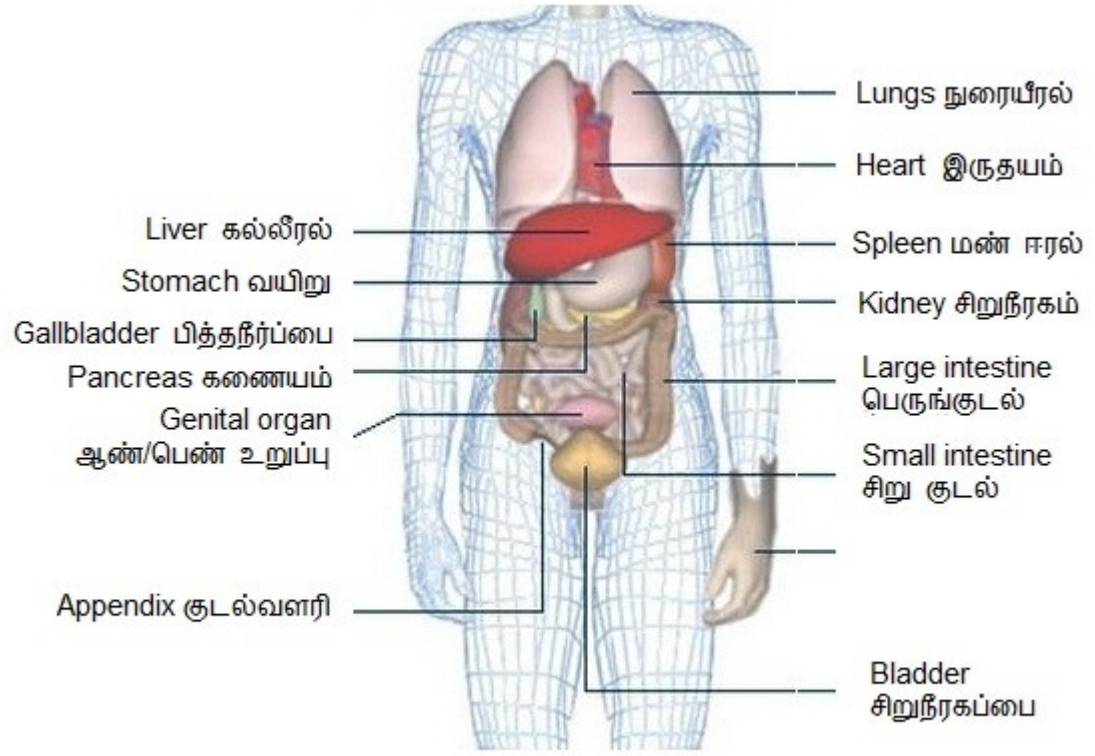
உடல் உறுப்புகள் & செயலபாடுகள் BODY ORGANS & FUNCTION



Human Body Organs மனித உடல் உறுப்புகள்

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HEART

To pump oxygen-rich blood throughout your body and oxygen-poor blood to your lungs.

Four chambers

Your heart is divided into four hollow chambers. The upper two chambers are called atria. They are joined to two lower chambers called ventricles. These are the pumps of your heart.

One-way valves between the chambers keep blood flowing through your heart in the right direction. As blood flows through a valve from one chamber into another the valve closes, preventing blood flowing backwards. As the valves snap shut, they make a thumping, 'heart beat' noise.

Double pump

Blood carries oxygen and many other substances around your body. Oxygen from your blood reacts with sugar in your cells to make energy. The waste product of this process, carbon dioxide, is carried away from your cells in your blood.

Your heart is a single organ, but it acts as a double pump. The first pump carries oxygen-poor blood to your lungs, where it unloads carbon dioxide and picks up oxygen. It then delivers oxygen-rich blood back to your heart. The second pump delivers oxygen-rich blood to every part of your body. Blood needing more oxygen is sent back to the heart to begin the cycle again.

Heart rate

Resting heart rate is usually between 72-80 beats per minute in women and 64-72 beats per minute in men.

When you exercise or feel anxious your heart beats more quickly, increasing the flow of oxygenated blood to your muscles.

On average, your maximum heart rate is 220 beats per minute minus your age. So a 40 year old would have a maximum heart rate of 180 beats per minute.

KIDNEY

To clean your blood by removing excess water (and salt) and produce urine.

Balancing your blood

For your body to work properly, the conditions inside it, such as water, pH and salt levels, need to be kept constant. Your kidneys play a vital role in keeping your blood composition constant. They filter your blood to remove excess water and waste products, which are secreted from your kidneys as urine.

The main substances your kidney filter out of your blood are:

- Water
- Nitrogen-containing compounds like urea
- Salts
- Acids
- Alkalis

Excess water and waste products are secreted as urine. Your kidneys vary the amount of a substance that is reabsorbed into the blood or secreted as urine. In 24 hours, your kidneys filter around 150 litres of blood and produce roughly 1.5 litres of urine.

