PHARMACHEMICAL IRELAND
Focused on a Healthy Future

Pharmachemical Ireland's

So Thats What Happens!

Volume 2

Science, only better



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What's the story with Depression

What is Cancer?

Cancer is the general name for a group ofmore than 100 diseases in which cells in a part of the body begin to grow out of control. Although there are many kinds of cancer, they all start because abnormal cells grow out of control. Untreated cancers can cause serious illness and even death.

Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide more quickly until the person becomes an adult. After that, cells in most parts of the body divide only to replace worn-out or dying cells and to repair injuries.

Cancer cells develop because of damage to DNA. This substance is in every cell and directs all of the cell's activities. Most of the time when DNA becomes damaged, either the cell dies or is able to repair the DNA. In cancer cells, the damaged DNA is not repaired. People can inherit damaged DNA, which accounts for inherited cancers. Many times though, a person's DNA gets damaged by things in the environment, like,chemicals, viruses, tobacco smoke or too much sunlight.

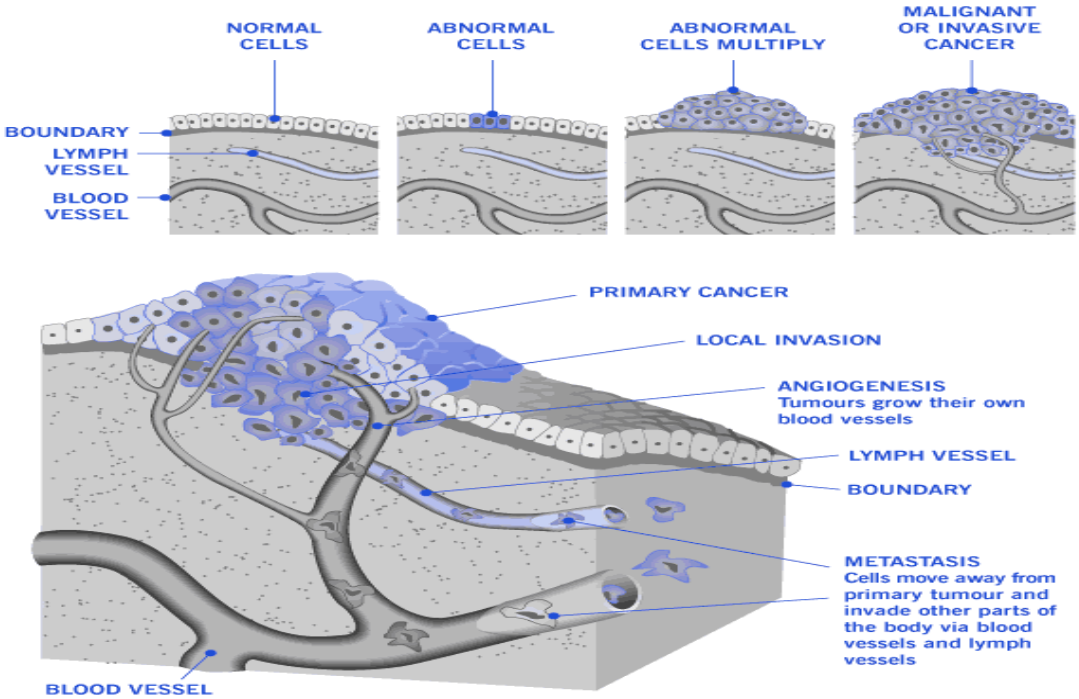

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Fig 1: Growth of cancer cells

What do malignant and benign mean?

In some tumours, the cells stay in the same place and as the tumour stops growing before it gets very large - often because it simply runs out space to grow. These are called benign tumours and they are not normally dangerous. We all have benign tumours, such as moles and warts. However, in other tumours the cells are able to invade the surrounding tissue and spread into nearby organs where they can cause serious and, eventually, fatal damage. These are called malignant tumours.

The origin of the word *cancer* is credited to the Greek physician Hippocrates (460-370 B.C.), considered the "Father of Medicine." Hippocrates used the terms *carcinos* and *carcinoma* to describe non-ulcer forming and ulcer-forming tumours. In Greek these words refer to a crab, most likely applied to the disease because the finger-like spreading projections from a cancer called to mind the shape of a crab. Carcinoma is the most common type of cancer.

Can you inherit cancer?

Cancer itself cannot be inherited, but some people do inherit a higher risk of getting cancer. This is because they inherit, from their parents, a slightly damaged version of one of the genes involved in controlling cell division. On its own, this damaged gene is not enough to make cells cancerous. Normally, two or three different genes have to be damaged before a cell will become cancerous. That is why so very few of the billions of cells in our body ever become cancerous. However, if someone starts out with every cell in their body carrying damage in one of these genes, the chance of a cell getting the other types of gene damage and becoming cancerous is much higher. Some of these inherited damaged genes have been identified, such as BRCA1 and BRCA2 which increase the risk of getting breast cancer by five to seven times.

Do tumours need a blood supply?

A tumour usually starts with a single cancerous cell that begins growing and dividing. The resulting mass of cancer cells soon gets large enough to need a new blood supply to provide oxygen and nutrients and to remove waste products. Without a blood supply, the cells in the middle of the tumour will die off. In fact,

tumours without a blood supply are unable to grow more that about one millimetre across. As soon as they start growing, tumours release small, hormone-like molecules that cause nearby blood vessels to start growing towards the tumour until they actually form a new branch supplying the tumour with blood.

