



British Heart
Foundation

Diabetes and your heart

Isabelle Masters



**FIGHT
FOR EVERY
HEARTBEAT**

bhf.org.uk

ABOUT THE BRITISH HEART FOUNDATION

As the nation's heart charity, we have been funding cutting-edge research that has made a big difference to people's lives.

But the landscape of cardiovascular disease is changing. More people survive a heart attack than ever before, and that means more people are now living with long-term heart conditions and need our help.

Our research is powered by your support. Every pound raised, every minute of your time and every donation to our shops will help make a difference to people's lives.

If you would like to make a donation, please:

- call our donation hotline on **0300 330 3322**
- visit **bhf.org.uk/donate** or
- post it to us at BHF Customer Services, Lyndon Place, 2096 Coventry Road, Birmingham B26 3YU.

For more information, see **bhf.org.uk**

CONTENTS

About this booklet	02
What is coronary heart disease?	04
What is diabetes?	10
What are the symptoms and possible complications of diabetes?	14
How is diabetes diagnosed?	18
How is diabetes treated?	20
How does diabetes affect the heart?	21
What can I do to reduce my risk of coronary heart disease?	24
If you have both diabetes and coronary heart disease	42
Your annual review	44
Other insulin-related conditions	45
Heart attack? The symptoms ... and what to do	49
For more information	52
Index	58
Have your say	60

If you have diabetes, you have a much greater risk of developing coronary heart disease than people who don't have diabetes. So it's vital that you protect your heart as much as possible. If you have both diabetes and coronary heart disease, it's very important to keep your diabetes under control, as this will help to keep your heart healthy.

This booklet is for people who have diabetes, and for their families and friends. It may also be useful if you don't have diabetes but you've been told you may develop it in the future.

The booklet tells you:

- what coronary heart disease is
- what diabetes is, and how it's diagnosed and treated
- why people with diabetes are more likely to get coronary heart disease
- what you can do to reduce your risk of developing coronary heart disease

- what medicines and treatments you might be given to help prevent or treat coronary heart disease, and
- what routine checks you should have.

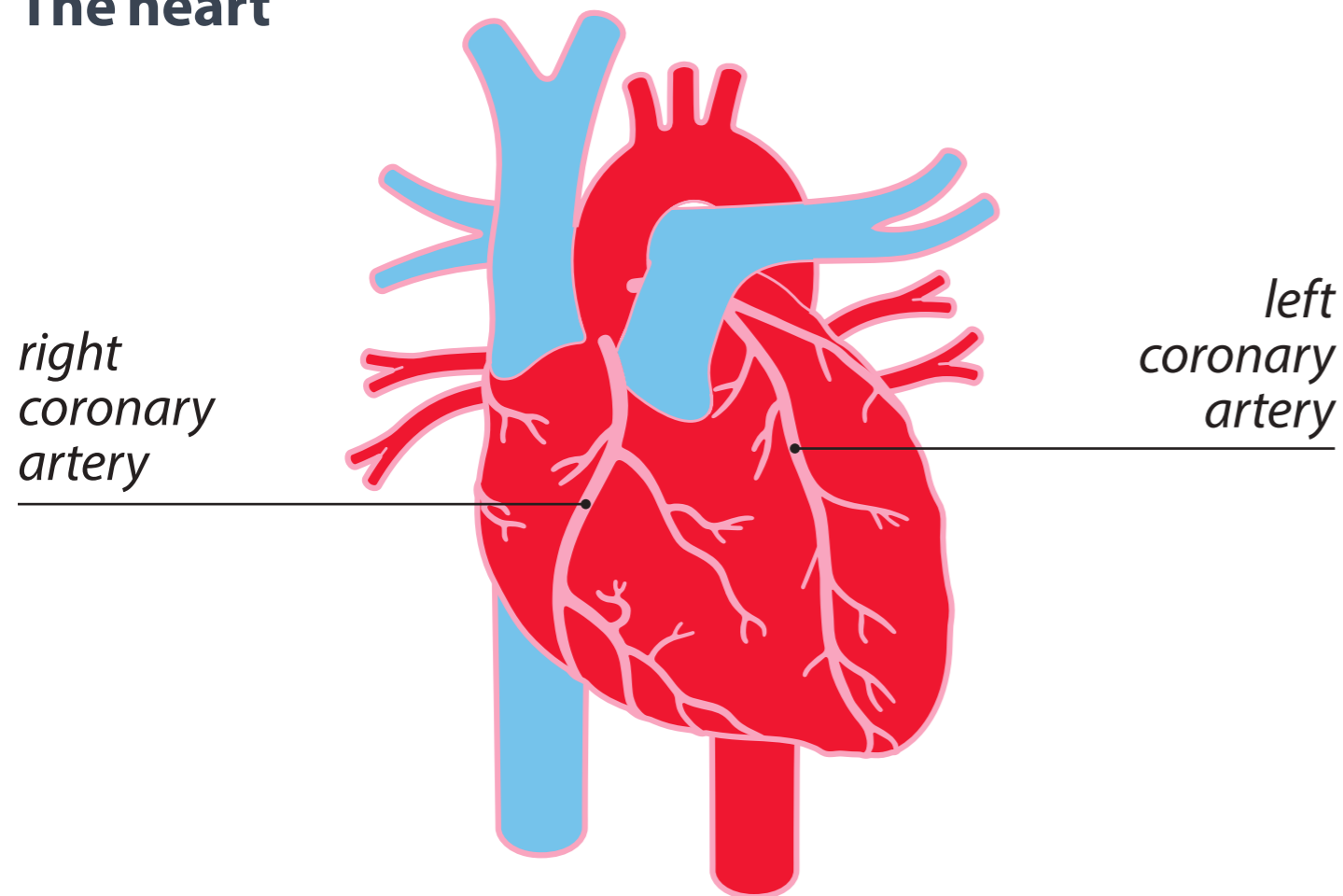
This booklet does not replace the advice that your doctor or the other health professionals looking after you may give you, but it should help you to understand what they tell you.

How the heart works

Your heart is a muscle that pumps blood around your body, delivering oxygen to all your organs through a system of arteries.

