NHS London Clinical Networks

Consensus Approach to the Diagnosis of Type 2 Diabetes

London Diabetes Clinical Network

Document History		
Version	**Date**	**Comments**
v1.0	20/05/2015	Initial release
v1.1	27/09/2018	Key figures updated. Flowchart amended to align to the National Diabetes Prevention Programme and new clinical coding

The London Diabetes Clinical Network recommends that a consensus approach to the diagnosis of type 2 diabetes be reached across London to ensure cross boundary differences in diagnosis are removed. Consistent with many CCGs across London and in line with the World Health Organisation[1,2], Diabetes UK[3,4] and NHS Health Check recommendations, we recommend the adoption of HbA1c for the diagnosis of type 2 diabetes mellitus* across London.

Background

Type 2 diabetes is a condition affecting 3.7 million (6%) of the UK population[5,6]. In London 442,350 are diagnosed with type 2 diabetes[7] and a further 749,777 are estimated to have non-diabetic hyperglycaemia[8]. A study conducted in 2011 by the Clinical Effectiveness Group in Queen Mary's University reviewed 519,288 GP records in patients aged 25-79 and identified that 1 in 10 had a 20% risk of diabetes over the next 10 years[9]. The total cost (direct care and indirect costs) associated with diabetes in the UK stands at £23.7 billion and is predicted to rise to £39.8 billion by 2035/6[5].

The aim of diagnosing type 2 diabetes is to prevent premature mortality and prevent complication-related morbidity[10]. Methods of diagnosis for type 2 diabetes mellitus need to have high sensitivity, specificity and accuracy. Various diagnosis methods exist including glycated haemoglobin (HbA1c) and fasting glucose[4]. Both of these methods have advantages and disadvantages and diagnose slightly different cohorts of people. Historically fasting glucose has been primarily undertaken.

Rationale

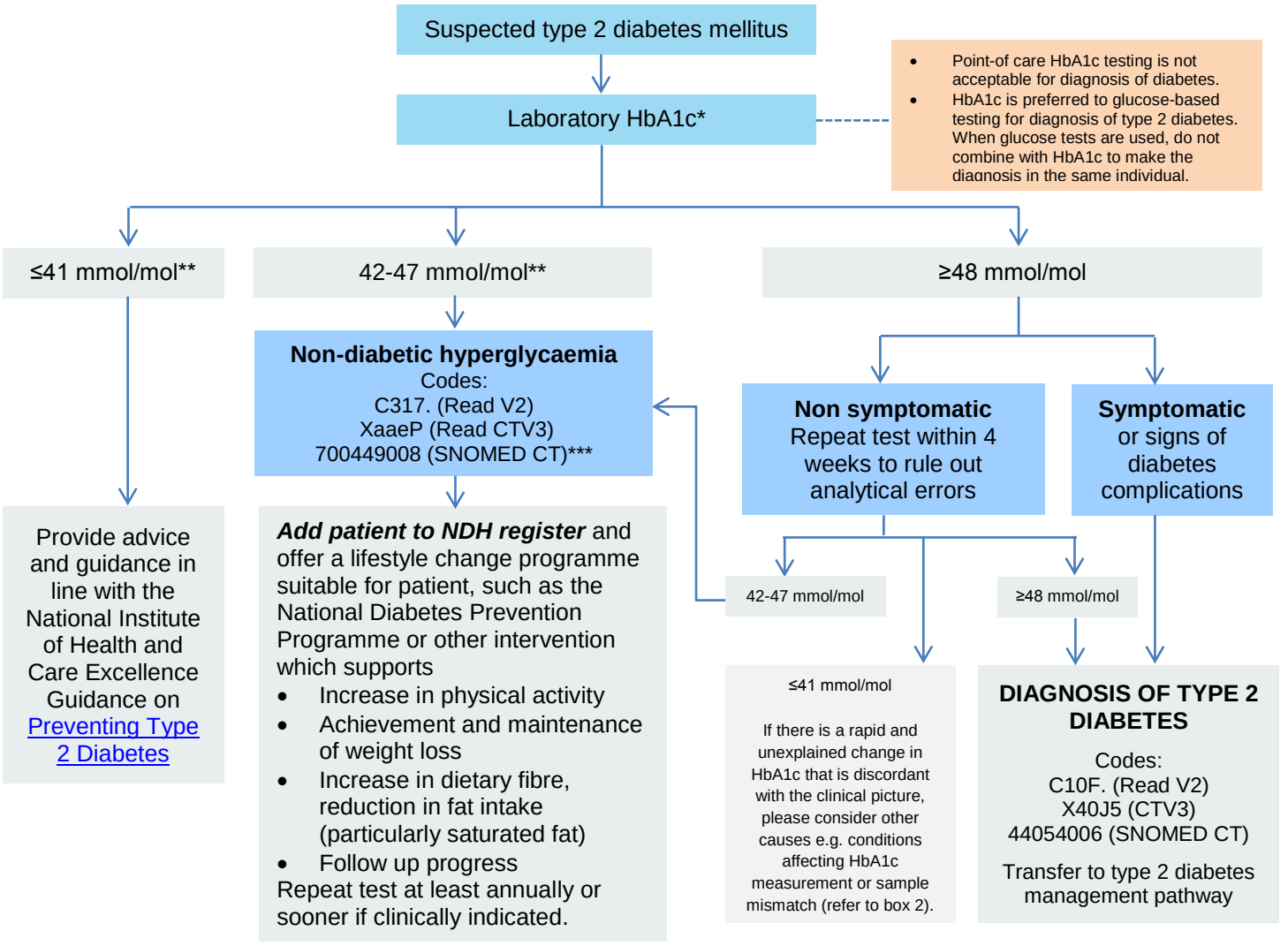
In 2011, the World Health Organisation (WHO) concluded that HbA1c can be used as a diagnostic test for diabetes as long as stringent quality assurance tests are in place and assays are standardised to criteria aligned to the international reference values, and that there are no conditions present which preclude its accurate measurement[1]. Since the publication of the WHO consultation, a number of organisations have moved towards using HbA1c for diagnosis where standardisation of HbA1c measurement has been achieved. This has increased the convenience of sampling, reduced the need for fasting and preceding dietary preparation, and avoids the problem of day to day variation in glucose levels[1].