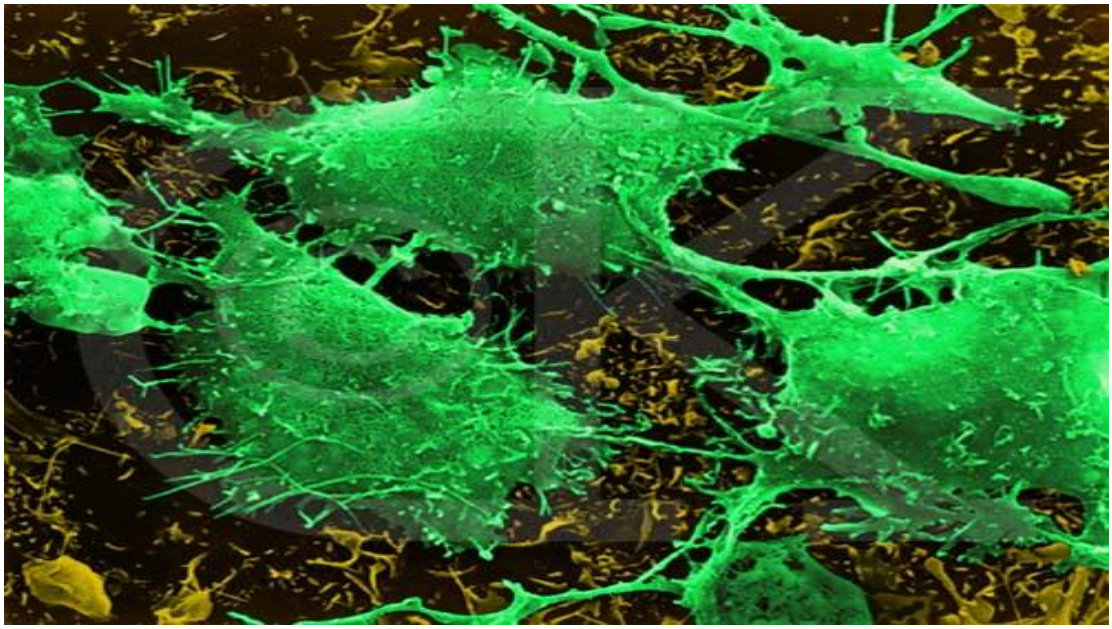

Fig 2: Brain cancer cells

What are the most common types of cancer?

Breast

Breast cancer is the most common form of cancer in women in Britain with about 38,000 new cases being diagnosed every year.

Cervical

All women woman aged 20-64, who've had sexual intercourse, should have regular smear tests - these tests can detect the early changes of cervical cancer.

Childhood Lymphoma

Lymphoma is a cancer of the lymphatic system - the system that helps the body fight infection.

Colorectal/Bowel

It may be embarrassing for some to talk about, but with early detection colorectal cancer is one of the most treatable.

Laryngeal

Laryngeal cancer, or cancer of the larynx, most commonly develops on the vocal chords.

Leukaemia

It may be perceived as a childhood cancer, but leukaemia can affect anyone at any stage of life.

Lung

There are more than 38,000 new cases of lung cancer in the UK every year.

Ovarian

Each year in the UK about 6,800 women are diagnosed with cancer of the ovary - it usually occurs after the menopause.

Prostate

A healthy, low-fat diet seems to help prevent prostate cancer.

Skin

Most types of skin cancer are fully curable and easily prevented.

Stomach

Stomach cancer is more common in men, particularly in late middle age.

Testicular

The number of cases of testicular cancer has doubled since the 1980s - about 1,500 new cases are diagnosed in the UK each year.

Womb

Cancer of the womb (also known as uterine or endometrial cancer) rarely occurs before the menopause, and is most common between the ages of 50 and 70.

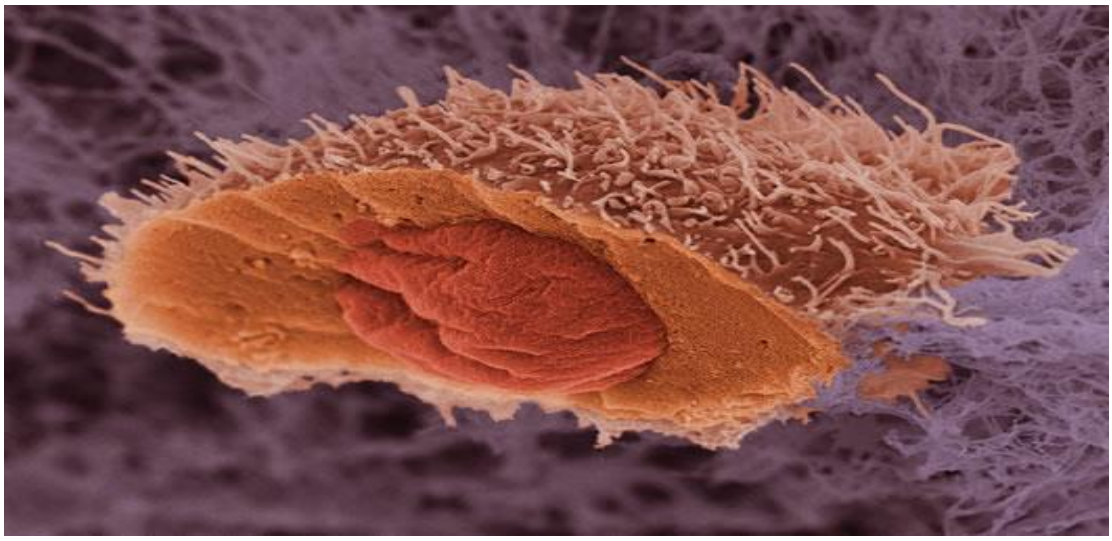

Fig 3: Cancerous cell under magnification

How is cancer treated?

Chemotherapy

Chemotherapy is the use of anti-cancer drugs. It is administered by pill, IV, injection or applied on the skin.

Surgery
This is usually the first choice used by physicians. However, it is not effective if the cancer has spread. Surgery is used to remove tumours, or masses.

Radiation Therapy
Radiation therapy is the use of energy to kill cancer cells and reduce the size of tumors.

Immunotherapy/Biological Response Modifiers (BRM)
Immunotherapy is treatment that uses the body's own immune system to fight cancer.

