

# Diabetes and High Blood Pressure

If you have diabetes you should aim to keep your blood pressure well controlled. Having high blood pressure is one of several 'risk factors' that can increase your chance of developing heart disease, a stroke, and some other complications of diabetes. As a rule, the higher the blood pressure, the greater the risk. Treatment includes a change in lifestyle risk factors where these can be improved - losing weight if you are overweight, regular physical activity, a healthy diet, cutting back if you drink a lot of alcohol, stopping smoking, and a low salt intake. If needed, medication can lower blood pressure.

## What is blood pressure?

Blood pressure is the pressure of blood in your arteries (blood vessels). Blood pressure is measured in millimetres of mercury (mmHg). Your blood pressure is recorded as two figures. For example, 130/80 mmHg. This is said as '130 over 80'.

- **The top (first) number is the systolic pressure.** This is the pressure in the arteries when the heart contracts.
- **The bottom (second) number is the diastolic pressure.** This is the pressure in the arteries when the heart rests between each heartbeat.

## What is high blood pressure?

This is not as simple to answer as it may seem. In general, the higher the blood pressure, the greater the risk to health. Depending on various factors, the level at which blood pressure is said to be high can vary from person to person.

### If you have diabetes without any complications

You will usually be advised to take medication to lower your blood pressure if your blood pressure is 140/90 mmHg or above.

### If you have diabetes with certain complications

You will usually be advised to take medication to lower your blood pressure if your blood pressure is 130/80 mmHg or above. Especially, if you have any kidney complications from diabetes.

### People without diabetes

The 'cut off point' that is said to be 'high' is 140/90 or above. However, people without diabetes and with a low risk of developing health problems may not be advised to take medication for blood pressure unless the pressure is 160/100 mmHg or above.

Note: high blood pressure means that the blood pressure remains above the cut off point each time it is taken. That is, the blood pressure is 'sustained' at the level higher than it should be, and is not just a 'one off' high reading when you happen to be stressed. High blood pressure can be:

- just a high systolic pressure, for example, 170/70 mmHg.
- just a high diastolic pressure, for example, 120/104 mmHg.
- or both, for example, 170/110 mmHg.

## How is high blood pressure diagnosed?

A one-off blood pressure reading which is high does not mean that you have 'high blood pressure'. Your blood pressure varies throughout the day. It may be high for a short time if you are anxious, stressed, or have just been exercising. *You are said to have 'high blood pressure' (hypertension) if you have several blood pressure readings which are high, and which are taken on different occasions, and when you are relaxed.*

**Observation period**

If one reading is found to be high, your doctor or nurse will usually advise a time of observation. This means several blood pressure checks at intervals over time. It is also a good time to address any lifestyle factors (see below). The length of the observation period varies depending on the initial reading, and if you have other health risk factors or complications from diabetes. If the blood pressure readings remain high after an observation period then treatment with medication is usually advised (see below).

Some people are given (or buy) machines to monitor blood pressure at home (home monitoring) or when they are going about doing their everyday activities (ambulatory monitoring). One reason this may be advised is because some people become anxious in medical clinics which can cause their blood pressure to rise. (This is called 'white coat' hypertension.) Home or ambulatory monitoring of blood pressure may show that the blood pressure is normal when you are relaxed.

**What causes high blood pressure?****The cause is not known in most cases**

This is called 'essential hypertension'. The pressure in the blood vessels depends on how hard the heart pumps, and how much resistance there is in the arteries. It is thought that slight narrowing of the arteries increases the resistance to blood flow, which increases the blood pressure. The cause of the slight narrowing of the arteries is not clear. Various factors probably contribute.

(It is a bit like water in a hosepipe. The water pressure is increased if you open the tap more, but also if you make the hosepipe narrower by partially blocking the outflow with your thumb.)

**Diabetic nephropathy (kidney disease) causes some cases**

A complication which develops in some people with diabetes is called diabetic nephropathy. In this condition the kidneys are damaged which can cause high blood pressure. This is more common in people with Type 1 diabetes.

**Rarely, high blood pressure is caused by other conditions**

It is then called 'secondary hypertension'. For example, certain kidney or hormone problems can cause high blood pressure.