Your heart muscle gets its own supply of blood from the coronary arteries. These are blood vessels on the surface of your heart.

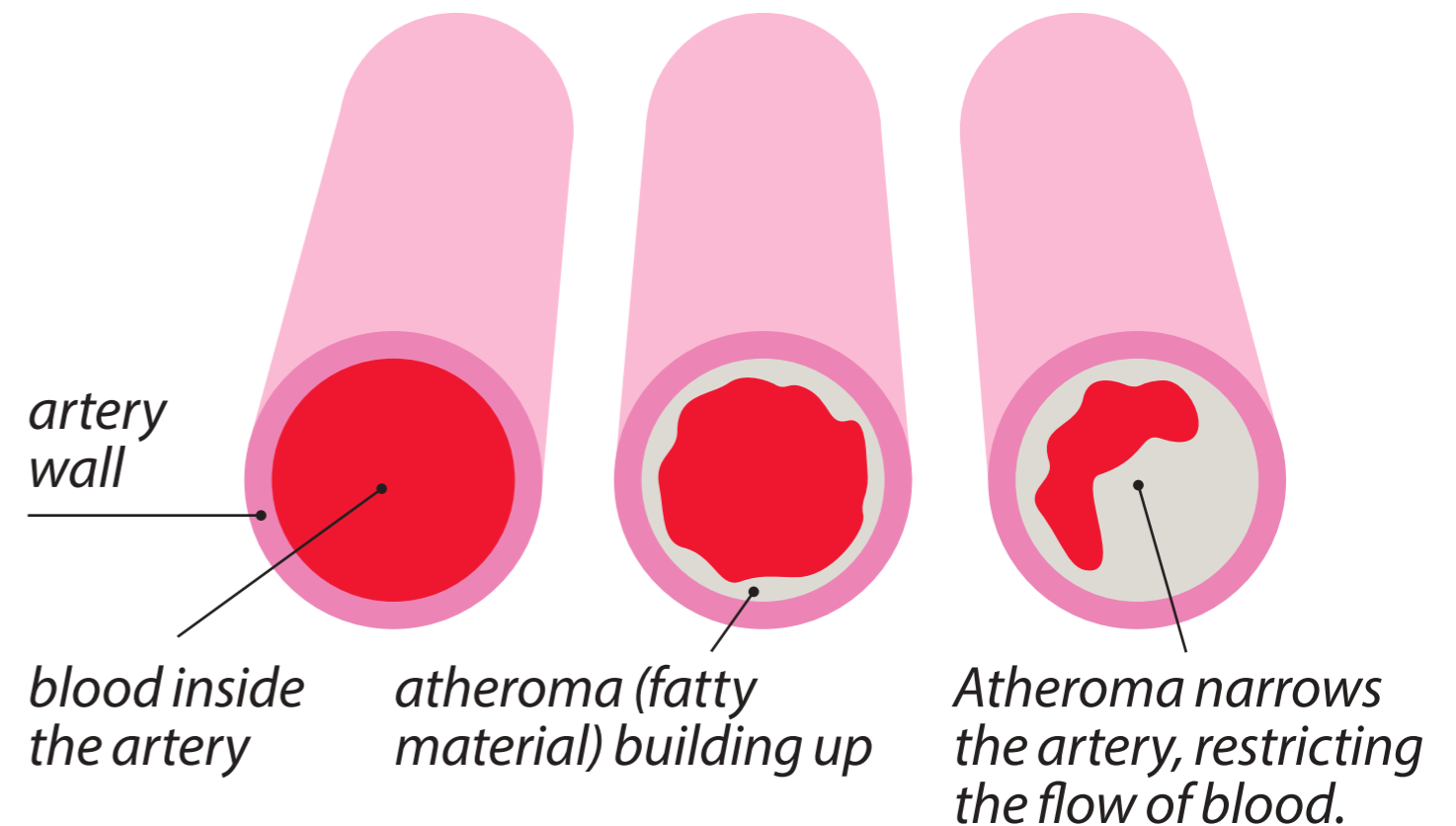
The heart



Coronary heart disease

Over time, the walls of the arteries can slowly become furred up with a fatty material called atheroma. **Coronary heart disease** is when the coronary arteries become so narrow that the blood supply to the heart muscle is restricted. This can cause **angina** (pain or discomfort in the chest). Or, if a coronary artery becomes completely blocked, it can cause a **heart attack**.

How atheroma builds up



Coronary heart disease is the UK's single biggest killer. Over one in seven men and nearly one in ten women die from this disease.

What increases the risk of coronary heart disease?

Having certain 'risk factors' increases your chance of coronary heart disease. (A 'risk factor' is something that increases your likelihood of getting a disease.)

The main risk factors for coronary heart disease are:

- Physical inactivity (lack of exercise).
- Smoking.
- High blood cholesterol.
- High blood pressure.
- Being overweight or obese.
- Having diabetes.
- Having a family history of coronary heart disease. This means if your father, mother, brother or sister has (or had) coronary heart disease at a young age – under 65 for women or under 55 for men.
- Ethnic background. If you're of a South Asian background, you may be at an increased risk of developing coronary heart disease.

On page 24, we explain more about what you can do to reduce many of these risk factors.

How does having diabetes affect my risk of coronary heart disease?

People who have diabetes have a much higher risk of developing coronary heart disease than people who don't have diabetes. They are also far more likely to have a heart attack, and if they do have one, their chances of survival are lower.

Among those who have diabetes, women have a greater risk of developing coronary heart disease than men.

If you're of a South Asian or African Caribbean background, there's an increased risk of developing diabetes, which can increase the chance of developing coronary heart disease.

Diagnosing angina and heart attacks in people who have diabetes

If you have diabetes, your diabetes may have caused nerve damage to your heart and blood vessels (see page 15). As a result of this, you may not always feel the pain or discomfort caused by angina or a heart attack in the same way as someone who doesn't have diabetes. Also, sometimes it's more difficult for doctors to diagnose angina or a heart attack in people who have diabetes.

If you get chest pain or think you are having a heart attack, call 999 immediately for an ambulance.