How to reduce your chances of cancer?

More than one in three of us will develop cancer at some time in our lives. Our risk of cancer is influenced by our genes and our environment. Things that increase our chance of developing cancer are commonly called risk factors. Here are 7 steps to help you reduce the risk of cancer, as recommended by the Mayo Clinic.

Cancer prevention step 1: Don't use tobacco

All types of tobacco put you on a collision course with cancer. Rejecting tobacco, or deciding to stop using it, is one of the most important health decisions you can make. It's also an important part of cancer prevention. Avoiding tobacco in any form significantly reduces your risk of several cancers, including: lung, oesophagus, voice box.

Cancer prevention step 2: Eat a variety of healthy foods

Though making healthy selections at the grocery store and at mealtime can't guarantee you won't get cancer, it may help reduce your risk. About 30 percent of cancers are related to issues of nutrition, including obesity. Eat plenty of fruit and veg, limit the amount of fat and drink alcohol in moderation, if at all.

Cancer prevention step 3: Stay active and maintain a healthy weight

Maintaining a healthy weight and exercising regularly also may play a role in cancer prevention. Obesity may be a risk factor for cancers of the prostate, colon, rectum, uterus, ovaries and breast. Physical activity can help you avoid obesity by controlling your weight. Physical activity on its own may also lower your risk of other types of cancer, including breast cancer and colon cancer. Try to be physically active for 30 minutes or more on most days of the week. Your exercise sessions can include such low-key activities as brisk walking, raking the yard or even ballroom dancing.

Cancer prevention step 4: Protect yourself from the sun

Skin cancer is one of the most common kinds of cancer — and one of the most preventable. Although repeated exposure to X-rays or contact with certain chemicals can play a role, sun exposure is by far the most common cause of skin cancer.

Most skin cancer occurs on exposed parts of your body, including your face, hands, forearms and ears. Nearly all skin cancer is treatable if you detect it early, but it's better to prevent it in the first place. Try these tips:

- **Avoid peak radiation hours.**
- **Stay in the shade.**
- **Cover exposed areas.**
- **Don't skimp on sunscreen.**
- **Don't use indoor tanning beds or sunlamps.**

Cancer prevention step 5: Get immunized

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Certain cancers are associated with viral infections that can be prevented with immunizations. Talk to your doctor about immunization against:

- **Hepatitis B.** Hepatitis B can increase your risk of developing liver cancer. Vaccination is recommended for all babies in the United States. Certain high-risk adults also may need to be vaccinated.

- **Human papillomavirus (HPV).** HPV is a sexually transmitted virus that can lead to cervical cancer. The Food and Drug Administration approved a vaccine to prevent HPV in 2006.

Cancer prevention step 6: Avoid risky behaviours

Reduce your risk of certain cancers by avoiding risky behaviours that can lead to infections that may increase your risk of cancer. Viruses transmitted sexually or by sharing contaminated needles include:

- **HPV.** HPV increases your risk of cervical cancer or penis (penile) cancer. The more sexual partners you have in your lifetime, the more likely you are to have HPV.

- **Human immunodeficiency virus (HIV).** People with HIV or AIDS have an increased risk of anal cancer, cervical cancer, liver cancer, lymphoma and Kaposi's sarcoma. People with multiple sexual partners and intravenous (IV) drug users who share needles have an increased risk of HIV.

- **Hepatitis B and C.** Chronic hepatitis B or hepatitis C infection can increase your risk of liver cancer. Both forms of hepatitis can be passed through sexual contact with an infected person or sharing needles with an infected drug user.

Cancer prevention step 7: Get screened

Regular screening and self-examination for certain cancers may not prevent cancer, but it can increase your chances of discovering cancer early — when treatment is more likely to be successful. Screening should include your skin, mouth, colon and rectum. If you're a man, it should also include your prostate and testes. If you're a woman, add cervix and breast cancer screening to your list. Be aware of changes in your body — this may help you detect cancer early, increasing your chances of successful treatment. If you notice any changes, see your doctor.

Fig 4: Ribbons for cancer awareness

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Aeroplanes – how do they fly?

The history of the aeroplane

There have been many pioneers in the history of aeroplanes but the first to successfully fly an aeroplane were the Wright Brothers, Orville and Wilbur. Orville and Wilbur were skilled craftsmen and keen experimenters. They owned a business making and repairing bicycles. They were able to bring the value of a scientific approach to the invention of a heavier-than-air machine.

On the 17th of December 1903 they were successful in producing the world's first powered flight. Wilbur ran alongside the plane, *Flyer*, as Orville took off on the sand dunes outside a town called Kitty Hawk in North Carolina, USA. The flight lasted just 12 seconds and travelled 37 metres. This distance is less than the wingspan of a modern airliner, but it was a major accomplishment at the time.

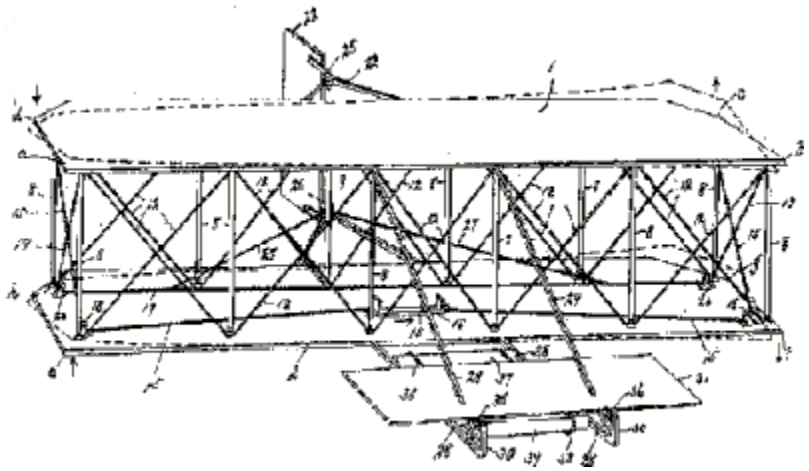

Fig 5: the Wright brothers patented drawing of aeroplane.

