



## **LEVEL 3 CERTIFICATE / DIPLOMA**

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**JANUARY 2022**

### **MEDICAL SCIENCE**

**UNIT 1: Human Health and Disease**

**Pre-Release Article for use in the following  
examinations on THURSDAY, 13 JANUARY 2022**

**Level 3 Diploma in Medical Science**

**Level 3 Certificate in Medical Science**

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**Prescription drugs and grapefruit ‘a deadly mix’**

27 November 2012

“A breakfast of grapefruit and marmalade on toast could be lethal for people taking medication” is the headline of a major UK newspaper.

The news is based on a review that has highlighted that the interaction of grapefruit and some medications can cause serious side effects. It is known that grapefruit contains a group of chemicals called furanocoumarins, which can affect drug metabolism.

Furanocoumarins inhibit enzymes that break down drugs. This can cause more of the ‘active’ drug to be present in the body than was originally intended by the given dose. This can then trigger unpleasant, and sometimes serious, side effects.

Researchers say that there are now at least 43 types of prescription medication that could cause serious side effects if taken with grapefruit or grapefruit juice. Drugs affected include those used to treat heart and blood vessel conditions including hypertension.

## High blood pressure (Hypertension)

Blood pressure depends on the force and volume of blood that is pumped through the arteries, as well as the size and flexibility of the arteries.

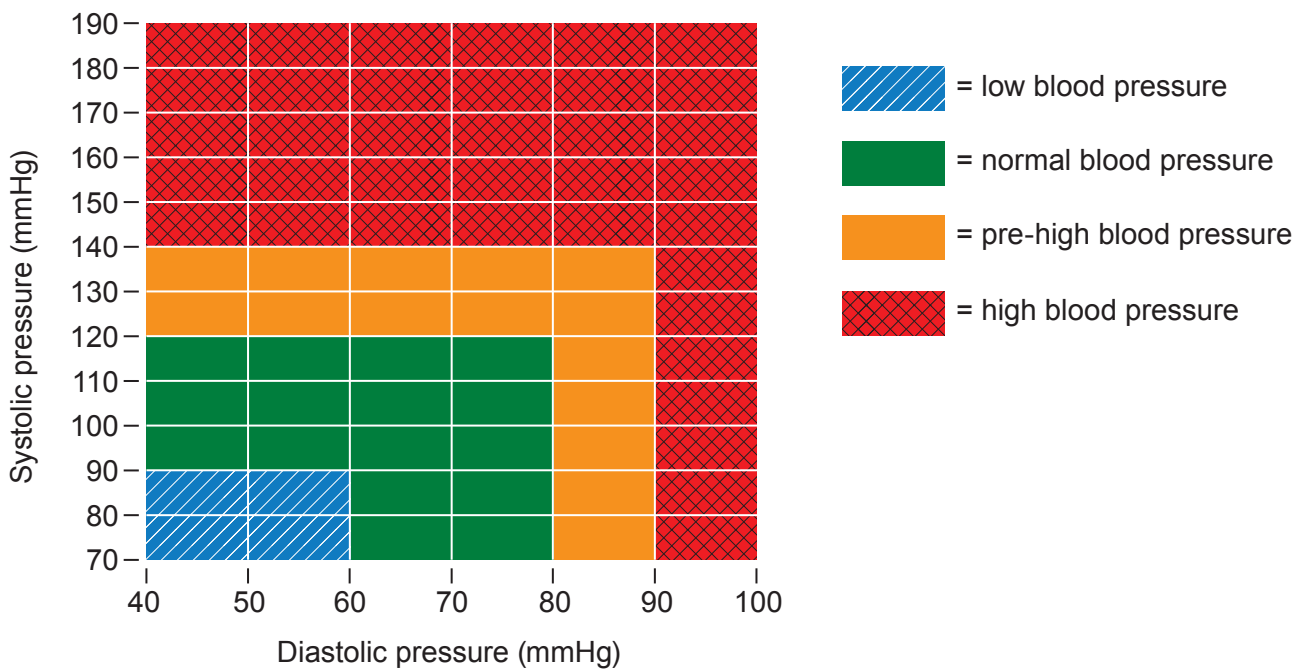
### What is high blood pressure?

