

About the NCFE Level 2 Certificate in Understanding the Care and Management of Diabetes

Approximately 366 million people worldwide currently have diabetes (World Health Organization 2011), and this figure is expected to increase to 552 million by 2030. In the UK about 3 million people have been diagnosed with diabetes, and about 850,000 more are unaware that they have the condition. Nearly one in four adults aged over 25 has diabetes or pre-diabetes (an under-diagnosed condition that makes them 15 times more likely to develop Type 2 diabetes).

Obesity is the primary cause of Type 2 diabetes (AusDiab 2005, IDI 2006). Approximately 80% of people are overweight when they are diagnosed with Type 2 diabetes.

Diabetes is the fourth leading cause of global death by disease. Type 1 diabetes is responsible for about 10% to 15% of diabetes cases, with Type 2 diabetes responsible for 85% to 90% of cases. Type 1 diabetes is not preventable. Type 2 diabetes is preventable in around 60% of cases with healthy eating and increased physical activity.

- Diabetes is one of the main causes of kidney failure in developed countries and is responsible for huge costs for dialysis.
- Diabetes is now the single most common cause of end-stage kidney disease.
- It is estimated that more than 2.5 million people worldwide are affected by diabetic retinopathy (damage to the retina of the eye).
- Diabetic retinopathy is the leading cause of vision loss in adults of working age (20 to 65 years) in industrialised countries.
- On average, people with Type 2 diabetes will die 5 to 10 years before people without diabetes, mostly due to cardiovascular disease.
- Cardiovascular disease is the major cause of death in diabetes, accounting for some 65% of all diabetes fatalities, and also much disability.
- People with Type 2 diabetes are over twice as likely to have a heart attack or stroke than people who do not have diabetes. People with Type 2 diabetes are as likely to suffer a heart attack as people without diabetes who have already had a heart attack.

The charity **Diabetes UK** reported (in 2010) that the **cost of diabetes** to the National Health Service (NHS) is approximately **£1 million per hour**, and is increasing rapidly. Diabetes accounts for approximately **a tenth of the NHS budget** each year. **This amount exceeds £9 billion per year!** The charity also reported that **one in ten people in hospital** in the UK have diabetes and that 60% of inpatients with diabetes were admitted as emergencies.

In the UK, it is estimated that **3 million** people have diabetes and this figure is expected to rise to **5 million by 2025**.

Aims

On completion of this course you should:

- Understand the different types of diabetes and how they can occur.
- Be aware of how the onset of Type 2 diabetes can be delayed with lifestyle changes.
- Understand diabetes diagnosis and initial care.
- Understand the on-going care and treatment of diabetes to control blood sugar levels.

Course content

This course has four units. These have been grouped into two modules as follows:

Module A

Unit 1: Understand diabetes

Unit 2: Prevention and early intervention of Type 2 diabetes

Module B

Unit 3: Understand the initial care of diabetes

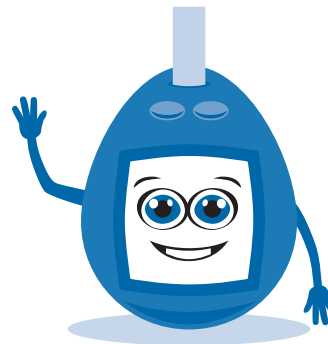
Unit 4: Understand the treatment and management of diabetes

Assessment

Each unit in this course is split into a number of sections. At the end of each section you will be asked to complete the assessment questions for that section. These questions can be found in your assessment booklet.

When you have completed all the assessments for each module, you should submit them to your assessor for marking and feedback.

Good luck with your studies!



Introduction to Unit 1

The aim of this unit is to enable learners to understand how glucose and insulin function in the body, how different types of diabetes occur and the risk factors associated with Type 2 diabetes.

This unit contains five sections:

Section 1: Understand the function of glucose in the blood

Section 2: Understand the function of insulin in the blood

Section 3: Understand the different forms and causes of diabetes

Section 4: Know the risk factors for developing Type 2 diabetes

Section 5: Understand how diabetes is confirmed

Did you know?

