

HAPPY AND HEALTHY



Aune Greggas

IN NEPAL

Workbook for Health Education

HAPPY AND HEALTHY IN NEPAL

Happy and Healthy in Nepal is a health education handbook. It has been planned for the Health Education and Tobacco Intervention Program in Nepal.

The program has continued in Nepal from the year 2001 with the help of Ministry for Foreign Affairs in Finland. The pilot in the year 1999 was opened by Dr. Ram Baran Yadaw, who at that time was the Health Minister in Nepal.

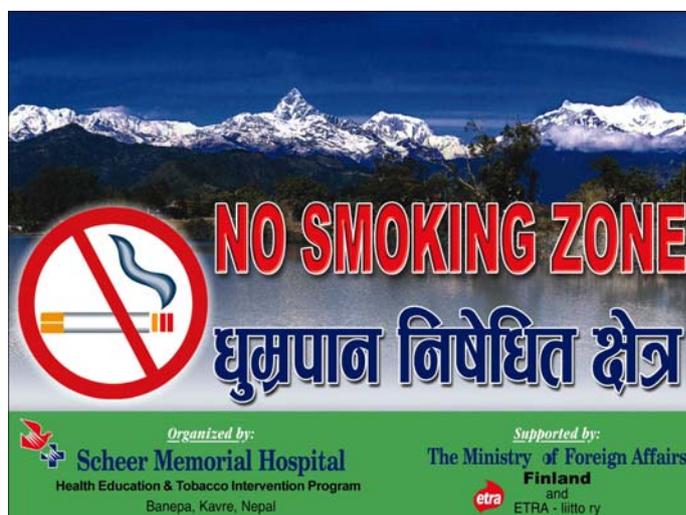
The program has reached by 2010 more than 500.000 students all over Nepal. We hope that this workbook will help both the health educators in the schools to guide their students and nurses and social workers to inspire their patients to choose a healthy lifestyle.

The workbook and the lectures have been planned by Aune Gregg (ETRA Association, Finland) and applied to Nepal and translated to Nepalese by Sundar Thapa and Pratigya Ranjit (Scheer Memorial Hospital).

We thank Wikipedia, Wikimedia and several other sources, among them Saunders (Arthur C. Guyton, Textbook of Medical Physiology), Miles Kelly Publishing (Human Body), A.D.A.M. and many others for ideas and pictures used during this lecture series.

ETRA-
Association
Tampere
Finland

Scheer
Memorial
Hospital
Banepa
Kavre
Nepal



Inauguration 1999



HETIP

The health minister of Nepal (later president), Ram Baran Yadaw arrives in the inauguration feast.

Program begins 2001



HETIP

The project leader of the Health Education and Smoking Intervention Program in Nepal Sundar Thapa welcomes all the participants to the program in 2001.

By 2010



HETIP

LIFE ESSENTIALS



Aime Greggat

Living being
Cell
Skin
Pulmonary system
Health threats

The Health Education & Tobacco Intervention Program in Nepal 2010



Aune Greggas

Living being

Life is unique and a great mystery. In every **living organism** we can admire every little detail. It is perplexing to see how all functions serve for the survival of its existence.

A little just born baby grows from a 50 cm long and 3 kilo weight to 165 cm long and 60 kilo weight adult. She learns to eat, walk and talk. She learns to live in a community and to take care of herself.

Not only **human beings** and **animals** are living beings. Also **plants** and **microorganisms** belong to living beings. Microorganisms include **bacteria** and **virus**.

Microorganisms can be dangerous for the health. However in the nature and in the living organisms there are also **beneficial microorganisms**. We can find them in the stomach, in the colon etc.

Lactic acid bacteria is needed when carbon hydrates are made to lactic acid through **fermentation**. They are also used when yoghurt, sour milk and cheese are made of milk and when sour cabbage or sour bread are prepared.

An antibiotic is a substance used to kill **harmful bacteria** or to inhibit their growth during infections. **Penicillin** was the first antibiotic found. It is produced of fungi. When antibiotics are used, they kill also the beneficial microorganisms.

When using antibiotics It is good to take the whole antibiotic **course**. If it is finished too early the microorganisms can become **resistant**. Then there will be no cure against them.

Cell

Microorganisms

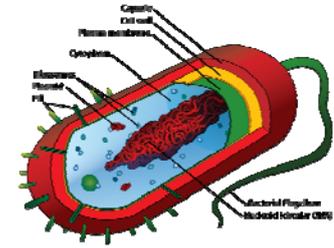


Diagram of a typical bacterial (prokaryotic) cell.

[http://en.wikipedia.org/wiki/Cell_\(biology\)](http://en.wikipedia.org/wiki/Cell_(biology))

Plants

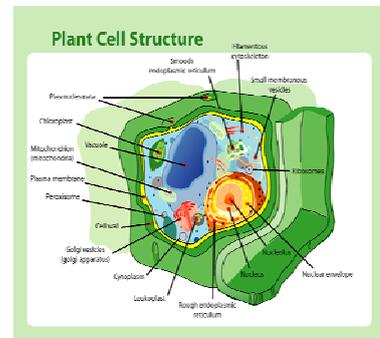


Diagram of a typical plant cell.

