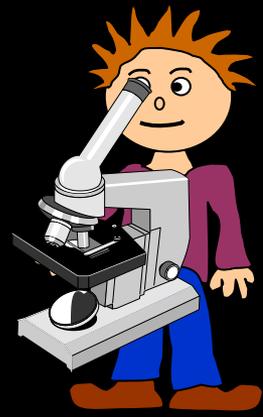


Keeping Healthy

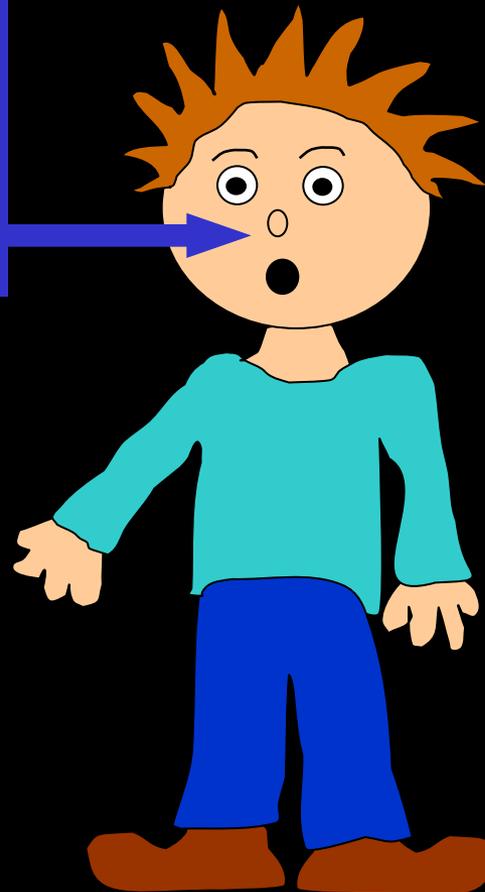
(OCR)



Microbes

Microbes are micro organisms that can cause diseases. They can enter the body in a number of ways:

They can be breathed in through the mouth or nose



They can enter through cuts or bites in the skin

...or other natural openings...

Disease

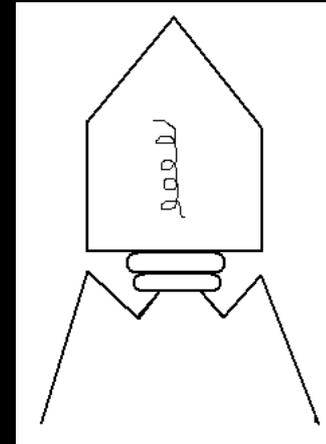
A disease is any condition where the body isn't working as it should. This could be caused by a malfunction in the body (as with diabetes) or it could be caused by a type of PATHOGEN (a microbe that causes disease):

Bacteria



- 1/1000th mm big
- Living cells (some are harmless)
- Grow very quickly
- Affected by antibiotics
- Examples: food poisoning, tetanus, sore throats

Viruses



- 1/1,000,000th mm big
- Genetic info inside a protein coat
- Not affected by antibiotics
- Release poisons
- Examples: colds, flu, polio, chicken pox, HIV, bird flu

Fungi

Fungi can also cause unwanted conditions. These conditions can be treated with anti-fungal medicine and antibiotics. Some examples (don't look if you're faint hearted!):



Microbes: our defence against them

Our bodies have five major defence mechanisms against invading microbes:

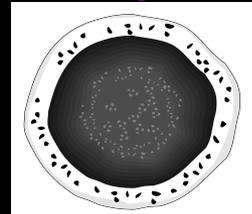
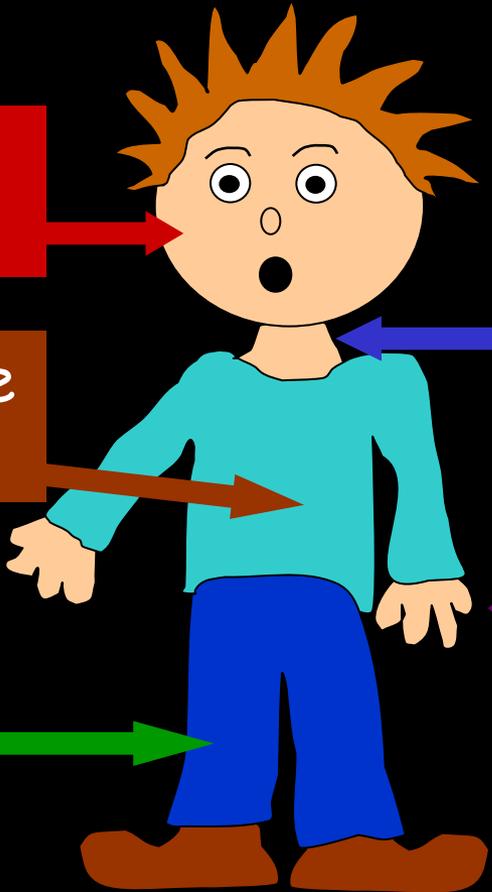
The skin acts as a barrier