People with diabetes have too much glucose in their blood. The hormone insulin, produced in the pancreas (a gland situated behind the stomach), regulates blood glucose.

Diabetes occurs when either too little or no insulin is produced or when the body is unable to use the insulin correctly and subsequently develops insulin resistance.

Understand the function of glucose in the blood

In this section you will learn about:

- **Blood glucose**
- **Simple and complex carbohydrates**
- **Glycaemia**
- **Hypoglycaemia**
- **Hyperglycaemia**
- **Pre-diabetes**

Blood glucose



DEFINITION: **Blood glucose** is glucose in the bloodstream. Throughout this course 'blood glucose' will also be used to describe 'blood sugar' and 'serum glucose'.

The following table shows the blood glucose levels before and two hours after a meal, for different groups of people. Blood glucose is measured in mmol/L (millimoles per litre).

Target levels by type of diabetes	Blood glucose levels before a meal	Blood glucose levels 2 hours after a meal
Children with Type 1 diabetes	4 to 8mmol/L*	Under 10mmol/L
Adults with Type 1 diabetes	4 to 7mmol/L	Under 9mmol/L
Adults with Type 2 diabetes	4 to 7mmol/L	Under 8.5mmol/L
Adults without diabetes	4 to 5.9mmol/L	Under 7.8mmol/L

Glucose (sugar) comes from eating and digesting carbohydrates.

Key point

Carbohydrate is another name for food consisting of starch or sugar.

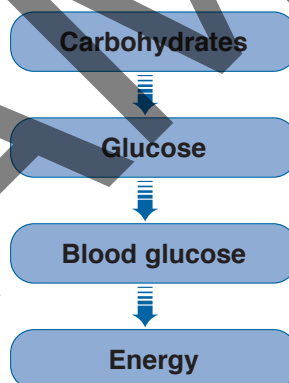
Foods containing starch include:

bread	lentils	potatoes	peas
rice	cereals	corn	porridge
pasta	grains	legumes	muesli

Foods containing sugar include:

fruit juice	sweets	chocolate
milk	sweet biscuits	chocolate biscuits and nougat
honey	soft drinks	
yoghurt	fresh fruit (such as apples, oranges, grapes, bananas and pears)	dried fruit (such as raisins, sultanas and apricots)
vegetables (such as carrots, onions and sweetcorn)		
cakes	sugar cane	preserves

Carbohydrates become blood glucose.



When we drink sugary drinks, or eat foods containing sugar or starch, they are digested by the body and turned into glucose. This glucose then enters the bloodstream and circulates around the body as blood glucose. The role of insulin is to assist glucose to leave the blood and enter the cells where the glucose is used as fuel. This fuel is converted into energy that the body uses to live and perform normal bodily functions.

Simple and complex carbohydrates

Those carbohydrates (carbs) that break down rapidly during digestion are known as **simple carbohydrates** because they rapidly release glucose into the bloodstream. Those carbohydrates that break down slowly during digestion are known as **complex carbohydrates** because they slowly release glucose into the bloodstream.

Foods containing simple carbohydrates (also known as simple sugars or refined sugars) **include:**



white sugar	sweets	corn syrup
honey	fruit juice	tinned fruits
chutney	jam	cakes
candy	chocolate	fudge
liquorice	boiled sweets	fizzy drinks
bread made with white flour	pasta made with white flour	all baked goods made with white flour and most packaged cereals

Foods containing complex carbohydrates include:

apples	muesli	strawberries
apricots	oat bran bread	skimmed milk
brown rice	oat bran cereal	soya beans
buckwheat bread	oatmeal	soya milk
carrots	onions	split peas
aubergines	oranges	whole barley
grapefruit	pears	wholewheat bread
kidney beans	pinto beans	wild rice
lentils	plums	sweet potatoes
lettuce	potatoes	yoghurt (low fat)
multi-grain bread	prunes	cereal grains

