

MANAGEMENT OF CHILDREN WITH DIABETES WHO REQUIRE ANAESTHESIA

If possible, please contact a member of the paediatric diabetes team, prior to a child's admission to hospital so that diabetes control can be optimised prior to surgery.

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1. **VERY SHORT ANAESTHETIC** - such as simple dental treatments, EUA etc

During a short anaesthetic the greatest risk to the patient is that of hypoglycaemia and this protocol has been designed to minimise this risk.

- ensure child is first on the list
- insert IV cannula
- check BM and correct hypoglycaemia if present
 - if* $BM \leq 4 \text{ mmol/l}$ give 1-2mls/kg of 10% dextrose and recheck bm after 15 mins – if still low repeat boluses until $>4\text{mmol/l}$
- start maintenance fluids using 4% dextrose + 0.18% saline + Kcl (10mmol/500ml)
- *if* child is on twice daily insulin regimen
 - give *two thirds* of normal morning insulin dose in the form of *intermediate acting* insulin (humulin I)
e.g. if normally on 24 units M2 in the morning give 16 units humulin I
- *if* child is on basal bolus regimen (ie fast acting insulin before meals and intermediate acting insulin at night)
 - give *no* insulin as they will have intermediate acting insulin around from the night before
- check BM prior to induction of anaesthesia and give extra glucose (1-2mls/kg of 10% dextrose) if blood glucose is $\leq 6\text{mmol/l}$ (recheck the BM if the blood glucose is $<4\text{mmol/l}$ to ensure that hypoglycaemia is corrected)
- check the blood glucose 2-4 hourly over the day until the child is fully recovered and eating normally
- give the normal dose of insulin with the next meal (ie normal fast-acting with lunch or normal insulin mixture with evening meal)

2. **LONGER OPERATIONS or CHILDREN WITH POORLY CONTROLLED DIABETES ($HbA1c \geq 10\%$)**

Children with poorly controlled diabetes and those undergoing longer procedures, which are likely to be more physiologically stressful, are more at risk of ketoacidosis.

- admit the day before
- arrange for child to be first on the list

- give fast acting insulin only with the evening meal (children on both twice daily insulin regimes and basal bolus regimes). (See appendix 1)
- insert iv cannula
- start maintenance iv fluids (4% dextrose and 0.18% saline) at bedtime
- start sliding scale of soluble (fast-acting) insulin intravenously (appendix 2)
- check blood glucose 2-4 hourly and adjust insulin accordingly
- check BM prior to induction of anaesthesia and give extra glucose (1-2mls/kg of 10% dextrose) if blood glucose is ≤ 6 mmol/l (recheck the BM if the blood glucose is <4 mmol/l to ensure that hypoglycaemia is corrected)
- continue iv fluids and insulin postoperatively until child is eating and drinking – insulin requirements may increase postoperatively following the release of hormones (catecholamines, cortisol, growth hormone) antagonistic to the action of insulin and the sliding scale may need to be amended (discuss with diabetes team)
- plan to restart normal insulin at a time when the child would be receiving insulin normally, e.g. breakfast or evening meal in children on bd regimens

Appendix

1. For children on twice daily insulin regimes fixed mixtures of insulin are prescribed at this hospital. The proportion of fast-acting insulin in the mixture is known by the number that comes after the name of the insulin: ie Humulin M1 and Mixtard 10 contain 10% fast-acting and 80% intermediate-acting insulin, M2 and mixtard 20 are 20% fast-acting, and so on.

E.g. a patient on 10U of humulin 2 or mixtard 20 will be receiving 2u of fast-acting and 8u of intermediate acting insulin.

2. Sliding scale insulin regimen

Making up an infusion of 50U of actrapid/humulin S in 50mls of 0.9% saline making a solution containing 1u/ml.

Blood glucose (mmol/l)	Insulin (U/kg/hour)
0-3.9	no insulin*
4-7	0.01
7.1-9.9	0.02
10-14.9	0.03
15-19.9	0.04
>20	0.05

*If BM <3.9 mmol/l give a bolus of 1-2mls/kg of 10% dextrose. Recheck BM in 15mins – if still low and not improving give another bolus. If low but improving repeat BM in 15mins. Restart insulin once BM >4 mmol/l.