The breathing organs produce mucus to cover the lining of these organs and trap the microbes

Our stomachs produce hydrochloric acid

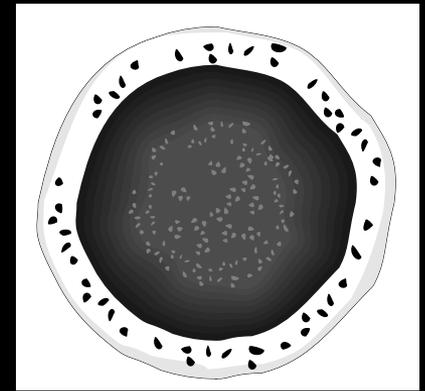
Our blood contains white blood cells

If our skin is cut platelets seal the wound by clotting



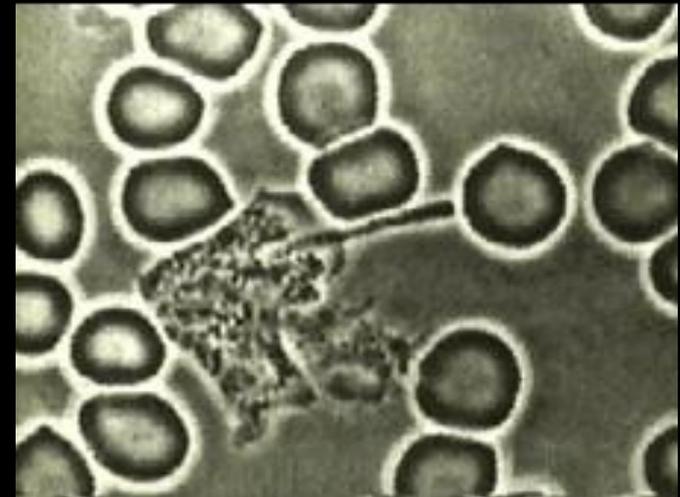
Fighting disease

If microbes enter our body they need to be neutralised or killed. This is done by **WHITE BLOOD CELLS**:

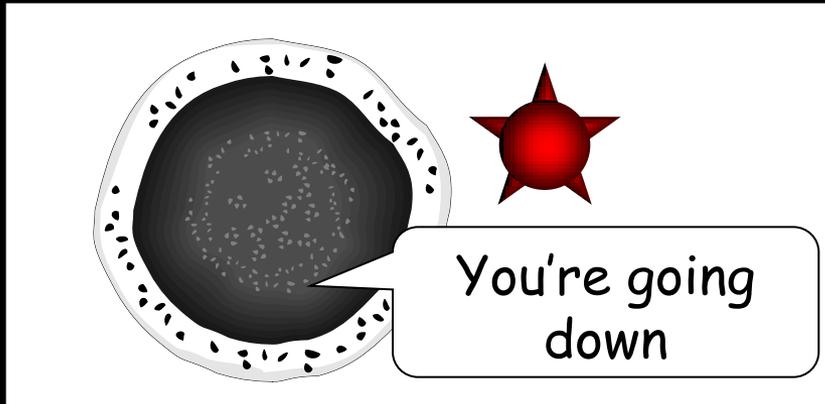


White blood cells do 3 things:

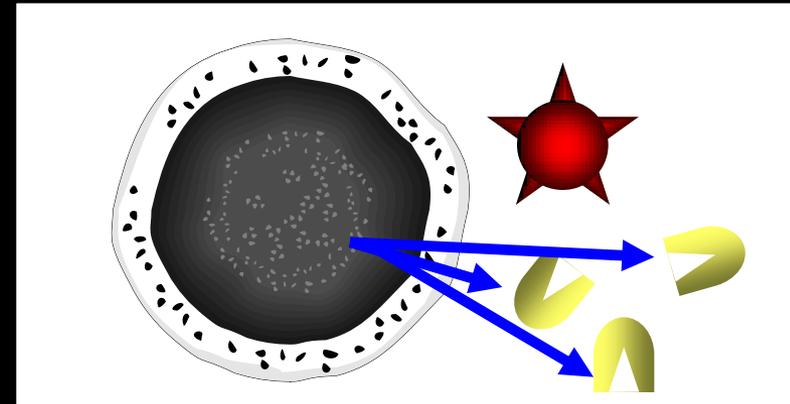
- 1) They eat the microbe
- 2) They produce antibodies to neutralise the microbe
- 3) They produce antitoxins to neutralise the poisons produced by microbes



