

HbA1c figures go INTERNATIONAL

From 1 July most countries will use the same figures to record HbA1c, writes **Sheila O’Kelly**

From 1 July, the format of the figures used to express your HbA1c levels is changing so that it will be the same all over the world.

The HbA1c test you have when you visit your GP or diabetes medical team shows what the average glucose levels in your blood have been over the previous six to eight weeks. It is not the same as the blood glucose testing you do every day – those daily tests measure only what your blood glucose level is at the moment you test it.

At first, HbA1c results will be reported in the old percentage terms we are used to; and the new figures expressed in mmol/mol (pronounced milimoles per mole) will be used alongside them. It’s a bit like when we changed to the euro and both the £ and € prices were printed on price labels. It didn’t mean the cost or value of the goods had changed and this is similar to these new HbA1c reporting figures. The full name of the figures we have been used to is:

- HbA1c (DCCT); and
- the new figures will be known as HbA1c (IFCC).

These changes will take effect from 1 July 2010. Both figures will be recorded until the end of 2011. From January 2012, only the new HbA1c (IFCC) figures will be used.

“You don’t need to remember all the numbers, just the ones that affect you,” Dr Ned Barrett, told the Diabetes Federation of Ireland recent National Spring Meeting. Dr Barrett is chairman of the HSE HbA1c Project Team and Consultant Biochemist of the Mid Western Regional Hospital.

Until now, the way of measuring HbA1c in Ireland has been aligned to that used in

How the old % figures will convert to new mmol/mol

| HbA1c % (DCCT) – OLD | HbA1c mmol/mol (IFCC) – NEW |
|----------------------|-----------------------------|
| 6.0 | 42 |
| 6.5 | 48 |
| 7.0 | 53 |
| 7.5 | 59 |
| 8.0 | 64 |
| 8.5 | 69 |
| 9.0 | 75 |

A leaflet ‘Information for People with Diabetes – international change to HbA1c results is available from the Federation. You can also get more information at www.hse.ie/go/diabetes.

the Diabetes Control and Complications Trial (DCCT). The test has been known as HbA1c (DCCT) and the results given as a percentage. Your doctor is likely to have agreed a specific HbA1c target value with you to suit your particular circumstances.

The International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) has put in place a new measurement system for the worldwide standardisation of HbA1c. This will make comparing HbA1c results throughout the world much easier. The new name for the test will be HbA1c (IFCC).

What does HbA1c measure?

- Haemoglobin (known as Hb) is present in the red cells of everybody’s blood (it is the Hb of HbA1c) – this is what makes your blood red.

- Glucose sticks to the haemoglobin in the red blood cells to give what is known as HbA1c – this happens by way of a complicated chemical reaction.
- The more glucose there is in the blood, the more glucose is attached to the haemoglobin.
- The amount of haemoglobin in your red cells with glucose attached is a good indication of the average glucose levels in your blood over the previous six to eight weeks.

Your doctor will use the HbA1c results to monitor how well your diabetes is controlled.

What does it not measure?

The HbA1c test is not a measure of the blood glucose at a moment in time – as



Dr Ned Barrett told the recent Diabetes Federation of Ireland National Spring Meeting how the new HbA1c figures would be put in place

you get when you test your blood using your own blood glucose meter. Your home blood glucose monitoring allows you to track your blood glucose level at different times of the day.

In contrast, HbA1c takes a long-term measure of your blood glucose control and expresses it in a different way.

Why measure HbA1c?

The HbA1c test tells you and your doctor:

- how good your blood glucose control has been; and
- whether or not you are on target to keep your risk of developing the complications of diabetes as low as possible.

The better you control your blood glucose, the less chance there is of you developing diabetes-related complications.

“At the end of September 1993 the Diabetes Control and Complications Trial results were published. They were very dramatic. They showed that the poorer the diabetes control in relation to HbA1c, the greater the likelihood of developing long-term complications of diabetes.

“For example, as HbA1c increased, the risk of developing retinopathy (eye disease) increased quite steeply. But then to counterbalance that as the HbA1c fell,

HbA1c measures long-term blood glucose

| JANUARY | | | | | | | FEBRUARY | | | | | | | MARCH | | | | | | |
|---------|----|----|----|----|----|----|----------|----|----|----|----|----|----|-------|----|----|----|----|----|----|
| M | T | W | T | F | S | S | M | T | W | T | F | S | S | M | T | W | T | F | S | S |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | | | | | 29 | 30 | 31 | | | | |

| APRIL | | | | | | | MAY | | | | | | | JUNE | | | | | | |
|-------|----|----|----|----|----|----|-----|----|----|----|----|----|----|------|----|----|----|----|----|----|
| M | T | W | T | F | S | S | M | T | W | T | F | S | S | M | T | W | T | F | S | S |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 26 | 27 | 28 | 29 | 30 | | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 28 | 29 | 30 | | | | |

HbA1c is an overall measure of blood glucose control over the past two-three months on the calendar

Home blood-glucose monitoring measures short-term blood glucose levels



| | Before breakfast | Before lunch | Before evening meal | Before bed |
|------|------------------|--------------|---------------------|------------|
| Mon | | | | |
| Tue | | | | |
| Wed | | | | |
| Thur | | | | |
| Fri | | | | |
| Sat | | | | |
| Sat | | | | |

The blood glucose testing you do at home just shows your glucose levels at that moment in time

particularly as you come down towards the upper limit of the normal range, the risk of having hypoglycaemic (low blood glucose) episodes increases.

“This means that medical care is the balance between having a good HbA1c to avoid the risk of developing retinopathy, and nephropathy and balancing that with the increased risk of hypoglycaemic episodes as the HbA1c falls into the normal range,” Dr Barrett told the Federation’s National Spring Meeting.

How often is HbA1c measured?

How often HbA1c is measured is usually decided by your doctor. This will depend on many factors, including the type of diabetes you have and the way you have been managing your diabetes.

Dr Barrett said that while home daily glucose testing was done several times a day according to a clock HbA1c testing was done according to the calendar.

“You measure your own blood glucose at certain times of the day, perhaps four times a day so you may feel you are perfectly in control. But of course there are large parts of the day when you’re not checking, especially during the night,” said Dr Barrett.

“HbA1c is different. It shows your control over a much longer time. It is a very good measure of control over four, six, eight, 10 weeks.

“People often agonise because they say ‘My glucose was over 20 for four hours, my HbA1c is going to be awful in six weeks’ time!’, but you need to remember that there are just 24 hours in a day. The HbA1c covers not only days but weeks. Over eight weeks there are 1,344 hours. So one hour of excellent glucose control or one hour of awful glucose control is not going to have a major impact on your HbA1c. It is the sustained level of control that matters,” Dr Barrett said.