 For more information, see our booklets **Angina and Heart attack.**

**There's a lot you
can do to reduce the
risk of developing
coronary heart
disease, or to reduce
its effects.**

Diabetes is a condition where the level of glucose (sugar) in the blood is too high.

Your body produces **glucose** when you digest food. The blood carries glucose to all the cells of the body, where it's used as fuel. As a result, the amount of glucose left in the blood goes down. A chemical called **insulin** controls the level of glucose in your blood by helping the glucose to leave the blood and enter the cells. Insulin is made in the pancreas – an organ that lies behind the stomach.

Diabetes develops when your body doesn't produce enough insulin, or if your body is unable to properly use the insulin that is being produced. The body's cells become starved of glucose because they can't get it from the blood. At the same time, because the glucose cannot move into the cells, the glucose level in your blood increases.

Nearly 3.5 million people in the UK have been diagnosed with diabetes and the numbers continue to rise. There are also hundreds of thousands more who have diabetes but don't yet know it.

Some ethnic groups in the UK have a higher rate of diabetes than the rest of the population, particularly South Asian and African Caribbean people. And having a parent or brother or sister who has, or had, diabetes can greatly increase your risk of developing it.

Types of diabetes

There are two main types of diabetes.

- People with **type 1 diabetes** don't produce any insulin.
- People with **type 2 diabetes** don't produce enough insulin, or the body is unable to properly use the insulin that's being produced.

Type 1 diabetes

This type of diabetes is less common than type 2 diabetes and it usually develops in children and young adults.

The cause of type 1 diabetes is not fully understood. It may happen because the body's own immune system (the cells that fight infection) attacks and destroys the insulin-producing cells, preventing them from making insulin. This leads to increased glucose levels in the blood.

Type 2 diabetes

Most people with diabetes – about nine out of every ten – have type 2 diabetes. This type of diabetes tends to develop gradually after the age of 40, although in black African Caribbean people and people of South Asian origin it tends to develop earlier – in some cases in people in their 20s and in children.

If the body has too much fat, this can affect the production of glucose or how it's used. The body can become less sensitive to insulin and continue to make glucose when it's not needed. So the glucose level in your blood starts to rise.

Being overweight, carrying too much weight around your middle and being inactive are all closely linked to type 2 diabetes. In the UK, many people are overweight or don't do enough activity. This is probably one of the reasons why an increasing number of people – including more younger people – are now developing type 2 diabetes.

Am I at risk of diabetes?

People who have any of the symptoms described on page 14 should see their doctor.

The risk of diabetes can be increased by:

- being overweight
- being physically inactive
- having a family history of diabetes
- being of South Asian or African Caribbean origin, or
- having a history of diabetes during pregnancy.

To find out if you're at risk of developing type 2 diabetes, see the *Diabetes risk score*, which is available at www.diabetes.org.uk

You can greatly reduce your risk of developing diabetes by eating healthily, controlling your weight and doing regular physical activity.

Symptoms

Different people develop different symptoms. The symptoms for diabetes are:

- increased thirst
- passing more urine than usual, particularly at night
- extreme tiredness
- unexplained weight loss
- blurred vision
- genital itching or regular episodes of thrush, and
- slow healing of wounds.

Symptoms are usually relieved quickly once the diabetes is treated and under control.

Don't ignore symptoms

With type 2 diabetes, the symptoms may not be very obvious, because the condition often develops slowly over time, and it's easy to put the symptoms down to the effects of ageing. This is partly why diabetes often goes undiagnosed. Anyone who is experiencing any of the symptoms listed above should see their doctor, as they may have diabetes.

It's vital to get diabetes picked up as soon as possible, so that you can start treatment to reduce the risk of any complications.

Possible complications

Over time, diabetes can cause damage to different parts of the body.

- **The heart and blood vessels** – Diabetes increases the risk of high blood pressure, coronary heart disease, strokes and peripheral arterial disease (disease of the arteries that carry blood to the different parts of the body such as the legs).
- **The eyes** – Diabetes can affect the blood vessels in the eyes, leading to problems with your eyesight, and in some cases blindness.
- **The kidneys** – Diabetes can cause damage to the small blood vessels in the kidneys, causing the kidneys to work less well.
- **The feet** – There may be problems with the circulation that can lead to ulcers.
- **The nerves** – Damage to the nerves can lead to loss of sensation, pain, numbness or tingling in the

hands, legs and feet. Nerve damage can also affect the penis, causing impotence (when a man has difficulty achieving and maintaining an erection).

The good news is that you can help to prevent or delay these problems by making changes to your lifestyle and managing your diabetes well. Good management includes:

- keeping your blood glucose, blood cholesterol and blood pressure levels under control
- eating healthily
- keeping to a healthy weight
- being active, and
- going for a review each year.

We explain more about all these things later in this booklet.

**It's vital to
diagnose diabetes
as soon as possible,
to reduce the risk
of complications.**

Various tests are used for diagnosing diabetes. Some of these tests are also used to check blood glucose levels in people who already have diabetes.

Blood glucose tests

If you have any symptoms associated with diabetes, you may have a blood test to check your blood glucose level. Sometimes this is done straight away, as a **random glucose test**. You don't need to fast before this test.

Or, sometimes the test is done as a **fasting test**, which means that you can't eat anything for several hours before the test (although you can drink water during this time).

Oral glucose tolerance test

With this test you need to fast for eight to twelve hours and then have your blood glucose level checked. You'll then be given a sugary drink. Two hours after having the drink, your blood glucose level is checked again to see how your body is dealing with the glucose in the drink.

HbA1c test

This blood test can help to diagnose type 2 diabetes and is a way of checking your long-term diabetes control. It measures your average blood glucose levels for the previous two to three months.

If you have high levels of HbA1c (glycated haemoglobin) in your red blood cells, it means that your blood glucose levels have been high over the last few months.

You don't have to fast for this test.

Diabetes can be managed very successfully with lifestyle changes and medicines. Good control of your diabetes is vital in order to reduce the risk of complications.

If you have type 1 diabetes, you'll need to have insulin injections. Your GP may also refer you to a specialist doctor.