The brothers received very little recognition in their home country. People were very sceptical about their achievement. On the 8th of October 1908, Wilbur flew their famous plane, *Flyer*, in front of a large crowd in France. The next day it was all over the French newspapers.

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How does an aeroplane fly?

Before we look at how the aeroplane flies we must first look at air. Air is a physical substance which has weight. It has molecules which are constantly moving. Air pressure is created by the molecules moving around. Moving air has a force that will lift kites and balloons up and down. Air is a mixture of different gases; oxygen, carbon dioxide and nitrogen. All things that fly need air. Air has power to push and pull on the birds, balloons, kites and planes.

In 1640, Evagelista Torricelli discovered that air has weight. When experimenting with measuring mercury, he discovered that air put pressure on the mercury.

Francesco Lana used this discovery to begin to plan for an airship in the late 1600s. He drew an airship on paper that used the idea that air has weight. The ship was a hollow sphere which would have the air taken out of it. Once the air was removed, the sphere would have less weight and would be able to float up into the air. Each of four spheres would be attached to a boat-like structure and then the whole machine would float. The actual design was never tried.

Hot air expands and spreads out and it becomes lighter than cool air. When a balloon is full of hot air it rises up because the hot air expands inside the balloon. When the hot air cools and is let out of the balloon the balloon comes back down.

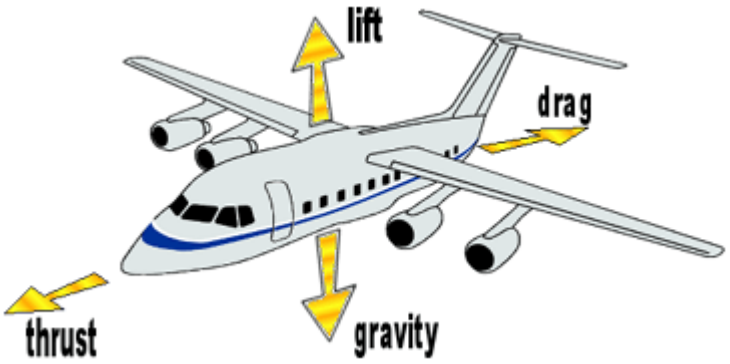

Fig 6: Aeroplane flight

Sir Isaac Newton proposed three laws of motion in 1665. These Laws of Motion help to explain how a planes flies.

1. If an object is not moving, it will not start moving by itself. If an object is moving, it will not stop or change direction unless something pushes it.
2. Objects will move farther and faster when they are pushed harder.
3. When an object is pushed in one direction, there is always a resistance of the same size in the opposite direction.

Aeroplanes planes are able to fly due to differences in air pressure. When a plane is on the ground, not moving, the pressure around it is the same top and bottom. The downward pressure of gravity is the same as the upward pressure of the ground. The plane has no lift.

The shape of the wing gives the aeroplane the ability to lift of the ground. The wings are more curved on top than they are the bottom. As the wings move through the air, the air that travels over the top of the wings has further to move than the air travelling below. Air that moves faster has lower air pressure than air that moves slower. This means that there is lower air pressure above the wing than below. The result is an upward force or pressure and the plane is able to lift.

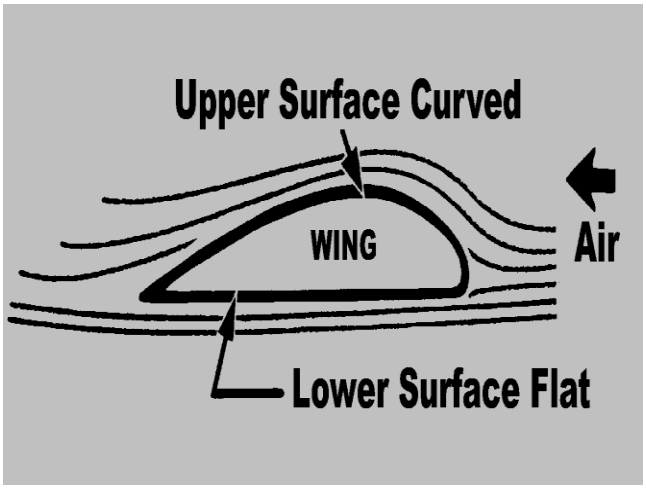

Fig 7: Cross section of a plane wing

A plane is able to move forward because of the engine powered propeller. As it starts to

move forward, the air pressure on the plane starts to change as the air moves over the wings. The upward pressure is now greater than the downward pressure of gravity and the plane starts to lift of the ground and is able to fly.

What speed is a plane travelling on the run way to allow it to take off?

Aircraft	Takeoff Weight	Takeoff Speed
Boeing 737	100,000 lb 45,360 kg	150 mph 250 km/h 130 kts
Boeing 757	240,000 lb 108,860 kg	160 mph 260 km/h 140 kts
Airbus A320	155,000 lb 70,305 kg	170 mph 275 km/h 150 kts
Airbus A340	571,000 lb 259,000 kg	180 mph 290 km/h 155 kts
Boeing 747	800,000 lb 362,870 kg	180 mph 290 km/h 155 kts
Concorde	400,000 lb 181,435 kg	225 mph 360 km/h 195 kts

Table 1: Take off speeds for various planes.

How do you manoeuvre the aeroplane in flights?

Real planes have segments called ailerons inserted in the wings and segments called rudders and elevators inserted respectively in the vertical fin and horizontal stabilizer. The pilot controls their position from the airplane cockpit. When the pilot moves them into the airstream, they cause the plane to react to air pressure. The pilot uses them to go right or left and also up and down.

