stitchlinks
Support
Friendship
Information
September 2008

Your Immune System

You can't see it or feel it, but your life depends on it. We take a look at the immune system and how you can improve yours…

Have you ever thought about why, when you're super busy, stressed out or over worked, life invariably hits you with another blow – a cold, flu or a cold sore? Perhaps you were studying for exams or preparing for a job interview or big day out, when wallop, you get the sniffles and start feeling under the weather. Stress can lower your immunity, but so can long-term illness, pain and poor diet, making you more susceptible to colds, flu and other infections.

So what is your immune system and what exactly does it do? You can't feel it, so how do you know whether it's healthy or not?

The fact is without your immune system you would die. It protects your body from bacteria, parasites, fungal infections, viruses and the growth of tumours. It's the system that deals with the harmful bacteria and viruses we all come into contact with on a day-to-day basis. When it's strong you'll fight off those colds; when it's weak, you'll feel as if you're a magnet for every bug going around.

When you recover from an infection, you know your immune system has worked as without it you just wouldn't get better at all.

Lines of defence

Skin and mucus membranes are the first line of defence. They create a barrier which prevents bacteria and viruses from penetrating further. Skin secretes antibacterial substances, whilst your saliva and the mucus membranes of your nose and mouth contain enzymes that attack harmful bacteria.

The major components of your immune system are your **bone marrow, thymus gland** (found between your heart and breast bone), **spleen, lymphatic system, white blood cells** (or **leucocytes**), **antibodies** and certain **hormones**. If invaders get beyond the initial barriers it will detect them and attack. A healthy immune system can even identify and destroy the early growth of malignant cells.

All components of the immune system originate from **stem cells** in your bone marrow, although some of these cells grow to maturity elsewhere. For example, the **thymus gland** is responsible for the maturation of **T cells**. One type of T cell kills cells that contain viruses or bacteria whilst another type controls and coordinates the whole immune response. They also kill certain tumour cells and some parasites, so are vital to life. It's these specific white blood cells that the HIV virus attacks, leaving your body open to many other infections.

Your **white blood cells** or **leucocytes** work as a team to fight infection and foreign invasion. They are unlike other cells in the body as they can move of their own accord. This mobility makes them available to fight infection anywhere. Each type has a specific function within the team. For

Copyright Stitchlinks Limited

Stitchlinks is unable to accept responsibility for health problems that arise and advise you to consult your GP

example, **neutrophils** – the most prevalent of white cells – are responsible for engulfing foreign particles or bacteria. Pus is a collection of dead neutrophils and other cell debris.

Eosinophils act on parasites, whilst **basophils** carry **histamine**. Histamine causes an inflammatory reaction, which is the first stage of the healing process. This causes blood vessels to dilate enabling more nutrients and white cells to reach the affected area and waste products to be carried away. It's also a chemical attractant for other members of your white cell team.

Mark and destroy

Lymphocytes, as their name implies, are found in lymph and blood. They are small white blood cells that deal with bacterial and viral infections and are made up of **B cells** and **T cells**. We've already talked briefly about T cells. The task of B cells is to produce **antibodies**. These are proteins that identify and neutralise bacteria and viruses.

Your blood contains millions of different antibodies and each type recognises a specific invader or **antigen**; an antigen is a substance that stimulates the immune system and the production of antibodies.

Antibodies mark invaders for destruction by **complement proteins** circulating in your blood. These cause the invading cells to burst, which sends out signals to other white cells to remove the debris. Complement proteins can recognise cells which don't have the markings of 'belonging to you', but the downside is that this puts barriers up for the transplantation of organs between species.

The formation of antibodies is the foundation of **vaccines**. There are many diseases that you only catch once because you will have certain B cells that have remained in your blood stream as a result of the first infection. If the same disease attacks again your body can eliminate it quickly.

A vaccine is where weakened or dead biological agents are given to stimulate an immune response and the production of antibodies against that specific disease. This will protect you against the disease itself in the future. However, some infections such as flu, or a cold have so many forms and strains that it would be impossible to vaccinate against every variation.

