

Belfast Trust Management of Diabetes in children (<18 yrs) in the Perioperative Period

Major Surgery (Missing more than one meal)

Preoperative
Period

- **Emergency Surgery:** if ketoacidosis present, follow DKA protocol and delay surgery until electrolytes and circulatory volume are corrected. If there is no DKA, start intravenous fluids and insulin infusions as below.
- Prioritise patient on the operating list - **First on the list if possible**
- **Investigations** – Capillary Blood Glucose (CBG), blood ketones, LAB glucose, U & E and HbA1c
- **Insulin** – if on long-acting insulin (Glargine/Lantus, Detemir/Levemir) give 80% of normal dose the evening before surgery. If on twice daily Levemir give evening dose as usual and omit morning dose. Omit the morning rapid-acting insulin
- Monitor Capillary Blood Glucose (CBG) hourly pre-operatively, Target blood glucose 6 – 10 mmol/L
- Monitor CBG half hourly intra-operatively

Fasting from 00⁰⁰h the night before surgery and protocol to start from 06⁰⁰ on day of surgery or earlier if CBG >12mmol/L

Fasting
Period

Variable Rate Insulin Infusion (VRII)

(50 units Actrapid insulin in 50 mls 0.9% sodium chloride)

CBG (mmol/L)	Insulin infusion rate (ml/kg/hr)
< 4.0	Suspend insulin infusion Give 2ml/kg of 10% dextrose as a bolus Check CBG after 10-15 minutes Restart the infusion according to the CBG
4.0 - 7.9	0.02
8.0 - 11.9	0.05
12.0 - 15.9	0.07
16.0 - 19.9	0.08
>20	0.1 Seek Medical Advice

Intravenous fluids

0.9% sodium chloride + 5% dextrose + 0.15% potassium chloride (10mmol KCl in 500mls bag of IV fluids)

If $K^+ < 4\text{mmol/L}$ give 20mmol KCl in 500mls bag of IV fluids

If $K^+ > 5\text{mmol/L}$ omit potassium until U & E rechecked in 6 hours

Body weight (kg)	ml/kg/hr
First 10 kg	4
Second 10kg	2
Each kg above 20kg	1

- Give 2/3 of calculated maintenance fluid.
- Maximum total fluid per 24hours:
 - 2.5 litres for boys
 - 2.0 litres for girls
- Check U/E 6hrly until normal then daily

Postoperative
Period

- Continue VRII and fluids until eating and drinking
- Recommence normal insulin treatment when eating and drinking and stop infusion after 30 minutes
- Dose adjustment of insulin may be required - Consider discussion with diabetic team.
- At least pre meal CBG monitoring in post-operative period

Minor Surgery* (Missing only one meal)

Preoperative Period

- Prioritise patient on operating list - **First on the list if possible**
- Monitor Capillary Blood Glucose (CBG) hourly during the pre-operative period and for four hours post-operatively
- During surgery monitor CBG half hourly, Target blood glucose 6 -10 mmol/L
- Give 2 ml/kg of 10% dextrose if blood glucose <4 mmol/L, consider starting maintenance IV fluids infusion (0.9% saline and 5% dextrose with 10 mmol KCl/ 500 ml bag fluid),
- If CBG >12mmo/L, check blood ketones and start Variable Rate Insulin Infusion (VRII) with maintenance IV fluid infusion

Insulin Pump

1. Run pump at usual basal rate
2. On return, when child can eat, give meal and normal bolus insulin via pump
3. If unable to tolerate oral intake, commence on maintenance IV fluids and continue basal insulin infusion via the insulin pump until adequate oral intake

Alternatively: Insulin pump can be discontinued and VRII commenced at least two hours before surgery

NB: insulin pump can **NOT** be worn for procedures that involve screening/exposure to radiation. i.e. Cardiac catheterization

Contact diabetes team (or out of hours medical on call) for further advice if needed

Twice daily injections regimen

Morning operations

1. If on long-acting insulin (Detemir, Glargine) give 80% of the dose the night before surgery
2. If not on long-acting insulin give 50% of the usual intermediate-acting insulin (Insulatard, Humulin I) with early breakfast
3. Omit the morning rapid-acting insulin (Novorapid, Humalog)

Afternoon operations

1. If on long-acting insulin, give usual dose the night before
2. Give 50% of the intermediate acting insulin and full dose of rapid-acting insulin with early breakfast (before 08:00am)

Multiple Daily Injections regimen

Morning operations

1. Give 80% of long-acting insulin the night before
2. If long-acting insulin is normally given in the morning or the child on split dose of long-acting insulin, delay the morning dose until after surgery
3. Omit morning rapid-acting insulin

Afternoon operations

1. Give normal dose of long-acting insulin the night before
2. Give 80% of long-acting insulin if it is normally given in the morning or the child on split dose of long-acting insulin
3. Give usual rapid-acting insulin with early breakfast (before 08:00am)
4. Omit lunchtime rapid-acting insulin

Operative Period

Postoperative Period

- Return to normal insulin regimen when eating and drinking
- If unable to tolerate oral intake, commence on VRII and maintenance IV fluids infusion until adequate oral intake
- Child may be discharged if eating, blood glucose levels are stable and the blood is free of ketones.

*Removal of central lines, dental extraction, oesophago-gastro-duodenoscopy (OGD) and insertion of Vents.

Based on recommendations from: ISPAD Clinical Practice Guidelines 'Management of children and adolescents with diabetes requiring surgery' Pediatric Diabetes 2007; 8: 242 – 247.