**How common is high blood pressure?**

In the UK, about half of people over 65, and about 1 in 4 middle aged adults, have high blood pressure. It is less common in younger adults. Most cases are mildly high (up to 160/100 mmHg). However, *at least* 1 in 20 adults have blood pressure of 160/100 mmHg or above. High blood pressure is more common in people:

- with diabetes. About 3 in 10 people with Type 1 diabetes and more than half of people with Type 2 diabetes eventually develop high blood pressure.
- from African-Caribbean origin.
- from the Indian sub-continent.
- with a family history of high blood pressure.
- with certain lifestyle factors. That is, those who: are overweight, eat a lot of salt, don't eat much fruit and vegetables, don't take much exercise, or drink a lot of alcohol.

**Do I need any tests?**

If you are diagnosed as having high blood pressure you are likely to be examined by your doctor and have some routine tests which include:

- A urine test to check if you have protein or blood in your urine.
- A blood test to check that your kidneys are working fine, and to check your cholesterol level.
- A heart tracing (an ECG).

The purpose of the examination and tests is to:

- Rule out (or diagnose) a 'secondary' cause of high blood pressure such as kidney disease.
- To check to see if the high blood pressure has affected the heart.
- To check if you have other 'risk factors' such as a high cholesterol level.

Several of these tests are tests that are routinely done anyway if you have diabetes, even if you do not have high blood pressure.

## Why is high blood pressure a problem?

**High blood pressure is a 'risk factor'** for developing a cardiovascular disease (such as a heart attack or stroke), and kidney damage, sometime in the future. If you have high blood pressure, over the years it may have a damaging effect to arteries and put a strain on your heart. In general, the higher your blood pressure, the greater the health risk. But, high blood pressure is just one of several possible risk factors for developing a cardiovascular disease.

Other risk factors that also increase the risk of developing a cardiovascular disease are:

- Lifestyle risk factors that can be prevented or changed:
  - Smoking.
  - Lack of physical activity (a sedentary lifestyle).
  - Obesity.
  - An unhealthy diet.
  - Excess alcohol.
- Diabetes.
- High cholesterol blood level.
- High triglyceride (fat) blood level.
- Kidney diseases that affect kidney function.
- A strong family history. This means if you have a father or brother who developed heart disease or a stroke before they were 55, or in a mother or sister before they were 65.
- Being male.
- An early menopause in women.
- Age. The older you become, the more likely you are to develop atheroma.
- Ethnic group. For example, people who live in the UK with ancestry from India, Pakistan, Bangladesh, or Sri Lanka have an increased risk.

Diabetes plus high blood pressure is a particularly strong combination of risk factors.

In addition, some other complications of diabetes are more common if you have high blood pressure. For example, diabetic retinopathy (damage to the back of the eye) and diabetic nephropathy (kidney damage related to diabetes).

**However, if you reduce a high blood pressure** the risk to your health is reduced. A large research study called the the UK Prospective Diabetes Study confirmed this. In this study many people with diabetes were monitored over several years. The study found that those with well controlled blood pressure had nearly a third less risk of dying from complications related to diabetes (heart attack, stroke, etc) compared to those with poorly controlled blood pressure. In fact, this study found that good control of blood pressure was even more beneficial than good control of the blood sugar level to reduce the risk of developing complications from diabetes.

## How can blood pressure be lowered?

There are two ways in which blood pressure can be lowered.

- Modifications to lifestyle (weight, exercise, diet, salt, and alcohol) if any of these can be improved upon (details below).
- Medication (details below).

## Lifestyle treatments to lower high blood pressure

### Lose weight if you are overweight

Losing some excess weight can make a big difference. Blood pressure can fall by up to 2.5/1.5 mmHg for each excess kilogram which is lost. Losing excess weight has other health benefits too.

### Regular physical activity

If possible, aim to do some physical activity on five or more days of the week, for at least 30 minutes. For example, brisk walking, swimming, cycling, dancing, etc. Regular physical activity can lower blood pressure in addition to giving other health benefits. If you previously did little physical activity, and change to doing regular physical activity five times a week, it can reduce systolic blood pressure by 2-10 mmHg.

### Have a low salt intake

The amount of salt that we eat can have an effect on our blood pressure. Government guidelines recommend that we should have no more than 5-6 grams of salt per day. (Most people currently have more than this.) Tips on how to reduce salt include:

- Use herbs and spices to flavour food rather than salt.
- Limit the amount of salt used in cooking, and do not add salt to food at the table.
- Choose foods labelled 'no added salt', and avoid processed foods as much as possible.