If you have type 2 diabetes, the first line of treatment is to try and lose some weight (if you're overweight), become more physically active, and eat a healthy diet. If this doesn't help to control your glucose levels, you may need to take tablets. They will help relieve your symptoms, and reduce your risk of complications.

There are different kinds of medicines that work in different ways. Type 2 diabetes can progress over the years and so treatment may change over time. Many people with type 2 diabetes eventually need to have insulin injections to control their diabetes.

Diabetes can damage the heart in several ways.

- High glucose levels in the blood affect the walls of the arteries, making them more likely to develop atheroma, which can lead to a heart attack or a stroke (see page 05).
- Diabetes can increase the risk of having high blood pressure.
- People with type 2 diabetes often have higher levels of triglyceride (a fatty substance in the blood) and lower levels of HDL cholesterol (the 'protective' type of cholesterol). This can increase the risk of atheroma developing.
- Diabetes can actually increase the damage done by some of the risk factors for coronary heart disease – including smoking, high blood pressure and high blood cholesterol.
- Diabetes can affect the heart muscle, making it less able to pump efficiently.

ISABELLE'S STORY

Isabelle was 14 when she was diagnosed with type 1 diabetes.

“I noticed that I was drinking a lot more, went to the toilet more often and was losing a lot of weight. They were the warning signs.

Diabetes is something that affects every part of your life in a lot more ways than people think. I spent some time learning about how diabetes can affect your body, and what to look out for. It was interesting and hard-hitting, but now I know about the risk of coronary heart disease.

I eat a balanced diet and my cholesterol and blood pressure are checked every year. It's not always perfect, but I try my best to keep everything under control.

I've always been active and I find that regular exercise helps me to control my condition. I cycle to work and I've just done a 10km run. I enjoy a challenge.”



If you have diabetes, you have a higher risk of developing coronary heart disease. Your doctor or nurse will assess your risk by asking you questions about your lifestyle, and checking your blood pressure and cholesterol levels, and your weight and waist size. And they will offer you advice on how you can reduce your risk.

The following will help protect you from coronary heart disease.

- Keep physically active.
- If you smoke, stop.
- Eat a healthy, balanced diet. This will also help reduce your blood cholesterol levels.
- Try to control or prevent high blood pressure.
- Be a healthy weight and body shape.
- Keep your blood glucose level to your agreed target.

We explain more about each of these on the following pages.

Medicines to help reduce your risk of coronary heart disease

If you have diabetes, your doctor will probably prescribe a statin for you, to help protect your heart and reduce your risk of having a heart attack. This is a medicine for reducing cholesterol levels, but you may need to take it even if you don't have a high cholesterol level (see pages 30-32).

If you have high blood pressure, your doctor may prescribe you medicines to lower it. This will also help to reduce your risk of coronary heart disease.

Keep physically active

Regular physical activity helps to reduce your risk of developing coronary heart disease. If you have diabetes, physical activity will also help you control your blood glucose, so that you may be able to reduce the number of tablets or the amount of insulin that you need to take.

The aim is to gradually build up to doing at least 150 minutes (2½ hours) of moderate-intensity physical activity a week, in bouts of 10 minutes or more.

One way to achieve this is to do 30 minutes' activity a day, on at least five days a week. Moderate-intensity activity means activity that makes you feel slightly out of breath and warmer than usual, but you should still be able to have a conversation.

If you're not used to doing this amount of activity, it's important to start at a level that suits you and gradually increase both the intensity of the activity and the amount of time you do the activity for. Some people may not be able to do much activity, but doing even a little is better than doing none, and can benefit your health.

The type of activity that helps both your heart and your diabetes is moderate-intensity activity such as brisk walking or cycling. Walking is one of the best forms of activity. You don't need to wear any special clothes, it's easy to fit into your everyday life, and it's free.

When you do any activity, make sure that you wear properly fitting footwear that provides good cushioning. This is particularly important if you have diabetes.

If you're taking insulin or certain tablets for your diabetes, you may find that your blood glucose level falls quickly during or after exercise. Speak to your doctor or diabetes specialist nurse about how to manage this. Ask them for advice about what to do if you feel that your blood glucose has dropped, or if you feel unwell while doing your activity.

Physical activity tips

- If you have heart disease or high blood pressure, check with your GP before you increase your physical activity, or before doing any new activity. Ask about how much and what type of activity you can do, and how intensely you should do it.
- When you're doing any physical activity or sport, begin slowly for the first few minutes and build up gradually. At the end, spend a few minutes slowing down gradually.
- Stop if you get any pain, or feel dizzy, sick or unwell, or very tired.
- Dress warmly when doing any physical activity outdoors in very cold or windy weather.

If you smoke, stop

Anyone who smokes cigarettes, a pipe, cigars or shisha risks damaging their health, but for people with diabetes the risks are even greater, because diabetes increases the damage done by smoking.

If you have diabetes, you already have an increased chance of developing heart disease or having a stroke. Combine this with smoking, and the chances of developing these conditions become even higher.

Stopping smoking is the most important thing you can do to reduce your risk of coronary heart disease, protect your heart, improve your health, and help you live longer.

Your GP, practice nurse or pharmacist can give you advice on stopping smoking and on local support services.

Smokefree can offer information, advice and support on stopping smoking. See their website at www.nhs.uk/smokefree. Or call the Smokefree National Helpline on **0300 123 1044**.



For more information, see our booklet **Stop smoking**.

Eat a healthy diet

Eating a healthy, balanced diet can help to reduce your risk of coronary heart disease and help to control your diabetes.

- Eat at least five portions of a variety of **fruit and vegetables** a day.
- **Choose healthier fats.** This will help to improve your cholesterol level and protect your heart. (We explain more about this on the next page.)
- Aim to have two portions of **fish** a week. One of these portions should be oily fish – such as trout, sardines, herrings, mackerel or fresh tuna.
- Eat **high-fibre foods**, especially foods like oats, and pulses such as kidney beans and lentils.
- Reduce the amount of sugar and salt that you eat.
- If you drink alcohol, you should not drink more than 14 units of alcohol a week. You should also have several alcohol-free days each week. These guidelines apply whether you're a man or a woman and if you drink regularly or only occasionally.