Natural born killers

One special type of white blood cell – a subset of lymphocytes – is the group of **Natural Killer Cells**. They make up about 15% of your white cells and are unusual as their numbers remain fairly constant whether you have an infection or not. They are thought to play a key role in killing malignant cells before they multiply and grow. They also attack and kill cells that contain infected material. Unlike other lymphocytes they don't react to specific antigens and have the ability to recognise and destroy tumour cells and those infected with viruses. This means they can act quickly and are thought to be effective in the early part of a viral infection, giving the back-up team of B and T cells time to respond.

A healthy immune system can even identify and destroy the early growth of malignant cells.

At the other end of the size scale you have large, scavenger **macrophages.** They gobble up cell debris and also produce **Tumour Necrosis Factor** (TNF) enabling your immune system to kill tumour cells and promote healing.

So you can see that between them your white cells have all the angles covered. A blood test will measure the numbers of each type in your blood, so your doctor can obtain information about the progress of an infection and other details from the results.

Lymph is blood plasma that has its own circulatory system separate from your blood system. It isn't

Stitchlinks

Stitchlinks is unable to accept responsibility for health problems that arise and advise you to consult your GP

pumped around by your heart, and relies on your movements and muscle contractions to keep the lymph flowing. This is one of the reasons why regular exercise is so important for maintaining a healthy immune system.

The **lymphatic system's** main function is to carry toxins away from the cells for elimination. It's also responsible for draining away fluids that occur as a result of the inflammatory process, plus it's able to detect and remove bacteria. Lymph is filtered through lymph nodes scattered throughout your body. These are mostly made up of B and T lymphocyte cells, which may become swollen when your body is fighting off infection.

Steroids and corticosteroids suppress the immune system, so if you're taking steroids as medication you should be aware that you will be prone to more infections.

Your **spleen** acts like a filter system for your blood; it looks for foreign invaders and filters them out. The B cells become activated in your spleen so it's an important part of the immune system. However, if it needs to be removed following an accident, it is possible to live without a spleen, although you will suffer more infections as a result. For this reason many people who have their spleen removed are advised to take regular antibiotics.

Immune suppression

It's known that certain **hormones**, notably steroids and corticosteroids suppress the immune system, so if you're taking steroids as medication you should be aware that you will be prone to more infections than normal. It's particularly important to avoid anyone with chicken pox or shingles as the Herpes Zoster virus, which is responsible for both diseases, can prove fatal if your immune system is weakened in any way.

Corticosteroids are also produced as a result of stress. Too much of this steroid circulating in your blood stream can suppress your immune system and interfere with its disease-fighting capabilities. So it's very important to keep your stress levels under control. A daily session of stitching is an excellent way of managing stress levels.

There are other hormones produced by the immune system which improve its functioning. Their primary function is to carry messages between the cells of the immune system to improve its team work.

In normal circumstances the cells of your immune system can tell which cells belong to you and which are foreign, but occasionally it makes a mistake. Conditions such as type 1 diabetes and rheumatoid arthritis (RA) are **autoimmune diseases**. This is where the immune system makes a mistake and attacks your own body's cells. In the case of type 1 diabetes the immune system slowly destroys the cells that produce insulin. In rheumatoid arthritis it attacks the joints and other tissues.

Steroids and corticosteroids suppress the immune system, so if you're taking steroids as medication you should be aware that you will be prone to more infections.

In other cases your body may react to a substance it should ignore, such as pollen or dust; this is known as an allergic reaction.

The question of transplant causes real problems as placing a foreign organ into a different body will stimulate an immune response to attack the transplanted organ. This is why it is important to match the donor and recipient closely and for the recipient to take drugs to suppress the immune system (immunosuppressants) for the rest of their lives. These bring with them the added problem of increased susceptibility to infection. There are steps we can all

Stitchlinks

Stitchlinks is unable to accept responsibility for health problems that arise and advise you to consult your GP

take to build a stronger immune system, and at this time of year it's particularly important for those of us living in the northern hemisphere as we move into our winter months.