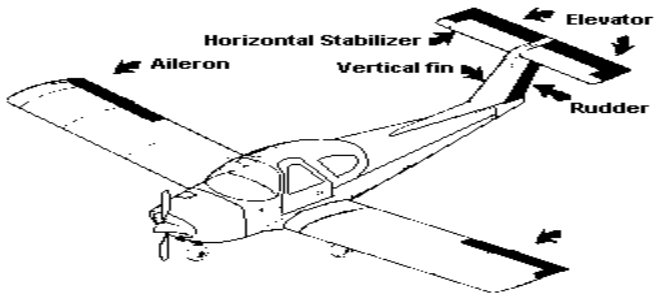

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Fig 8: movement controls on a plane

An airplane in flight changes direction by movement around one or more of its **three axes of rotation**: **lateral** axis, **vertical** axis, and **longitudinal** axis. These axes are imaginary lines that run perpendicularly to each other through the exact weight center of the airplane. The lateral axis runs from wing tip to wing tip. The longitudinal axis runs from nose to tail. The vertical axis runs down through the top surface of the plane through the bottom. The airplane's rotation around them is called **pitch**, **roll**, and **yaw**. The pilot guides the airplane by controlling pitch, roll, and yaw, and by use of the elevators, ailerons, and rudder.

Yaw - **Rudder** rotates the airplane around **vertical axis**

Roll - **Ailerons** rotate the airplane around **longitudinal axis**.

Pitch - **Elevators** rotate airplane around **lateral axis**.

What is the biggest aeroplane ever?

The "Antonov AN-225 "Mriya" is the world's largest aircraft. It has payload capacity of 250 tonnes and was designed and manufactured at O.K.Antonov ASTC in 1988. Unlike any other commercially available aircraft, the An-225 has the ability to carry external loads of up to 90 tonnes mounted on its "roof rack" also.

The An-225 has six engines, a 32-wheel landing gear system, and does not have the rear ramp/door assembly.

The An-225 was designed for the Soviet space program as a replacement for the Myasishchev VM-T ‘Atlant’. Able to airlift the Energia rocket’s boosters and the Buran space shuttle in captive carry, its mission was almost identical to that of the American Shuttle Carrier Aircraft.

The biggest passenger jet is the Airbus 380 which can seat up to 555 passengers. The wingspan of the jet, at almost 262 feet, means that most airports have to increase the size of their run way to accommodate the jet.

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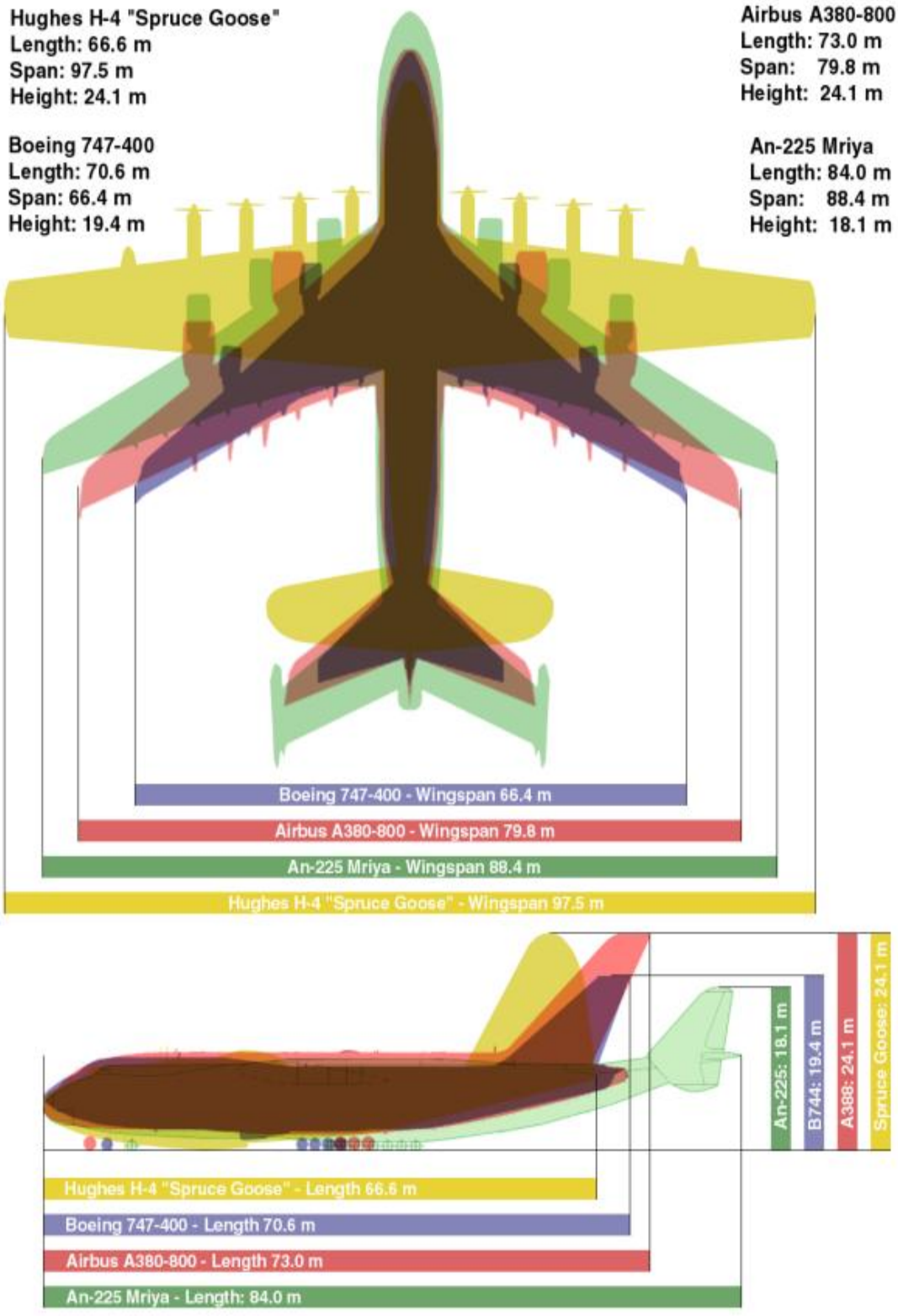

