

## Hypoglycaemia

### What is hypoglycaemia?

Hypoglycaemia ("Hypo") means a low level of glucose in the blood. For people with type 1 diabetes, this is a blood glucose value of less than 4.0 mmol/L. Mild to moderate hypoglycaemia is common and is an expected to occur in good diabetes care. True physiological hypoglycaemia does not occur until the BGL is less than 3.5mmol

### Hypoglycaemia can be caused by:

- Too much insulin
- Vigorous exercise without extra carbohydrate
- Missing or delayed meals
- Not eating all serves of carbohydrate
- Alcohol intake

Or, there may be no obvious reason.

People affected by hypoglycaemia may start to experience symptoms when the blood glucose level is less than 4mmol/l, or more commonly when the BGL is less than 3.4mmol. Sometimes the blood glucose level can be lower than this and no symptoms are experienced, this is referred to as "hypo unawareness".

### Common signs and symptoms of hypoglycaemia are:

- paleness
- heart pounding
- shakiness
- irritability, change in mood
- headache
- lack of concentration
- sweating
- confusion, vagueness
- feeling hungry
- crying
- dizziness
- weakness

All BGLs less than 4mmol need to be treated, regardless of their signs and symptoms.

Mild hypoglycaemia is common and is an expected to occur in good diabetes care.

**Note:** The treatment must be taken to the person having the hypo. Never make them walk to get treatment as this may exacerbate the hypo.

## Treatment

A blood glucose test should be done to confirm the hypoglycaemia before treating. Treat the hypo if the blood glucose level is 3.9mmol or lower. **Do not delay treatment.**

### Step 1

**Give 5-10grams of high GI (quick acting) carbohydrate to raise the blood glucose levels quickly**

Treatment options are based on age

5 years old or younger, or less than 25kg give 5 grams

6 years old and older, or more than 25kg give 10 grams

e.g.

- 60-120mls Juice
- Glucose tablets (1.5-2 TRUEplus™ or 3-6 Glucodin™)
- Polyjoule/Sucrose Solution
- 50-100ml Lemonade
- 100-200ml Cordial
- 1-2 teaspoon Honey
- 2-4 jelly beans (Glucogel™)

### Step 2

**WAIT 15 minutes, perform another blood glucose test.**

**If BGL remains under 4mmol/L : REPEAT Step 1.**

**If BGL is above 4mmol/L : Give 10-15 grams of a sustaining (low GI) carbohydrate to keep the blood glucose in the target range.**

e.g.

- 4 - 6 Savoy biscuits/7-10 rice crackers
- 200-250mls of milk
- 1 apple or small banana
- ½ cup of fruit yoghurt
- 1 slice of bread

Recheck your child's blood glucose level if signs and symptoms do not improve after 15 minutes.

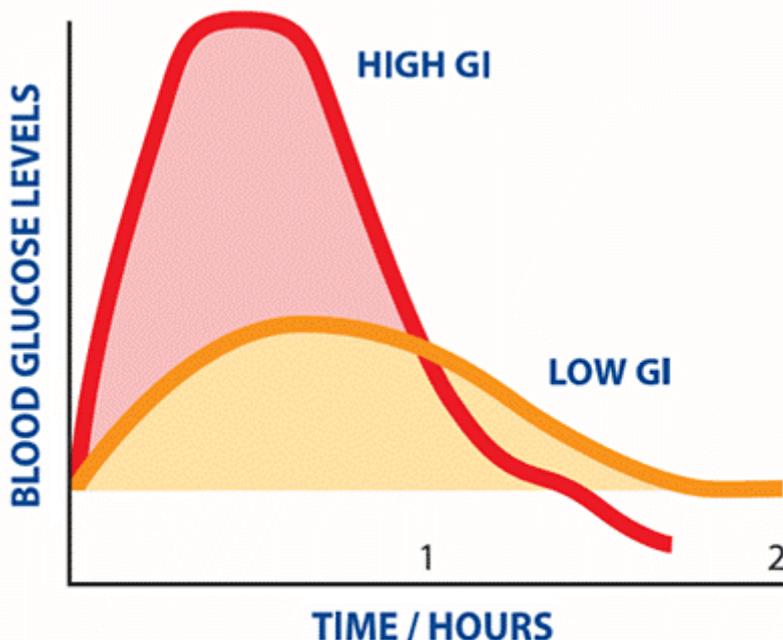
If a hypo occurs within 20 minutes of meal time, please use **the meal** as your STEP 2, low GI carbohydrates.

