

# Mission Bay Doctors Ltd – HbA1c Advice Sheet

## GUIDE TO HBA1C

### HBA1C FORMS WHEN HAEMOGLOBIN JOINS WITH GLUCOSE IN THE BLOOD

HbA1c is a term commonly used in relation to diabetes. This guide explains what HbA1c is, how it differs from blood sugar levels and how it's used for diagnosing diabetes.

### WHAT IS HBA1C?

The term *HbA1c* refers to glycosylated haemoglobin. It develops when haemoglobin, a protein within red blood cells that carries oxygen throughout your body, joins with glucose in the blood, becoming 'glycosylated'.

By measuring glycosylated haemoglobin (HbA1c) we are able to get an overall picture of what our average blood sugar levels have been over a period of weeks/months.

The higher the HbA1c, the greater the risk of developing diabetes-related complications.

IF IT COMES UP HIGHER THAN OR GREATER THAN 50 YOU'RE PRETTY MUCH DEFINED AS HAVING DIABETES. IF IT COMES UP BETWEEN 41- 49 YOU ARE PROBABLY GOING TO BE DIAGNOSED WITH PRE DIABETES.

### HBA1C

- <41 YOU ARE NOT CONSIDERED TO BE PRE DIABETIC OR DIABETIC.
- BETWEEN 41 AND 49 INDICATE INCREASED RISK OF DIABETES (PREDIABETES)
- 50 MEANS YOU HAVE DIABETES

The good news is that cases of prediabetes that are identified early on can be reversed, preventing them from progressing into full-blown type 2 diabetes.

The two principle factors for consideration are the making changes to your diet and the addition of appropriate physical exercise to your lifestyle.

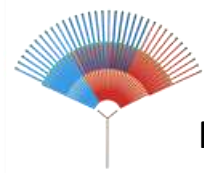
By making these changes, blood sugar levels can be returned to normal.

### HOW DOES HBA1C DIFFER FROM A BLOOD GLUCOSE LEVEL?

**HbA1c** provides a longer-term trend, similar to an average, of how high your blood sugar levels have been over a period of time.

**Blood glucose level** is the concentration of glucose in your blood at a single point in time, i.e. the very moment of the test. This is measured using a fasting plasma glucose test, which can be carried out using blood taken from a finger or can be taken from a blood sample from the arm.

However, fasting glucose tests provide an indication of your current glucose levels only, whereas the HbA1c test serves as an overall marker of what your average levels are over a period of 2-3 months.



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## HOW DOES HBA1C RETURN AN ACCURATE AVERAGE MEASUREMENT OF AVERAGE BLOOD GLUCOSE?

When the body processes sugar, glucose in the bloodstream naturally attaches to haemoglobin.

The amount of glucose that combines with this protein is directly proportional to the total amount of sugar that is in your system at that time.

Because red blood cells in the human body survive for 8-12 weeks before renewal, measuring HbA1c can be used to reflect average blood glucose levels over that duration, providing a useful longer-term gauge of blood glucose control.

If your blood sugar levels have been high in recent weeks, your HbA1c will also be greater.

## HBA1C TARGETS

For **people without diabetes**, the range is **20-41 mmol/mol**

For **people with diabetes**, an HbA1c level of **<48** is considered good control, although some people may prefer their numbers to be closer to that of non-diabetics

For **people at greater risk of hypoglycemia** (lower than normal blood sugar), a target HbA1c of **59** to reduce the risk of hypos

<i>HbA1c targets</i>	<i>mmol/mol</i>
<i>Non-diabetics</i>	20 - 40 mmol/mol
<i>Diabetics</i>	48 mmol/mol
<i>Diabetics at higher risk of hypoglycemia</i>	59 mmol/mol

## WHAT ARE THE BENEFITS OF LOWERING HBA1C?

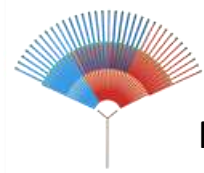
Two large-scale studies demonstrated that **improving HbA1c by 11 mmol/mol** for people with diabetes **cuts the risk of microvascular complications by 25%**.

## MICROVASCULAR COMPLICATIONS INCLUDE:

<b>Retinopathy</b>	<b>damage to the small blood vessels within the retina</b>
<b>Neuropathy</b>	a nerve disorder which commonly affects the sensory nerves under the skin but can also affect the nerves which control our muscles and organs.
<b>Diabetic nephropathy</b>	kidney disease

Research has also shown that people with type 2 diabetes who reduce their HbA1c level by 11 mmol/mol are:

- **19%** less likely to suffer cataracts
- **16%** less likely to suffer heart failure
- **43%** less likely to suffer amputation or death due to peripheral vascular disease



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## LIFESTYLE CHANGES FOR TO REDUCE HBA1C

Physical activity and diet changes and often advised to those at high risk

**Lifestyle changes are always advised for people at higher risk of diabetes and those who are newly diagnosed, to help manage their diabetes.**

**The recommended lifestyle interventions include:**

**Taking two and a half hours each week of moderate intensity physical activity or one hour and 15 minutes of high intensity exercise.**

**Losing weight gradually to achieve a healthybody mass index**

**Replacing refined carbohydrates with wholegrain foods and increase intake of vegetables and other foods high in dietary fibre**

**Reducing the amount of saturated fat in the diet**

## PHYSICAL ACTIVITY

We recommend taking either 2 ½ hours of moderate intensity physical activity or 1 ¼ hours of intense exercise.

**Moderate intensity physical activity includes:**

**Vigorous physical activity may include:**

Brisk walking	Jogging
Cycling on relatively flat terrain	Swimming lengths
Water aerobics	Cycling either rapidly or over steep terrain
Hiking	Rugby
Rollerblading	Gymnastics
Using a manual lawnmower	Skipping

## WEIGHT LOSS

We recommend those that are overweight aim to lose weight gradually until a healthy BMI is achieved.

**A HEALTHY BMI RANGE IS:**

**BETWEEN 18.5 AND 24.9 OR BETWEEN 18.5 AND 22.9 FOR PEOPLE OF SOUTH ASIAN DESCENT**

For those with a BMI above the healthy range, aim to achieve weight loss gradually, with a target to reduce weight by 5 to 10% over a period of a year.

Weight loss can help to reduce the risk of developing diabetes and can enable people with existing pre-diabetes or type 2 diabetes to better control blood glucose levels.