

## Immune system

The immune system is made up of special cells and chemicals that fight infection. The white blood cells that make up the immune system are made in the bone marrow. These cells move through blood and tissue. Every time a microbe (germ) is overcome, the immune system remembers that microbe. If the body comes in contact with that microbe again, it will be defeated quickly.

The immune system also produces proteins called antibodies that can help neutralise infection or the toxins that some germs produce.

### The response to a cut

When skin is broken, microbes can enter the cut. The immune system sets up a defence to this invasion, which includes the following:

- White blood cells, which circle the bloodstream, 'hear' of the breach via a chemical alarm sent out by damaged cells. The white blood cells move to the cut and start 'eating' the bacteria. Pus is actually dead microbes and dead white blood cells.
- Lymphocytes are another type of immune system cell. B-lymphocytes try to identify the microbe. If the microbe has been defeated before, the lymphocytes know which antibodies have to be made in order to kill it.
- There are a number of different T-lymphocytes. Helper cells help the B-lymphocytes to make antibodies. Killer cells attack infection. Suppressor cells help to call a halt to the immune system response.

### The lymphatic system

The lymphatic system is part of the immune system. It is made up of lymph nodes that trap microbes, and the spleen (a blood-filtering organ). Lymphocytes are also found in the lymphatic system.

### Fever

A rise in body temperature, or fever, can happen with some infections. This is actually an immune system response. A rise in temperature can kill some microbes. Fever also triggers the body's repair process.

### Viral infections

The immune system keeps a record of every microbe it has ever defeated. This means it can destroy the microbe quickly if it enters the body again, before it can multiply and make you feel sick.

Some infections, like influenza and the common cold, have to be fought many times, because so many different viruses can cause these illnesses. Catching a cold from one virus does not give you immunity against the others.

### Immunisation

Immunisation works by mimicking the body's natural immune response. A small amount of the specially treated virus, bacterium or toxin (vaccine) is injected into the body. The body then makes antibodies. If a vaccinated person is exposed to the actual virus, bacterium or toxin, they won't get sick. Vaccinations are available against many diseases, such as measles and tetanus.

### Other defences

As well as the immune system, the body has a number of other ways to defend itself against microbes, including:

- **Skin** – a waterproof barrier that secretes oil with bacteria-killing properties.
- **Lungs** – mucous (phlegm) traps particles, and small hairs (cilia) wave the mucous upwards so it can be coughed out.

- **Digestive tract** – the mucous lining contains antibodies, while the acid in the stomach can kill most microbes.
- **Other defences** – body fluids like skin oil, saliva and tears contain anti-bacterial enzymes that help reduce the risk of infection. The constant flushing of the urinary tract and the bowel can also help.

### Common problems

Some common problems of the immune system include:

- **Allergies** – the immune system reacts to a harmless substance as if it were harmful. Allergenic substances include pollen, dust or animal proteins. Common allergies include hay fever, asthma and allergic reactions to food.
- **Lupus erythematosus** – symptoms include skin rashes and painful joints.
- **Rheumatoid arthritis** – the immune system attacks the joint, causing inflammation and swelling.

### Where to get help

- Your doctor
- A specialist (ask your doctor for a referral – this may be a dermatologist, rheumatologist or immunologist).

### Things to remember

- The immune system fights infection.
- It keeps a record of every microbe defeated.
- Other lines of defence include the skin, lungs and digestive tract.

**This page has been produced in consultation with, and approved by:**

Australasian Society of Clinical Immunology and Allergy (ASCIA)

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