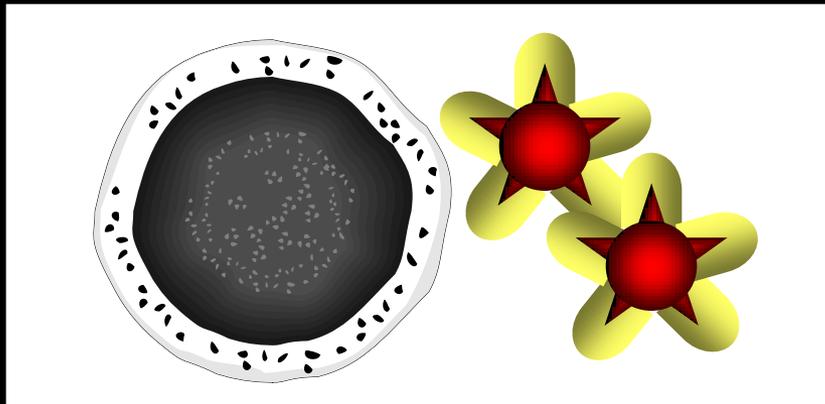
Producing antibodies



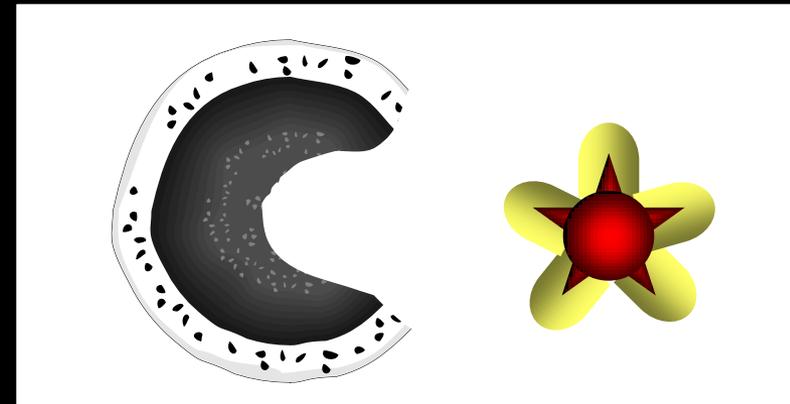
Step 1: The white blood cell "sees" the pathogen (microbe)



Step 2: The cell produces antibodies to "fit" the pathogen

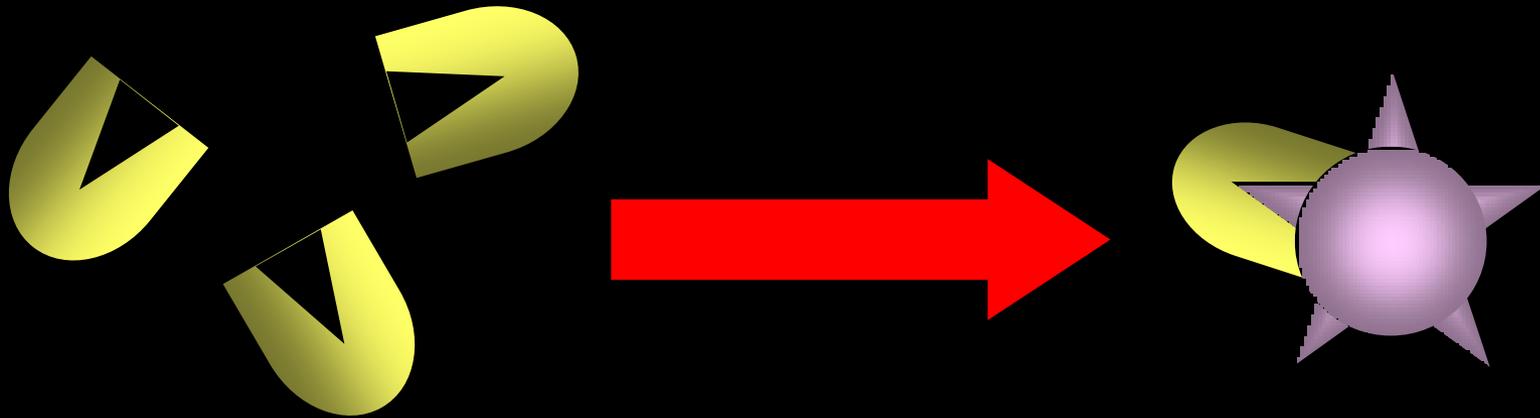


Step 3: The antibodies fit onto the pathogens and cause them to "clump"

