

Changes to HbA_{1c} reporting: What you need to know



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One of the cornerstones in assessing glycaemic control in people with diabetes is the measurement of HbA_{1c}. For several years, most laboratories in the UK have reported HbA_{1c} in “DCCT (Diabetes Control and Complications Trial) units”, which have allowed us to directly equate the values in our own patients with those who participated in this study as well as in the UKPDS (UK Prospective Diabetes Study).

Only one problem remained. The results reported are not actually the true HbA_{1c} concentrations, but rather the best estimates we had using the technology that was available in the 1980s when the DCCT and UKPDS studies were performed.

More recently, the International Federation of Clinical Chemists (IFCC) has established the “true” concentrations of HbA_{1c} in samples, but they tend to be 1.5–2 percentage points lower than we are used to. For example, 7% in DCCT units is 5.3% in IFCC units. Worries about possible confusion between old and new units has led to two recent developments. Firstly, the IFCC has recognised that confusion may occur and has completely changed its units for HbA_{1c}. It now proposes that HbA_{1c} be reported in mmol of HbA_{1c} per mol haemoglobin, which is 10 times the value of previous IFCC percentage units. This means that 5.3% is now 53 mmol/mol. The second development is the suggestion to express HbA_{1c} as a “mean blood glucose equivalent” or “estimated average glucose” (eAG), where, for example, an HbA_{1c} of 7% (DCCT units) is expressed as an eAG of 8.6 mmol/L.

In fact, in 2007 it was recommended that, globally, each person with diabetes should have all three numbers (DCCT [%], IFCC [mmol/mol] and eAG [mmol/L]) mentioned on the same report (Consensus Committee, 2007). More recently, 18 professional organisations in the UK have rationalised this recommendation.

With concerns that HbA_{1c} may not be able to give an accurate assessment of mean glucose in many people (thereby causing more, rather than less, confusion), it was decided that in the UK only the DCCT and IFCC values will be reported as in *Table 1*, for now at least (Barth et al, 2008). It was also appreciated that there will need to be a major programme to educate healthcare professionals and people with diabetes on these new HbA_{1c} units.

When are the changes happening?

The target date for laboratories to start reporting HbA_{1c} in IFCC units has been named as 1 June 2009 (National Diabetes Support Team et al, 2009). Mindful of the fact that the new units are very different to current ones it has been recommended that both DCCT and IFCC results be reported simultaneously in order to give everyone time to become accustomed to the new numbers. It is anticipated that as of 1 June 2011 only the IFCC result will be reported.

Will it mean that our local HbA_{1c} analysers will need to change?

The instruments used in laboratories or clinics will remain the same. All that will change is the numbers that they are calibrated to report. Laboratories should be able to adapt to this quite easily, but there may be issues in some point-of-care HbA_{1c} analysers issuing two numbers, so this might need to be clarified with the instrument manufacturer.

Getting used to IFCC numbers

Changes such as this can be difficult for everyone involved. In order to help with the transition, I have come up with “Kilpatrick’s Kludge” to convert DCCT to IFCC units. It is known as “minus two minus two”. If the DCCT HbA_{1c} is 9%, the IFCC HbA_{1c} is nine minus two (7) minus two (5) equalling 75 mmol/mol. As can be seen from *Table 1* this works for other

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whole percentages of HbA_{1c} encountered and in fact, holds true for all integer percentages between 4 and 13%, inclusive.

Why bother?

In the same way that time is now measured by atomic clocks rather than sand in an hourglass, it makes sense that when a more accurate way of measuring a test becomes available then we should probably use it. One comfort in changing to these new units is that, because the result is now calibrated to the true HbA_{1c} concentration, the numbers should never need to change again. Indeed, I suspect that once IFCC numbers become second-nature then the HbA_{1c} targets themselves will probably change to become the round numbers of either 50 or 60 mmol/mol. ■

More information is available at <http://www.birminghamquality.org.uk/72.html> (accessed 09.02.09).

Barth J, Marshall S, Watson I (2008) Consensus meeting on reporting glycated haemoglobin (HbA_{1c}) and estimated average glucose (eAG) in the UK: Report to the National Director for Diabetes, Department of Health. *Diabetic Medicine* 25: 381–2

Consensus Committee (2007) Consensus statement on the worldwide standardization of the hemoglobin A1c measurement: the American Diabetes Association, European Association for the Study of Diabetes, International Federation of Clinical Chemistry and Laboratory Medicine, and the International Diabetes Federation. *Diabetes Care* 30: 2399–400

National Diabetes Support Team, Diabetes UK, The Association for Clinical Biochemistry (2009) *HbA_{1c} standardisation for clinical health care professionals*. Diabetes UK, London

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Table 1. Conversion of HbA_{1c} from DCCT units to IFCC units.

HbA _{1c} (%) DCCT	HbA _{1c} (mmol/mol) IFCC
4%	20
5%	31
6%	42
7%	53
8%	64
9%	75
10%	86