



## Blood Glucose Control

Knowing the level of glucose in your blood is useful to maintain day to day control of your diabetes, detect abnormally low blood glucose levels (hypoglycaemia), assess diabetes control during any illness, and helps to provide your healthcare team with information to alter your treatment to prevent any long-term complications from developing.

## Testing

Checking your blood glucose level can tell you how well your treatment plan is working. It is a two-part process:

- Self-testing of blood glucose at home gives your blood glucose level at the exact time of the test.
- The HbA1c (glycated haemoglobin; more of it is produced in the body by high blood glucose levels) test is done at your doctor's practice. It shows your average blood glucose over a sustained period of time, usually 90 days. The recommended goal is less than 7.5% (~9mmol/L).

The target blood glucose ranges below are indicated as a guide:

### Children with Type 1 diabetes (NICE 2004)

Before meals: 4-8mmol/L

Two hours after meals: less than 10mmol/L

### Adults with Type 1 diabetes (NICE 2004)

Before meals: 4- 7mmol/L

2 hours after meals: less than 9mmol/L

### Type 2 diabetes (NICE 2008)

Before meals: 4-7mmol/L

Two hours after meals: less than 8.5mmol/L.

## Hypoglycaemia

It is important to learn your own signs and symptoms when your blood glucose is abnormally low:

- trembling, confusion
- hunger
- headaches, blurred vision
- irritability, anger, sadness
- tiredness, disturbed sleep, sweating, chills
- seizures, unconsciousness (if left untreated, in which case injectable glucagon [a hormone] kit would be used to stimulate the liver to release stored glucose into your bloodstream).

Treatment of hypoglycaemia - Consume 15-20 grams of glucose or simple carbohydrates (i.e. dextrose tablets, glucose gel, fruit juice, sweets). Recheck your blood glucose after 15 minutes. If hypoglycaemia continues, repeat. Once blood glucose returns to normal, eat a small starchy snack if your next planned meal or snack is more than an hour away.

## Hyperglycaemia

This is the technical term for abnormally high blood glucose, when the body has too little insulin or cannot use insulin properly. A number of things can cause hyperglycaemia:

- If you have type 1 diabetes, you may not have given yourself enough insulin.
- If you have type 2 diabetes, your body may have enough insulin, but it is not as effective as it should be.
- You ate more or exercised less than planned.
- You are stressed, i.e. from an illness, relationship conflicts.
- You may have experienced the dawn phenomenon (early morning 4 am to 8 am rise in blood glucose level).

Signs and symptoms of hyperglycaemia - High blood glucose, high glucose level in urine, frequent urination, increased thirst. Checking your blood glucose according to the doctor's recommendation and then treating high blood glucose early will help avoid problems associated with hyperglycaemia. Changes in your diet and exercise (but not if you have ketones in your urine) can lower blood glucose.

If you fail to treat hyperglycaemia, ketoacidosis (diabetic coma) could occur. When your body does not have enough insulin, it cannot use glucose for fuel so breaks down fats for energy. The waste products of this fat breakdown - ketones - are produced. Your body cannot tolerate large amounts of ketones and will try to rid them through urine, although a build-up in your blood can lead to ketoacidosis. Symptoms of this include shortness of and fruity smelling breath, nausea, vomiting and dry mouth. Ketoacidosis is life-threatening and needs immediate medical treatment.

## When should blood glucose levels be measured?

Each diabetic should seek individualised expert medical advice regarding the need to measure their blood glucose level.

## Your responsibilities

Get an action plan from your diabetes team that tells you exactly what to do if you get sick. For example, you should know:

- whether you will need insulin, or extra insulin.
- when to call the doctor; call the doctor if your blood glucose is excessively high.
- what soft food and drink you should have on hand in case you are not able to eat normally; If you cannot eat, drink juice or regular (not diet) soda to keep your blood glucose up. If you cannot keep anything down, suck on ice chips and then sip clear soda such as regular ginger ale.
- what extra medicine you may need, for example, to settle your stomach. Keep taking your medicine.