Both nationally and internationally there continues to be debate around which diagnostic test is preferred. To date, consensus regarding the most appropriate method of diagnosis has not been reached. Advice from the WHO is that choice of diagnostic method depends on local considerations for example cost, availability of equipment, population characteristics and presence of a national quality assurance system[1].

The London Picture

In 2015, approximately 60% of all Clinical Commissioning Groups (CCGs) across London reported using HbA1c in preference to fasting glucose for the majority of patients[11], whereas 40% had no preference and left it up to clinician discretion. This creates problems when patients move across practices, CCG boundaries and care pathways and why this consensus statement has been developed. Although the reagent costs for HbA1c tests are higher, when other costs such as the cost of oral glucose tolerance tests are factored in, both in the short and longer term, the use of HbA1c is more economical as part of the screening and diagnostic pathway[12].

Flowchart - Recommended cut off points for diagnosis of type 2 diabetes mellitus using HbA1c and interventions[1,2,4,10,13]



*BOX 1 & 2: Exclusions to using HbA1c for diagnosis of type 2 diabetes mellitus (glucose based diagnosis required)[1,3,12,14]	
BOX 1 **URGENT BLOOD GLUCOSE BASED TESTING REQUIRED**	• Suspected type 1 diabetes, (all ages) • Short (<2 months)/rapid onset of diabetes symptoms • Patients at high diabetes risk who are acutely ill (e.g. those requiring hospital admission) • Acute pancreatic damage or pancreatic surgery • All children and young people up to the age of 30 years old • Patients taking medication that may cause rapid glucose rise e.g. corticosteroids, antipsychotic drugs (2 months or less)

BOX 2
BLOOD GLUCOSE BASED TESTING REQUIRED
	• Pregnancy (current or recent <2months)
	• Haematological factors
	  ○ Anaemia – haemolytic and iron deficiency
	  ○ Haemoglobinopathies
	• Renal failure (CKD Stage 3b and above)
	• Human Immunodeficiency Virus (HIV) infection
	• Presence of genetic, haematologic and illness-related factors that influence HbA1c and its measurement.
	• Factors affecting the life span of red cells - recent commencement of erythropoietin therapy will result in a decrease in HbA1c as will occur with some haemoglobinopathies, splenomegaly, rheumatoid arthritis or with drugs such as antiretrovirals, ribavirin and dapsone. Increased erythrocyte lifespan e.g. in splenectomy may increase HbA1c levels

If there is a high suspicion of diabetes (symptoms or multiple risk factors and HbA1c <48mmol/mol), an oral glucose tolerance test may be performed, although this should be considered **exceptional[14]**.** Older people without diabetes appear to have higher HbA1c values than younger individuals; approximately 4 mmol/mol (0.4%) higher at 70 years than at 40 years[3].

***Research and analysis carried out on people with non-diabetic hyperglycaemia should consider including the previously recommended Read codes 14O80 (ReadV2) or XaZLG (CTV3) for people at high risk of diabetes.

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