Choose healthier fats to help reduce your cholesterol levels

Cholesterol and triglycerides are fatty substances that are mainly made in the body.

Cholesterol is made in the liver and plays a vital role in how every cell in the body works. However, too much cholesterol in the blood can be harmful. One of the causes of high cholesterol is eating too much saturated fat. This is a type of fat we get mainly from foods like butter, ghee, cheese and fatty meats.

There are several different types of cholesterol.

- **HDL** is a protective type of cholesterol, because it helps to remove some of the harmful types of cholesterol from your bloodstream.
- **Non-HDL** includes all the harmful types of cholesterol in your body. Having a high level of non-HDL cholesterol is thought to increase your risk of developing coronary heart disease.

Triglycerides are another type of fatty substance in the blood. They come from fats in food and are also produced in the liver.

People who are very overweight, eat a lot of fatty and sugary foods, or drink too much alcohol are more likely to have a high triglyceride level.

If you have a high triglyceride level, you run a greater risk of coronary heart disease. The risk is particularly high if you also have a low level of HDL – the protective type of cholesterol. Unfortunately, this pattern is often seen in people with type 2 diabetes.

What you can do

Eating healthily can help to improve your cholesterol levels and protect your heart. In particular, you need to replace **saturated fats** with **unsaturated fats**.

Unsaturated fats include monounsaturated fats like olive and rapeseed oils, and polyunsaturated fats like sunflower oil or the fats in oily fish.

Keeping to a healthy weight and being active will also help to improve your cholesterol.

If you have diabetes, your doctor will probably recommend that you take a statin to help lower your cholesterol. You may need to take this medicine even if you don't have a high level of non-HDL cholesterol. This is because statins help to reduce the risk of coronary heart disease. Your doctor may also recommend that you take a fibrate medicine to help control your triglyceride levels.

If you're given statins, the aim is to reduce your level of non-HDL cholesterol (the harmful type) by at least 40 per cent. So, for example, if your non-HDL level is 5 mmol/l before you start taking statins, you should aim to reduce this by at least 40 per cent, to under 3 mmol/l.

 For more information on cholesterol and healthy eating, see our booklets **Eating well** and **Reducing your blood cholesterol**.

Try to control or prevent high blood pressure

High blood pressure is very common in people with diabetes and it's essential to control it, to protect your heart and reduce your risk of complications. If you have diabetes, your goal is for your blood pressure to be 130/80mmHg or below. It's important to have your blood pressure checked at least once a year, or more often if your doctor or nurse thinks it's necessary.

Some people can control their blood pressure by losing weight, doing more physical activity and cutting down on alcohol and salt. However, many people need to take medicines too.

 For more information on high blood pressure, see our booklet **Blood pressure**.

Be a healthy weight and body shape

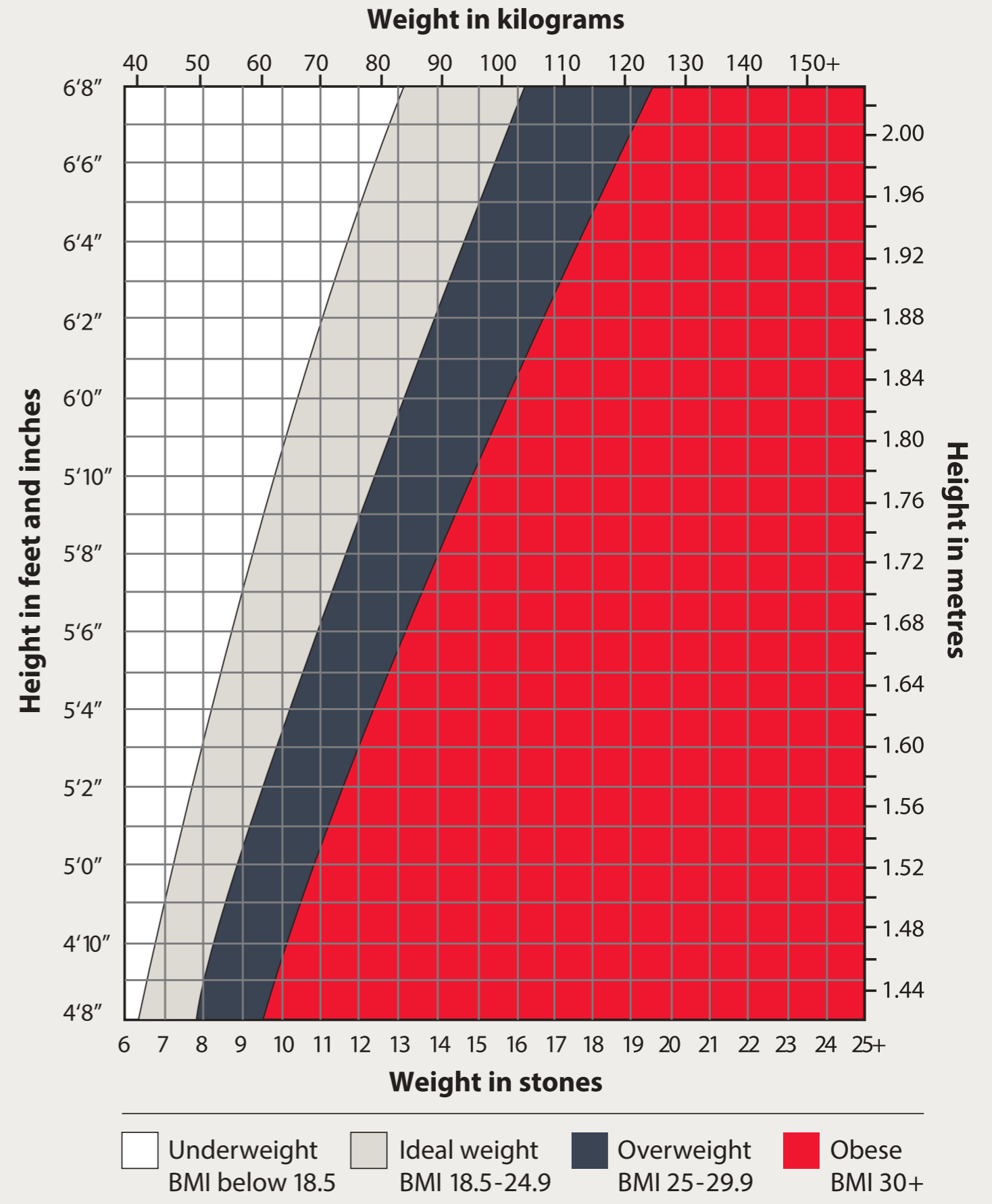
If you're overweight, losing some weight can help lower your blood pressure and cholesterol levels and help to prevent or control diabetes. This will also help to reduce the risk of coronary heart disease.