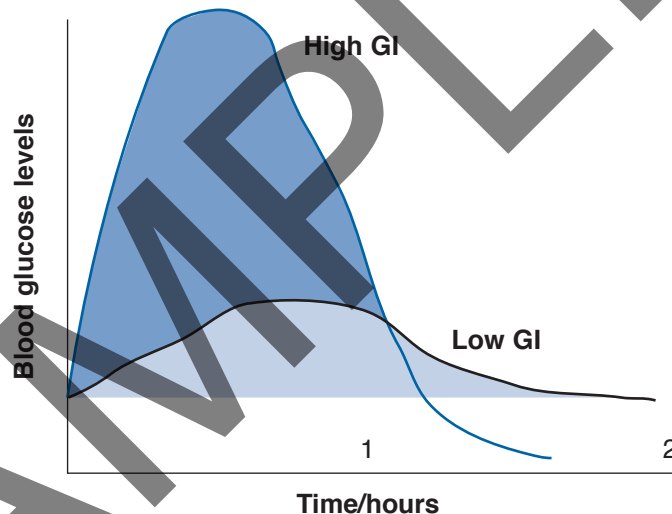
Blood glucose concentrations vary throughout the day as a result of eating, drinking and physical activity. Typically, they are higher after eating and drinking and lower as the time increases from last eating or after fasting.

Glycaemia

DEFINITION: Glycaemia is the **presence of glucose (sugar) in the blood**. It is usually measured in millimoles per litre (mmol/L).

The **glycaemic index (or GI)** is a numerical ranking system for carbohydrates (from 0 to 100), used to describe how fast and how much they cause an increase in blood glucose levels after eating them.

This graph shows the effects of low and high GI foods on blood glucose levels:



Foods with a low GI will help to maintain a more stable and longer lasting blood glucose level.

Foods with a high GI will produce a sudden sugar rush that lasts for a shorter period of time.

This table lists the numerical GI ranges:

Glycaemic index (GI)	GI range
low GI	55 or less
medium GI	56 to 69
high GI	70 to 99
pure glucose	100

Low GI foods are a healthier option for anyone, but are essential for people with diabetes.

NCFE LEVEL 2 CERTIFICATE IN UNDERSTANDING THE CARE AND MANAGEMENT OF DIABETES

Module A assessment

After completing your assessment please return it to your tutor/assessor

ADVICE TO ALL CANDIDATES

- Please complete your personal details and candidate statement below.
- Complete all questions in this assessment.
- Write your answers in the spaces provided. Add any additional work for any of the questions on plain paper and attach to this assessment.
- You do not need to return your completed activities for the units – just this assessment.
- If you require any assistance or guidance please contact your tutor/assessor.

PERSONAL DETAILS

Name _____

Contact address _____

Postcode _____

Telephone no. (evening) _____ (day) _____

Email (home) _____ (work) _____

CANDIDATE STATEMENT

I certify that I began the learning materials for Units 1 and 2 (Module A) on _____*
and have completed all sections in this assessment. I confirm that this is my own work.

Signature _____ Date _____

*Please insert the date you started working through the course materials for the module.

For office use only

Candidate ref: _____

Assessor: _____

IV: _____

Passed

Date _____

Re-submit

Date _____

Tutor feedback:

Written

Telephone

Personal tutorial

SAMPLE

Assessment 1.1: Understand the function of glucose in the blood

(The reference in brackets at the end of each task refers to the assessment criteria for the learning outcomes of this qualification and is for your assessor's use.)

1. Explain what 'blood glucose' is. (1.1)

2. Describe the difference between simple and complex carbohydrates. (1.2)

3. Define the term 'glycaemia'. (1.3)

4. Define the term 'hypoglycaemia'. (1.3)

5. Define the term 'hyperglycaemia'. (1.3)

6. Describe what 'pre-diabetes' is. (1.4)

7. What are the two pre-diabetic states? (1.4)

a)

b)

Assessment 1.2: Understand the function of insulin in the blood

1. Which organ in the body produces insulin? (2.1)

2. Describe how insulin is produced. (2.1)

3. Explain how insulin affects blood glucose levels. (2.2)

4. Describe what 'insulin resistance' means. (2.3)

SAMPLE