

Oral glucose tolerance test in children and young people - Full Clinical Guideline

(Ref: CG-CLIN/4147/23)

1. Introduction

The majority of children and young people presenting with symptoms of diabetes have Type 1 and should be investigated and managed according to NICE guidance (CG18 August 2015, updated June 2022).

The diagnosis of diabetes mellitus can be made if:

- Fasting plasma glucose ≥ 7.0 mmol/L
- Post oral glucose tolerance test (OGTT) 2-hour plasma glucose ≥ 11.1 mmol/L
- Symptoms of diabetes (including polyuria, polydipsia and unexplained weight loss) and a random plasma glucose >11.1 mmol/L

OGTT need not be done routinely where HbA1c is ≥ 48 mmol/mol and should not be done where HbA1c is <42 mmol/mol.

All glucose values in this document refer to laboratory venous plasma glucose levels. Glucose results obtained from “near patient” testing should not be used to confirm the diagnosis of diabetes mellitus (although may be a useful first step in screening).

2. Guideline

INDICATIONS

Diagnosis of diabetes mellitus. It is unusual to need an OGTT in most children presenting with symptoms suggestive of diabetes, such as thirst, polyuria, fatigue and weight loss who will be diagnosed on a laboratory blood glucose test +/- HbA1c.

This guidance can be used for asymptomatic screening of children and young people with cystic fibrosis, thalassaemia and if the body mass index is >85 th centile with one or more of: first or second degree family history of type 2 diabetes, high risk race/ethnicity, or insulin resistance (acanthosis nigricans or presence of other metabolic conditions, such as hypertension and hyperlipidaemia, PCOS or SGA)

CONTRAINDICATIONS

None

SIDE EFFECTS

Occasionally nausea, vomiting or diarrhoea as the glucose drink is hyperosmolar.

PRECAUTIONS

None

PREPARATION

Planning

If the OGTT is to be done as an outpatient procedure, it can be arranged on Sunflower (day case) or an early slot in LBBT in the children's outpatient department at Derbyshire Children's Hospital or Ward 1 daycase in Burton. The consultant responsible for the child or young person should arrange the test. Remember to order Polycal in advance.

Patient

The patient should have a normal diet containing unrestricted carbohydrate for three days prior to the test. Drugs such as oral contraceptives, steroids, thiazide and loop diuretics may impair glucose tolerance.

The patient should fast from 10pm the previous evening, to give a minimum of 10 hour fasting period and not eat or drink anything other than water until the test is completed.

Equipment

For use in Derbyshire Children's Hospital, Derby

Polycal liquid - this is a carbohydrate drink based on maltodextrin, a partial hydrolysate of corn starch. It is supplied by Nutricia in 200 mL bottles

Measure 113 mL Polycal (equivalent to 75g anhydrous glucose) and add water to a volume of 300mls. Shake to mix. The dose used is: 1.75 g/kg (maximum of 75g).

For example, for a 30kg child:

$$\begin{aligned} 30 \times 1.75g &= 52.5g \text{ anhydrous glucose} \\ (52.5g / 75g) \times 300 &= 210 \text{ mls of solution} \end{aligned}$$

Discuss with pharmacy if Polycal liquid not available (potential to use equivalent as RapiLOSE) as Polycal powder is not suitable for this test.

For use in Queens Hospital Burton

RapiLOSE OGTT solution (300mls equivalent to 75g anhydrous glucose). The dose used is: 1.75 g/kg (maximum of 75g).

Specimen tubes required

Each test requires two fluoride/oxalate (grey top) tubes.

PROCEDURE

The patient may drink additional water during the test and must be seated quietly throughout the test. Smoking is not permitted during the test.

The OGTT procedure is described below. **Samples must be clearly labelled with patient name, date and time, e.g. 09:30**

TIME	BLOOD SAMPLE (Grey top sample for glucose)
Fasting sample	Minimum volume 1 mL (grey top)
0 hours	Give Polycal to be drunk within 5 minutes. Offer water to drink after.
2 hours sample	Minimum volume 1 mL (grey top)

INTERPRETATION

Diagnostic criteria for diabetes mellitus

- Fasting plasma glucose ≥ 7.0 mmol/L
- Post OGTT 2-hour plasma glucose ≥ 11.1 mmol/L

Diagnostic Criteria for Impaired Glucose Tolerance

Both of the following criteria must be met:

- Fasting glucose < 7.0 mmol/L
- 2 hour OGTT glucose ≥ 7.8 mmol/L but < 11.1 mmol/L

Equivocal Results

If the results of the GTT are equivocal the test should be repeated annually or sooner if the patient becomes symptomatic. A high index of suspicion should be maintained in a patient with equivocal results who also has a first degree relative with DM. Patients should not be falsely reassured that DM has been excluded when equivocal results are obtained.

TURNAROUND TIME

24 hours

3. References

1. [Recommendations | Diabetes \(type 1 and type 2\) in children and young people: diagnosis and management | Guidance | NICE](#)
2. Association of Children's Diabetes Clinicians Clinical Guideline A Practical Approach to Management of Type 2 diabetes in Children and Young People (CYP) under 18 years. [Type-2-guideline-ACDC-format-publish-2.pdf \(a-c-d-c.org\)](#) February 2023
3. World Health Organisation definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia. 2006
4. British National Formulary for children [Glucose | Drugs | BNFC | NICE](#)

4. Documentation Controls

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