Your weight

To find out if you're an ideal weight – that is, a healthy weight for your height – a measurement called body mass index (BMI) is often used. This is calculated from your weight and height.

You can use the chart on the next page to find out if you need to lose weight. If you fall into the 'Overweight' or 'Obese' category in the chart, you need to lose some weight.

Take a straight line up or down from your weight, and a line across from your height (without shoes). Put a mark where the two lines meet to find out if you are a healthy weight. This is an approximate guide.



Your body shape

To find out if you have a healthy body shape, measure your waist with a tape measure. Find the midpoint between the bottom of your ribs and the top of your hips. For most people this is at the level of the tummy button. Breathe out normally and measure around your waist. Try to relax, and avoid breathing in while taking your measurement. Check your measurement in the box on the next page.

Research shows that if you're South Asian, African Caribbean, Black African, Chinese, Middle Eastern or have parents of two or more different ethnic groups, you may be at increased risk of some health conditions at a lower BMI and waist size than people from white European backgrounds. This means the measurements that indicate high risk are lower for people from these groups.

 For more information on how to lose weight, see our booklet **Facts not fads – Your simple guide to healthy weight loss.**

	Your health is at risk if your waist size is:	Your health is at high risk if your waist size is:
Men – White European	Over 94 centimetres (about 37 inches)	Over 102 centimetres (about 40 inches)
Men – African Caribbean – South Asian – some other minority ethnic groups	–	Over 90 centimetres (about 35½ inches)
Women – White European	Over 80 centimetres (about 31½ inches)	Over 88 centimetres (about 34½ inches)
Women – African Caribbean – South Asian – some other minority ethnic groups	–	Over 80 centimetres (about 31½ inches)

Control your blood glucose level

Keeping your blood glucose level under control will help to reduce your risk of coronary heart disease. You can help control your blood glucose level by doing regular physical activity, eating healthily and keeping to a healthy weight.

If you have type 1 diabetes, you'll need daily insulin injections. Many people with type 2 diabetes will have to take tablets or insulin to control their blood glucose level effectively. It's important that you take these as your doctor has prescribed, as this will help to relieve your symptoms and reduce the risk of complications.

If you find it difficult to take your medicines for any reason, ask for help from your pharmacist, doctor or nurse.

You can help to prevent or delay the complications of diabetes by making changes to your lifestyle and managing your diabetes well.

JASKARAN'S STORY

Jaskaran was diagnosed with arthritis, diabetes and high blood pressure at around the same time, and in 2002 he had a heart attack.

“Arthritis makes exercise difficult, so I have to be very careful with what I eat.

We used to eat Asian food morning, afternoon and evening. But that’s all changed now. I eat more salads and we’ve cut down on butter, cheese and dairy products. My wife uses very little oil to cook, and we’ve also cut down on salt.

My diabetes and high blood pressure are both under control now.

I edit a free community newspaper, published in three languages, and I use that to promote healthy diets to the community.”



If you have both diabetes and coronary heart disease, the things which help to reduce the risk of coronary heart disease – as described on page 24 – will also help to protect your heart and keep you as healthy as possible.

The treatment of coronary heart disease for people with diabetes is more or less the same as for those who don't have diabetes.

Regular medicines

As well as prescribing a statin to control your cholesterol (see page 32), your doctor may also prescribe aspirin and other medicines to help protect your heart and to control any symptoms that you may have.

If your angina gets worse

If you have angina symptoms that are not controlled by your medicines, your doctor may advise you to have tests – which may include a **coronary angiogram** – to decide if you need to have either a coronary angioplasty or coronary bypass surgery. Both of these are treatments to improve the blood

supply to the heart. Your doctor will be able to discuss with you which treatment is more suitable for you.

If you have a heart attack

Immediately after a heart attack, it's very important to control your blood glucose well, to limit the damage done and to promote healing. Your doctor may need to change your usual diabetes treatment. If you have type 2 diabetes, you may need to use insulin for a short time.

Good blood glucose control is also very important in the months after a heart attack.



For more information on these topics, see our booklets:

- **Medicines for your heart,**
- **Tests,**
- **Coronary angioplasty,**
- **Heart surgery, and**
- **Heart attack.**

See page 53 for information on how to get these booklets.

If you have diabetes, you should have a review each year to make sure that you're not developing any of the complications of diabetes (see page 15), including coronary heart disease.

During the annual review, as well as the normal checks for diabetes, the doctor will check your eyes and how well your kidneys are working. He or she will also check your feet to see if there are any problems with your circulation or nerve supply.

Your doctor should check your blood pressure, your weight, your long-term blood glucose control, and your cholesterol and triglyceride levels. These tests will help your doctor decide how well your medicines, lifestyle and diet are working, and whether you need to make any further changes.

As well as the annual review, you may also need to have more frequent check-ups.

 For more information, see the leaflet **Diabetes: 15 healthcare essentials**, produced by **Diabetes UK**. This outlines the 15 checks and services people with diabetes should receive from the NHS. It's available from www.diabetes.org.uk

Insulin resistance

If you're 'insulin resistant', it means that the cells in your body don't respond properly to insulin. As a result, your body needs more insulin to help glucose enter the cells. The pancreas produces more insulin, but eventually it fails to keep up with the body's needs. Too much glucose builds up in the bloodstream, making you more prone to diabetes. Many people with insulin resistance have high levels of glucose and insulin circulating in their blood at the same time.

