

**Learning objectives**

After studying this topic, you should be able to:

- ✓ know about different types of drugs
- ✓ evaluate why some people use illegal drugs for recreation



▲ Statins lower blood cholesterol. Some statins cause muscle pain in some people, and a doctor will need to find the best type for each patient.

- A** Why do you need to have a prescription from a doctor to get certain drugs, like strong painkillers?
- B** Why do legal drugs have a greater impact overall on people's health than illegal drugs?

**Drugs may be beneficial or harmful**

A **drug** is a chemical that alters the way your body or brain works. Drugs may alter your behaviour as well as altering your metabolism.

Beneficial drugs are medicines like painkillers, antibiotics, and statins. Some drugs have to be prescribed by a doctor.

This is because they may

- have side-effects
- interfere with another medicine the patient is taking
- be harmful for a particular patient if they have another condition
- be harmful if taken too often.

**Using drugs for recreation****Legal recreational drugs**

Some drugs are legal and used for recreation. These include caffeine, nicotine in tobacco, and alcohol. Caffeine is usually not harmful. Nicotine makes people **addicted** to tobacco, and that causes cancer. Alcohol can harm the nervous system. It alters people's behaviour and may lead to violence or accidents.

**Illegal recreational drugs**

Some athletes use performance-enhancing drugs like anabolic steroids. These can have harmful side-effects. It may be unethical to use them as it gives some athletes an unfair advantage. The athletes may also suffer side-effects from taking the anabolic steroids.

**Progression to hard drugs**

Many young people experiment briefly with some types of drugs. Unfortunately some of them may go on to take hard drugs like heroin and cocaine. Both these drugs are very addictive. When users try to stop taking them they get **withdrawal symptoms**.

**Impact on health**

All drugs have an effect on your health. However, the legal drugs, like alcohol and tobacco, have a greater overall impact and cause more harm. This is because more people use them so more people are harmed.



▲ Field of opium poppies in Dorset. Opium is obtained from the seed heads of this poppy. Opium contains morphine and codeine. Opium can also be refined to make the illegal drug heroin.

**Cannabis**

Some people believe cannabis is a very good painkiller. People with multiple sclerosis find it relieves their symptoms. However, some people have concerns that the chemicals in cannabis smoke may

- lead to mental health problems in some people
- lead the user on to addiction to hard drugs like heroin and cocaine
- increase the risk of heart attacks and strokes.

In the UK cannabis is illegal and cannot be prescribed. However, it is used illegally for recreation by some people.

**Testing new drugs**

New drugs have to be rigorously tested before being licensed. They are tested on laboratory animals and human tissue to see if they are toxic. Then they are trialled on human volunteers.

**Questions**

- |   |  |   |
|---|--|---|
| 1 | Name three drugs that can be obtained from opium poppies.                              | S |
| 2 | Explain the following terms: drug; addiction; withdrawal.                              | M |
| 3 | Explain why new drugs have to be tested before they are licensed for use as medicines. | H |

**Did you know...?**

Some animals self-medicate. They eat certain leaves that they do not normally eat, to treat parasitic infections.

**Key words**

drug, addiction, withdrawal symptoms



▲ Cannabis products: seeds, a leaf, dried parts, and marijuana

- C** What are the medical benefits of cannabis?
- D** Why is cannabis not available on prescription in the UK?

**Exam tip AQA**

- ✓ Do not fall into the trap of saying that because something is made from natural substances it is bound to be good for you. Many strong poisons come from plants.

**Learning objectives**

After studying this topic, you should be able to:

- ✓ understand why new drugs have to be tested
- ✓ describe how a double blind trial is carried out

**Key words**

thalidomide, clinical trial, placebo, double blind trial

**Did you know...?**

Sometimes clinical trials do not have a placebo. If the patients are very ill it would not be ethical to give them a placebo, because they need some treatment. In this case the new drug is tested against the best current treatment. Once again, the trial is double blinded.

**A** Why was thalidomide given to pregnant women?

**B** What is a side-effect?

**Thalidomide**

Between 1957 and 1961 a drug called **thalidomide** was developed as a sleeping pill. It was prescribed to pregnant women, as it also prevented morning sickness. However, it had not been properly tested on animals, or in humans in **clinical trials**. Unfortunately it had side-effects. These are effects of the drug on the body other than the beneficial effects it is designed for. Many side-effects are minor, but thalidomide caused birth defects. The babies of women who took the drug in pregnancy had very short limbs.

Later research found that the drug interfered with genes. It prevented the normal development of limbs in the fetus.

The drug was then banned. However, since the 1980s it has been used in some countries to relieve the side-effects of the drugs used to treat leprosy. Unfortunately doctors have not always checked that patients are not pregnant. As a result, in those countries, children have more recently been born with very short limbs.



▲ X-ray of upper chest and arms of a baby. The baby's mother was given thalidomide when she was pregnant. This caused the baby to have very short arms because the arm bones did not develop properly.

Because of this tragedy, new drugs have to be rigorously tested in clinical trials before being licensed.

**How new drugs are tested**

- New drugs are tested in laboratories, on human tissue and animals, to see if they work and to find out how toxic they are.
- If they pass these tests the drugs are tested on humans in clinical trials.
- At first very low doses of the drug are given to volunteers.
- Then doses are increased to find the dose that works best.
- Volunteers are divided into two groups. The control group is given a **placebo** (dummy pill) and the experimental group is given the real drug.
- Neither the doctors nor the patients know who is getting the placebo and who gets the real thing, until the end of the trial. This is called a **double blind trial**. It makes the trial fair.
- At the end of the trial the two groups are compared to see if there is any real difference between them.
- If the drug makes a real difference and causes no harm it is licensed for use.
- However, if some new side-effects occur, some drugs are recalled even when they have been used on many people.



▲ One of these capsules contains real medicine. The other is a placebo. It looks like the real thing but does not contain medicine. Sometimes people feel better when taking a placebo, because they believe they are being treated.



▲ This boy is taking a tablet of omega-3 oil. He is part of a clinical trial to see if omega-3 can improve children's brain function. One group took the real tablets twice a day for eight weeks. The control group took a placebo twice a day for eight weeks. Members of each group had memory tests. Their reaction times and attention spans were also measured.

**Questions**

- 1 What were the effects of thalidomide when given to pregnant women? **S**
- 2 Explain why new drugs have to be tested before they are licensed for use as medicines. **S**
- 3 How are new drugs tested? **M**
- 4 Discuss why in a double blind trial (a) the patient and (b) the doctor does not know whether they are being treated with the real drug or a placebo. **H**