Gloucestershire Hospitals
NHS Foundation Trust

PAEDIATRIC DIABETES ACTION CARD	
TITLE - Hypoglycaemia in Diabetes	**PD1**
FOR USE BY: Paediatric medical and nursing staff	**LIAISES WITH:** other Paediatric staff, relatives/carers, Paediatric Diabetes team

Definition:

- Hypoglycaemia in children with diabetes is a blood glucose of less than 4.0 mmol/L
- This provides a safety margin, as 2.8 mmol/L is used for patients **without** diabetes

Signs and symptoms:

- These vary between individuals and may change with age
- A child/adolescent may exhibit some of the symptoms below, whereas other may have none.
- Symptoms are classified as autonomic, neuroglycopaenic and behavioural – see table below.
- **This list is not exhaustive**

Autonomic	Neuroglycopaenic	Behavioural
• Pale • Sweating/clammy • Hungry • Tremor • Restlessness	• Headache • Confusion • Weakness • Glazed expression • Lethargy • Visual/speech disturbances • Seizures • Unconsciousness	• Irritability • Mood change • Erratic behaviour • Nausea • Combative behaviour

Treatment:

IMPORTANT NOTES:
- **Do not leave a child/adolescent with hypoglycaemia alone**
- **Do inform Paediatric Diabetes Nurse Specialists of any patients with diabetes presenting with hypoglycaemia to the ED, even if not admitted**

- Treatment varies with the degree of severity (mild, moderate or severe) and the method of insulin delivery (pen therapy compared to pump therapy)
- Mild and moderate **low**s receive the same treatment as there is little clinical research to suggest otherwise
- Mild/moderate hypoglycaemia – child able to tolerate oral fluids/Glucogel - see algorithm on page 2
- Severe hypoglycaemia – unconscious or fitting child requires parenteral therapy – see algorithm on page 3

We encourage families and children to refer to mild/moderate hypoglycaemia as **low**s. These are easily treated and are not harmful, so we would like them not to feel anxious about lows.

Treatment of Mild or Moderate Hypoglycaemia (lows)

TEST BLOOD GLUCOSE LEVEL, THEN IF LESS THAN 4MMOLS/L:

1. Follow this box if child is co-operative and able to tolerate oral fluids

Aiming for 0.3g/kg of body weight of fast acting carbs, e.g. in a 40kg child would need 12g fast acting carbohydrate.

As a rough guide, give 10-15g of fast acting oral carbohydrate such as:

- 3-4 glucose tablets (8.7-11.6g)
- 150mls Orange Juice (12g)
- 130mls Lucozade Original (11.5g)

NB Chocolate, milk, biscuits or toast WILL NOT bring glucose levels up quickly enough

2. Follow this box if child refuses to drink, is uncooperative, but is conscious

Give Glucogel® or Dextrogel® (formerly known as Hypostop®). This is a fast acting sugary gel, in an easy twist top tube.
Each tube contains 10g glucose

- Use ½ tube in children < than 16kg
- Use 1 tube for children 16kg – 42kg
- Use 1.5 tubes for children 42kg – 58kg
- Use 2 tubes for children >58kg

Squirt tube contents in the side of each cheek (buccal) evenly and massage gently from outside enabling glucose to be swallowed and absorbed quickly.
DO NOT use Glucogel in an unconscious or fitting child.

After 10 minutes recheck blood glucose:

1. If still low (<4mmol/L) and able to take oral fluids repeat Box 1 above (once)
2. If still low (<4mmol/L) refuses to take oral but is conscious, follow Box 2 above (once)
3. If deteriorated after first run through above or not responded after having administered 2nd dose of above then proceed to Box 4 (Page 3)

3. Insulin Pump Therapy - If feeling better and blood glucose level >4.0mmol/L no further action required.

4a. Multiple Daily Injections – If Blood Glucose Level >5.0mmol/L no further action is required (unless the low blood sugar was as a result of a deliberate insulin overdose, exercise related or if alcohol has been consumed within the last 24 hours) – for these three instances follow the steps below (4b).

4b. Multiple Daily Injections – If Blood Glucose Level 4.0-5.0mmol/L or one of the three instances above:
Give an additional 10-15g slow acting carbohydrate snack (or normal meal if it is meal time) such as:

- One piece of fresh fruit (not banana), apple/ small pack of raisins/ orange would all be appropriate
- One plain digestive biscuit
- Glass of milk (200mL)

If low is just before a meal time the low should be treated first and once the blood glucose is >4.0 mmol/L the insulin should be given pre-meal as usual. **DO NOT OMIT INSULIN,** especially important with an early morning low.

Treatment of Severe Hypoglycaemia

Follow this page if child unconscious or fitting (or also if not responded from page 2)

- Do involve medical assistance by this stage:
  Outside hospital: call emergency services **Inside hospital**: bleep paediatric registrar
- Place in the recovery position if possible and assess Airway Breathing Circulation
- **DO NOT** attempt to give any oral fluid or Glucogel®
- **If IV access is present, go straight to box 5**

4. Give Glucagon (Glucagen) by intramuscular injection

- Check if IM glucagon has been given at home or in ambulance.
- Check expiry date.
- Administer intramuscularly in the thigh.

Dose: Age < 8 yrs or body weight <25 kg: 0.5 mL (half syringe)
Age > 8 yrs or body weight >25 kg: 1.0 mL (whole syringe)

Glucagon is a fast acting drug and the child/adolescent should respond after 5 minutes.

After the child has regained consciousness leave him/her on one side as one of the common side effects of glucagon is vomiting/nausea.

5. IV 10% Glucose

If recovery is not adequate after a dose of glucagon or IV access is readily available, then administer 2 mLs/kg 10% Dextrose as slow IV bolus.

Note: If alcohol causes or contributes toward hypoglycaemia, glucagon may be ineffective (as hepatic stores of glycogen depleted) and intravenous glucose will be required.

Further Monitoring after a severe hypo:

- Check blood glucose after 5 minutes, 15 minutes and then half hourly until BG stable above 5mmol/L
- Continue to monitor baseline observations: oxygen saturations, pulse, blood pressure, temperature
- Record presence or absence of ketones.
- Document management.
- Inform diabetes team if during the day, or if concerns during the night.
- Do not omit normal insulin unless instructed to do so by diabetes team.

If blood glucose >4.0mmol/L and child able to tolerate oral fluids:

- Offer clear fluids, and once tolerating clear fluids offer simple carbohydrates, such as toast, crackers (see box 3, page 2)
- Try to identify the cause of hypoglycaemia and discuss this with the patient/family
- Refer to diabetes team for review of treatment, advice or education

If child not improving:

- If patients have protracted vomiting and are unable to tolerate oral fluids, hospital admission and IV glucose infusion must be considered. Consider this particularly if a child has returned to the emergency department with further hypoglycaemia during the same intercurrent illness.
- If a child/adolescent remains unconscious on correction of blood glucose consider cerebral oedema, head injury, adrenal insufficiency or drug overdose.