The easy-to-do audit series

An audit to identify people who have not been coded correctly for non-diabetic dysglycaemia or type 2 diabetes

Undertaking simple audits and reflecting and acting on our findings can be a powerful way to change practice and improve the care we deliver. In this series, the PCDS hopes these hands-on "how to" audit guides will provide the practical guidance and motivation we all need to take action in the limited time available.

In 2009, the use of the HbA_{1c} assay was recommended in the diagnosis of diabetes, with an HbA_{1c} of 48 mmol/mol (6.5%) indicative of a diabetes (The International Expert Committee, 2009). The diagnosis of diabetes in an asymptomatic person should not be made on the basis of a single abnormal plasma glucose or HbA_{1c} value, but should be confirmed with a repeat HbA_{1c} test, unless clinical symptoms are present or plasma glucose levels are >11.1 mmol/L (200 mg/dL), in which case further testing is not required. An HbA_{1c} just below 48 mmol/mol (6.5%) indicates a high risk of developing diabetes. The International Expert Committee (2009) recommended that those with an HbA_{1c} level between 42 and 47 mmol/mol (6.0 and 6.4%) should be considered for diabetes prevention interventions. People with an HbA_{1c} in this range also need surveillance with annual re-testing (NICE, 2012).

A diabetes diagnosis should be made using the best technology available, avoiding blood glucose monitoring meters and single-use HbA_{1c} test kits, except where this is the only option available or where there is a stringent quality assurance programme in place (The International Expert Committee, 2009). It is advisable to use either fasting blood glucose or HbA_{1c}, but if both are used and are "diagnostic" then a diagnosis can be recorded without further testing.

The audit

There are two ways to identify people who are at high risk of type 2 diabetes but have not yet been coded as having non-diabetic dysglycaemia or type 2 diabetes.

Firstly, we can use software, such as the Leicester Practice Risk Score (http://bit.ly/2gKq0jk), to identify people in the practice who have not been coded with type 2 diabetes, but who have a variety of risk factors or blood tests that make them high risk. We can then arrange blood testing to confirm or refute the diagnosis.

Secondly, there are instances on general practice computer databases when abnormal HbA_{1c} or blood glucose results have been recorded but there is no diagnostic code for diabetes. In some cases, these will be asymptomatic patients who required repeat blood tests for diabetes diagnosis confirmation but who failed to have the confirmatory test. There may also be people who have been informed that they have type 2 diabetes, possibly even on treatment, but have not been assigned a diagnostic code. Additionally, most practices will have asymptomatic patients who have been labelled as type 2 diabetes inappropriately after a single test. In a recent cross-sectional study, the percentage of people who did not have diabetes but were coded with the condition was 6.1% (Seidu et al, 2014).

Inappropriate diagnosis leads to inappropriate management (therapeutic or education), psychological distress for the individual and financial disadvantage and inaccuracies for the practice when auditing or analysing progress.

1. The first aim of this audit is to identify adults who may have existing type 2 diabetes that has been missed or is not coded.
2. The second aim of this audit is to identify

Sam Seidu

GP and Primary Care Fellow at the Diabetes Research Centre, University of Leicester, Leicester

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adults with non-diabetic dysglycaemia at high risk of developing type 2 diabetes who are not coded and, therefore, are not receiving annual reviews or lifestyle intervention*.

Potential intervention

The Leicester Practice Risk Score is recommended by NICE for the identification of people at risk of diabetes (http://bit.ly/2gKq0jk). The score identifies people who are at high risk of diabetes or currently have undiagnosed type 2 diabetes using data on age, sex, BMI, ethnicity, family history of diabetes and anti-hypertensive use. The electronic version (for practices) comprises software that calculates the Leicester Diabetes risk score for all those aged between 18 and 75 years excluding people with known diabetes, the terminally ill and those coded with gestational diabetes, using the data stored within your practice's electronic medical records. The software can be downloaded from the website above and analyses any existing oral glucose tolerance test/HbA_{1c}/glucose data, as many people will have been screened with blood tests already.