<http://en.wikipedia.org/wiki/Eukaryote>

Animals

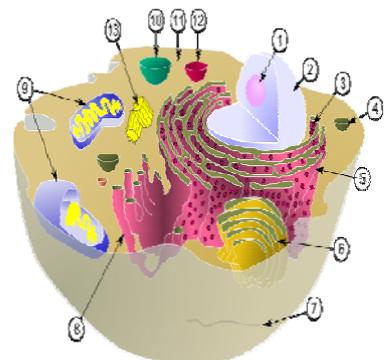


Diagram of a typical animal cell.

[http://en.wikipedia.org/wiki/Cell_\(biology\)](http://en.wikipedia.org/wiki/Cell_(biology))

Organelles are labelled as follows:

1. Nucleolus
2. Nucleus
3. Ribosome
4. Vesicle
5. Rough endoplasmic reticulum
6. Golgi apparatus (or "Golgi body")
7. Cytoskeleton
8. Smooth endoplasmic reticulum
9. Mitochondrion
10. Vacuole
11. Cytosol
12. Lysosome
13. Centriole

Cell division

Mitosis

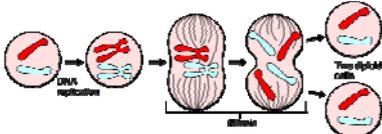


Image from NCBI

Meiosis

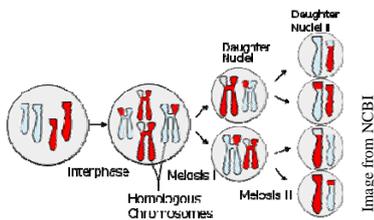
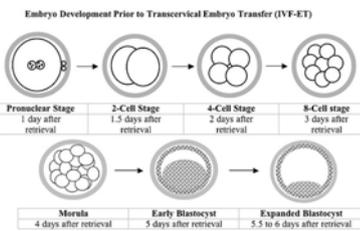


Image from NCBI

Cell multiplication



Cell differentiation

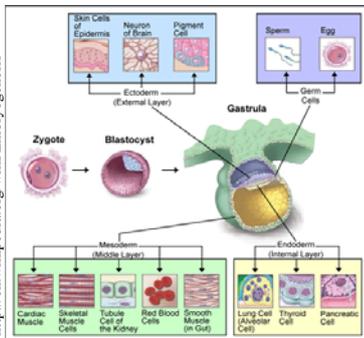
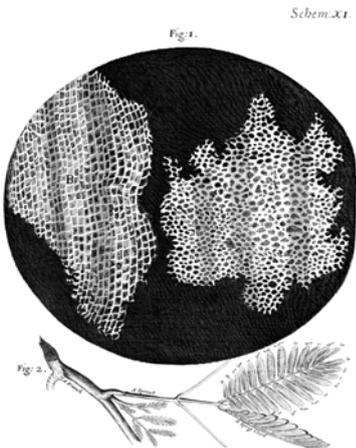


Image from NCBI

First picture of a cell



http://en.wikipedia.org/wiki/Cell_(biology)

Cell

The smallest living organisms consist of only one **cell**. Already a cell is a miracle. One cell includes all the needed elements for sustaining life: **all the functions to use and store energy**. In every cell there is also all the needed **genetic material to reproduce** a similar living organism.

Biologically **the physical requirements of the living organism** are food, water and air. 96 % of **living tissue** is made of the four **basic chemical elements: hydrogen, oxygen, coal and nitrogen**. Others are found only in small amounts. More than half of a cell is water. The most important **organic compounds** in a cell are **coal hydrates, lipids, proteins and amino acids (DNA and RNA)**.

There are **millions of cells** in every human being. However, in the beginning every one of them has been **just one cell**. That has begun to **divide in two** and then each of the new cells again in two etc. The amount of the cells increases like this: 2-4-8-16-32...

Each new cell has all the genetic material of the first cell. But although every cell has the same genetic material, during the **embryogenesis** the cells **begin to differentiate**:

- **endoderm** (innermost cells) to the lungs, stomach, pancreas, liver and intestines
- **mesoderm** (cells in the middle) to the skeleton, cardiovascular, muscular and urinary system
- **ectoderm** (cells on the surface) to nerves and epidermis (outer layer of skin, teeth, nails and hair)

Most of the cells maintain their **reproductive ability**. For example, the **skin heals** after a scar, a broken **bone grows fast** etc. The only exception are **nerve cells**. The amount of the nerve cells **increases** until the individual is about 25 years old. Then they **begin to decrease**. However, if lots of nerve cells are destroyed in an accident, the other already existing nerve cells can **take over the functions** of the destroyed cells.

Because of this reproductive and compensating ability of the cells, it is possible to make **operations in the hospitals**. When the diseased area has been removed, the operation scars will be healed and the function capacity will return. Maybe because of this Scheer Memorial Hospital in Banepa, Kavre has a saying: **We treat, God heals**.

