Drug Development
Drug Development

What are drugs?

- Drug trials
- Ethical issues
- Summary activities
Drug use

How often do you see drugs being used?
A drug is any chemical substance that affects the way in which the body works. This might include effects on the brain.

Drugs can be categorized in several ways:

- legal or illegal
- beneficial or harmful
- by the type of effect that they have on the body, e.g. stimulant, painkiller or depressant.
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Why do drugs need to be controlled?

You probably know that illegal drugs, and legal recreational drugs like alcohol and tobacco, can be dangerous. However, some medicinal drugs have the potential to be equally harmful.

Certain medicinal drugs are beneficial at certain doses, for certain people or if used for a certain length of time, but are potentially risky if used in other ways.

These drugs are generally only available on prescription. Doctors must prescribe the right amount of medicine to prevent patients from overdosing.
What are drugs tested for?

Scientists are continually developing new drugs. These need to be thoroughly tested through a series of stages.

What are drugs tested for?

Press "start" to begin.

start
How are new drugs developed?

The drug development process

Press on a section of the arrow for more information on the stages of drug development.

0 1 2 3 4 5 6 7 8 9 10 11 years

pre-clinical development clinical development regulatory review drug launch
Drug trials are long and expensive

Few drugs successfully pass through all stages of the development process. For every new drug that is launched, many more are abandoned.

A drug must be tested on thousands of patients to see how effective and safe it is.

Why do you think a drug needs to be tested on so many patients?

Long-term human trials and continuous monitoring of drugs are needed.

Why do you think these are so important?
The placebo effect

It is very important that the results from drug trials can be trusted, and so a **placebo** is sometimes used as a control. This is an inactive substance that looks like the drug.

Sometimes patients who are only taking the placebo seem to get better. This is called the **placebo effect**. It is not completely understood, but is probably to do with the reassurance of being treated, and the power of the brain over the body.

To prove that a drug is effective, it must perform better than a placebo. Sometimes patients and doctors are not told if they are getting medicine or a placebo, in order to eliminate bias. This is called **blinding** the trial.
### Types of drug trials

#### Drag the statements into the correct places

<table>
<thead>
<tr>
<th>type of trial</th>
<th>who knows?</th>
<th>advantages</th>
<th>disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>open label</td>
<td>both the doctor and patient</td>
<td>fairly easy to conduct</td>
<td>doctor's attitude may influence patient</td>
</tr>
<tr>
<td>blind</td>
<td></td>
<td>little possibility of bias</td>
<td></td>
</tr>
<tr>
<td>double blind</td>
<td></td>
<td>most complex to conduct</td>
<td></td>
</tr>
</tbody>
</table>
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Drug trials

Ethical issues

Summary activities
What are some of the objections to drug trials?

- placebo-controlled trials
- testing on human cells
- testing on human volunteers
- testing on animals

All types of drug trials attract some objections. Press on each label to learn more.
Should human embryonic cells be used in drug trials?

- 0 yes
- 0 unsure
- 0 no
**What is thalidomide?**

**Thalidomide** is a drug that was used as a sleeping pill in the 1950s and 1960s. It was then found to be effective at relieving morning sickness. However, pregnant women who were given the drug gave birth to babies with limb deformities.

How did this happen?

The drug manufacturers had tested thalidomide on animals, but the tests on pregnant animals had not been completed.

Since then, drugs have had to be tested according to very strict guidelines. Thalidomide is now being tested for the treatment of diseases such as leprosy and some cancers.
**Cholesterol** is a chemical found in the blood. In some people it sticks to the walls of blood vessels, increasing their blood pressure and risk of heart disease or stroke.

**Statins** are a group of medicines that can be used to lower the level of cholesterol in the blood.

When statins were first developed, pharmaceutical companies worked hard to:

- convince the public of the dangers of high cholesterol
- convince doctors that the drugs were safe and effective at saving lives.
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Glossary of keywords: drug development

blind trial – A type of drug trial in which only the doctor knows whether or not the patient is taking a placebo.

cholesterol – A chemical found in the blood. In some people it sticks to the walls of blood vessels, increasing their blood pressure and risk of heart disease or stroke.

clinical development – The second part of the drug development process, which is split into three phases.

clinical trial – A vigorously controlled test of a new drug that must be carried out before it can be considered safe.
Anagrams relating to drug development

How quickly can you unscramble words about drug development?

Press "start" to begin.

start

clue

60
Will you find this quiz testing or beneficial?

Press "start" to begin.