Fig 9: Size comparisons of aircrafts

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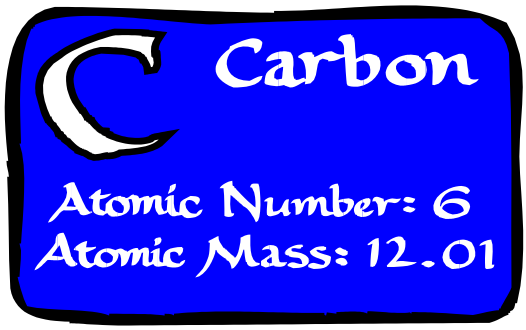
The Essential Elements

More than 30 elements have a key function in helping plants and animals live and be healthy.

Everything around us is composed of chemical elements. Elements are the basic building blocks of our lives. Elements combine with one another in different proportions to form everything from the air that we breathe, to the materials that we use to build our homes, to our own bodies.

Our bodies use different chemical elements for different functions. For instance, our bodies use calcium to build strong bones and fluorine makes our teeth healthier. As our bodies consume these elements through daily functioning, we have to replace them in order to stay healthy and strong. The greatest source of these elements is through the food we eat. Because some of us do not always eat the right foods, we sometimes have to take dietary supplements, such as vitamins, to assure that we maintain the proper chemical balance in our bodies.

We will now look at some of these elements in detail. There are too many to look at them all in great detail, we will focus on the main elements.

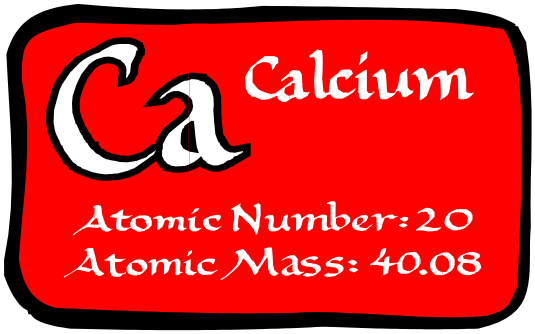


The element carbon is perhaps the single most important element to life. Virtually every part of our bodies is made with large amounts of this element. The carbon atom is ideal to build big biological molecules. The carbon atom can be thought of as a basic

building block. These building blocks can be attached to each other to form long chains, or they can be attached to other elements.

This can be difficult to imagine at first, but it may help to think about building with Legos. You can think of carbon as a bunch of red legos attached together to form one long chain of legos. Now, you can imagine sticking yellow, blue and green legos across the tops of the red (carbon) legos. These other colours represent other elements like oxygen, nitrogen or hydrogen. As you stick more and more of these yellow, blue and green legos to the red chain, it would start to look like a skeleton of legos with a "spine" of red legos and "bones" of yellow, blue and green legos. This is a lot like the way that big molecules are made in the body. Without carbon, these big molecules could not be built.

Now, virtually every part of your body is made up of these big molecules that are based around chains of carbon atoms. This is the reason we are known as "carbon based life forms". Without carbon, our bodies would just be a big pile of loose atoms with no way to be built into a person.

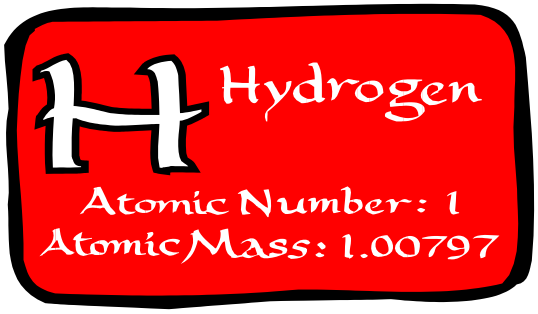


Calcium is an extremely important element in the human body. It is one of the most abundant elements in our bodies and accounts for 2 to 3 pounds of our total body weight. Most of us know that calcium is important in building and maintaining strong bones and teeth, but it is also important for many other things. It helps control things like muscle growth and the electrical impulses in your brain. This vital element is also necessary to maintain proper blood pressure and make blood clot when you get cut. Calcium also

enables other molecules to digest food and make energy for the body. Increasing calcium intake in our diet is believed to lower high blood pressure and prevent heart disease. It is also used to treat arthritis.

When we don't get enough calcium, many things happen in our bodies. It is possible to get leg cramps, muscle spasms, our bones may become brittle and even we may even have an increased risk of getting colon cancer. Also, when we don't get enough calcium in our diets, our bodies will actually use the calcium that we have stored in our bones. This makes the bones thinner and more brittle. In growing children and teenagers the bones may not develop fully and the person can enter adulthood with brittle bones. Further calcium deficiency can lead to serious problems.

Therefore, it is extremely important to get enough calcium in your diet. Unfortunately, that is not always easy to do. Most people don't get enough from their diets. Eating a good balanced diet, including drinking milk on a daily basis, should get you enough calcium.



It would be virtually impossible to understate the importance of this element to human life. First of all, water is a compound of hydrogen and oxygen (H_2O). We can survive years, or at least months without getting most of the other elements that we need to survive. We can survive weeks without food, but we would die after only a few days without water. Water is incredibly important in our bodies. In fact, almost all of our bodies are made of water. It dissolves other life-supporting substances and transports

them to fluids in and around our cells. It is also a place in which important reactions take place in our bodies. Chemically, water is a remarkable substance and it's many unique attributes make life possible. Hydrogen is obviously a critical component of water and minute chemical bonds called "hydrogen bonds" are what give water many of its unique attributes.

