

Glucose Tolerance Test

NB Anyone wishing to use this procedure should first check the website for the current version. Only the version on the website is authorised

Purpose of the Test

The oral glucose tolerance test (GTT) is used for the diagnosis of diabetes mellitus, as recommended by the World Health Organisation.

Principle of the Test

The ability of the body to handle a glucose load provides an indication of the glycaemic status.

Limitations and Contraindications

There are no contraindications to glucose tolerance testing. If fasting capillary blood glucose on a point of care testing device meter is <3.0 mmol/L or >10.0 mmol/L, do not proceed with the glucose load, however, the abnormal result should be acted upon and an endocrine referral may be appropriate.

Specimen Requirements, Means of ID

Glucose is measured on fluoride oxalate plasma (grey top vacutainer). Samples must be labelled in accordance with the BSPS policy for rejection of samples available on the trust website: <http://www.nhspathology.fph.nhs.uk>

Required Equipment and Reagents

Point of care testing device for glucose measurement

Venesection materials

75 g anhydrous glucose given in the form of:

- a) 75 g anhydrous dextrose in 300 ml H₂O
- b) 82.5g dextrose monohydrate in 300 ml H₂O (this delivers 75 g of glucose)
- c) RapiLOSE(r) Glucose Tolerance Test (GTT) Solution

Lucozade must NOT be used.

Instructions for Performance of Examination

PATIENT PREPARATION

- The patient should be taking a normal, unrestricted diet, with a minimum of 150 g carbohydrate for at least 3 days prior to the test.
- The patient should fast overnight (10-14 hours), but can drink clear water freely. The patient should continue taking medications as usual unless otherwise instructed by their doctor (occasionally patients taking metformin for example will have the test carried out while off metformin).
- During the test the patient should be sitting down as exertion can give a misleadingly low 120 minute glucose value. Smoking is not permitted during the test.
- For patients who have undergone bariatric surgery, the GTT can be performed if a gastric band has been used. It is not appropriate to perform a GTT on patients who have had a gastric sleeve or bypass surgery (Roux-en-y).
- A patient information leaflet is available for glucose tolerance tests on the BPS website: <http://www.nhspathology.fph.nhs.uk>.

PROCEDURE

- Check that the patient is fasted and explain the procedure to the patient.
- Take a capillary blood specimen, analyse the glucose level on the point of care device and record the level on the GTT worksheet, or request form as appropriate.
- If the capillary blood glucose level is < 3.0 mmol/L or > 10.0 mmol/L do not proceed with the glucose load but take a venous blood specimen and send to the laboratory for fasting glucose analysis. Explain to the patient that the test will not continue. The abnormal result from the point of care device should be acted upon and an endocrine referral may be appropriate.
- If the capillary blood glucose is 3.0 - 10.0 mmol/L, take a venous blood specimen and proceed with the test.
- Give glucose solution orally at 0 minutes. This should be consumed within a five minute period. (In children give glucose 1.75 g/kg ideal body weight to a maximum of 75 g).
- At 2 hours, take a venous blood specimen.

INTERPRETATION OF RESULTS

Glycaemic status	Venous plasma (mmol/L)	
	Fasting	120 min after glucose dose
Normoglycaemia	< 6.1	< 7.8
Impaired Fasting Glycaemia	≥ 6.1 & < 7.0	-
Impaired Glucose Tolerance	-	≥ 7.8 & < 11.1
Diabetes Mellitus	≥ 7.0	≥ 11.1

A diagnosis of diabetes mellitus cannot be made from a single glucose result in an asymptomatic patient: a minimum of two glucose results is required. The diagnosis may be made from a single glucose result if the patient is symptomatic. Venous plasma glucose measurements by the laboratory analyser should be used for diagnosis, never use a point of care result for diagnosis of diabetes mellitus.

References

1. Bouloux, PMG and Rees LH. *Diagnostic tests in endocrinology and diabetes*. Chapman and Hall Medical Press 1994.
2. *Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia*. World Health Organisation, 2006.

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