



Your HbA1c test: The measurements are changing

Each time you come to clinic, as well as measuring your weight and height to make sure you are growing as we'd expect, we also do a finger-prick test called an HbA1c. The way this test is reported is changing. This leaflet explains what this test is and how it is changing.

What is HbA1c and what does it tell us?

The HbA1c gives a measure of overall blood glucose control over the last 2 to 3 months. While blood glucose tests give important information about daily variations in blood glucose levels, the HbA1c gives important information about long term control. The HbA1c should be measured approximately every three months when you visit your diabetes clinic.

As the red blood cells move around in the bloodstream, the haemoglobin they contain picks up glucose. The amount of glucose picked up depends on how much glucose there is in the bloodstream. If the average blood glucose levels are high over a two to three month period, lots of glucose will stick to the haemoglobin and the HbA1c will be high (> 58/7.5%). If the blood glucose levels are mostly in the target range the HbA1c will be in the desired range (less than 58/7.5%). If blood glucose levels are swinging from high to low, the HbA1c may be in the target range but this is not good balance. The HbA1c can be a little more influenced by recent readings than earlier readings in the two to three month period it is measuring.

Daily blood glucose and regular HbA1c measurements (approximately every three months) are important in monitoring diabetes control. Diabetes control is assessed by both the HbA1c and the daily blood glucose levels.

How is HbA1c tested?

At our clinic, the HbA1c is done by finger-prick, and tested in a machine in clinic called a DCA analyser. When you are older and are being seen within Adult Diabetes Clinics, you will have blood taken from a vein in your arm and the test will be done in a much bigger analyser in a laboratory.

What are the changes in the way HbA1c measurements about?

Laboratories in New Zealand are changing the way HbA1c results are reported. This is to keep NZ in line with laboratories and clinics around the world. The table below will show the old reading compared to the new measurements. Over the next year, we will continue to use the old measurement in percentages as well as the new measurement in mmol/mol, so there is time to get used to the new readings.

Current DCA units as %	New units (mmol/mol)
6%	42
6.5%	48
7.0%	53
7.5%	58
8.0%	64
8.5%	69
9.0%	75
9.5%	80
10.0%	86
11%	97

What are we aiming for?

The closer your HbA1c is to target range the better, provided that there is not too much hypoglycaemia. Below are realistic recommendations for target blood glucose levels and HbA1c.

Recommended ranges for Blood Glucose levels and HbA1c	
Blood Glucose Range *	HbA1c
Target ranges for blood glucose levels are generally Before meals 4 to 7 mmol/l After meals 5 to 10 mmol/l At bedtime 6 to 10 mmol/l At 3am 5 to 8 mmol/l	Less than 58mmol/mol or 7.5%
Individualised targets may need to be set for some individuals	

People who do not have diabetes have a HbA1c of less than 42/6% but people with diabetes usually experience too much hypoglycaemia if the HbA1c is maintained in this range. Therefore, the HbA1c with diabetes runs higher than the "non-diabetic" range.

Young people often feel frustrated when they cannot get all the blood glucose levels in the target range. This is rarely possible. The aim is to get the majority of readings within or close to target range, but realistically often only 60-80% of readings will be in the target range. While the above glucose and HbA1c targets are desirable, they will not be possible for some young people at certain times. The aim however, is always to be moving towards the targets – any degree of improvement in control will be beneficial.

Your HbA1c today in clinic:	
HbA1c mmol/mol	HbA1c %

The aim for your HbA1c next clinic:	
HbA1c mmol/mol	HbA1c %

Problems with Diabetes Control

The nature of diabetes is such that there will be periods where blood glucose levels will be stable and other more difficult periods when they fluctuate. Sometimes, despite everything you do, there will be ups and downs that cannot be explained. This can be frustrating but will generally improve with time.

The following are signs that there are problems with diabetes control and that a review of management is needed.

Signs indicating problems with diabetes control

1. Blood glucose levels are often falling outside the target range
2. More than 3 or 4 mild hypos per week especially if the reason is unclear
3. Hypoglycaemia unawareness; that is you are not aware of hypos – they are only noted on testing or by others
4. Any episode of severe hypoglycaemia
5. HbA1c above the recommended range or rising over the last 2 measurements