Drawing of the structure of cork as it appeared under the microscope to Robert Hooke from Micrographia which is the origin of the word "cell" being used to describe the smallest unit of a living organism.



Nails protect finger tips and toe tips and make them more sensitive. Besides fingernails can be used as tools.

Skin

The epidermis is the outermost layer of the **skin**. Deep-est in the epidermis there are **melanocytes**. They pro-duce the **pigment** that gives the skin its color. Under the epidermis there is the dermis. **Hair** as well as **nails** and **teeth** are also an appendage of the skin.

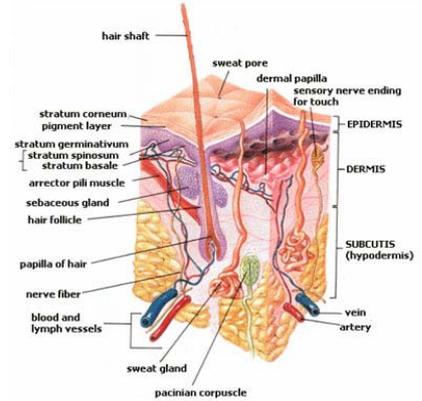
Hair is mainly composed of **keratin**. Keratin assembles onto **ropelike filaments**. The structure of these filaments provides strength to the hair shaft. Hair growth begins under the skin in a **hair follicle**. The only "living" portion of hair is found in the follicle. The base of the root is called a **bulb**. Other structures of the hair follicle include the **oil producing sebaceous gland** which lubricates hair and the **erector pili muscles**, which are responsible for causing **goose bumps**.

Fingernails and toenails are also made of keratin. It is a tough protein. Nails grow at an average rate of 3 mm (0.12 inch) a month. Fingernails require 3 - 6 months to grow completely, and toenails 1 -1,5 years. **Growth rate** is dependent upon age, gender, season, exercise level, diet, and hereditary factors.

Healthy fingernails has the function of **protecting the fingertips** and the surrounding soft tissues from injuries. It also serves to enhance precise delicate movements of the finger. The nail acts as a counterforce, when the finger touches an object, thereby **enhancing the sensitiv-ity of the fingertip**. The nail functions also as a **tool**.

The **teeth** has a hard **white enamel**. It protects the teeth against **decay**. Sour drinks and sweets may destroy it.

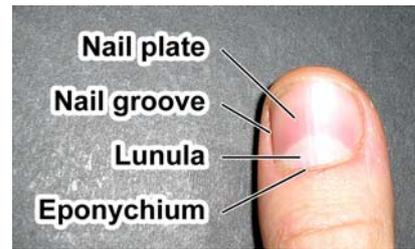
Skin



Teeth



Nails

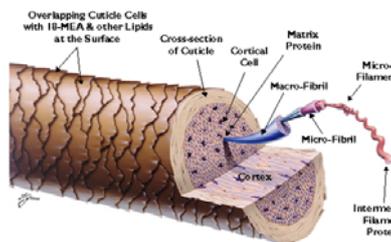


This injured fingertip with a broken nail will be healed in about two months.



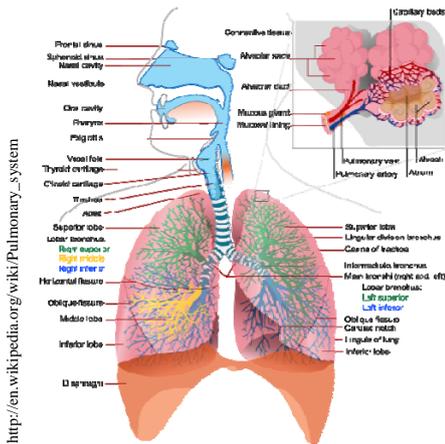
Hair & eyelashes

Eyelashes and eyebrows help to protect the eyes from dust, dirt, and sweating.



Goose pumps

Pulmonary system



http://en.wikipedia.org/wiki/Pulmonary_system

Pulmonary system

Every living cell needs oxygen. Human beings get oxygen through **lungs**. The lungs have developed from the endoderm, the innermost cells during the embryogenesis.

As the individual **breathes in**, **oxygen** is transferred into the body. When the individual **breathes out**, **carbon dioxide** is transported out of the body. Carbon dioxide is a **byproduct**, which is released in the body when energy is created in **metabolism** or in **exercise**.

Living beings cannot survive without oxygen. If a human being cannot breathe or gets water in her lungs, she will die in a couple of minutes because of the lack of oxygen. All the **life sustaining activities** - even thinking and heart beat, not only exercise - need constantly oxygen. It is said that a human being **dies**, when she ceases to breathe.

However there are situations, when life can be saved by giving **artificial respiration**. Especially children survive quite a long time in water without their brains being destroyed. Artificial respiration can also be given to older people with a heart attack with good results.

