

## Glucose Tolerance Test (Non-Pregnant Adult) - Full Clinical Guideline

Reference no.: CHISCG10

### 1. Introduction

The diagnosis of DM should not be made on the basis of a single raised plasma glucose in the absence of symptoms. In 2011 WHO recommended the use of HbA1c as a test to diagnose (rather than just monitor) diabetes. This offers an alternative to the oral glucose tolerance test (GTT) that eliminates the need for patients to fast and wait for 2 hours for the test to be completed. However, HbA1c is contraindicated for diagnosis of diabetes in some situations – please see the Southern Derbyshire Shared Care Pathology guideline ‘Diagnosis of type 2 Diabetes Mellitus using HbA1c’ at <https://www.uhdb.nhs.uk/shared-care-pathology-guidelines>

All glucose values in this document refer to venous plasma glucose levels. Glucose results obtained from “near patient” testing strips should not be used in the diagnosis of DM.

### 2. Guideline

#### INDICATIONS

Diagnosis of DM. A GTT is indicated if HbA1c is contraindicated and:

- a) there is impaired fasting glycaemia, (fasting plasma glucose >6.0 mmol/L, but <7.0 mmol/L)
- b) previous history of gestational diabetes
- c) there is a possible low renal threshold for glucose i.e. glycosuria and random glucose <11.1 mmol/L.

#### CONTRAINDICATIONS

None

#### SIDE EFFECTS

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

#### PREPARATION

##### Planning

A GTT is an outpatient procedure carried out in the Phlebotomy Department at the FNCH or RDH. Patients must make have appointment before 10am (made using Swiftqueue). Some GP surgeries can also carry out the procedure.

##### Patient

- The patient should maintain a normal diet for three days prior to the test.
- All medication the patient is receiving should be noted on the request form. Drugs such as oral contraceptives, steroids, thiazide and loop diuretics may impair glucose tolerance.
- **The patient should fast from 10p.m. the previous evening**, to give a minimum 10 hour fasting period, and not eat or drink anything other than water, until the test is completed.

Equipmenta) Polycal

GP surgeries can obtain Polycal from pathology by emailing [dhft.pathsupplies@nhs.net](mailto:dhft.pathsupplies@nhs.net)  
 Polycal is a carbohydrate drink based on maltodextrin, a partial hydrolysate of corn starch. It is supplied by Cow and Gate in 200 mL bottles. Only 113 ml is required for each patient. This is equivalent to 75g anhydrous glucose. If 3 patients are being tested 2 bottles are sufficient. Measure 113 mL Polycal into a special beaker, add water up to 200 mL mark. Secure plastic cap firmly onto beaker, shake to mix. Polycal is now ready.

**Note:** A further 100mL of water must be drunk by the patient to make the final volume 300mL

b) For use if the patient has an allergy to citrus flavouring

In exceptional circumstances, when a patient has an allergy to the lemon flavouring, a 'Polycal neutral liquid' is available but prior notice may be required to obtain this.

c) Specimen tubes

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.

**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 glucose solution to be drunk within 5 minutes or Polycal drink, followed by 100ml water, to be drunk within 5 minutes
2 hours sample	Minimum volume 1 mL (grey top)

**INTERPRETATION**Normal

**Both** of the following criteria must be met:

- 1) Fasting glucose  $\leq 6.0$  mmol/L
- 2) 2 hour GTT glucose  $< 7.8$  mmol/L

Diagnostic Criteria for Diabetes Mellitus

**Either** of the following is diagnostic:

- 1) Classical symptoms of DM **and** any one of the following:
  - a) fasting glucose  $\geq 7.0$  mmol/L
  - b) random glucose  $\geq 11.1$  mmol/L
  - c) 2 hour GTT glucose  $\geq 11.1$  mmol/L
- or** 2) In an asymptomatic patient, any two of the following, obtained on separate occasions
  - a) fasting glucose  $\geq 7.0$  mmol/L
  - b) random glucose  $\geq 11.1$  mmol/L
  - c) 2 hour GTT glucose  $\geq 11.1$  mmol/L

Diagnostic Criteria for Impaired Glucose Tolerance

**Both** of the following criteria must be met:

- 1) Fasting glucose <7.0 mmol/L
- 2) 2 hour GTT glucose  $\geq$ 7.8 mmol/L but < 11.1 mmol/L

Diagnostic Criteria for Impaired Fasting Glycaemia

**Both** the following criteria must be met:

- 1) Fasting glucose >6.0 but <7.0 mmol/L
- 2) 2 hour GTT glucose <7.8 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. American Diabetes Association – Report of the expert committee on the diagnosis and classification of diabetes mellitus. Diabetes Care 1997; 20: 1183-1197
2. WHO Expert Committee on Diabetes Mellitus. WHO Technical Report Series 2000
3. Recommendations for the Management of Diabetes. Diabetes UK October 2000.  
[www.diabetes.org.uk](http://www.diabetes.org.uk)

**4. Documentation Controls**

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