Use of HbA_{1c} in the diagnosis of diabetes:

The implementation of WHO guidance 2011

This guidance is supported by:

An expert group* have discussed the World Health Organization (WHO, 2011) report. The group agree that the WHO requirements are met in the UK (*Box 1*). HbA_{1c} is not suitable for use in everyone. Do not use HbA_{1c} to diagnose diabetes in pregnancy.

The test

Analysis of venous HbA_{1c} in UK laboratories participating in national quality assurance schemes currently fulfils WHO requirements. HbA_{1c} should usually be measured on a laboratory venous blood sample. Point-of-care HbA_{1c} should not be used for diagnosis unless the healthcare staff have been appropriately trained and the HbA_{1c} method used can demonstrate an internal quality control and external quality assessment performance that matches that of a laboratory method. Confirm a point-of-care diabetes diagnosis with laboratory venous HbA_{1c}.

Box 1. Recommendations from the World Health Organization (2011).

- HbA_{1c} can be used as a diagnostic test for diabetes providing that stringent quality assurance tests are in place and assays are standardised to criteria aligned to the international reference values, and there are no conditions present which preclude its accurate measurement.
- An HbA_{1c} of 48 mmol/mol (6.5%) is recommended as the cut point for diagnosing diabetes. A value of less than 48 mmol/mol (6.5%) does not exclude diabetes diagnosed using glucose tests.

Most patients

HbA_{1c} ≥48 mmol/mol (≥6.5%) can be used to diagnose diabetes in most situations. In patients without diabetes symptoms repeat venous HbA_{1c} in the same lab within 2 weeks. If the second sample is <48 mmol/mol (<6.5%) treat as high risk of diabetes and repeat the test in 6 months or sooner if diabetes symptoms develop. In symptomatic adults with relatively slow onset of symptoms a single result of ≥48 mmol/mol (≥6.5%) will suffice.

Situations where HbA_{1c} must not be used as the sole test to diagnose diabetes

HbA_{1c} reflects glycaemia over the preceding 2–3 months so may not be raised if blood glucose levels have risen rapidly. For example:

- ALL symptomatic children and young people.
- Symptoms suggesting type 1 diabetes (any age).
- Short duration diabetes symptoms.
- Patients at high risk of diabetes who are acutely ill.
- Taking medication that may cause rapid glucose rise, such as corticosteroids, antipsychotics.
- Acute pancreatic damage/pancreatic surgery.

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Do an immediate quality-assured finger-prick capillary glucose test. Check blood/urine ketones if available. If glucose is >11.0 mmol/L seek same-day specialist diabetes advice. For children and teenagers phone the specialist paediatric diabetes team same day. Send same day laboratory venous glucose, adding HbA_{1c} to exclude stress hyperglycaemia and/or for baseline, but **do not delay** seeking advice while awaiting the result.

Presence of factors that influence HbA_{1c} and its measurement

See Annex 1 from the WHO (2011) report. Discuss the patient with your local laboratory or specialist diabetes team or use glucose testing. Factors include abnormal haemoglobins, anaemia, altered red blood cell lifespan.

Patients whose HbA_{1c} is <48 mmol/mol (<6.5%)

These patients may still fulfil WHO glucose criteria for the diagnosis of diabetes which can be used in patients with symptoms of diabetes or clinically at high risk of diabetes. Glucose tests are not recommended routinely in this situation.

WHO did not provide specific guidance on HbA_{1c} criteria for people at high risk of diabetes. Clinicians should consider the individual patient's personal risk of diabetes and provide advice and monitoring accordingly. Pending NICE guidance (consultation document available at: http://bit.ly/uPRuC4), the expert group suggested using HbA_{1c} values below.

High risk of diabetes: HbA_{1c} 42–47 mmol/mol (6.0–6.4%)

Provide intensive lifestyle advice. Warn patients to report symptoms of diabetes. Monitor HbA_{1c} annually.

HbA_{1c} <42 mmol/mol (<6.0%)

Some of these patients may still be at risk of diabetes. If clinically at high risk manage as above pending NICE guidance. A detailed report will be available shortly. ■

World Health Organization (2011) *Use of Glycated Haemoglobin (HbA1c) in the Diagnosis of Diabetes Mellitus. Abbreviated Report of a WHO Consultation.* WHO, Geneva. Available at: http://bit.ly/seLcYT (accessed 28.11.11)

This guidance is supported by the Association of British Clinical Diabetologists, Association for Clinical Biochemistry, Community Diabetes Consultants, Diabetes UK, NHS Diabetes, PCDS and Training Research and Education for Nurses in Diabetes UK.

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