When air comes in the lungs, it goes first through the **nasal cavity**, then from the **pharynx** through the **larynx** to the **trachea**. Then it is divided to two **bronchi**, one to each **lung**, and then to **several bronchioles** in the lungs.

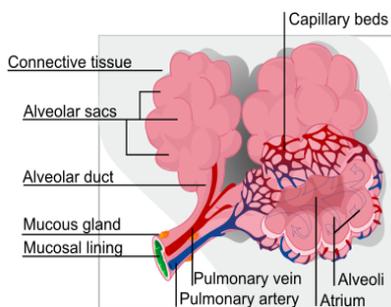
Bronchioles lead to **alveoli**. They are air bags with blood veins all over them. The area of all the alveoli in human beings is about the size of a tennis court. That is the area where the needed oxygen is delivered to the organism and carbon dioxide removed from the blood cells.

The construction of the lungs is genius. If certain cells during the embryogenesis had not differentiated to lung cells and formed the lungs, it would have been difficult to get enough oxygen to all the activities in the body of a human being.

Fishes has another way to obtain oxygen. They have **gills**. When a fish is swimming, water is flushed through its gills. It gets the needed oxygen from the water. Also **frogs** have in their early life phases gills. Later when they have lungs, they can take oxygen also **through the skin**.

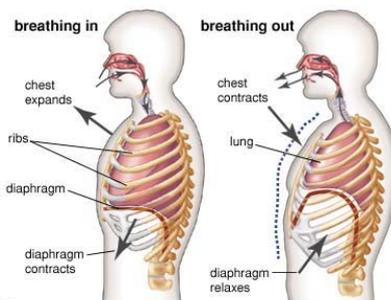
Swimming mammals (whales and seals) and **swimming birds** (penguins) have not gills. They have lungs. Because of that they need to go to the surface of the water to get oxygen.

Alveoli



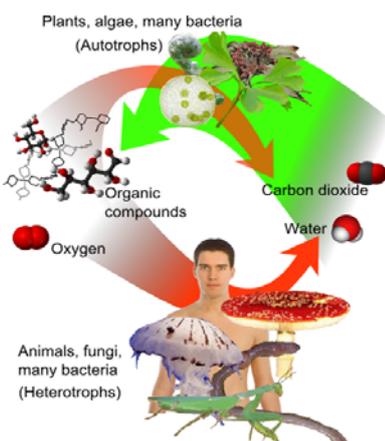
<http://en.wikipedia.org/wiki/Alveoli>

Respiration



<http://www.britannica.com/EBchecked/topic/499530/human-respiration>

Oxygen circulation



<http://readerfeedback.labs.wikimedia.org/wiki/Oxygen>



Smoking in Nepal has decreased during the last ten years with about 40 %. The decrease is a result of the work of all the health organizations and health workers and schools all over Nepal. The work has been done by the request of the Ministry of Health and the Ministry of Education in Nepal.

The Health Education & Tobacco Intervention Program, financed by Finland, is one of the projects which has been invited to Nepal to help in that work. From the year 1999 it has reached about 500.000 Nepalese. Because of it hundreds of schools in Nepal have claimed to be NO SMOKING ZONE –schools.

Health threats

Air is not always clean. It might be **foggy** or include lots of **exhaust fumes**. At home there can be smoke from a **kitchen fireplace**. Exhaust fumes from cars or oven smoke are not good for health. **Tobacco smoke** is still worse. It includes thousands of **poisonous substances**.

Tar is one of them. It will collect in the lungs. Because of that the lungs become little by little darker. Tar can cause **cancer**. The smokers can also get **chronic obstructive pulmonary disease** or **emphysema**. In them the alveoli are destroyed. Besides the smokers much more often than nonsmokers die in **cardiovascular diseases**. Reasons are the **constriction of the veins** and **carbon monoxide** which takes the place of oxygen in blood cells.

Smoking is **one of the largest health threats** in the world today. Millions of people die too early because of it. However, during the last years **smoking has decreased** in the countries where the **living standard** is high. Also in Nepal most of the **well educated** people, especially in **urban** areas, have stopped smoking.

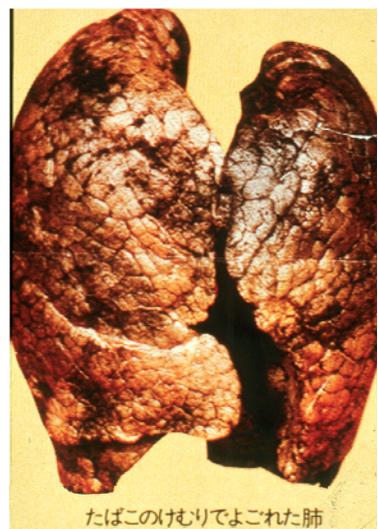
If someone begins to smoke, it is very **hard to stop smoking**. The reason is **nicotine**, one of the chemicals in tobacco. It is a chemical which arouses a **strong dependency**. The longer you use it the more you need it.