Also, hydrogen is practically always bound to the carbon that our bodies are constructed of. Without this arrangement, our bodies would be little more than a pile of atoms on the ground. Stomach acid is a compound of hydrogen and chlorine (hydrochloric acid, or HCl). Logically, hydrogen is extremely important in allowing us to digest our food properly and to absorb the many other elements that we need to survive. Finally, many chemical reactions that make life possible involve the hydrogen ion. Without this unique and important element, we simply couldn't exist.

Magnesium is an element that is required by our bodies for numerous different functions. We need it for the proper growth, formation and function of our bones and muscles. In fact, magnesium and calcium even control how our muscles contract. Magnesium prevents some heart disorders and high blood pressure. Higher intake of magnesium is also associated with improved lung function. Our bodies use it to help convert our food into energy and it helps our bodies absorb calcium and potassium. This important element also helps our brains function normally. Magnesium even helps to prevent depression.

Magnesium is essential in allowing your body to control insulin levels in your blood.

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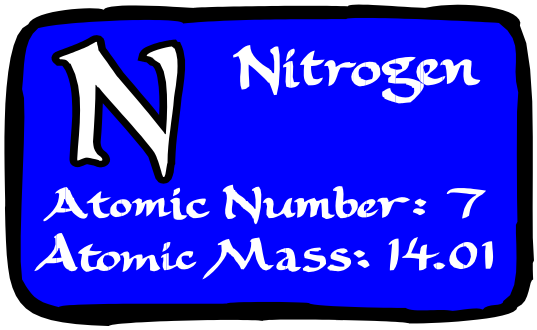
This means that it is very important in the amount of energy that your body has to operate. It is suspected that taking extra magnesium might be beneficial for those suffering from fatigue.

Taking extra magnesium is helpful for treating some medical conditions. Magnesium is sometimes injected into patients' veins in emergency situations such as an acute heart attack or acute asthma attack. In non-emergency situations, magnesium is sometimes given to asthma sufferers in a pill form. It relaxes the muscles along the airway to the lungs, which allows asthma patients to breathe easier. Magnesium is effective in treating numerous heart / lung diseases and has been used for over 50 years. Foods high in magnesium include fish, dairy products, lean meat, whole grains, seeds, and vegetables.

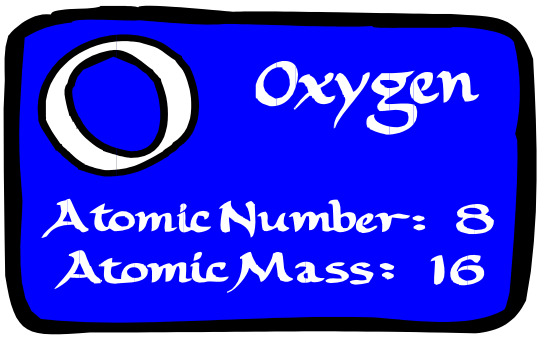


Nitrogen is another important element. It plays an important role in digestion of food and growth. As you may know, almost 80% of the air we breathe is made up of nitrogen. But humans cannot use the nitrogen in the air we breathe, that nitrogen is in the wrong form. We have to get nitrogen, in a different form, from the food that we eat. Fortunately, there is plenty of nitrogen in food to nourish our bodies.

Nitrogen is found in large amounts in all kinds of food. Spaghetti, salads, breakfast cereal, hamburgers and even cookies have lots of nitrogen in the form that our bodies need. When your body digests this food and makes it into energy, the first step is to remove nitrogen atoms from the molecules in the food. While your body is busy digesting the rest of this food and making it into energy, these nitrogen atoms are already being used to help you grow. One specific time that this is especially important is

during pregnancy. When a woman is pregnant, the nitrogen removed from food during digestion is needed to help the fetus to grow properly. By term, the mother and infant will have accumulated over a pound of nitrogen.

It is also worth noting that in the plant kingdom, nitrogen is one of the 3 main elements that make plant life possible. (Potassium and phosphorus are the other two, and you may hear them referred to collectively as N-P-K whenever talking about key plant nutrients.)



It may seem obvious that people need to breathe oxygen to survive, but plants need this element too. Many people think plants "breathe" carbon dioxide and "exhale" oxygen. In reality, plants also "breathe" oxygen at certain times. Without oxygen, plants could not survive.

It is also worth mentioning that water is a compound of hydrogen and oxygen (H_2O) and that water is absolutely necessary for virtually all life as we know it. Water is incredibly important in our bodies. In fact, more than 50% of our bodies are made of water. It dissolves other life-supporting substances and transports them to fluids in and around our cells. It is also a place in which important reactions take place in our bodies. Many people consider water to be the "blood of life".

When you consider the full importance of oxygen, it becomes clear that this versatile element is the single most important substance to life.

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Phosphorus is one of the most abundant minerals in the human body, second only to calcium. This essential mineral is required for the healthy formation of bones and teeth, and is necessary for our bodies to process many of the foods that we eat. It is also a part of the body's energy storage system, and helps with maintaining healthy blood sugar levels. Phosphorus is also found in substantial amounts in the nervous system. The regular contractions of the heart are dependant upon phosphorus, as are normal cell growth and repair.

Since phosphorus is found in almost all plant and animal food sources, a deficiency of this mineral is rarely seen. However, phosphorus deficiency can and does occur, particularly in people who take certain types of antacids for many years. Since phosphorus is important in maintaining the body's energy system and proper blood sugar levels, it should seem logical that not getting enough of this mineral will affect the energy level in the entire body. Indeed, feeling easily fatigued, weak and having a decreased attention span can be symptoms of mild phosphate deficiency.

It is also worth noting that in the plant kingdom, phosphorus is one of the 3 main elements that make plant life possible.

