

Can we retire the oral glucose tolerance test?



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The use of HbA_{1c} as a diagnostic test for diabetes was recommended by the World Health Organization (WHO, 2011) early last year, and after much delay, consensus guidance is now available (John et al, 2011). This should make identification of type 2 diabetes easier, as the test does not require fasting and can be taken at any time of day.

The advantage of early diagnosis of diabetes is that individuals are able to access treatment and education before they develop complications. These individuals are easier to treat, often managing just with lifestyle changes for a significant period of time. It will also have a favourable effect on attainment of QOF indicators for HbA_{1c} as the practice will have a greater proportion of people with diabetes who can achieve tight targets safely.

Can we, therefore, now throw away the cumbersome, time-consuming, oral glucose tolerance test (OGTT)? Although the use of

HbA_{1c} is likely to become the main method of diagnosis, there are a number of situations in which it is not recommended and the traditional methods should be used, including OGTT (*Table 1*).

Despite its approval for use in the UK, HbA_{1c} as a diagnostic tool has not been agreed with all laboratories so some practices will not be able to use this method to diagnose diabetes if their local laboratory facilities are not offering this service. Also, point-of-care HbA_{1c} testing is not recommended unless it meets stringent quality assurance requirements. As HbA_{1c} is a reflection of the previous 12 weeks' blood glucose levels, it should not be used to diagnose diabetes with acute onset of symptoms (suggesting type 1 diabetes). This is because it may not have reached the diagnostic cut point (≥ 48 mmol/mol [$\geq 6.5\%$]) even though the individual has high blood glucose levels. Any condition that includes abnormalities of haemoglobin, severe

Table 1. Which test should be used for whom?

	Venous FBG, random BG or OGTT	HbA _{1c}
Asymptomatic and none of the below	Yes	Yes
Abnormalities of haemoglobin, red blood cell turnover, or severe anaemia	Yes	No
Acute onset of symptoms/possible type 1 diabetes	Yes	No
Gestational diabetes	OGTT only	No
Children/young people	Yes	No
People who are acutely ill	Yes	No
People taking corticosteroids, antipsychotics or other medications that cause a rapid rise in blood glucose	Yes	No
Formal identification of IGT	OGTT only	No
Lack of local suitable HbA _{1c} testing facilities that meet WHO recommended quality assurance requirements	Yes	No

BG=blood glucose; FBG=fasting plasma glucose; IGT=impaired glucose tolerance; OGTT=oral glucose tolerance test; WHO=World Health Organization.

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anaemia (<8 g/dL) or alteration in red blood cell turnover will mean HbA_{1c} as a diagnostic tool will be unreliable. It should also not be used to diagnose gestational diabetes.

Where HbA_{1c} is not recommended, testing for diabetes should be performed using either a fasting or random blood glucose using a venous sample (Table 2). A fasting blood glucose between 6.1 and 6.9 mmol/L should lead to a 75 g oral glucose challenge to confirm or exclude diabetes. Gestational diabetes should only be diagnosed using an OGTT (NICE, 2008). Table 3 looks at how to interpret OGTT results.

The WHO has not recommended the use of HbA_{1c} in identifying people at high risk of diabetes (often termed “pre-diabetes”) although

an HbA_{1c} of between 42 and 47 mmol/mol (6.0 and 6.4%) may suggest this. Formal identification of impaired glucose tolerance will still require an OGTT. In the increasingly litigious NHS, there may still be a place for the OGTT as the gold standard in the formal diagnosis of diabetes. ■

John WG, Hillson R, Alberti G (2011) Use of HbA_{1c} in the diagnosis of diabetes: The implementation of WHO guidance 2011. *Diabetes & Primary Care* **13**: 333–4

NICE (2008) *Diabetes in Pregnancy: Management of Diabetes and its Complications from Pre-conception to the Post-natal Period. Clinical Guideline 63*. NICE, London. Available at: <http://bit.ly/y8Snpu> (accessed 07.02.12)

World Health Organization (2011) *Use of Glycated Haemoglobin (HbA_{1c}) in the Diagnosis of Diabetes Mellitus. Abbreviated Report of a WHO Consultation*. WHO, Geneva. Available at: <http://bit.ly/seLcYT> (accessed 07.02.11)

Table 2. Diagnosis of diabetes with the available tests.

Test	Diagnostic criteria
Venous fasting	≥7.0 mmol/L
Venous random	≥11.1 mmol/L
OGTT	FBG of ≥7 mmol/L and/or ≥11.1 mmol/L 2 hours after 75 g oral glucose load
HbA _{1c}	≥48 mmol/mol (≥6.5%) or greater

If asymptomatic, another result in the diagnostic range in one of the above, taken on another day, is required.

FBG=fasting plasma glucose; OGTT=oral glucose tolerance test.

Table 3. Interpretation of oral glucose tolerance tests.

	Fasting venous blood glucose (mmol/L)	2 hours post-75 g glucose load (mmol/L)
Normal glycaemia	≤6.0	<7.8
Impaired fasting glycaemia	6.1–6.9	<7.8
IGT	<7.0	7.8–11.0
Diabetes	≥7.0	≥11.1

FBG=fasting plasma glucose; IGT=impaired glucose tolerance; OGTT=oral glucose tolerance test.