People who try to break the habit usually get severe **habit-breaking symptoms**: headache, dizziness, irritability, difficulties to concentrate, difficulties to sleep, sweating hands, coldness in hands and feet, extra heart beat etc. However, these usually disappear in **five non-smoking days**. Psychological dependency stays longer.

Smoking and lungs



Lungs of a traffic accident death (non-smoker).



Lungs of a lung cancer death (smoker).

Scars

<http://en.wikipedia.org/wiki/Scar>



The scars have to be treated in a right way not to hinder the healing process:

- wash your hands well before you touch the scar
- clean up the scar area with soap water
- disinfect the scar (if there is no disinfectant with salted water which has been boiled and cooled)
- pick up all the foreign things from the scar with forceps cleaned in boiling water or in fire
- use gauze to bind the scar; if it is little, plaster will be enough
- bleeding can be restricted by pushing the scar with bandaging materials.
- take the patient to the doctor, if you are not able to clean up the scar, if the bleeding does not finish, if the patient has been bitten by an animal, if the muscles or tendons might have been destroyed and the scar is deep and needs to be sewed (it has to happen in 6—10 hours).
- If the scar is deep, use scar tape to keep the scar sides closed
- change the gauze after two days (more often if there is lots of yellowish fluid extract)
- if the gauze has dried to the skin, loosen by cooked water
- In larger scars ask Tetanus vaccine to prevent lockjaw

Assignment 1

If you have a **microscope**, take a leaf of a tree and look it in the microscope. Can you see the cell structure of the leaf? All living organisms are made of cells.

Assignment 2

Every human being has different **fingerprints**. They do not change much during one's life. Because of that they are used in identifying people. Can you make your own fingerprint by some suitable color substance on a piece of paper or on a piece of tree.

Assignment 3

Check **how much air you have in your lungs**. Try to breathe all air from your lungs through a small pipe to a glass bowl upside down in the water. Compare your result with the results of others. Was there any difference with those who were good in sports and those who were not?

Assignment 4

Check **how many times you breathe** in one minute when you are sitting, walking and after you have run 80 meters. The breathing tells **how much more you need oxygen**, when you are straining you physically.

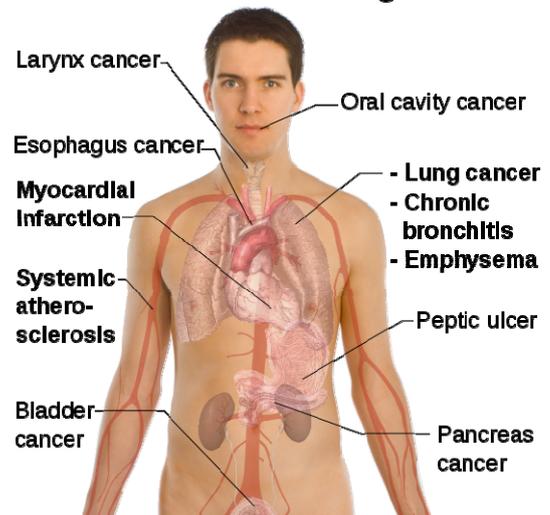


<http://bioweb.wku.edu/courses/BIO115/wnat/Metabolism/Glycolysis2.htm>

Assignment 5

Tobacco is one of the most harmful merchandises in the world and **millions of people die** because of it every year. It affects almost anywhere in the human body: in mouth, in oral cavity, in larynx, in lungs, in esophagus, in stomach, in pancreas, in bladder, in heart, in arteries and veins.

Common adverse effects of Tobacco smoking



http://en.wikipedia.org/wiki/Tobacco_smoking

However, usually the effects cannot be seen straight. According to the **statistics** it takes about 20 years to develop lung cancer. Problems with blood circulation and deaths because of the diseases in the heart and brains usually come earlier.

Promise: **“I will never smoke.”**



http://en.wikipedia.org/wiki/Lung_cancer

Different ways to use gauze

http://www.redeross.fi/ensiapu/ensiapuohjeet/fi_FI/



http://www.terveyskirjasto.fi/terveyskirjasto/ok_koti?p_artikkeli=spr00007&p_teos=spr&p_osio=106&p_selaus=

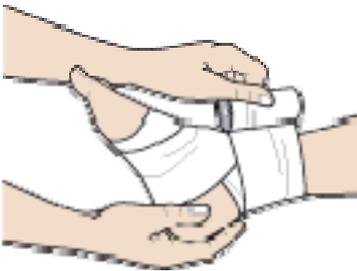


<http://www.terveyskirjasto.fi/xmedia/spr/Kuva7.10.jpg>



<http://turvaopas.pelastustoimi.fi/lyhyt-ensiapuopas.html>

http://www.terveyskirjasto.fi/terveyskirjasto/ok_koti?p_artikkeli=spr00019&p_teos=spr&p_osio=106&p_selaus=



<http://images.coronaria.fi/8095345.jpg>



Assignment 6

Practice to give first aid in following situations:

- A scar in a finger
- A scar in the hand
- Bleeding in a scar in the arm does not stop
- The right arm has been broken
- A bruise in the foot

Assignment 7

Learn how to give artificial respiration.



