

ORAL GLUCOSE TOLERANCE TEST (OGTT) – PROTOCOL FOR NON-PREGNANT ADULTS

Indications for the test

An oral glucose tolerance test (OGTT) is performed to exclude/confirm the diagnosis of diabetes mellitus. In patients with characteristic symptoms of diabetes (e.g. weight loss, thirst, polyuria), a single random glucose concentration often confirms the diagnosis. For individuals not presenting with these classical symptoms, measurement of fasting plasma glucose concentration is essential. If the fasting glucose concentration is equivocal, an oral glucose tolerance test may then be performed, to assess the ability of the individual to handle a glucose load.

Before subjecting a patient to an OGTT, ensure that there has been an appropriate diagnostic work-up (see WHO guidelines). During the OGTT, blood samples are collected before (fasting) and after (2 hours) administration of an oral glucose load for measurement of plasma glucose. Polycal liquid (previously called Fortical) is used as the glucose load. Adherence to the following instructions will ensure the test is conducted in accordance with the recommendations of the World Health Organisation. If you require any further information or clarification please contact the duty biochemist on telephone number 01233 616287.

Contraindications

Oral glucose tolerance test must not be performed if the fasting capillary (finger prick) or venous blood glucose concentration is greater than 10 mmol/L.

Requirements

- Two timed blood (2 mL) samples collected into fluoride oxalate (grey top) tubes (see below for patient preparation)
- It is essential that the blood samples are processed by the laboratory: results obtained using blood glucose meters are of no value in establishing or refuting the diagnosis of diabetes mellitus.
- Polycal liquid containing 61.4 g maltodextrin per 100 mL.
- Measuring cylinder. These can be obtained from pathology on request.

Patient preparation

A patient Information leaflet (Oral glucose tolerance test) is available within the patient and visitor area of Trustnet (<http://www.ekhft.nhs.uk/patients-and-visitors/>). This document can also be found on QPulse (BIO EX 413).

The patient must have fasted for at least 8, and no more than 14 hours (water is permitted). The patient must have been following their normal carbohydrate diet for three days preceding the test and must not smoke on the morning of the test or during the test. Patients must sit quietly during the test and not leave the area where the test is being performed.

Procedure

- Confirm the patient's details and that he/she has fasted and has not smoked on the morning of the test (or during the test). If the patient has eaten or smoked on the morning of the test, the test must be abandoned and a repeat appointment arranged.
- Explain the nature of the procedure to the patient. Two blood samples will be collected, 2 hours apart, before and after the Polycal drink.
- Using a glucose meter, determine the patient's fasting blood glucose concentration with a capillary blood sample obtained by finger prick.
- The result must be less than, or equal to 10 mmol/L. If the result is greater, the GP must be informed and we do not recommend continuing with the test. Instead, take a venous sample of blood for a fasting glucose concentration and send it to the laboratory to confirm the result obtained on the glucose meter.
- Providing the glucose meter result is less than, or equal to 10 mmol/L, proceed with the test. Blood (2 mL) must be collected into a fluoride oxalate tube (grey top). Record full patient details on the collection bottle including the test time (i.e. time zero/fasting). Record the glucose meter result on the laboratory request form.
- The Polycal must then be administered. **DO NOT GIVE THE WHOLE BOTTLE OF POLYCAL.** Measure 113 mL of Polycal into a measuring cylinder and dilute with water to a total volume of 200 mL. This must be drunk over the course of 5 minutes, followed immediately by a further 100 mL of water (113 mL is equivalent to a 75 g anhydrous glucose load).
- Note the time the Polycal was given on the request form.
- After **exactly** 2 hours, collect a further blood (2 mL) sample and record full patient details on the collection bottle including the actual time and time post glucose load (i.e. time 2 hours).
- The test is complete. The patient may eat and drink normally again and is free to leave. Send the blood samples to the laboratory for analysis as soon as possible.

Interpretation

	Glucose concentration (mmol/L)
Diabetes mellitus:	
Fasting <i>or</i>	≥7.0
2 h post glucose load	≥11.1
<i>or both</i>	
Impaired glucose tolerance (IGT):	
Fasting (if measured) <i>and</i>	<7.0
2 h post glucose load	≥7.8 and ≤11.0
Impaired fasting glycaemia (IFG):	
Fasting	≥6.1 and ≤6.9
<i>and (if measured) 2 h post glucose</i>	<7.8

Please note the above glucose concentrations do not apply if the patient is pregnant. Please see BIO NO 050 (Oral glucose tolerance test – protocol in pregnancy) for details of glucose concentrations for diagnosing gestational diabetes.

Laboratory results will be issued with an interpretative comment. The East Kent Hospitals University NHS Foundation Trust diagnostic algorithm for diabetes mellitus can be found on Trustnet in the following location:

<https://www.ekhuft.nhs.uk/patients-and-visitors/services/pathology/clinical-biochemistry/>

If you require any further advice with respect to the interpretation of the test results, please contact the duty biochemist on 01233 616287.

References

1. World Health Organisation. Definition, diagnosis and classification of diabetes mellitus and its complications: report of a WHO consultation. Geneva, World Health Organisation, 2006.
2. Colley CM, Larner JR. The use of Fortical in glucose tolerance tests. *Ann Clin Biochem* 1990; 27:496-98.
3. Smith J and Natrass M. Diabetes and laboratory medicine. ACB venture publications 2004.
4. Patient Information leaflet (Oral glucose tolerance test) – available within the patient and visitor area of Trustnet.