Insulin resistance is not the same as diabetes. However, many people who have insulin resistance go on to develop type 2 diabetes within ten years. People with insulin resistance also have an increased risk of developing coronary heart disease or of having a stroke.

You're at greater risk of having insulin resistance if you have:

- too much fat around your waist
- high blood pressure, or
- a high cholesterol level.

If you're told you have insulin resistance, or that you're at risk of developing it, it's important to do what you can to prevent diabetes from developing – such as managing your weight, doing more physical activity and controlling your blood pressure and cholesterol levels (see page 13).

Pre-diabetes

Pre-diabetes is when glucose levels are higher than normal but not high enough to be diagnosed as diabetes. Having pre-diabetes increases the risk of developing type 2 diabetes. Lifestyle changes such as losing weight (if you're overweight) and doing more physical activity can delay or even prevent type 2 diabetes from developing.

Pre-diabetes is sometimes called **borderline diabetes**, or **impaired glucose tolerance (IGT)**, or **impaired fasting glucose (IFG)**.

Metabolic syndrome

Metabolic syndrome is when a person has several particular conditions at the same time. You're considered to have metabolic syndrome if you're overweight (and in particular if you have too much fat around your middle), and you have any two of the following four conditions:

- high blood pressure
- high triglyceride levels
- low levels of HDL cholesterol (the protective type of cholesterol) in the blood, or
- a high level of fasting blood glucose or type 2 diabetes.

Having these conditions together can be particularly dangerous, and greatly increases the risk of developing coronary heart disease, stroke and diabetes.

It's possible to treat metabolic syndrome, and help prevent diabetes and heart disease from developing, by making changes to your lifestyle – in particular, by increasing the level of physical activity that you do and by controlling your body weight and shape

(see pages 25 and 34). Some people with metabolic syndrome may need medicines to help control their blood pressure and blood glucose levels, and to improve their cholesterol and triglyceride levels.

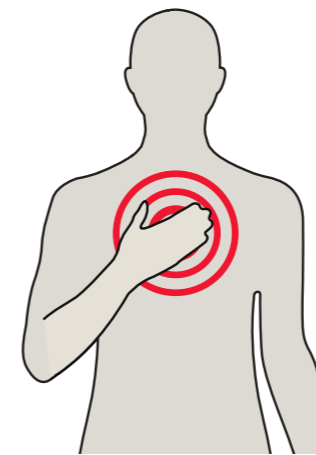
Gestational diabetes

This type of diabetes can develop during pregnancy—usually during the middle or late stages of the pregnancy. It happens because the body cannot produce enough insulin to meet the extra needs of pregnancy.

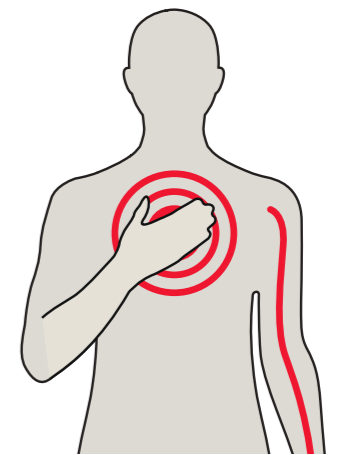
Gestational diabetes usually disappears after the baby is born, but women who have had gestational diabetes are more likely to develop type 2 diabetes in later life than other women.

A heart attack is when a part of the heart muscle suddenly loses its blood supply. This is usually due to coronary heart disease.

The symptoms of a heart attack



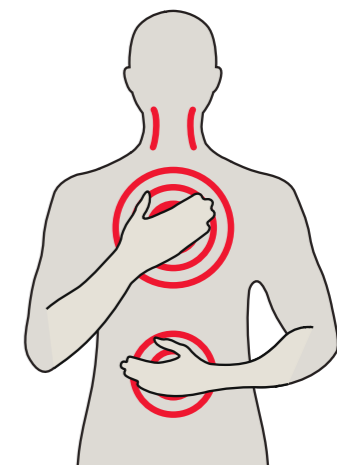
Pain or discomfort in the chest that doesn't go away.



The pain may spread to the left or right arm ...



... or may spread to the neck and jaw.



You may feel sick or short of breath.

Think quick ... act fast. Call 999 immediately.

People with diabetes may not always feel the pain or discomfort caused by a heart attack in the same way as someone who doesn't have diabetes.

If you have symptoms that don't match the ones described on page 49, but think that you are having a heart attack, call 999 immediately.

ACT FAST...

What to do if you think someone is having a heart attack

- 1** Send someone to call 999 for an ambulance immediately.

If you are alone, go and call 999 immediately and then come straight back to the person.
- 2** Get the person to sit in a comfortable position, stay with them and keep them calm.
- 3** Give the person an adult aspirin tablet (300mg) to chew if one is easily available, unless they're allergic to aspirin or they've been told not to take it.

If you don't have an aspirin next to you, or if you don't know if the person is allergic to aspirin, just get them to stay resting until the ambulance arrives.

**British Heart
Foundation website****bhf.org.uk**

For up-to-date information on cardiovascular disease, the BHF and its services.

**Genetic
Information Service****0300 456 8383**

(A similar cost to 01 or 02 numbers.)
For information and support on inherited heart conditions.

**Online community
community.bhf.org.uk**

Share your experiences, stories, tips and ideas with other people like you in our online community.

Heart Helpline**0300 330 3311**

(A similar cost to 01 or 02 numbers.)
For information and support about your heart condition and keeping your heart healthy.

Twitter**@TheBHF**

Get our latest news and views directly into your Twitter feed.

Facebook**facebook.com/bhf**

Join the conversation and get our latest news and updates on Facebook.

Booklets and DVDs**To order our booklets or DVDs:**

- call the BHF Orderline on **0870 600 6566**
- email **orderline@bhf.org.uk** or
- visit **bhf.org.uk/publications**

You can also download many of our publications from our website. For a list of resources available from the BHF, ask for a copy of our catalogue *Take heart*.