### Eat a healthy diet

If you have diabetes you will normally be given a lot of advice about a healthy diet. Briefly, it means:

- AT LEAST five portions, and ideally 7-9 portions, of a *variety of* fruit and vegetables per day.
- THE BULK OF MOST MEALS should be starch-based foods (such as cereals, wholegrain bread, potatoes, rice, pasta), plus fruit and vegetables.
- NOT MUCH fatty food such as fatty meats, cheeses, full-cream milk, fried food, butter, etc. Use low fat, mono-, or poly-unsaturated spreads.
- INCLUDE 2-3 portions of fish per week. At least one of which should be 'oily' such as herring, mackerel, sardines, kippers, pilchards, salmon, or *fresh* (not tinned) tuna.
- If you eat meat it is best to eat lean meat, or poultry such as chicken.
- If you do fry, choose a vegetable oil such as sunflower, rapeseed or olive oil.
- Low in salt.

A healthy diet provides health benefits in different ways. For example, it can lower cholesterol, help control your weight, and has plenty of vitamins, fibre, and other nutrients which help to prevent certain diseases. Some aspects of a healthy diet also directly affect blood pressure. For example, if you have a poor diet and change to a diet which is low-fat, low-salt, and high in fruit and vegetables, it can lower systolic blood pressure by up to 11 mmHg.

### Drink alcohol in moderation

A small amount of alcohol (1-2 units per day) may help to protect you from heart disease. One unit is in about half a pint of normal strength beer, or two thirds of a small glass of wine, or one small pub measure of spirits.

However, too much alcohol can be harmful.

- Men should drink no more than 21 units of alcohol per week (and no more than four units in any one day).
- Women should drink no more than 14 units of alcohol per week (and no more than three units in any one day).

Cutting back on heavy drinking improves health in various ways. It can also have a direct effect on blood pressure. For example, if you are drinking heavily, cutting back to the recommended limits can lower a high systolic blood pressure by up to 10 mmHg.

## Treatment with medication

### When is drug treatment started for high blood pressure?

If you have diabetes, drug treatment is usually advised if your blood pressure remains at 140/90 mmHg or above (after a trial of any lifestyle changes, where relevant). However, if you have certain complications from diabetes then treatment may be advised if your blood pressure is 130/80 mmHg or above. For example, if you have a kidney problem related to your diabetes.

### What is the target blood pressure to aim for?

If you have diabetes and are taking medication to lower high blood pressure then the target is to get your blood pressure to less than 130/80 mmHg.

### What drugs are used to lower blood pressure?

There are several drugs that can lower blood pressure. The one chosen depends on such things as: if you have other medical problems; if you take other medication; possible side-effects of the drug; your age; your ethnic origin; etc. One drug reduces high blood pressure to the target level in less than half of cases. It is common to need two or more different drugs to reduce blood pressure to a target level. In about a third of cases, three drugs or more are needed to get blood pressure to the target level. A separate leaflet called '*Medication for High Blood Pressure*' gives more details.

### How long is medication needed for?

In most cases, medication is needed for life. However, in *some* people whose blood pressure has been well controlled for three years or more, medication *may* be able to be stopped. In particular, in people who have made significant changes to lifestyle (such as lost a lot of weight, or stopped heavy drinking, etc). Your doctor can advise.

### Other medication

If you have diabetes and require drug treatment to lower a high blood pressure, you are also likely to be prescribed:

- Medication to lower your blood cholesterol level.
- A daily low dose of aspirin. This reduces the risk of blood clots forming in the blood vessels (which cause strokes and heart attacks).

## Smoking and high blood pressure

Smoking does not directly affect the level of your blood pressure. However, smoking greatly adds to your health risk if you already have high blood pressure and diabetes. If you smoke, you should make every effort to stop. If you smoke and are having difficulty in stopping, then see your practice nurse for help and advice.

## Further help and information

### Diabetes UK

10 Parkway, London, NW1 7AA

Tel (careline): 0845 120 2960 Web: [www.diabetes.org.uk](http://www.diabetes.org.uk)

### Blood Pressure Association

60 Cranmer Terrace, London, SW17 0QS

Tel: 020 8772 4994 Web: [www.bpassoc.org.uk](http://www.bpassoc.org.uk)

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