Blood pressure is recorded as two numbers. The systolic pressure is the force at which the heart pumps blood around the body. The diastolic pressure is the resistance to the blood flow in the blood vessels. They are both measured in millimetres of mercury (mmHg).

Ideal blood pressure is considered to be between 90/60 mmHg and 120/80 mmHg with high blood pressure considered to be 140/90 mmHg or higher.

Many people who have high blood pressure do not present any symptoms.

**Figure 1:** Blood pressure value chart



### Causes of high blood pressure

In approximately 1 in 20 cases, high blood pressure occurs as the result of an underlying condition or medication.

Conditions that can cause high blood pressure include:

- kidney disease
- long-term infections
- diabetes
- obstructive sleep apnoea
- narrowing of the arteries
- hormone problems
- lupus

Medication and drugs that can increase blood pressure include:

- contraceptive pill
- steroid medication
- non-steroidal anti-inflammatory drugs
- some herbal remedies
- some illegal drugs
- some antidepressants

## **Diagnosis**

High blood pressure does not initially have any symptoms. It can only be diagnosed by measuring blood pressure. Healthy adults aged over 40 should have their blood pressure checked at least once every 5 years. People who are at an increased risk of high blood pressure should have their blood pressure checked more often, ideally once a year.

A GP will carry out some blood and urine tests and ask questions about a person's health to determine their risk of other problems e.g. cardiovascular disease.

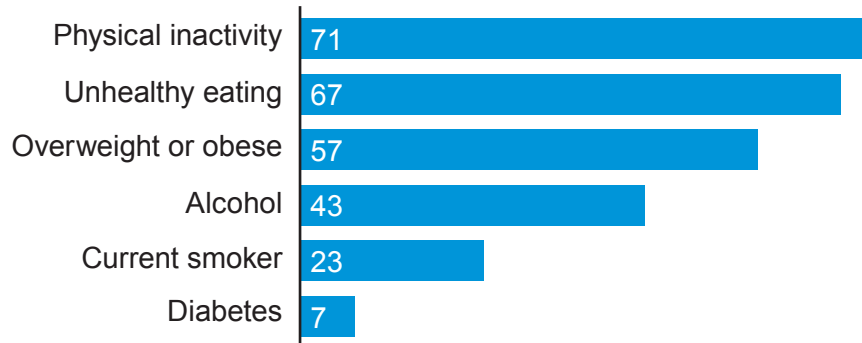
## **Who is at risk of high blood pressure?**

Factors that can raise the risk of developing high blood pressure include:

- age
- family history of high blood pressure
- being of African or Caribbean origin
- a high amount of salt in the diet
- lack of exercise
- being overweight or obese
- regularly drinking large amounts of alcohol or caffeine-based drinks
- smoking
- long-term sleep deprivation
- stress

If a person makes healthy lifestyle changes then they can help to keep their blood pressure within the normal range.

**Figure 2:** Percentage of adults at risk of developing hypertension in England, grouped according to risk factor.



### Blood pressure testing

Blood pressure testing is available at GP surgeries, pharmacies, some workplaces and health screening events. Home testing kits are also available for people to self-check their blood pressure.

A stethoscope, arm cuff, pump and dial can be used to measure blood pressure, but electronic devices with sensors and digital displays are also commonly used.

**Figure 3:** A blood pressure monitor



A high blood pressure reading in one test does not necessarily mean that a person has hypertension. Blood pressure can fluctuate throughout the day. Feeling anxious or stressed when visiting the GP can also raise blood pressure.

The patient may be asked to take some further readings with a home blood pressure monitor if they have a high reading. They may wear a 24-hour monitor that checks blood pressure throughout the day. This will confirm whether the person has consistently high blood pressure.

Regular home testing can also allow a person to monitor their condition more easily in the long term. Low-cost blood pressure monitors are readily available for use at home.

