint or dizzy and think you are having a “hypo”, **or** if your CBGT is less than 4 mmol/l, drink half a cup of this drink and tell the ward staff you have done so when you arrive
- Bring your own insulin and any instructions you have for giving it, with you to the hospital.

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#### The day before:

- During the day, eat and drink normally and take your normal doses of insulin
- Do not eat or drink anything from midnight (*but ensure that you have your before-bed snack*).
- However if you are on long acting analogue insulin e.g. (Glargine i.e. Lantus or Detemir i.e. Levemir) you may need to reduce the dose by  $\frac{1}{3}$  –  $\frac{1}{2}$  the day BEFORE the procedure and part of the insulin in the evening.

#### Take the following amount of insulin:

Date:	Pre – evening meal	Pre – Bed
Type of insulin		
Dose in units		
Signed		

#### The day of the procedure or surgery:

- Do not have your morning insulin
- Measure your blood sugar with a testing stix (if you know how to do so)
- Bring a sugar containing drink (e.g. Lucozade) with you on the way to the hospital
- If you feel faint or dizzy and think you are having a “hypo” or if your CBGT is less than 4 mmol/l, drink half a cup of this drink and tell the ward staff you have done so when you arrive
- Bring your own insulin and any instructions you have for giving it, with you to the hospital

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#### The day of the procedure or surgery:

Take the following amount of insulin:

Date:	Pre – evening meal	Pre – Bed
Type of insulin		
Dose in units		
Signed		

- Have your dose of morning insulin with breakfast, finishing 6 hours before the planned procedure
- Omit your mid-morning snack
- Measure your blood sugar with testing stix (if you know how to do so)
- Bring a sugar containing drink (e.g. Lucozade) with you on the way to hospital
- If you feel faint or dizzy and think you are having a “hypo” or if your CBGT is less than 4 mmol/l, drink half a cup of this drink and tell the ward staff you have done so when you arrive
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