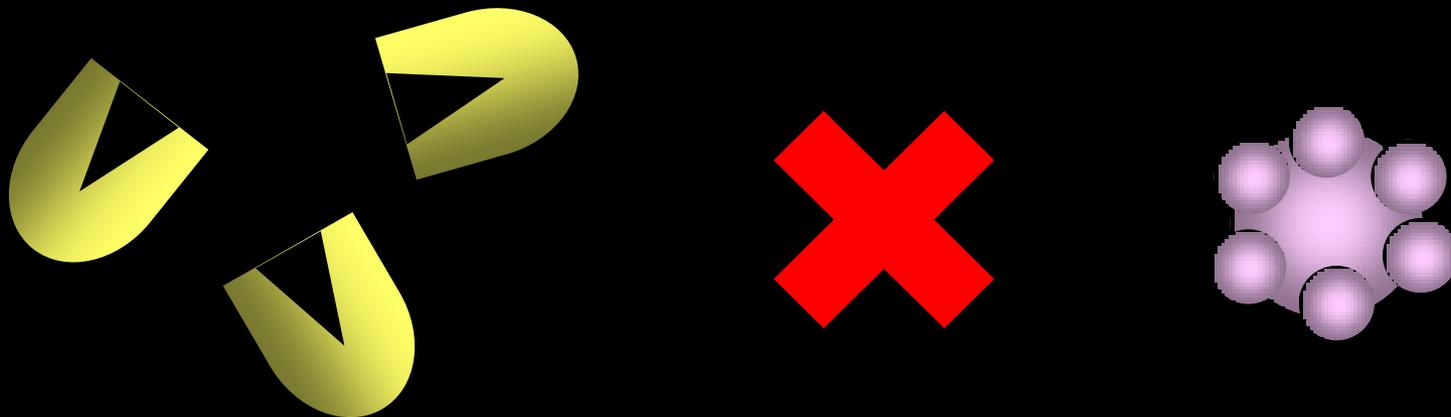


Step 4: The pathogens are "eaten" by the white blood cells

Specific antibodies



Antibodies are specific - they will neutralise the microbe they have been made for.



Fighting disease

NATURAL IMMUNITY

This is when antibodies are naturally produced by a person when needed or they are passed on by the mother during _____.



ARTIFICIAL IMMUNITY

A vaccine with _____ microbes is injected - the body is " _____ " into producing antibodies ready for the real thing. The antibodies then remain in the _____ in case a real microbe comes along.



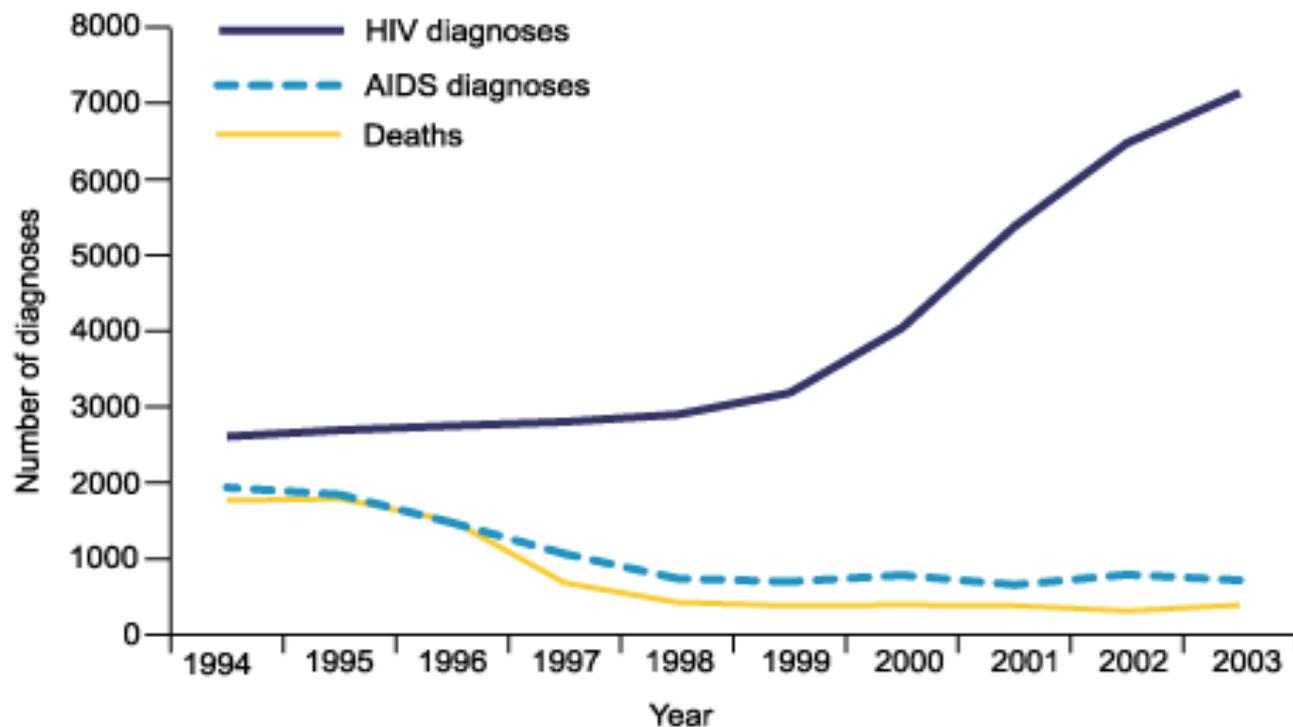
Words - dead, tricked, pregnancy, bloodstream