The software outputs an Excel spreadsheet that enables you to rank those stored within your practice records by risk. The output ranks those who may already have diabetes at the top of the list and these people can be invited for confirmatory diagnosis and discussion. Those at highest risk of developing diabetes but who do not yet meet the diagnostic criteria for the disease, for example the top 10%, could be

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- Pre-diabetes
- Impaired glucose regulation
- At risk of diabetes mellitus
- High risk of diabetes mellitus

N.B. People diagnosed with a fasting plasma glucose or oral glucose tolerance test only should be coded as:

- Impaired fasting glycaemia
- Impaired glucose tolerance

Instructions to complete the audit.

Aims

1. To identify adults who may have existing type 2 diabetes that has been missed and is not coded.
2. To identify adults with non-diabetic dysglycaemia at high risk of developing type 2 diabetes who are not coded and, therefore, are not receiving annual reviews*.

Audit method

This will be a two-step completed audit in primary care centres in the UK. The first data collection will be done between 1 January and 28 February 2017 and follow-up data collection will be done 6 months later to allow for appropriate interventions to be put in place at the local or practice level in order to effect change.

Criteria

1. Adults with abnormal existing oral glucose tolerance test/HbA_{1c}/glucose above the diagnostic cut-offs for diabetes on their general practice data should have a diagnostic code for type 2 diabetes if symptomatic or have the blood test repeated if asymptomatic.
2. Adults with non-diabetic dysglycaemia (HbA_{1c} 42–47 mmol/mol [6.0–6.5%], fasting plasma glucose 6.1–7.0 mmol/L, or 2-hour postprandial glucose 7.8–11.1 mmol/L) should have a diagnostic code* and be referred for a quality-assured intensive lifestyle programme where available, or signposted to local lifestyle support.

Standards

1. For criterion 1, 100% of people should be coded as type 2 diabetes if symptomatic, or have the tests repeated and be appropriately coded if asymptomatic.
2. For criterion 2, 100% of people with non-diabetic dysglycaemia should have a diagnostic code and be referred for prevention programmes.

N.B. Set a reminder on the practice's electronic calendar to repeat the audit 6 months later.

Your turn:

You can download the full-size audit form from www.diabetesandprimarycare.co.uk/audits to fill in and retain. The audit should take no more than a few hours to complete. After you have completed the first data collection, you can send in your top-line aggregated data to **dpc@omniamed.com**.

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referred to the national diabetes prevention programme where available.

Alternatively, if this is difficult to run on your practice computer system, individual audits can be carried out using simple searches to identify those with previous abnormal blood tests and who may have type 2 diabetes or be at risk of diabetes – see *Box 1* for more details. ■

NICE (2012) *Preventing type 2 diabetes – risk identification and interventions for individuals at high risk* [PH38]. NICE, London

Seidu S, Davies MJ, Mostafa S et al (2014) Prevalence and characteristics in coding, classification and diagnosis of diabetes in primary care. *Postgrad Medical J* **90**: 13–7

The International Expert Committee (2009) International Expert Committee Report on the Role of the A1C Assay in the Diagnosis of Diabetes. *Diabetes Care* **32**: 1327–34

Box 1. Instructions to complete the audit using simple searches to identify those with previous abnormal blood tests and who may have type 2 diabetes or non-diabetic dysglycaemia.

If you are unable to run the Leicester Practice Risk Score software on your practice system to identify those at highest risk of diabetes based on risk factors and previous blood tests, you can still undertake audits of those who have already had abnormal HbA_{1c} results to identify those who have type 2 diabetes or non-diabetic dysglycaemia and ensure they are correctly coded*.