**If hypoglycaemia occurs immediately before a meal when insulin is due:**

- Give a sugar serve, wait a few minutes until feeling better
- Give the normal dose of insulin
- Serve the meal immediately

Remember that the less sticky the hypo treatment, the better it is for good dental hygiene. Regular flossing and brushing will also help this!

You can see in the picture below, hypo's must be treated with high GI carbohydrates immediately to raise blood glucose levels quickly. Following on with low GI carbohydrates, will minimise the chance of repeated hypoglycaemia once the initial fast acting high GI food has worn off.



The amount of carbohydrate in the reference and test food must be the same.

Over treating hypoglycaemia can be a problem for many families. If you are experiencing high BGLs after treating a hypo, please contact the diabetes allied health team to discuss hypo treatment.

#### Tips for assisting with hypoglycaemia

- Always carry fast acting high GI carbohydrates on you at all times
- Hypo treatment should be kept at school, in the car and other places that are easily accessible
- Check blood glucose levels whenever possible to confirm hypoglycaemia
- Do not ignore mild symptoms. Do not delay treatment
- Eat meals and snacks on time
- Supervise your child's injections
- Never give rapid acting insulin unless food is available
- Give extra serve of low GI carbohydrates before any activity
- Teach family and friends how to recognise and treat low blood glucose levels
- If low blood glucose levels continue to happen without explanation, please contact the diabetes team.
- Wear a diabetes identification bracelet at all times.

### Severe hypoglycaemia

A severe hypo has occurred if your child's BGL is less than 4mmol and is unconscious, is having a seizure (fitting), is too drowsy to eat or drink or is being uncooperative. If this occurs, **please do not** attempt to administer anything by mouth.

Call 000 for an ambulance

Glucagon is a hormone that raises the blood glucose level by making the liver release its store of glucose into the bloodstream. This medication can be used to treat your child if they are having a severe hypo.

Glucagon is a very safe medication to give and is injected into either the subcutaneous tissue or the muscle to raise blood glucose levels. **If it is possible to do a blood glucose check before administering Glucagon, please do so.**



### Instructions for administering Glucagon:

1. Place the child on their left side in the coma position to prevent anything from being breathed into the lungs.
2. If you haven't already called an ambulance, please do so. Call 000.
3. If possible please do a blood glucose check
4. Remove the orange plastic cap from the bottle of white powder (glucagon) and the needle guard from the syringe containing sterile water.
5. Inject all the water into the bottle containing glucagon. Leave the needle in the bottle. The glucagon will dissolve into the fluid with gentle rotation of vial.

6. Turn the bottle upside down. Pull  $\frac{1}{2}$  the needle out of the bottle to keep the end of the needle in the solution.
7. Draw up the glucagon into the syringe.
8. Inject all the glucagon into a muscle on the outside of your child's thigh.

#### How much glucagon do I give my child?

- 0.5mls: Children who weigh less than 25kg or less than 6 years old
- 1ml: Children who weigh more than 25kg or who are older than 6 years old

#### How long will it take my child to recover after giving them glucagon?

Glucagon may take 5 to 15 minutes to work, therefore don't expect an immediate improvement.

#### What do I do after I have given my child glucagon?

Glucagon can cause nausea, vomiting and headache.

Once your child is rousable, encourage high GI carbohydrates fluids such as juice or lemonade. Because Glucagon depletes glycogen stores, you must be give your child sugary food or drink by mouth as soon as they have roused and are able to take it. This will prevent the occurrence of secondary hypoglycaemia.

Within the hour it is important to give a low GI carbohydrate, such as bread or milk in order to prevent recurrence of the hypoglycaemia and assist in return to normal eating. The liver needs to replenish its store of glycogen before glucagon can work again

Monitor blood glucose levels every 15 minutes for the first hour then every hour for 4 hours.

If you have had to use glucagon, please contact the Royal Children's Hospital to discuss further management over next 24 hours.

Blood glucose levels are often elevated following a severe hypo. Any high blood glucose levels after a severe hypo requiring glucagon should not be treated with extra insulin.

#### **Expired Glucagon**

Novo Nordisk provides a service with the ability to register to activate a reminder for when your hypoglycaemia medication is due to expire.