HIV and AIDS

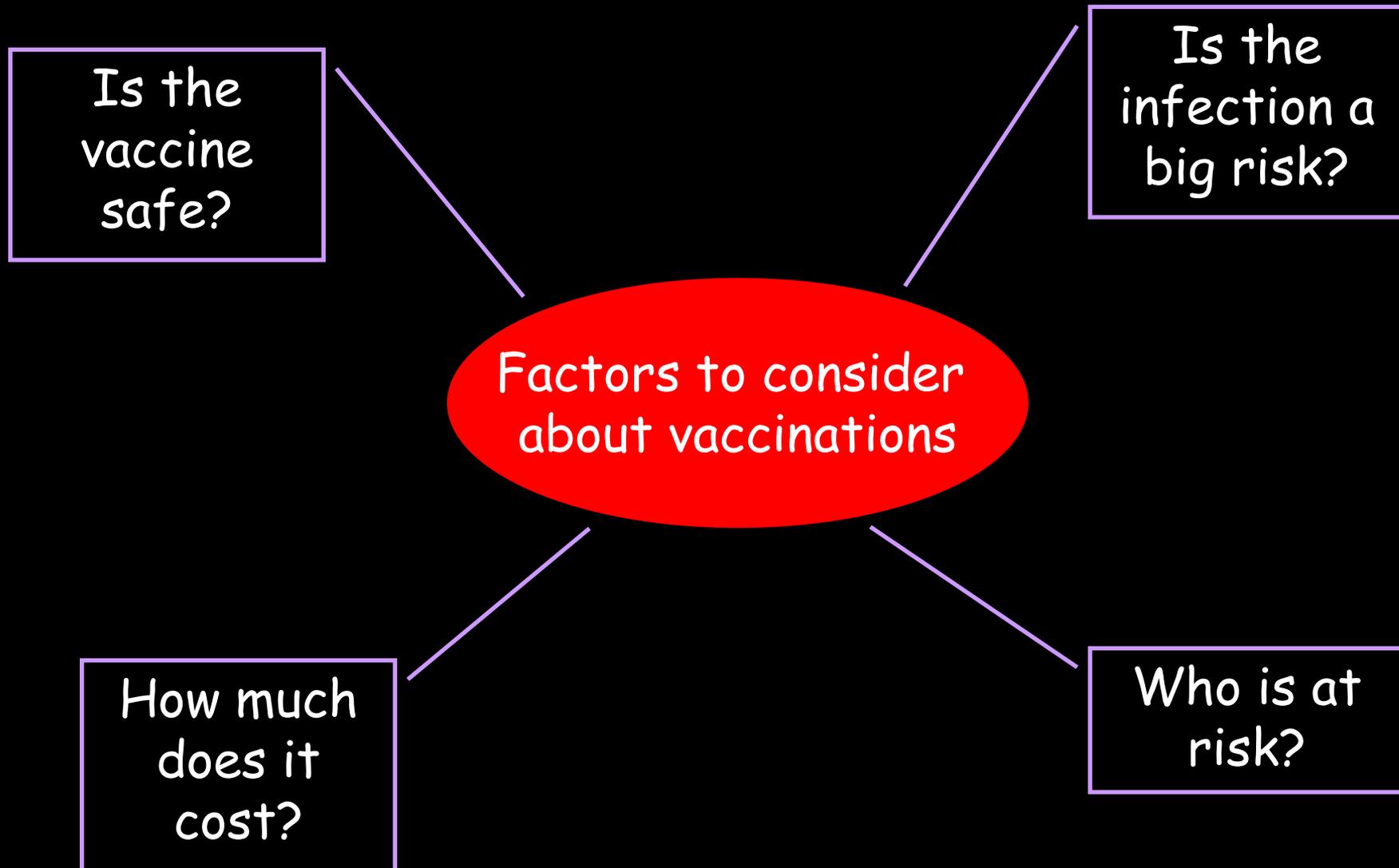
HIV stands for Human Immunodeficiency Virus, and can be undetected for years before developing into....

AIDS, which stands for Acquired Immune Deficiency Syndrome.

Graph showing HIV and AIDS trends in the UK.



Vaccination Policies



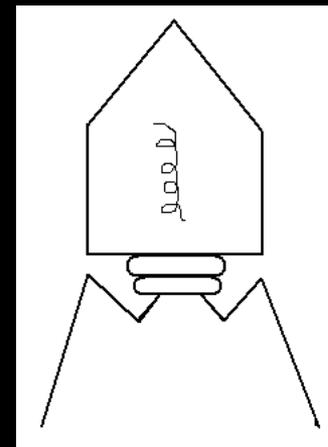
Using Antibiotics

Antibiotics can be used to kill bacteria. However, there are two problems:

1) Overuse of antibiotics can lead to bacteria becoming resistant (e.g. the MRSA "superbug"). This means that antibiotics must be used sparingly.