1. Identify the population who do not have diabetes – use adults who are not on the diabetic register as your baseline population for the search.
2. Perform a search on this "non-diabetic register group" for all those who have an abnormal HbA_{1c} (IFCC aligned ≥48 mmol/mol). It may be helpful to also search historically for those with an HbA_{1c} (DCCT aligned) ≥6.5%. Ensure that for each you choose the correct HbA_{1c} search code then add the value range.
3. Review of patients identified will demonstrate that they fit one of four groups:

- **One HbA_{1c} ≥48 mmol/mol (6.5%) and more recent HbA_{1c} measurements in the normal or dysglycaemic range (42–47 mmol/mol [6.0–6.5%]).** Ensure those in the dysglycaemic range are coded appropriately to ensure annual testing and arrange appropriate referral to a prevention programme or intensive lifestyle advice.
- **One HbA_{1c} ≥48 mmol/mol (6.5%) result but they were asymptomatic when tested, and no follow-up testing occurred.** Arrange a further HbA_{1c} test as soon as possible. Code and manage as type 2 diabetes or dysglycaemia depending on HbA_{1c}.

In both these groups where there is one normal and one abnormal HbA_{1c} result, you may still want to consider these people at high risk and arrange annual HbA_{1c} and referral to a prevention programme as they have demonstrated they are high risk even if the repeat test is now normal.

- **One HbA_{1c} ≥48 mmol/mol (6.5%) result and they were symptomatic when tested.** This group meet the criteria for type 2 diabetes diagnosis. Decide whether to code and manage or whether to recall them for repeat HbA_{1c} and further discussion regarding diagnosis of type 2 diabetes, especially if the testing was undertaken some time ago.
- **Two or more HbA_{1c} ≥48 mmol/mol (6.5%) previously.** Code as type 2 diabetes and arrange appropriate review and discussion regarding the diagnosis if this has not taken place previously. Some of this group will already be on treatment and attending clinic so only correct coding is required.

4. Count those who have type 2 diabetes but were not previously coded to calculate the percentage achievement for criterion 1 (e.g. if there were previously 425 people with diabetes and another 45 have been identified, then the percentage achievement would be 90% [425/470 already coded]).
5. Repeat the search on the same baseline population who do not have type 2 diabetes to identify those with an HbA_{1c} of 42–47 mmol/mol (6–6.4%). Exclude those who are already coded with any of the non-diabetic dysglycaemia codes, then review records of those who remain. Identify those who are not currently coded. Count those with a new diagnosis of dysglycaemia and compare with the total number with dysglycaemia to calculate the achievement for criterion 2 (e.g. if there were previously 250 people coded and another 30 are identified and coded, then the percentage achievement would be 89% [250/280 already coded]).

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Aim

1. To identify adults who may have existing type 2 diabetes that has been missed and is not coded.
2. To identify adults with non-diabetic dysglycaemia at high risk of developing type 2 diabetes who are not coded and, therefore, are not receiving annual reviews*.

This will be a two-step audit completed in a primary care centre in the UK. The first data collection will be between 1 January and 28 February 2017 and the follow-up data collection will be completed 6 months later.

Date of first data collection: __/__/__
Date of second data collection (6 months later): __/__/__

Criterion

1. Adults with abnormal existing oral glucose tolerance test/HbA_{1c}/glucose above the diagnostic cut-offs for diabetes on their general practice data should have a diagnostic code for type 2 diabetes if symptomatic or have the blood test repeated if asymptomatic.
2. Adults with non-diabetic dysglycaemia (HbA_{1c} 42–47 mmol/mol [6.0–6.5%], fasting plasma glucose 6.1–7.0 mmol/L, or 2-hour postprandial glucose 7.8–11.1 mmol/L) should have a diagnostic code* and be referred for a quality-assured intensive lifestyle programme where available, or signposted to local lifestyle support.

Standard

1. For criterion 1, 100% of people should be coded as type 2 diabetes if symptomatic, or have the tests repeated and be appropriately coded if asymptomatic.
2. For criterion 2, 100% of people with non-diabetic dysglycaemia should have a diagnostic code and be referred for prevention programmes.

Method

See the above article for a step-by-step guide.

Criteria	Number sampled (0 months)	Achievement Number of adults meeting the criterion	%	Number sampled (6 months)	Achievement Number of adults meeting the criterion	%	Standard
1							100%
2							100%

1. What change(s) will be implemented after the first data collection?

2. What are the conclusions and lessons learned following the first and second data collections?

3. Are there any further steps required for change?

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