

Children and Young People's Diabetes Service

Multiple Daily Injections (MDI/Insulin Pens) Hypoglycaemia

Information for patients, parents and carers

What is Hypoglycaemia?

Hypoglycaemia means a low blood glucose level; sometimes it is called a hypo. In someone without diabetes the body is able to keep the blood glucose levels within very narrow targets by constantly changing the amount of insulin that is produced. In Type 1 Diabetes this is much harder to do. Hypoglycaemia happens when blood glucose levels go too low usually when there is a mismatch between insulin, food and activity levels. A low blood glucose level in a child or young person with diabetes is **3.9mmol/L or below**.

What causes hypoglycaemia?

- Taking too much insulin
- Taking insulin at the wrong time
- Not eating enough carbohydrate food for example missing carbohydrate from a meal or snack or a late meal or snack
- Physical activity and exercise
- Hot or cold temperatures
- Stress or illness
- Alcohol



The body does not like the blood glucose level to drop too low, so it will produce warning signals that mean the blood glucose level may be falling too low.

Symptoms are divided into 2 types; symptoms caused by the body trying to raise the blood glucose level and symptoms caused by the effect of the low blood glucose level on the brain. Not everybody will have the same symptoms, it is important to check the blood glucose level if you suspect a hypo. A hypo may be **mild** and easily treated, **moderate** which needs some help or **severe**. A severe hypo usually needs treatment with glucagon, medical help or hospital.

Signs and Symptoms of a Hypo

Mild or early		Moderate	Severe
Pale	Tired or sleepy	Blurred vision	Fainting
Hunger	Headache	Aggressive	Fitting
Shaky	Trembling	Moody or irritable	Loss of consciousness
Wobbly legs	Tingling	Slurred speech	
Sweating	Faint or dizzy	Confused	
		Strange behaviour	

Often it is possible to explain why a hypo has happened, but sometimes they may happen unexpectedly. The symptoms of a hypo may be any one or a combination of the above. It is important to treat a hypo immediately. Untreated hypos can lead to loss of consciousness or fitting.

How much carbohydrate is needed to treat a hypo?

The amount of carbohydrate needed to treat a low blood glucose level depends on your age and weight. The maximum treatment is 20g carbohydrate. Use the table below as a guide to how much hypo treatment to use.

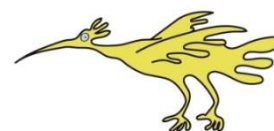
Age	Amount of carbohydrate	Examples
Under 1 year	2-3g	50ml fruit juice, ¼ tube of Glucogel, 4g Polycal power mixed in 20ml water.
1-5 years	5g	1-2 glucose tablets (check the label), 60ml Lucozade, 1 jelly babies, 2 fruit pastilles, 100ml fruit juice, ½ tube Glucogel
5-10 years	10g	3-4 glucose tablets (check the labels), 120ml Lucozade, 2-3 jelly babies, 4 fruit pastilles, 200ml fruit juice, 1 tube Glucogel
10-17 years	15g	4-5 glucose tablets (check the label), 180ml Lucozade, 4-5 jelly babies, 6 fruit pastilles, 300ml fruit juice, 1 ½ tubes Glucogel

Chocolate is not recommended as a hypo treatment as it is broken down to glucose slowly.

If fruit juice is used, a double dose may be needed as natural sugars are absorbed more slowly.

Long acting carbohydrate is not recommended in addition to fast acting rescue treatment. Sometimes a snack may be needed. No more than 20g of carbohydrate should be taken. Consider an extra snack if

- Hypo is just before or after exercise
- Too much insulin is the cause of the hypo
- Alcohol is the cause of the hypo
- If your child has had a hypo in the last 24 hours or you are worried.



How to manage hypoglycaemia

How to treat a mild or moderate hypo

1. Check the blood glucose and give hypo treatment, if it is not possible to do a test go ahead and treat as a hypo.
2. Wait 10 – 15 minutes, recheck blood glucose level. If blood glucose level is below 5.6mmol/L repeat steps 1 and 2 until better

If blood glucose level is 5.6mmol/L or more no further action needed unless:

- You are about to do sport/physical activity – have an extra 15-20g carbohydrate snack before exercise.
- You are concerned about blood glucose dropping again because the hypo has been caused by too much insulin, alcohol or you have treated 2 or more hypos already.

