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How to naturally boost your immune system

When the winter months arrive, so do viruses like colds and flu – and our immune systems have to work to fight them off. But how do our immune systems work to tackle germs – and what can you do to support it?

What is the immune system?

It's easy to think of the [immune system](#) as a single thing that gives us resistance to infection and toxins. In fact, it is a complex network of cells, tissues and organs that work together to protect the body. Organs like the thymus and lymph nodes – as well as our bone marrow – are key to immune function, as are our white blood cells (leukocytes) which seek out and fight off infection.

Around 80% of our immune tissue lies within our digestive tract, acting as a protective barrier between our bloodstream and potential pathogens – organisms that cause disease – from the outside world¹. The [microbiome](#) – the millions of micro-organisms and bacteria that live in our guts – also play a key role in immune response and overall health and fitness.

How does the immune system work?

The immune system can be split broadly into two parts which have different functions – the innate and adaptive responses.

What is the innate immune system?

Professor James Brewer, chair of Basic Immunology at the University of Glasgow, explains: "The innate system is what you're born with – it very rapidly tries to control the spread of an invading pathogen, giving your adaptive immune response time to mobilise and react against the specific infection you're faced with."

The innate response is what causes a [high temperature](#), being sick, mucus production and a streaming nose, as the body tries to quickly get rid of the invader.

What is the adaptive immune response?

"The adaptive immune response is more specific," continues Brewer. "In your infant years you're generating millions of random, adaptive immune cells. These cells might be specific for dangerous challenges such as infection, or non-dangerous ones like food or body components such as insulin or joint tissues. It takes a while for your immune system to screen all these specificities and find the one that fits the infection you're faced with."

In most cases, once the immune system has found the specific fit that will eliminate the virus or bacteria, it will generate memory cells giving you lifelong immunity to that particular infection.

When rhinoviruses – the virus that causes colds – replicate they rarely produce exact copies of themselves, which is part of their strategy for survival. This is why we don't yet have a vaccine for the common cold.

"Another classic example is [HIV](#)," explains Brewer. "That's why an HIV vaccine is so difficult to develop, because there is so much variation in the virus."

Can you boost your immune system with supplements?

[Supplements](#) and products that claim to boost your immune system are commonplace, but the popular concept of 'boosting' your immune system is largely misunderstood.

Professor Charles Bangham, chair of Immunology at Imperial College London, says: "It is usually inappropriate to boost your immune system. If someone is healthy and well-nourished, the immune system is balanced between its ability to recognise toxins, viruses and bacteria – and making an inappropriate attack on the host's own tissues. In other words, an autoimmune response."

The danger is that boosting your immune response might increase the risk of autoimmune or [allergic reactions](#). A more useful approach would be to support the immune system to remain in balance.

"When we talk about boosting our immune system it only makes sense if you boost it very specifically in the way vaccines do," adds Brewer. "They are boosting a specific immune response to a particular infection."

How to support your immune system effectively

From echinacea to nasal sprays and good old vitamin C, everyone has something they swear by to stave off colds, but many of these products are not supported by scientific evidence. So what has been proven actually to support your immune system?

How to boost your immune system with diet

"Diet plays an essential part in normal immune function, by ensuring that we have the necessary nutrients to allow the immune cells to work normally," says Bangham.

"Vitamins can be helpful, but only if the person has an obvious deficiency, and probiotics might be helpful to restore a normal amount of bacteria in the gut if it has been altered by antibiotics. It seems clear that exercise, stress levels, a healthy sex life and adequate sleep also affect the efficiency of the immune response."

Eating a variety of fruits and vegetables in a wide range of colours – as part of a balanced diet – will help boost your vitamin intake.

How to boost your immune system with sleep

When we're stressed, the hormone corticosteroid is released. This can suppress the effectiveness of the immune system by lowering the number of lymphocytes. Lack of sleep has also been proven to affect the immune system. Research shows that someone sleeping five to six hours a night has a far greater risk of catching a cold than someone who sleeps for seven hours².

"Sleep is an area of interest in immunology," says Brewer. "There's an increasing number of papers looking at the link between circadian rhythms - our internal clock that regulates when we are awake or sleepy - and our immune systems³. There was a study showing that if you vaccinated in the morning you would get better immune responses than later in the day, and suggesting that your immune system is heightened in the morning and starts to wane later on⁴."

Symptoms of immunodeficiency

Indicators of serious immunodeficiency - when the immune system is compromised in some way and isn't able to fight off infections - can include recurring bouts of bronchitis and [pneumonia](#), ear and sinus infections, [meningitis](#), skin infections, blood disorders and infection of internal organs.

Why am I always ill?

Dr Tanya Lawson, a GP for Dr Morton's - the medical helpline, says: "There's no hard and fast guidance for GPs regarding how to manage recurrent viral infections in patients. Though in adults, the cause of reduced immune response is likely to be due to another disease or deficiency that has an effect on the immune system, such as low thyroid hormone levels ([hypothyroidism](#)), [type 2 diabetes](#), [anaemia](#), or undiagnosed [coeliac disease](#)."

Testing for immunodeficiency

These conditions can be easily checked for by blood testing, but adults who have recurring infections can often pose an issue for GPs if no obvious immune deficiency can be established.

"It can be down to lifestyle factors such as [obesity](#), smoking, lack of exercise, [excess alcohol](#) and poor diet," says Lawson. "Asthma and allergies may also increase the frequency of recurrent mild infections, although they do not indicate an underlying impaired immune response."

Immunodeficiency as a medication side-effect

Medication such as anti-autoimmune drugs and [chemotherapy](#) - during cancer treatment - can also impact upon immunity.

Immunodeficiency in children

Children naturally suffer more mild self-limiting viral infections than adults and the frequency reduces with age. Although in old age the immune system becomes less effective.

"At school, children will have around six or seven viral infections per year," continues Lawson. "If they have more frequent infections, especially if these are complicated by a bacterial infection requiring antibiotics, they should be investigated. And it is crucial that children are [fully immunised](#) against common diseases."

It is also important for the elderly and those who may be immune-suppressed to get the [flu vaccine](#) each year.

Is immunodeficiency genetic?

If you're prone to frequent bugs and sniffles, yet all tests prove normal and you're living a healthy lifestyle, it might be down to your genes.

"It is very hard to analyse in detail why some people get ill more often than others, as so many factors are involved, but undoubtedly your genome influences your adaptive immune response," says Brewer.

In other words, the genes you carry determine how effectively your immune system recognises viruses or bacteria and is able to deal with them. But with a healthy lifestyle and being fully vaccinated, you may be able to reduce the severity of viruses like the common cold - as your body will be better equipped to fight the infection.

Further reading

1. [Vighi et al: Allergy and the gastrointestinal system.](#)
2. [Prather et al: Behaviourally assessed sleep and susceptibility to the common cold.](#)
3. [Labrecque et al: Circadian clocks in the immune system.](#)
4. [Long et al: Morning vaccination enhances antibody response over afternoon vaccination: A cluster randomised trial.](#)

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