

W.H.O. CRITERIA FOR INVESTIGATION OF SUSPECTED DIABETES MELLITUS USING THE GLUCOSE TOLERANCE TEST

REFERRALS FOR HOSPITAL PERFORMED OUT-PATIENT GLUCOSE TOLERANCE TESTS

For extended Glucose Tolerance Tests (GTT) in patients suspected of having reactive hypoglycaemia or for those with metabolic disorders e.g. acromegaly, please refer to Clinical Biochemistry or Consultant Endocrinologist for instructions.

The Department of Clinical Biochemistry is not involved directly with performing GTTs. These are performed by the Phlebotomy Department at either the Tunbridge Wells Hospital (TWH at Pembury), Maidstone or Sevenoaks Hospitals.

The requesting Doctor should first establish the need for a GTT. This is indicated if:

- The fasting plasma glucose is >6.1 mmol/L (but not >7.0 mmol/L) **or** the glycated haemoglobin is >48 mmol/mol on two separate occasions
- OR**
- The fasting plasma glucose is >6.1 mmol/L (but not >7.0 mmol/L) **and** the glycated haemoglobin is >48 mmol/mol on one occasion.

Please note that although WHO have accepted glycated haemoglobin >48 mmol/mol as a diagnostic test for Diabetes Mellitus normal values do not exclude the diagnosis.

Should the above criteria apply, then referral forms should be downloaded from the Pathology or GP website and sent to the Phlebotomy Department and an appointment will then be sent to the patient.

The majority of ante-natal GTTs are performed in the maternity day unit and samples are sent to the laboratory for analysis.

GLUCOSE TOLERANCE TEST (GTT).

1.1 PREPARATION

- The patient should have been on a “free-living”, unrestricted diet containing at least 150 g of carbohydrate a day during the three days prior to the test.
- For 12 - 14 hours before the test the patient should fast (nothing to eat or drink except water). The patient should also refrain from smoking or exercising.

1.2 PROCEDURE

- Check patient details and confirm the patient has fasted for 12 hours.
- Using a point of care glucose meter check patient blood glucose and record on request form.
If the initial result is
 - ≥ 10 mmol/L. Do not proceed with Glucose tolerance test. Draw 4 mL venous blood into fluoride oxalate (grey top) bottle and label with Hospital number, first name, surname, DOB, time and date. Send to the laboratory, with a comment on the request form that test was terminated. If patient is feeling OK they can be discharged home.
 - ≤ 3.0 mmol/L ensure the patient is feeling OK, repeat to confirm and seek immediate medical advice.
 - If the result is < 10 mmol/L then continue.
- Draw 4mL venous blood into fluoride oxalate (grey top) bottle and label with Hospital number, first name, surname, DOB, time and date.
- 75 g of anhydrous glucose should be dissolved in at least 300 mL of water. Alternatively 113 mL of Polycal® (Nutricia Clinical) ⁽¹⁾ can be used, plus extra water to make a total volume of 200- 300 mL. This should then be consumed by the patient over 3-5 min.
- The patient should be asked to sit quietly and told by the Phlebotomist not to eat or drink anything except water for the two hours of the test and should refrain from smoking or leaving the Department.
- After two hours check patient blood glucose using point of care meter and record.
 - If result ≤ 3.0 mmol/L ensure the patient is feeling OK and seek immediate medical advice.
 - If the result is > 2.5 mmol/L then continue.
- Draw 4 mL venous blood into fluoride oxalate (grey top) bottle and label with Hospital number, first name, surname, DOB, time and date.

Blood samples should be sent to the laboratory for plasma glucose levels. A glucose tolerance test should not rely on readings from blood glucose meters. Only two blood samples are required at 0 and 120 minutes. Any enquiries please contact Clinical Biochemistry.

1.3 INTERPRETATION

- The following guidance ^(2,3) does not apply to the diagnosis of Gestational Diabetes please refer to Ante Natal Department for further advice.
- This is only applicable if GTT was performed correctly (first sample was truly fasting and second was 2 hours post 75g oral glucose which was completely consumed and patient did not vomit) and is based on laboratory venous glucose results and not capillary readings from blood glucose meters.

Venous Plasma Glucose results in mmol/L

		2 hours Post Glucose result		
		<7.8	7.8 – 11.0	≥ 11.1
Fasting Glucose result (0 Mins)	<6.1	Normal	IGT	DM
	6.1 – 6.9	IFG	IFG + IGT	DM
	≥ 7.0	DM	DM	DM

Diagnosis key -

DM = Diabetes Mellitus

IGT = Impaired glucose tolerance (2hr glucose is between 7.8 and 11.0 mmol/L)

IFG = Impaired fasting glycaemia (fasting glucose values above the normal range but below those diagnostic of diabetes)

Normal = Not supportive of diabetes mellitus (assuming 2h post 75g glucose)

Laboratory will inform the requesting Clinician by telephone if 2 hr Glucose result is ≥ 15.0 mmol/L

Enquires

If you have any enquiries about this test please contact the Duty Biochemist on extension 24465 or 01622-224465.

Reference

1. British National Formulary 59 March 2010, Polycal ® Oral Glucose Tolerance test. Available from <http://bnf.org>

2. Alberti KGMM, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus. Provisional report of a WHO consultation. Diabetic Medicine 1998; 15: 539-53

3. Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia. Joint Report from WHO and International Diabetes Federation (IDF) November 2005 Available from http://whqlibdoc.who.int/publications/2006/9241594934_eng.pdf