Regulating blood pressure

When your kidneys detect that your blood pressure is dropping, they secrete an enzyme called renin. This enzyme triggers a chain of events that makes your kidneys reabsorb more salt and water, leading to an increase in blood pressure.

When kidneys go wrong

People can live healthily with one functioning kidney. However, when about 90% of kidney function has been lost, a person can only survive by having dialysis. Dialysis works by using a machine that replicates the blood-cleaning function of healthy kidneys. In the most extreme cases of kidney failure, survival depends on the person receiving a donor organ.

LUNGS

To deliver oxygen to and remove carbon dioxide from your blood.

Network of airways

Your lungs are a pair of large sponge-like organs that almost fill your chest cavity. Your left lung is slightly smaller than your right lung, to make space for your heart.

When you breathe in, you suck air in through your nose and mouth and down a tube called the trachea. Your trachea divides into two tubes called the primary bronchi. One enters each lung. From there, the bronchi progressively branch into smaller airways, which eventually lead to tiny air sacs called alveoli. This intricate network of airways looks like an upside-down tree.

Exchanging gases

Your alveoli are surrounded by minute blood vessels, as this is where gases diffuse from your lungs into your blood and from your blood into your lungs. Oxygen passes from your alveoli into your blood and carbon dioxide, which is produced when your cells break down nutrients, passes from your blood into your alveoli.

The total surface area of your alveoli is about the size of a tennis court. However, if you're not doing vigorous exercise, you only use about one-twentieth of your lungs' gas-exchanging surface.

Breathing in and out

You normally breathe in and out about 500ml of air 15 times a minute. This is increased if your body needs more oxygen, for example when you're doing exercise.

Air is forced in and out of your lungs by movements of your diaphragm and other breathing muscles. When you breathe in, your breathing muscles contract, pulling your ribs up and out. The space within your chest increases and reduces the air pressure inside your lungs. As a result, air flows into your lungs. When you breathe out, your muscles relax and your ribs move down and in. The space within your chest decreases again, the pressure inside your lungs increases, and air flows out.

LIVER

To get rid of toxins, to regulate your blood sugar levels and to produce bile.

Chemical processing factory

Hepatic cells in Liver carry out chemical processes and change most of the nutrients you consume into forms your body cells can use.

They

- Convert sugars and store and release them as needed, thereby regulating your blood sugar level
- Break down fats and produce cholesterol
- Remove ammonia from your body.
- Detoxify drugs and alcohol
- Produce bile, which breaks down fats in the food your eat

Security guard

Kupffer cells in Liiver.

- Remove damaged red blood cells
- Destroy microbes and cell debris

Essential for life

Because your liver fulfils so many vital functions, you would die within 24 hours if it stopped working. A common sign of a damaged liver is jaundice, a yellowness of your eyes and skin. This happens when bilirubin, a yellow breakdown product of your red blood cells, builds up in your blood.

SPLEEN

Cleaning your blood, destroying old red blood cells and fighting infection.

Filtering blood

Your spleen acts as a filter for your blood, cleansing it of bacteria, viruses and other debris. When blood flows through your spleen, white blood cells attack and remove any foreign invaders. This keeps your blood clean and helps protect you against infection.

Destroying old red-blood cells

Red blood cells have a lifespan of around 120 days, after which your spleen breaks them down. The red blood cell remains are transported elsewhere in your body where they are excreted or recycled to manufacture new red blood cells.

Making blood cells

Before birth, foetuses produce red and white blood cells in their spleens. Shortly before birth the spleen loses its ability to make red blood cells and bone marrow takes over this job.

PANCREAS

Secreting digestive enzymes and hormones that control blood sugar levels

Digestion

When you eat, your pancreas releases digestive juices through a duct into your first part of your small intestine. This fluid is rich in enzymes that break down fats, proteins and carbohydrates. It also contains sodium bicarbonate which neutralises acid in your stomach.

Blood sugar levels

Your pancreas produces insulin and glucagon, two hormones that regulate sugar levels in your blood. Insulin and glucagon are secreted from your pancreas directly into your blood.

When the concentration of glucose (a sugar) rises in your blood, insulin is released. Insulin lowers blood glucose levels.

Glucagon has the opposite effect of insulin. It triggers the release of stored sugars, increasing the concentration of glucose in your blood. Glucagon acts as a control mechanism whenever your body produces too much insulin.

GALLBLADDER

To store and concentrate bile produced in your liver

Storing and concentrating bile

Bile is a greenish-yellow, slightly acidic fluid that is made in your liver. You produce about one litre of it a day.

Bile is stored in your gall bladder and once it gets there, it is concentrated by the removal of water.