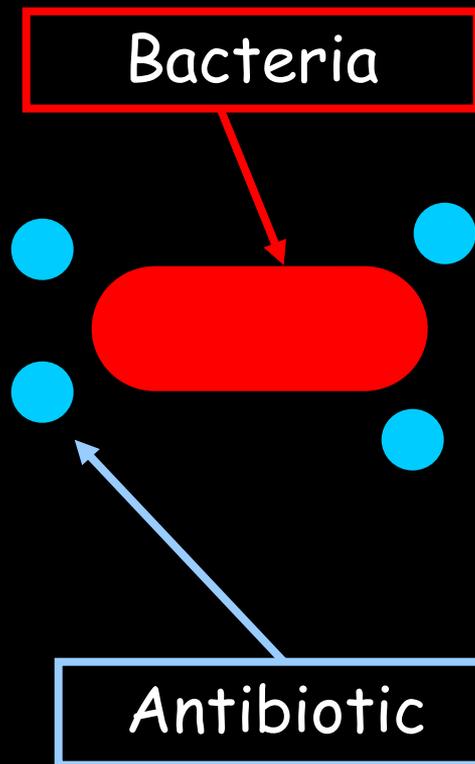


2) Antibiotics have no effect on a virus, like the common cold. It is difficult to kill a virus without damaging body tissue. A virus is usually allowed to "run its course".



Super Bacteria

Here's how the bacteria become resistant over time:



- 1) Some strains of bacteria are resistant and some aren't.
- 2) The non-resistant bacteria are killed by the antibiotic.
- 3) The resistant bacteria survive.
- 4) The resistant bacteria reproduce and pass on their survival genes to their offspring. This is how the bird flu virus developed.

Vaccinations

Some people argue that the MMR vaccine is a good idea, others think it is a bad idea. Briefly summarise each side of the argument:

For

Against

MMR vaccine

Developing new drugs

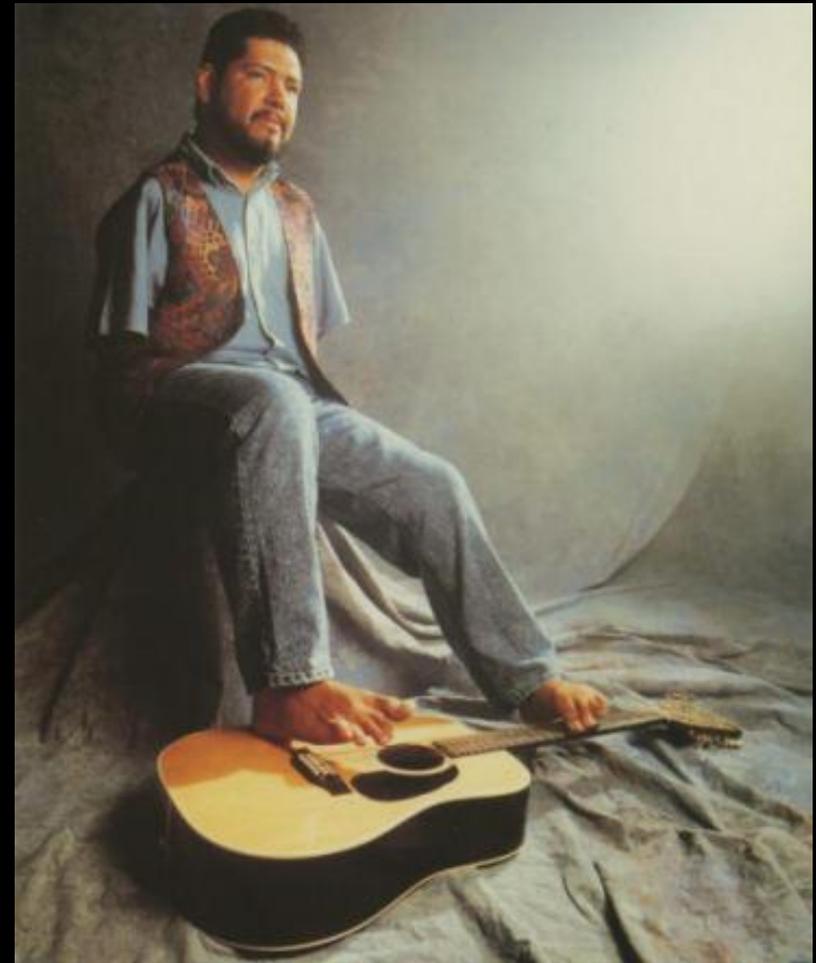
Before a new drug can be approved it has to go through a strict testing process. Consider the example of thalidomide:

Date	Event
Mid 1950s	Animal testing using thalidomide was undertaken. Tests showed that it was safe but the tests were "inadequate" - no tests were done on pregnant animals
Late 1950s	Thalidomide prescribed to pregnant mothers to help sleep and morning sickness problems
Early 1960s	Babies are born with birth defects and the drug was banned worldwide. Around 12,000 deformed Thalidomide babies born, 4,000 die in first year.
Mid 1960s	Tests show that Thalidomide can help leprosy sufferers and it is still used today for this purpose.

Thalidomide children



Mat Fraser,
comedian and actor



Tony Melendez,
guitarist

Researching new medicines

Before new drugs can be approved they have to go through three stages. What are the advantages and disadvantages of each stage?