How to treat a severe hypo

If the child is unconscious, having a fit or is unable to take anything by mouth follow the steps below:

Do not give anything by mouth – this can cause choking

- Place your child in the recovery position, away from danger
- Check the time
- Give the glucagon injection
- ½ dose for under 8 years (0.5mg)
- Full dose for over 8 years (1mg)
- Check the blood glucose

If you are not able to give the glucagon injection call 999 for an ambulance

Stay with the child, if there is no sign of recovery after 10 minutes or if they are not fully recovered after 30 minutes call 999 for an ambulance.

When fully awake follow steps 1 and 2 (on page 2)

A severe hypo can cause vomiting. If vomiting occurs after the fast acting carbohydrate is given, wait a few minutes and repeat the fast acting carbohydrate.

A severe hypo will leave you feeling tired and unwell. Before falling asleep some longer acting carbohydrate must be eaten to prevent the blood glucose falling again.

Check the blood glucose every ½ hour for 2 -3 hours after a severe hypo.

Night time hypos

Treat a night time hypo in the same way as you would in the day.

A child who has had a hypo at night may be agitated and call out as if they are having a bad dream. It is possible for a child/young person to sleep through a hypo. This is more common after exercise in the afternoon or evening, after a hypo in the day or when alcohol has been consumed.

A hypo at night may cause

- Frequent nightmares
- Feeling sick, with a headache in the morning
- Blood glucose of less than 4mmol/l before breakfast
- Blood glucose above 14mmol/L in the morning.
- No symptoms at all



If you suspect a night hypo you should check blood glucose levels between midnight and 3am. If you find night time hypos are happening discuss this with the diabetes team.

Preventing and treating Hypoglycaemia Checklist

- Everyone who looks after a child with diabetes needs to be able to recognise and treat a hypo
- Always carry some hypo treatment for example *Lucozade Energy* drink or glucose tablets
- Hypos can happen quickly at any time, treat them quickly
- If possible check the blood glucose before treating the hypo
- Think about why the hypo might have happened
- If you use *Glucagon* or *Glucogel*, always make sure you replace it.
- Check that your Glucagon and Glucogel are in date
- Always carry or wear some diabetes identity
- Calculate your carbohydrate and insulin doses as carefully as possible
- Use different ICRs (insulin to carb ratios) at different times of day if needed
- Check your ICR if hypos happen within 4 hours of a meal injection
- Avoid injecting after meals.
- Use correction doses carefully, use a bolus advisor or calculator whenever possible and remember that fast acting insulin works for 2-5hours in the body.
- Treat any high blood glucose levels after hypos with caution. A high blood glucose level 2-4hours after a hypo treatment should not be corrected with insulin.
- Adjust your insulin doses for planned exercise.
- Never give insulin for alcohol unless you know how it affects the blood glucose levels

Who to contact for further help or advice

If you need urgent advice about diabetes management Monday – Friday 8am – 6pm, call 0151 252 5766.

For out of hours advice call the hospital switchboard on 0151 228 4811 and ask for ‘Diabetes nurse on call’.

For non-urgent advice contact your diabetes nurse on the usual numbers or email diabetes@alderhey.nhs.uk

Follow us on Twitter: @AlderHeyDiab

Website: <https://alderhey.nhs.uk/parents-and-patients/services/diabetes> – Meet the team, useful guidelines, research and publications, helpful advice and video guides.



Download the Digibete app, the video platform to share videos and educational resources about Type 1 Diabetes. The content is to support children, young people and their families to self manage their own diabetes by extending the reach of their clinical teams online using the clinic code - **AEBDR**



This leaflet only gives general information. You must always discuss the individual treatment of your child with the appropriate member of staff. Do not rely on this leaflet alone for information about your child’s treatment. This information can be made available in other languages and formats if requested.

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