

Diagnosis and management of type 1 diabetes in children and young people

Diagnosis

World Health Organization 1999 criteria:

- hyperglycaemic (random blood glucose more than 11mmol/l)
- polyuria
- polydipsia
- weight loss

Immediate management

- Urgent (same-day) referral to multidisciplinary paediatric diabetes care team
- Involve the child/young person and family in making decisions
- Offer home-based initial management with 24-hour access to advice from care team
- Offer inpatient care if child/young person has diabetic ketoacidosis, is less than 2 years old, has social or emotional difficulties, or if family lives a long way from hospital
- Offer MDI regimens to young people (11 years or older; see below for under 11 years)
- Aim to optimise glycaemic control (see below)
- Offer education about: insulin; monitoring glycaemic control; effects of diet, exercise and intercurrent illness on glycaemic control; and avoidance, detection and management of hypoglycaemia
- Screen for coeliac disease and thyroid disease

Insulin preparations and regimens

Preparation	Onset	Duration
Rapid-acting analogues*	15 minutes	2–5 hours
Short-acting	30–60 minutes	up to 8 hours
Intermediate-acting	1–2 hours	16–35 hours
Long-acting analogues	1–2 hours	> 24 hours

*Optimally given before eating but can be given just after eating if eating habits are erratic (children under 5 years)

Regimens

1. One, two or three injections per day: rapid- or short-acting insulin pre-mixed or self-mixed with intermediate-acting insulin
2. MDI regimen: rapid- or short-acting insulin before meals with intermediate- or long-acting insulin
3. Insulin pump therapy (CSII)

Young people:

- ✓ Offer MDI as part of an integrated package of care if MDI fails (impossible to maintain HbA_{1c} less than 7.5% without disabling hypoglycaemia):
- ✓ Offer CSII (requires commitment and competence to use it effectively)
- ✓ Consider one, two or three injections per day

Children under 11 years:

- ✓ Offer most appropriate regimen to optimise glycaemic control

Monitoring glycaemic control

Short-term

- ✓ Use frequent self-monitoring of blood (not urine) glucose
- ✓ Aim for preprandial blood glucose 4–8 mmol/l and postprandial blood glucose less than 10 mmol/l
- ✓ Adjust insulin dose according to the trend in preprandial, bedtime and night-time blood glucose measurements if on two injections per day
- ✓ Adjust insulin dose after each preprandial, bedtime or night-time blood glucose measurement if appropriate when on MDI regimen
- ✓ Measure blood glucose more than 4 times/day during intercurrent illness or if trying to optimise glycaemic control

Offer blood glucose monitor with memory and encourage use of a diary

Long-term

- ✓ Use HbA_{1c} (test 2–4 times/year or more frequently if poor glycaemic control)
 - ✓ Aim for HbA_{1c} less than 7.5% without frequent disabling hypoglycaemia
 - ✓ Current HbA_{1c} should be available at clinic visits
 - ✓ Offer additional support if HbA_{1c} is consistently more than 9.5%
- Aiming for low HbA_{1c} increases risk of hypoglycaemia but high HbA_{1c} increases risk of long-term microvascular complications

Education

- Ongoing education with access to information and opportunities for discussion at clinic visits
- Tailor according to maturity, culture, existing knowledge and wishes of child/young person and family
- Explain effects of alcohol, smoking and substance misuse on glycaemic control and vascular complications

Exercise

- Encourage exercise and participation in sports
- Advise on effects of exercise on blood glucose
- Prevent exercise-induced hypoglycaemia by monitoring blood glucose levels before and after exercise and making appropriate changes in insulin/food intake

Diet

- Advise on effects of nutritional changes on glycaemic control
- Give support to help optimise weight
- Discuss timing and composition of snacks and problems associated with fasting and feasting
- MDI regimens: adjust insulin to carbohydrate intake