The human body must maintain a balance between magnesium phosphorus, and calcium. Excess intake of phosphorus can occur in people with diets high in processed foods, soft drinks, and meats, leading to osteoporosis. The Recommended Dietary Allowances for phosphorus is 300 milligrams for infants, and between 800 and 1,200 milligrams for adults. It is estimated that Americans ingest on average between 1,500 and 1,600

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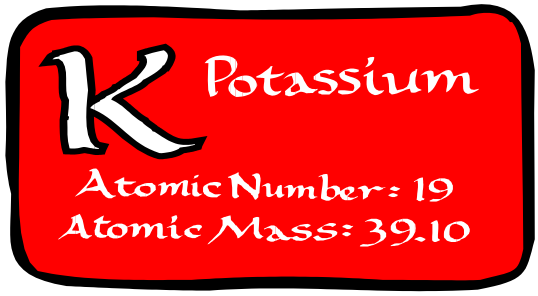
milligrams of phosphorus per day, almost twice the recommended amount. Foods highest in phosphorus include asparagus, brewers yeast, dairy products, eggs, fish, dried fruit, meats, garlic, legumes, nuts and seeds, and whole grains.

Many antacids, which are widely used for treatment of peptic ulcer disease, gastritis (heart burn) and acid reflux, contain magnesium and aluminum, both of which bind to phosphate, preventing its absorption into the body.

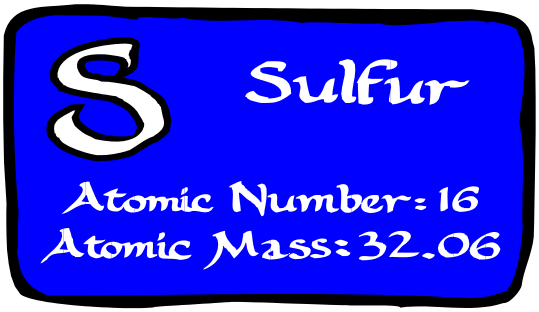


The element Potassium is an extremely important element in the human body. Our bodies are made up of millions of tiny cells, such as brain cells, skin cells, liver cells etc. These cells make up the different organs in our bodies, such as the brain, skin, or liver. Potassium is extremely important to cells, and without it, we could not survive.

Cells are the small building blocks of the human body. In order to work properly, cells need to let things enter and leave them. Cells have many ways by which they can control what (and how much) enters and leaves. Most of the ways that cells do this requires potassium. In fact, without potassium, cells loose control of what can enter and leave them. As you can imagine, this could be very bad. Imagine a nerve cell in your finger for a moment. Normally, it doesn't really do very much. But when you touch something, it sends messages down a chain of many nerves to your brain that help you determine what it is that you just touched. When a nerve cell does this, it actually pumps out chemicals, which give the message to the next nerve cell and eventually to the brain. Potassium helps control the release of those chemicals. Without potassium, the nerve cell

couldn't send those messages to your brain.

But it is not just nerve cells that depend on potassium. Most, if not all, of our cells depend on it. Just think of it for a minute. Every time you flex your muscles, blink your eyes, yawn in chemistry class, eat lunch, or do anything, you are using potassium. This element is indeed a very important element in our bodies.



S is an important element that is used in small amounts to help construct virtually all parts of the human body. Sulphur helps protect the cells in our bodies from environmental hazards such as air pollution and radiation. Consequently, sulphur slows down the aging process and extends our life span. Also, sulphur helps our liver function properly, helps us digest the food that we eat and then turn that food into energy. Sulphur is also important for helping our blood clot when we cut or bruise ourselves. Additionally, sulphur is an important part of vitamin B1 and insulin. Interestingly, sulphur is also an important part of a substance that keeps your skin supple and elastic. If you don't think that is important, just imagine trying to get a date to the graduation dance with stiff, loose skin hanging all over your body.

Fortunately, there is plenty of sulphur in the food that we eat and it is easy to get enough of this important element in our daily diets. There is no need to worry about getting too much sulphur in your diet. If you get more than your body needs, you just excrete it in your urine. Foods that have a lot of sulphur include meats, fish, dairy products, eggs and garlic.

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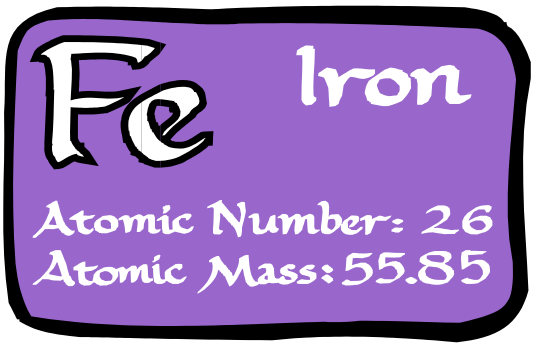

The element iron has many functions in the body. This element is used by the body to make tendons and ligaments. Certain chemicals in our brain are controlled by the presence or absence of iron. It is also important for maintaining a healthy immune system and for digesting certain things in the food that we eat. In fact, plays a vitally important part of how our body obtains energy from our food.

The iron we obtain from our diet is an essential part of haemoglobin - the part of our blood that carries oxygen. Iron is essential for blood to work efficiently. If we don't get enough iron in our diets, our blood won't carry enough oxygen to our bodies and we can feel tired, have decreased alertness and attention span and our muscles may not function properly. This type of iron deficiency is not uncommon among athletes, especially long distance runners. This is frequently the cause of fatigue among these athletes. If the lack of iron in our bodies is severe, we can get "iron deficiency anaemia", which essentially means that our blood won't carry enough oxygen to our bodies so we can function normally. Iron deficiency anaemia is probably the most common nutritional disease in the world, affecting at least five hundred million people.

Fortunately, it is easy to get enough iron in your food, if you eat a balanced diet. Many foods contain iron, and eating a wide range of foods can help most people meet their needs for this important element.

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