**Treatment**

Simple lifestyle changes can often help reduce high blood pressure. Some people may need to take medication depending on their blood pressure reading and the risk of developing problems such as heart attacks or strokes.

When the blood pressure is consistently above 140/90 mmHg but the risk of other problems is low, the patient will be advised to make some changes to their lifestyle.

When the blood pressure is consistently above 140/90 mmHg and the risk of other problems is high or the blood pressure is consistently above 160/100 mmHg, the patient will be offered medication to lower their blood pressure, in addition to lifestyle changes.

**Medication for high blood pressure**

Several medications can be used to help control high blood pressure. Many people need to take a combination of different medicines. The medication recommended will depend on the age and ethnicity of the person.

Some people must take blood pressure medication for their entire life. Medication may be reduced or stopped if blood pressure stays under control for several years. Medications used to treat high blood pressure can have side effects.

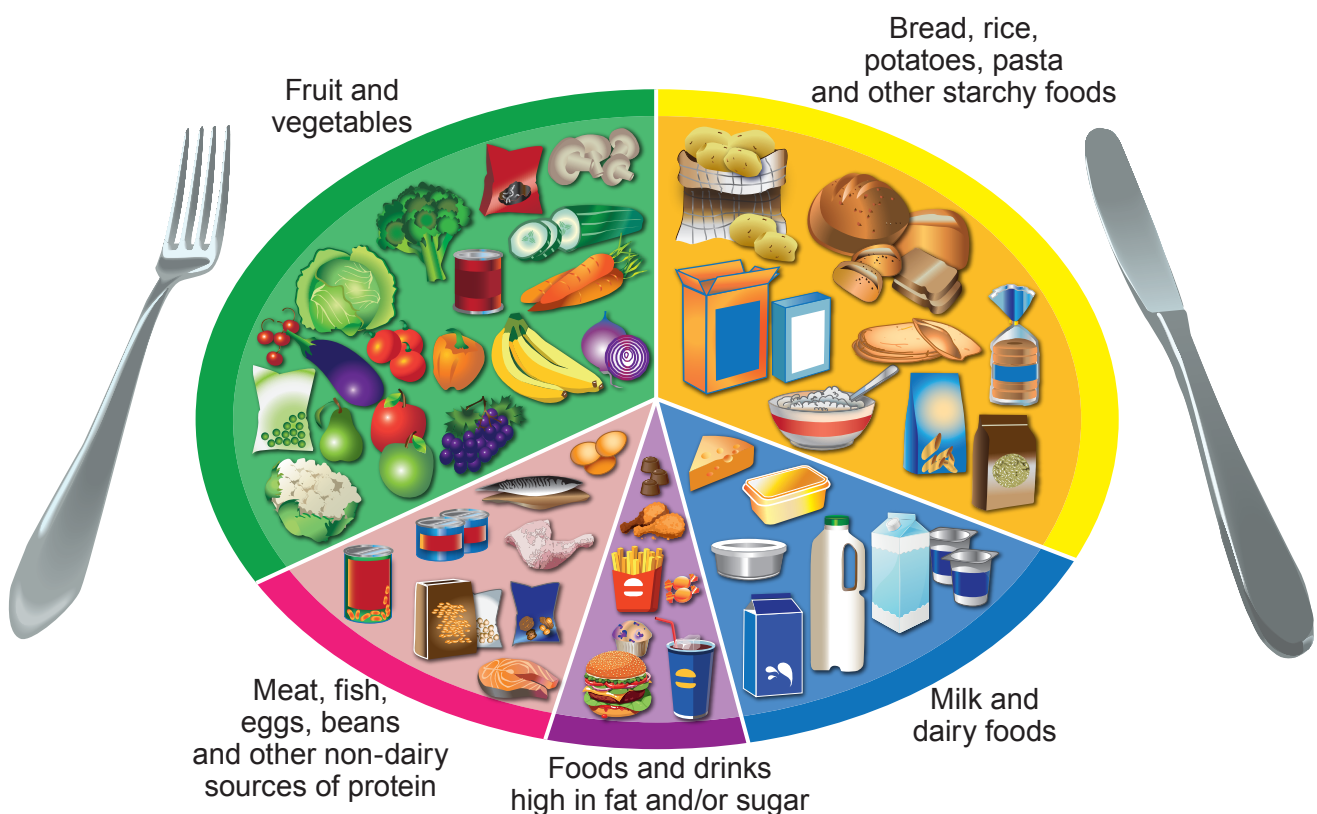
## Prevention

High blood pressure can often be prevented or reduced by sensible lifestyle choices.

## Healthy diet

The Eatwell Guide highlights the different types of food that make up a healthy balanced diet. It shows the proportions in which these foods should be eaten.