Breaking down fats

After a meal, your gallbladder contracts, squeezing bile into your small intestine. Bile breaks down fat in the food you eat.

Gallstones

Most gall bladder disorders are due to the presence of gallstones. Gallstones form when cholesterol, one of the components of bile, crystallises to form a stone-like material.

STOMACH

Storing food, breaking food down and mixing it with juices secreted by your stomach lining

Food store

Your stomach is a short-term food-storage facility. This allows you to consume a large meal quickly and then digest it over an extended period of time. When full, your stomach can hold around one litre of chewed up food.

Chemical breakdown

As soon as food enters your stomach, your stomach lining releases enzymes that start breaking down proteins in the food. Your stomach lining also secretes hydrochloric acid, kills bacteria, protecting your body from harmful microbes which can enter your body in food.

Your stomach protects itself from being digested by its own enzymes, or burnt by the corrosive hydrochloric acid, by secreting sticky, neutralising mucus that clings to the stomach walls. If this layer becomes damaged in any way it can result in painful and unpleasant stomach ulcers.

Physical breakdown

Waves of muscular contraction along your stomach wall, known as peristalsis, break food down into smaller pieces, mix it with fluids secreted from your stomach lining and move it through your stomach. This creates a mixture that resembles thick cream.

Release of food into small intestine

When food has been broken down sufficiently, small amounts are squirted out of your stomach into your small intestine for further processing. This normally occurs within four hours of eating a meal.

SMALL INTESTINE

Chemical digestion of food and absorption of nutrients into your blood

Longest section of your digestive tract

Your small intestine is around five metres long. It is longer than your large intestine but has a smaller diameter.

Chemical digestion

After food is churned up in your stomach and squirt small amounts of food into the top of your small intestine called the duodenum.

Your pancreas releases digestive juices through a duct into your duodenum. This fluid is rich in enzymes that break down fats, proteins and carbohydrates. It also contains sodium bicarbonate which neutralises acid produced in your stomach.

Your gall bladder squeezes out bile down a duct into your duodenum. Bile helps break down fats in your food.

Absorbing nutrients

Most of the nutrients in the food you eat pass through the lining of your small intestine into your blood.

Remains passes into the large intestine

By the time food leaves your small intestine all the nutrients in your food will have entered your bloodstream. All that remains is indigestible food which is passed from your small intestine to your large intestine for further processing.

LARGE INTESTINE

To convert food waste products into faeces

Making faeces

Your large intestine is the final part of your digestive tract. Undigested food enters your large intestine from your small intestine. It then reabsorbs water that is used in digestion and eliminates undigested food and fibre. This causes food waste products to harden and form faeces, which are then excreted.

BLADDER

To store urine

Filling up

Urine, made in your kidneys, is transported to your bladder via two narrow tubes known as ureters. As your bladder fills up with urine it stretches. An adult bladder can usually hold about a pint of fluid comfortably.

Taking a leak

Urine leaves the body by flowing out of the bladder down a tube called the urethra. The junction between the bladder and urethra is opened and closed by a muscle known as a sphincter. When you decide you need to urinate your brain tells this sphincter to relax, opening the bladder-urethra junction. At this moment, the bladder contracts, forcing the urine down the urethra and out of the body.

APPENDIX

No known function in humans

The appendix has no known function in humans. Some scientists believe that the appendix will disappear from the human body.

Rich in infection-fighting lymphoid cells

The appendix is rich in infection-fighting lymphoid cells, suggesting that it might play a role in the immune system. Whether the appendix has a function or not, it can be removed without any ill effects.

Appendicitis

Indigestible food delivered from the small intestine to the large intestine flows into the appendix and is forced out by contraction of the muscular walls of the appendix. A blockage in the opening where the appendix attaches to the large intestine can lead to inflammation of the appendix, known as appendicitis. This can cause acute pain, fever, nausea, vomiting and loss of appetite, but can be cured easily by removing the appendix.

GENITAL ORGAN

To produce eggs, carry a developing baby and to give birth

Eggs, ovaries and sex hormones

The female genitals consist of two glands called ovaries that are responsible for producing eggs and female sex hormones. Once women reach sexual maturity, they experience a hormone regulated monthly fertility cycle known as a menstrual cycle. These hormones control the maturation and release of an egg from one of the ovaries every month, and they affect the lining of the womb making it ready to receive a fertilised egg. Mature eggs are released from the ovary and move along the fallopian tube to the uterus. If an egg is fertilised, it tries to embed itself in the uterus wall, ready to develop into a foetus. If no egg becomes implanted, the uterus lining is shed, and this results in a flow of menstrual blood, know as the 'period'.

When a baby girl is born, she already carries all the eggs that she will ever produce through her life. A boy, however, does not carry sperm at birth, and only begins to produce sperm when he reaches sexual maturity.