All in the balance

Finding balance in life is important for a strong, efficient immune system and, as with other topics we've covered, this means a well-balanced diet, regular exercise, good quality sleep and managing your stress levels. A positive attitude is also very relevant in building up your immunity to infection. We all have friends who just never seem to catch colds – take a closer look at their attitude to life and you'll invariably find it's a positive, outgoing one. For a strong immune system your emotional balance is as important, perhaps more so, than the physical factors involved. Yet again this demonstrates the power of your mind.

Quick tips to boost your immune system

- Manage your stress levels – A daily dose of knitting or stitching is great for enabling you to escape from the sources of stress and helping you to relax.
- Eat foods high in antioxidants – Naturally colourful food is high in antioxidants, so fill up your plate with fruit, veg and sweet potatoes. The more natural colour you eat the better.
- Drink smoothies – Blitz together strawberries, raspberries, blueberries, blackberries and bananas with some live yoghurt to boost your good bacteria and your immune system.
- Enjoy a cup of tea – Green tea is high in antioxidants, as is Roibois (or Redbush) tea. They're naturally decaffeinated so you can drink as much as you like.
- Eat Omega-3 fats – Found in oily fish and flaxseed, Omega-3 strengthens the immune system and has been found to be beneficial in the treatment of autoimmune diseases.
- Get enough sleep – Lack of sleep will lower your ability to fight off infection, so make sure you try to get seven or eight hours of good quality sleep on most nights.
- Exercise regularly – Move around more and, if you can, exercise moderately for 30 minutes five times a week to mobilise your lymphatic system.
- Think positively – As with managing chronic pain, a positive attitude can stimulate your immune system to work more efficiently. Make a conscious effort to stop those negative thoughts in their tracks.

Copyright Stitchlinks Limited

Stitchlinks is unable to accept responsibility for health problems that arise and advise you to consult your GP

Quick tips for a healthier heart

- Recognise your moods – It's known that depression suppresses the immune system making you prone to infection and then more depressed. Get help for your depression.

- Eat more garlic – Garlic has been shown to stimulate the production and activity of white blood cells and to boost the activity of Natural Killer Cells.

- Eat live yoghurt – It's packed with friendly bacteria, which supports your own good bacteria in the fight against harmful invaders. Make sure you eat the low fat variety.

- Laugh more – A good hearty laugh helps your circulation, reduces stress and boosts your immune system. Why not take a look at the Jokes on our Free Stuff page of the website?

- Eat a balanced diet – Get enough vitamins, minerals and antioxidants. Selenium, found in Brazil nuts, zinc from wholegrains and seeds, and vitamin E found in nuts, seeds and wheat germ are immune boosters.

- Cut down on sugar – One teaspoon of sugar can significantly reduce the effectiveness of your immune system for hours. An 8oz glass of processed juice or a bowl of ice cream can contain 12 teaspoons!

- Cut down on alcohol – Three or more drinks can reduce your white cells' ability to kill invaders, inhibit Natural Killer Cells and lessen the production of Tumour Necrosis Factor. It also deprives you of nutrients.

- Give up smoking – Smoking suppresses the immune system which may make you more susceptible to lung cancer and respiratory infections. It will start to recover approximately a month after you stop.

- Don't overuse antibiotics – The over use of antibiotics can prevent you from building up your own natural defences, and kill off some of your friendly bacteria. Bacteria can also become resistant to them.

- Nurture your friendships – It has been shown that close supportive friendships can boost immunity. Close contact and hugging are even more effective. Talking problems over will help to lower stress as well.

- Knit or stitch – A knitting or stitching project can help you to manage your stress levels, control your weight, stop smoking and drinking and, as our first research project showed, improve your mood.

Copyright Stitchlinks Limited

Stitchlinks is unable to accept responsibility for health problems that arise and advise you to consult your GP