**Figure 4:** The Eatwell Guide



## Alcohol intake

Staying within the recommended alcohol level is the best way to reduce the risk of developing high blood pressure:

- Men and women are advised not to regularly drink more than 14 units a week.
- Spread drinking over 3 days or more if drinking as much as 14 units a week.

Alcohol is also high in calories, which will cause weight gain and can therefore further increase the risk of developing high blood pressure.

## Lose weight

Being overweight forces the heart to work harder to pump blood around the body, which can raise blood pressure. A small weight loss will make a big difference to blood pressure and overall health.



**Get active**

Being active and taking regular exercise lowers blood pressure by keeping the heart and blood vessels in good condition. Regular exercise can also help with weight loss.

**Cut down on caffeine**

Caffeine-rich drinks such as coffee, tea, cola and some energy drinks should be reduced and should not be the main source of fluid in the diet.

**Stop smoking**

Smoking doesn't directly cause high blood pressure, but it increases the risk of heart attacks and stroke. Smoking can cause the arteries to narrow.

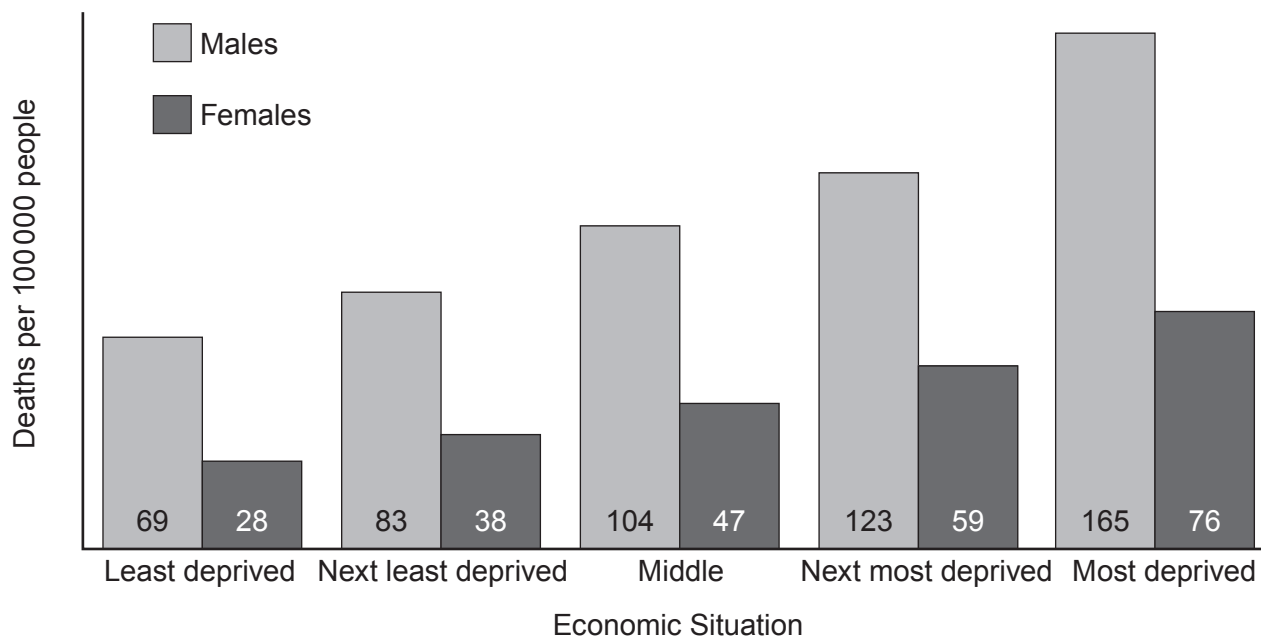
**Get a good night's sleep**

Long-term sleep deprivation is associated with a rise in blood pressure. It is a good idea to try to get at least 6 hours sleep a night.

