

# FAILING TO RECORD BLOOD GLUCOSE PROVENANCE WASTES TIME, MONEY, AND DELAYS DIAGNOSIS OF DIABETES

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## Introduction

We have previously noted that the majority of blood glucose tests undertaken in primary care are recorded without providing information about the provenance of the sample (fasting, random, or glucose tolerance test) [1-2]. Here we look at the magnitude and impact of this problem.

Recording of test provenance is important as the diagnostic thresholds for diabetes vary depending on whether the test is fasting or non fasting. Failing to record this information makes glucose measurements difficult or even impossible to interpret.

## Methods

We performed mixed methods study to quantify the number of glucose test in primary care with unrecorded provenance data and to analyse the impact of unrecorded provenance.

### Quantification of the problem:

We undertook a cross-sectional analysis, of over 1 million patient records from 2013, using data collected by the RCGP Research Surveillance Centre (RSC) to quantify the number of tests without provenance information. This comprises GP records from across the UK. We looked for test provenance information using Read codes.

### The impact of failing to record glucose provenance:

We also undertook a manual clinical notes review of all 480 people with diabetes in a single GP practice to identify what type of test was used to make the diagnosis and if glucose test provenance caused any issues with making the diagnosis.

## Results

### Cross-sectional analysis

From 222,829 recorded glucose measurements in 2013 in the RSC database majority (117,893; 58%) did not have any provenance information recorded (figure 1).

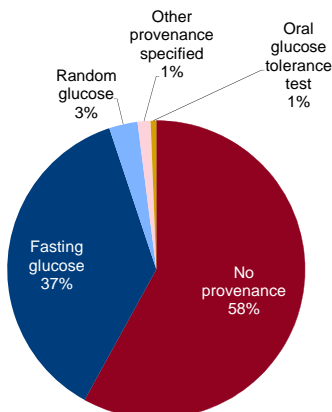


Figure 1. The abundance of recorded glucose measurements in primary care by test provenance (Read code provenance).

### Clinical notes review

Of the 490 patient notes reviewed, the first positive test result for diabetes was a blood glucose measurement in 262 cases. The remaining cases were diagnosed using HbA1c measurements or tests outside of their current GP practice.

Out of the 262 positive glucose results, 23 had no associated Read code at all (results had been scanned in or were mentioned in free text). From the 239 results that did have a Read code, 170 (71%) had no provenance. GPs recorded notes questioning the test provenance in 36 (15%) cases (Box 1).

#### Box 1. Typical comments made by GPs and practice nurses about the provenance of glucose test results when not recorded

- "If fasting diabetic. See GP for review"
- "Was this fasting?"
- "Glucose high but was it fasting?"
- "Raised if fasting, needs repeat"
- "Consistent with diabetes if fasted"
- "? Fasting test. Need to contact patient."

In many cases the patient was contacted to establish the test provenance. 15 people underwent repeat tests because the test provenance was unclear. Three of these had a delay in diagnosis of over a year. Problems also occurred with second tests. Where the second positive test was again a glucose result, 87/132 (66%) had no provenance and GPs questioned whether the test was fasting in 6/132 (4.5%) of cases.

In the practice studied implemented electronic test requesting improved provenance recording (figure 3).

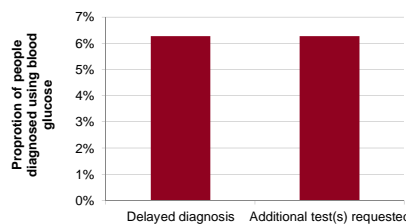
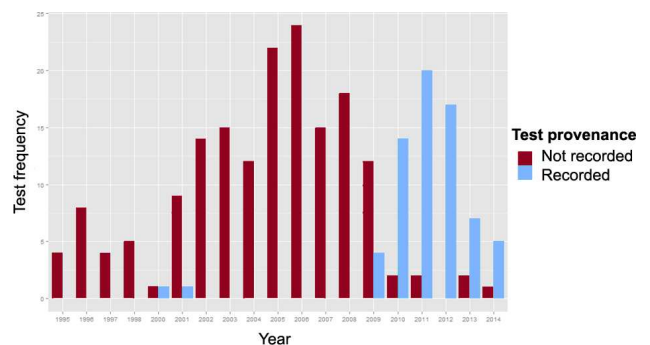


Figure 2. Proportion of problems caused by failed glucose provenance recording.

### Figure 3. Changes in recording of glucose provenance in the single audited practice. Introduction of electronic test requesting in 2009 improved recording.



## Conclusions

1. Currently the majority of glucose tests in primary care are recorded without provenance information (fasted, random, etc)
2. This was found to lead to requests for additional test and time spent by GPs attempting to identify test provenance by contacting patients.
3. Diagnosis of diabetes was delayed occasionally by months to several years.
4. Electronic test requesting was correlated with improved recording of test provenance

## Summary

Early identification and intervention in diabetes is key to minimising complications. Poor recording of glucose provenance is a common and overlooked problem leading to unnecessary management challenges. Implementation of electronic test requesting software greatly improves provenance recording.

PDF available from:

[www.mcgov.co.uk/research.php](http://www.mcgov.co.uk/research.php)



## References

1. de Lusignan S: Flagging fasting plasma glucose specimens: time to routinely label the context in which pathology specimens are recorded. *Inform Prim Care* 2009, 17:63-64.
2. McGovern AP, Butler L, Jones S, van Vlymen J, Sadek K, Munro N, Carr H, de Lusignan S: Diabetes screening after gestational diabetes in England: A quantitative retrospective cohort study. *Br J Gen Pract* 2014, 64:22-23.

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