Our resources and services are free of charge, but we rely on donations to continue our vital work. If you'd like to make a donation, please call our donation hotline on **0300 330 3322** or visit our website at **bhf.org.uk/donate**

Heart Information Series

This booklet is part of the *Heart Information Series*. The booklets in this series are:

- Angina
- Atrial fibrillation (AF)
- Blood pressure
- Cardiac rehabilitation
- Caring for someone with a heart condition
- Coronary angioplasty
- Diabetes and your heart
- Heart attack
- Heart rhythms
- Heart surgery
- Heart transplant
- Heart valve disease
- Implantable cardioverter defibrillators (ICDs)
- Keep your heart healthy
- Living with heart failure
- Medicines for your heart
- Pacemakers
- Peripheral arterial disease
- Primary angioplasty for a heart attack
- Reducing your blood cholesterol
- Returning to work
- Tests

Our services

For more information about any of our services, contact the BHF on **0300 330 3322** or visit **bhf.org.uk**

Nation of Lifesavers

This BHF campaign aims to help save up to 5,000 extra lives each year in the UK, by increasing knowledge of CPR (cardiopulmonary resuscitation) and how to use public access defibrillators (PADs) in an emergency. Join our Nation of Lifesavers at **bhf.org.uk/lifesavers**

- **Heartstart** is a free, two-hour course where you can learn CPR and other emergency life saving skills.
- Our **Call Push Rescue Training Kit** is available free to secondary schools and community groups, and for a small fee to workplaces. It has everything you need to learn CPR, including a training DVD.

Heart Matters

Heart Matters is the BHF's free, personalised service offering information to help you lead a heart-healthy lifestyle. Join today and enjoy the benefits, including

Heart Matters magazine and access to online tools. Call the **Heart Matters Helpline** on **0300 330 3300**, or join online at **bhf.org.uk/heartmatters**

Heart Support Groups

Local Heart Support Groups give you the chance to talk about your own experience with other heart patients and their carers. They may also include exercise classes, talks by guest speakers, and social get-togethers. To find out if there is a Heart Support Group in your area, contact the **Heart Helpline** on **0300 330 3311**.

Make yourself heard – Heart Voices

Heart Voices gives you the skills, confidence and knowledge you'll need to influence health services for the benefit of heart patients and their families across the UK. By signing up, you'll join a network of representatives that speaks out on behalf of heart patients and their carers, and get opportunities to have your say. Visit **bhf.org.uk/heartvoices** for more information and to sign up.

For information about diabetes

Diabetes UK

Macleod House
10 Parkway
London NW1 7AA

Diabetes UK Careline: 0345 123 2399
(Monday to Friday 9am to 7pm)

Website: www.diabetes.org.uk

Diabetes UK provides information on diabetes, and support for those living with the condition.

activity	25	impaired fasting glucose	46
angina	05, 42	impaired glucose tolerance	46
angioplasty	42	insulin	10
annual review	44	insulin resistance	45
arteries	04	kidneys	15
atheroma	05	medicines	20, 25, 42
blood pressure	15, 21, 25, 33	metabolic syndrome	47
borderline diabetes	46	non-HDL	30
bypass surgery	42	obesity	06, 34
check-up	44	overweight	34
chest pain	05, 08, 49	pre-diabetes	46
cholesterol	21, 25, 30	review	44
complications of diabetes	15	risk factors for coronary heart disease	06
coronary heart disease	05	smoking	28
diabetes		stroke	15, 21, 28
diagnosis	18	symptoms	
effects on the heart	21	of a heart attack	49
symptoms	14	of diabetes	14
treatment	20	tests for diabetes	18
drugs	20, 25, 42	treatment of diabetes	20
eating	29	triglycerides	31
exercise	25	type 1 diabetes	11
eyes	15	type 2 diabetes	11, 12
feet	15	waist	36
gestational diabetes	48	weight	34
glucose	10, 38		
HDL	30		
heart attack	05, 07, 08, 21, 25, 43, 49		

HAVE YOUR SAY

We would welcome your comments to help us produce the best information for you. Why not let us know what you think? Contact us through our website [bhf.org.uk/contact](https://www.bhf.org.uk/contact). Or, write to us at:

BHF Customer Services
Lyndon Place
2096 Coventry Road
Birmingham B26 3YU.

ACKNOWLEDGEMENTS

The British Heart Foundation would like to thank all the doctors, nurses and other health professionals who helped to develop the booklets in the *Heart Information Series*, and all the patients who commented on the text and design.

Particular thanks for their work on this booklet are due to:

- **Florence Findlay White**, National Care Advisor, Diabetes UK, and
- **Professor Mark Kearney**, BHF Professor of Cardiovascular and Diabetes Research, and Director, Leeds Institute of Cardiovascular and Metabolic Medicine.

THANK YOU

This booklet is part of the *Heart Information Series*. We distribute 2 million booklets from this series each year. Without your hard work and support the British Heart Foundation wouldn't be able to provide this vital information for people with heart conditions.

Donate to the fight at [bhf.org.uk/donate](https://www.bhf.org.uk/donate), or text **FIGHT** to **70080** to donate £3 to fund our life saving research.



**British Heart
Foundation**

For over 50 years we've pioneered research that has transformed the lives of millions of people living with cardiovascular disease. Our work has been central to the discoveries of vital treatments that are changing the fight against heart disease.

But cardiovascular disease still kills around one in four people in the UK, stealing them away from their families and loved ones.

From babies born with life-threatening heart problems, to the many mums, dads and grandparents who survive a heart attack and endure the daily battles of heart failure.

Join our fight for every heartbeat in the UK. Every pound raised, minute of your time and donation to our shops will help make a difference to people's lives.

Text FIGHT to 70080 to donate £3*

**FIGHT
FOR EVERY
HEARTBEAT**

bhf.org.uk

*This is a charity donation service for the BHF. Texts cost £3 + 1 standard rate msg. The BHF will receive 100% of your donation to fund our life saving research. To opt out of calls and SMS text NOCOMMS BHF to 70060, or if you have any questions about your gift call 0203 282 7863.

© British Heart Foundation 2016, a registered charity in England and Wales (225971) and Scotland (SC039426).

HIS22/0616