Try to wake up. If not: Call ambulance and begin resuscitation. Open the airways first and check then if the person breathes.

If yes:
Place the unconscious person so that the breath ways stay open and he can breathe. The picture shows how to do it.



If not:



Push 30 times (100 times / minute) on the breast and then blow lightly mouth to mouth 2 times so that you see the breast move. Continue in the same way until the help comes or you are not able to do it any more.

Assignment 8

Practice how to help your friend if she has gulped down to the trachea a piece of food:

Bend her down, beat on the back between the shoulder blades.

If it does not help, take with both hands around her waist and squeeze quickly. The air from the lungs might help.

Continue in the same way, if the problem still exists.



<http://turvaopas.pelastustoimi.fi/lyhyt-ensiapuopas.html>

http://www.redeross.fi/ensiapu/ensiapuohjeet/fi_FI/vierassine/

Assignment 9

You can find **first aid** in all the places where the next type of emblems are seen. Which one of them is First Aid Material, Red Cross, Red Star, Red Crescent and Red Chrystal?



http://en.wikipedia.org/wiki/International_Red_Cross_and_Red_Crescent_Movement

EXERCISE



Aune Greggas

Musculoskeletal system
Blood circulation
Health promotion

Health Education & Tobacco Intervention Program in Nepal 2010



Aune Greggas

Musculoskeletal system

Musculoskeletal system gives your body structure, protection and power. The 206 bones of the skeleton are the body's framework. The 640 skeletal muscles produce and control every movement made by the body.

Skeleton

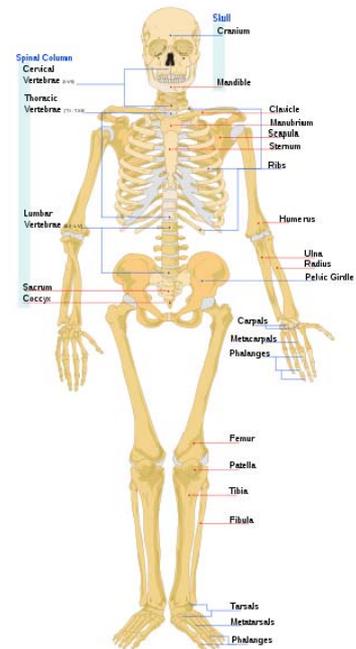
The skeleton is made of many different **bones**.

The **skull** is oval hard bone and it protects the brains. The **backbone** is a column of 33 drum shaped bones called vertebrae. They are separated by soft discs. The **ribs** (12 pairs) are around the chest and protect heart, lungs, liver, kidneys and stomach. The **hip bone** and the bones in the **feet and foot** are well planned for walking and the bones in the **arms and hands** to grasp and to work.

Bones are light but very strong. They make ca. 14 % of the body's total weight. The deposited minerals **calcium and phosphate** make bones strong. The bone structure is not homogenous: it is full of holes. They are provided by cross-crossing struts each angled perfectly to cope with stresses and strains. The more exercise the **stronger the bones**. Also if there is lack of calcium or phosphate, the bones will become weaker and wholes in the bones larger.

The bones are living tissue. The bones grow near the end of the bone. In each bone there are also special cells called **osteoblasts**. They can renew the bone structure. Some bones have jelly-like **bone marrow**, The red and the white blood cells are made in the bone marrow.

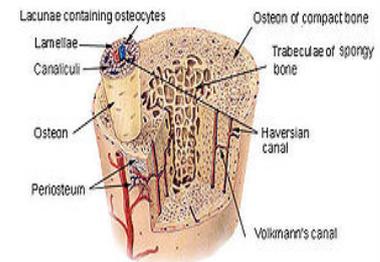
Skeleton



<http://fr.wikipedia.org/wiki/Anatomie>

Bone structure

Compact Bone & Spongy (Cancellous Bone)

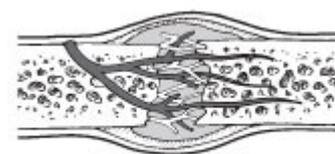


http://en.wikipedia.org/wiki/Bone#Gross_anatomy

Bone healing



Inflammation



Bone production

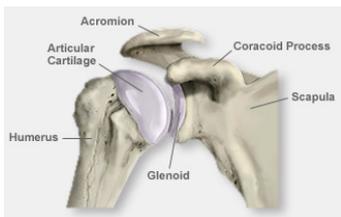


Bone remodeling

http://www.foothealthfacts.org/footankleimfo/Bone_Healing.htm

Joints

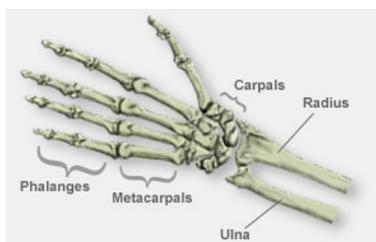
The bones join to each other in many different ways: The basic joints are: **shoulder, elbow, hand, hip, knee and ankle and spine.**



