Unexplained hypoglycaemia – Management in children – Flowchart

Child presents to ED with BGL < 3.0 mmol/L on glucometer*

- Obtain IV access for formal testing (IO if unable to obtain IV)
- Check BGL on ABG machine / iSTAT/ formal lab tests
- Check blood ketones

**Investigations**

**Blood:**
- ideal volume = 5 mL
- if collection difficulties, minimum volume required = 2 mL
  See over page for required tests and collection tubes.

**Urine:**
- Put a urine bag on for first pass urine
- Collect and send for a urine metabolic screen regardless of age and time since hypoglycaemic episode

Seek senior emergency/paediatric advice re BGL monitoring

Refer to Paediatric/Metabolic team as per local practice

**Confirmed BGL ≤ 2.6 mmol/L**

Yes

Consider possibility of an underlying disorder (see Guideline)

Fasting > 30 hours & ketones > 4?

**Possible underlying disorder**

- Admit to SSU/inpatient service
- Continue Glucose 10% + Sodium Chloride 0.9%
- +/- Ondansetron
- Encourage:
  - oral fluids (Glucose 10% polymer or 100% apple juice)
  - oral diet (carbohydrates preferred)
- Organise discharge medication (Glucose gel, Glucose 10% polymer, +/- Ondansetron)
- Monitor urinary ketones
  - after 12-24 hours of treatment
  - continue 12-24-hourly until clear

BGL is NOT required while on Glucose 10% infusion unless hyperinsulinism is suspected

Tolerating oral intake

- Discontinue IV fluids/reduce to Glucose 5% + Sodium Chloride 0.9% at lower rate

Consider discharge with education

Follow-up as per Paediatric +/- Metabolic advice

**Manage as ketotic hypoglycaemia of childhood**

- IV bolus of 2 mL/kg of Glucose 10%
- After bolus, commence infusion of Glucose 10% + Sodium Chloride 0.9% at maintenance rate
- Monitor IV site hourly for signs of extravasation

Clinical improvement?

Yes

- Manage as per senior advice

  Consider:
  - IV fluid miscalculation
  - IV fluid made up to Glucose 10% incorrectly
  - alternate diagnosis such as ingestion including oral hypoglycaemics, beta blockers or insulin

No

- Observe/Botulinum toxin injection

**No**

**Yes**

Consider seeking senior emergency/paediatric advice as per local practice

Seek senior emergency/paediatric advice as per local practice. Consider seeking paediatric metabolic advice.

*Excluding children with a diagnosis known to present with hypoglycaemia (manage as per their emergency sick day plan).

If Make an outpatient referral to the Metabolic team, Queensland Children’s Hospital if an overnight fast precipitated hypoglycaemic event.

CHQ-GDL-60024- Appendix 1 V2.0
## Blood collection for initial investigations of unexplained hypoglycaemia

### Preferred blood collection (minimum volume 5.0mL)

<table>
<thead>
<tr>
<th>Tube type</th>
<th>Tube description</th>
<th>Volume required</th>
<th>Tests required</th>
</tr>
</thead>
</table>
| Serum              | Red or yellow pedi-pot    | 3 mL            | • free fatty acids  
|                    |                           |                 | • βhydroxybutyrate  
|                    |                           |                 | • cortisol  
|                    |                           |                 | • growth hormone  
|                    |                           |                 | • insulin  
|                    |                           |                 | • E/LFTs  |
| Lithium heparin no gel | Green pedi-pot or adult pot | 0.5 mL     | • acylcarnitine  
|                    |                           |                 | • plasma amino acids  |
| Fluoro-oxalate     | Grey pedi-pot             | 1 mL            | • glucose  
|                    |                           |                 | • lactate  
|                    |                           |                 | **Can be performed on VBG**  |
| EDTA               | Purple pedi-pot           | 0.5 mL          | • ammonium  
|                    |                           |                 | **Notify and send to lab urgently. Check with lab if needs to be on ice**  |

### Recommended blood collection for child with collection difficulties

#### Essential blood collection (minimum volume 2 mL)

<table>
<thead>
<tr>
<th>Tube type</th>
<th>Tube description</th>
<th>Volume</th>
<th>Tests required</th>
</tr>
</thead>
</table>
| Lithium heparin no gel  | Green pedi-pot or adult pot | 0.5 mL  | • acylcarnitine  
|                         |                           |         | • plasma amino acids - may be done from a newborn screening card if collection is difficult.  |
| Fluoro-oxalate          | Grey pedi-pot              | 1 mL    | • glucose  
|                         |                           |         | • lactate  
|                         |                           |         | **Can be performed on VBG**  |
| Serum                   | Red or yellow pedi-pot     | 0.5 mL  | • cortisol  
|                         |                           |         | • insulin  |

#### Second priority investigations (2 mL volume)

<table>
<thead>
<tr>
<th>Tube type</th>
<th>Tube description</th>
<th>Volume</th>
<th>Tests required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>Red or yellow pedi-pot</td>
<td>0.5 mL</td>
<td>• growth hormone</td>
</tr>
</tbody>
</table>
| EDTA      | Purple pedi-pot           | 0.5 mL  | • ammonium  
|           |                           |         | **Notify and send to lab urgently (check if needs to be on ice)**  |
| Serum     | Red or yellow pedi-pot    | 1.0 mL  | • E/LFTs  |