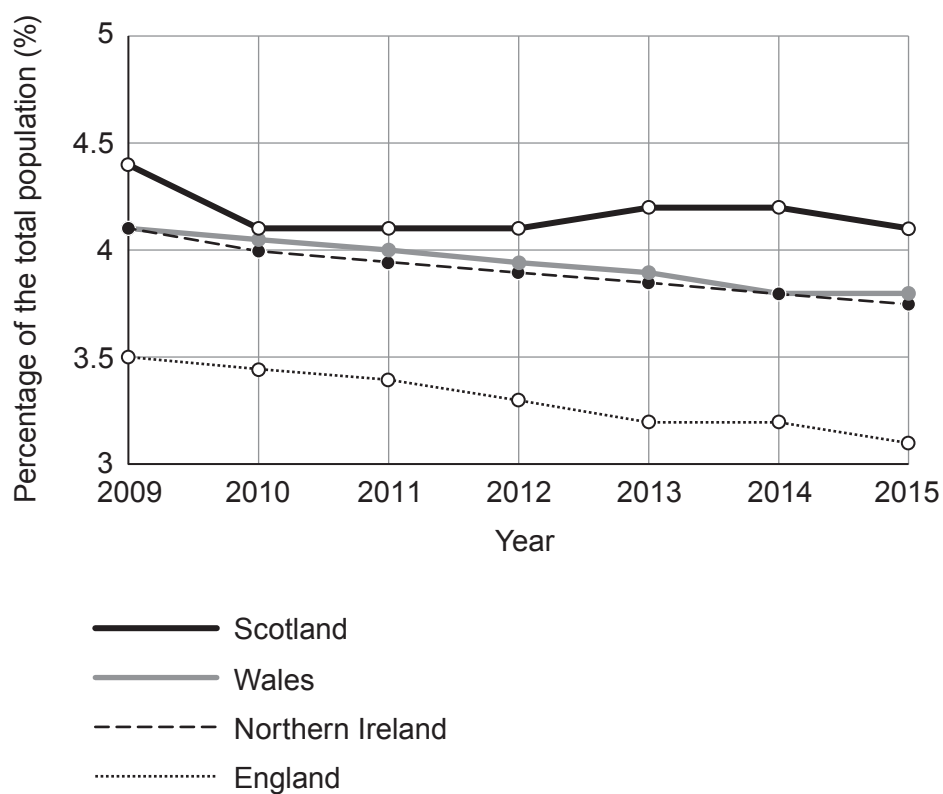
**High blood pressure statistics for England (2015)**

- A person is four times more likely to die from a stroke when their blood pressure is high.
- Around 50% of heart attacks and strokes are associated with high blood pressure.
- A person with high blood pressure is three times more likely to die from heart disease than someone who does not suffer from high blood pressure.
- 5.5 million people have undiagnosed high blood pressure.
- For every 10 people who are diagnosed with high blood pressure another 7 remain undiagnosed.
- Diseases caused by high blood pressure cost the NHS over £2.1 billion every year. Strokes are the biggest cost at £850 million every year.
- More than 25% of adults are affected by high blood pressure.
- People from deprived areas are 30% more likely to have high blood pressure compared to those in more affluent areas.

**Figure 5:** Cardiovascular disease deaths per 100 000 in England, for people aged 75 and under, in different economic situations.



**Figure 6:** Coronary heart disease prevalence rates in the countries of the UK 2009–2015.



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