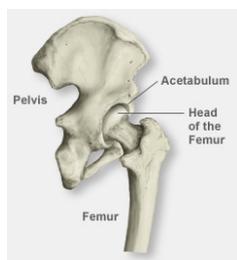
<http://www.scoi.com/sholanat.htm>



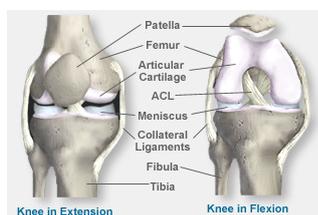
<http://www.scoi.com/elboanat.htm>



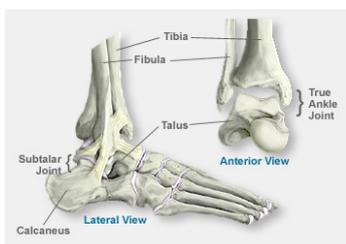
<http://www.scoi.com/handanat.htm>



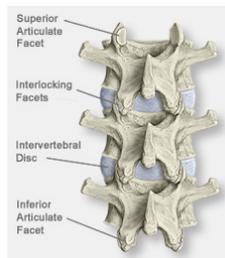
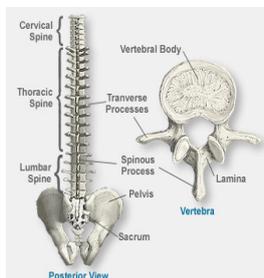
<http://www.scoi.com/hip.htm>



<http://www.scoi.com/kneeanat.htm>

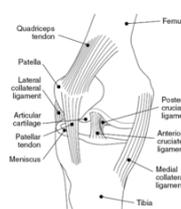


<http://www.scoi.com/anklanat.htm>

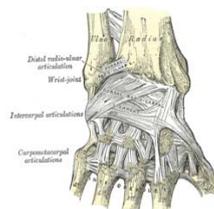


<http://www.scoi.com/spinanat.htm>

Tendons and ligaments



<http://en.wikipedia.org/wiki/>



<http://en.wikipedia.org/wiki/Hand>

Tendons are cords that tie a **muscle to a bone** or **muscle to another muscle**. Most are rope-like bundles of fiber. They bind the bones to muscles and ligaments to keep the bones together.

The most known tendons are **Achilles tendon**, which pulls up the heel at the back. Finger movements are also based on movements in the forearm connected with long tendons to the **fingers**. Also the **toes** are connected to the feet muscles with long tendons.

Ligaments are cords attached to bones on **either side of a joint** to strengthen it. They are made up of bundles of collagen and a stretchy substance called elastic. Ligaments also support various organs, including the liver, bladder and uterus (womb).

When the human being dies and the muscles, tendons and ligaments decay all the bones will loose from each other.

Cartilage

Cartilage is a **rubbery substance** used in various places around the body. There are three different types of cartilage in the body: hyaline, fibrous and elastic. **Hyaline cartilage** is used in joints between bones to cushion them against impacts. **Fibrous cartilage** is really tough and it is found between the bones of the spine and in knee. **Elastic cartilage** is very flexible and it is used in airways, nose and ears.

Muscles

Muscles are special **fibers** that contract (tightens) and relax to move parts of the body. Muscles can shorten themselves, but they cannot make themselves longer, so the **flexor muscle** that bends a joint is always paired with an **extensor muscle** to straighten it.

There are three types of muscles in the body: skeletal, cardiac (heart) and smooth muscles.

- There are 640 **skeletal muscles** in the body. The skeletal muscles are **voluntary muscles**. Most skeletal muscles are arranged **in pairs**. Skeletal muscles are **striated**.
- The **cardiac muscle** is a unique muscle. It has muscle cells that work in a similar way to nerve cells, transmitting the signals for muscle contraction to sweep through it. The heart is an **involuntary muscle**. It is also a **striated** muscle.
- **Smooth muscles** are **involuntary muscles**. They work automatically. Such are the **muscles of intestine** which move the food forward in the intestine. Even if they cannot be affected by will, their function becomes slower when a person has depression. Caffeine has an opposite effect to the intestine muscles.

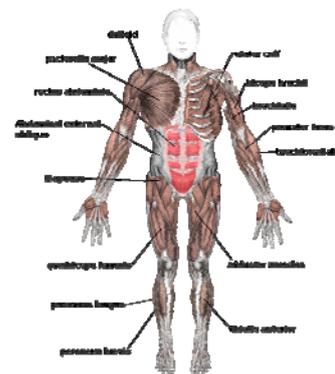
The energy needed to contract the muscle can be received by anaerobic alactate, anaerobic lactate or aerobic **energy production**.

- In **anaerobic alactate** energy production the body is using the adenosine triphosphates (ATP) which have been collected to the muscle cells. Their amount is not large enough to continue the work for a long time.
- In **anaerobic lactate** energy production ATP is produced from carbohydrates, glycogen or glucose. However it leaves in the body milk acid which makes that the muscles become tired and begin to ach.
- In **aerobic energy** production the energy (ATP) is produced from carbon hydrates, fats and proteins with the help of oxygen. It can continue as long as there are energy storages and oxygen. However the production ability is limited.