1. Is it toxic? Tests are done on cells



2. Is it safe for animals? Animal tests are carried out



3. Is it safe for humans? Human volunteers are tested on.

Placebos

Clinical trials can be done in different ways:

1) Blind trials

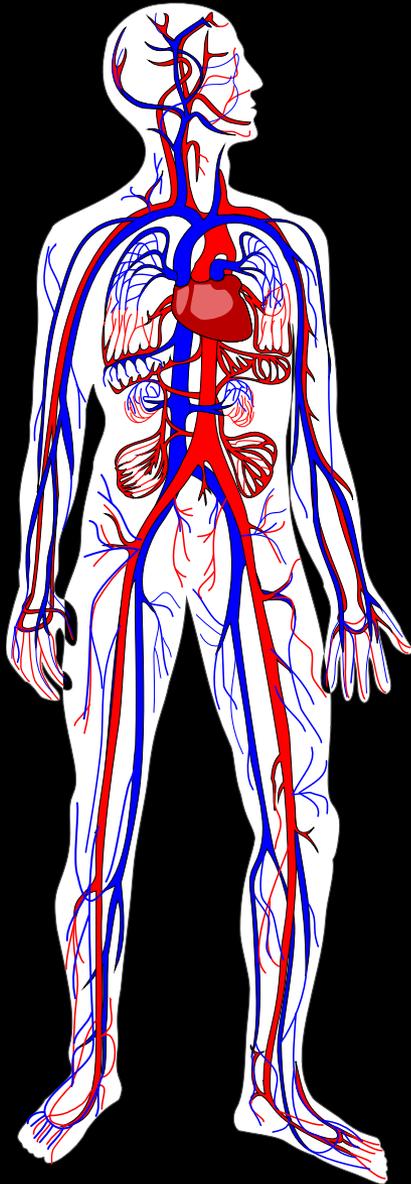
Patients do not know which drugs they are taking - a real drug or a "placebo"

2) Double blind trial

Neither the doctors or the patients know if they are taking the real drug

Placebos offer an ethical dilemma as a patient might be sick and still be given a "dummy" pill. Also, you might notice if you had a placebo as you wouldn't get the side effects of normal drugs...

The Circulatory system

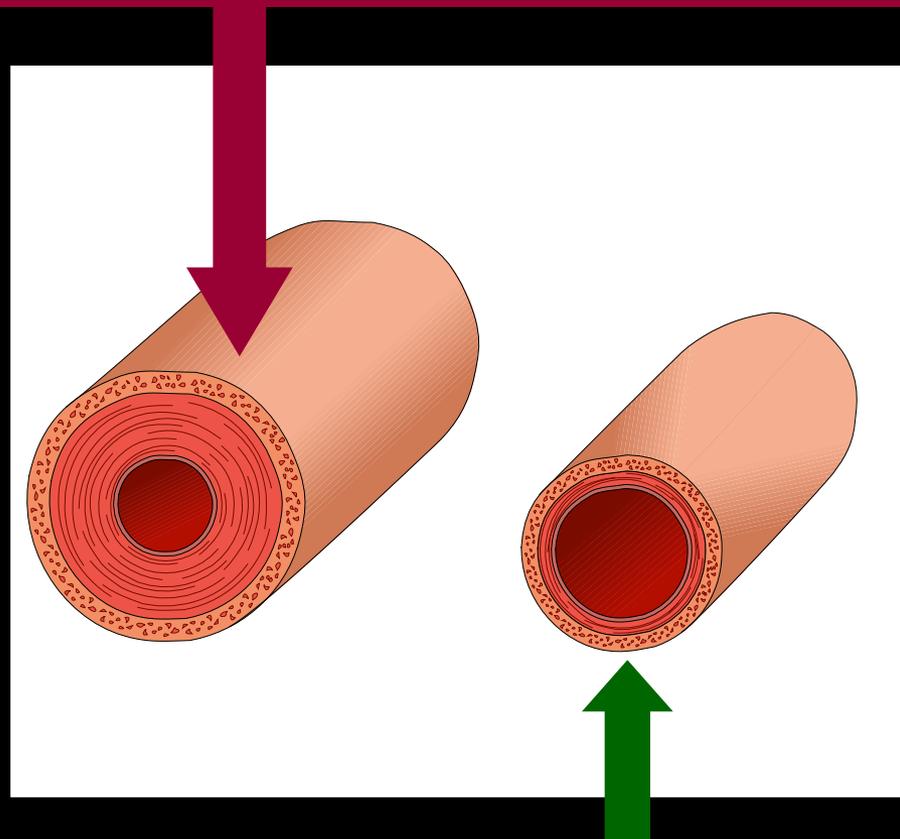


The circulatory system is responsible for pumping _____ around the body. We need blood to be taken around the body because blood contains _____ and _____. These are needed so that all the _____ in our bodies can produce _____ through _____.

Words - energy, blood, glucose, respiration, oxygen, cells

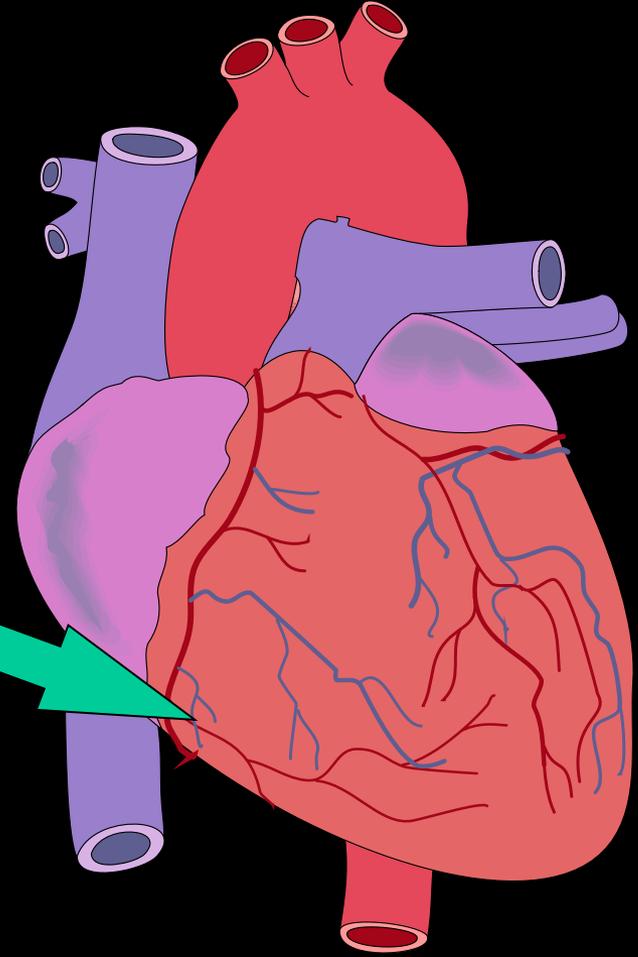
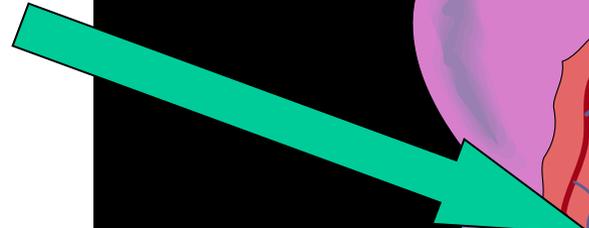
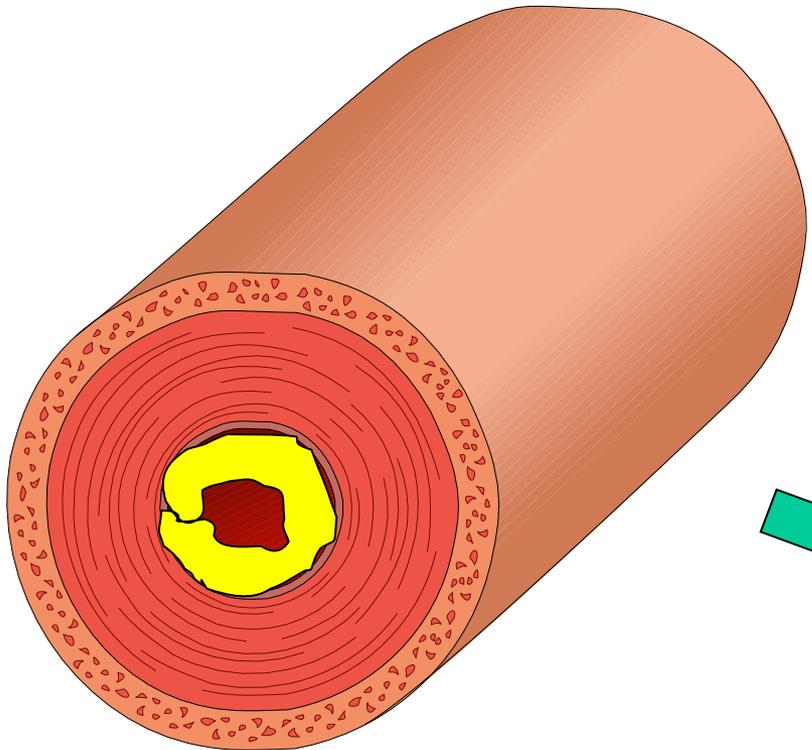
Arteries and veins

Arteries carry high pressure blood away from the heart. They have smaller lumen (channels) and no valves.



Veins carry low pressure blood back to the heart. They have thinner, less elastic walls and have valves to prevent backflow of blood.

Heart disease



Heart disease and High Blood Pressure

Heart disease and high blood pressure are conditions where the _____ and blood vessels experience extra strain. They can be caused by:

- Excess weight
- High stress levels
- _____
- Excess _____
- Diets that are high in saturated _____, sugar or salt



Long term high blood pressure can cause blood vessels to weaken or even _____.

Words - alcohol, burst, smoking, heart, fat