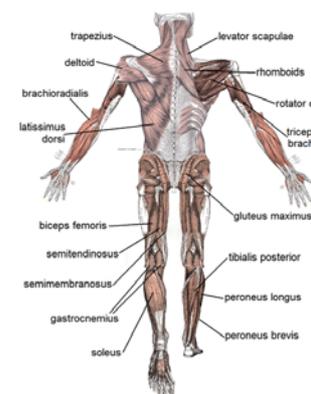
In real life all of these energy sources can be used at the same time. Then the milk acids are removed from the body by the unused muscle cells and internal organs.

Aerobic exercises improve blood circulation and lower blood pressure. They help in making heart stronger. By pumping more blood in the heart they reduce the risk of heart attacks. They also increase the red blood count.

Muscles



http://en.wikipedia.org/wiki/File:Muscles_anterior_labeled.png

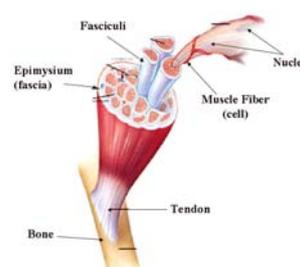


http://en.wikipedia.org/wiki/File:Muscle_posterior_labeled.png

Three types of muscle cells

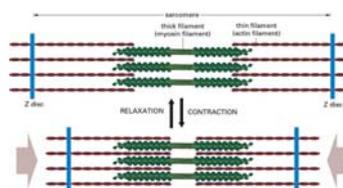


http://en.wikipedia.org/wiki/File:Illu_muscle_tissues.jpg



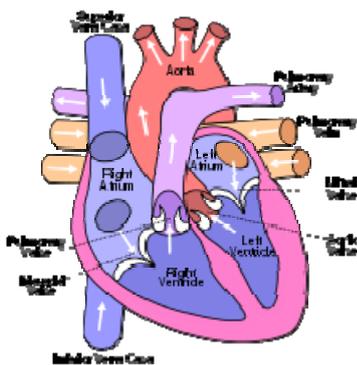
<http://www.ucl.ac.uk/~sjjgsca/MuscleStriated.gif>

Muscle cell contraction

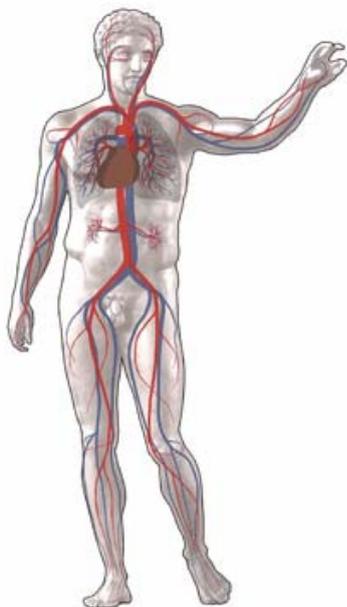


<http://scienceblogs.com/clock/upload/2006/06/muscle%20contraction.jpg>

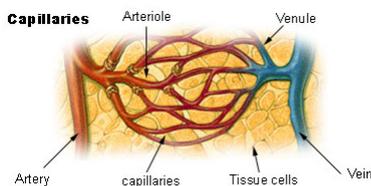
Heart



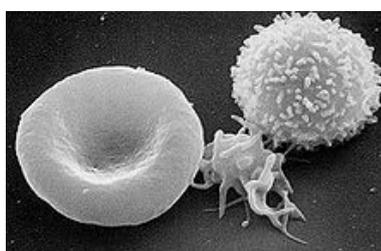
Main arteries and veins



Capillaries



Blood cells



Blood circulation

Each of the body's 600 billion cells need oxygen. They get it through blood. Blood circulates continuously round and round the body through **blood vessels**. Blood vessels are an intricate series of tubes. On the other side there is the heart with its large **veins** and **arteries** and on the other side there are small **capillary vessels**.

The **heart** is a powerful pump. It is made of a muscle. It has **two sides**, weaker **right side** and stronger **left side**. Both of them has **two chambers**, a **ventricle** and an **atrium**.

In the blood circulation there are two different parts. The smaller is **pulmonary circulation**. In it the blood which comes from different parts of the body is sent through the **right ventricle** and **right atrium** to the pulmonary arteries.

Pulmonary arteries take the blood to the **lungs** where the red blood cells give away **carbon dioxide** and get **oxygen**. Carbon dioxide is a product of energy consumption in the body. The blood with carbon dioxide is **bluish**. When carbon dioxide is changed to oxygen, the color of the blood becomes **red**.

The red oxygenized blood returns from the lungs to the heart and from there to the **systemic circulation**. It goes through the **left ventricle** and **left atrium** and from there it intrudes with a high pressure through **aorta** and **larger arteries** all over the body: to the heart, to the brains, to the intestines, to the hands and to the feet, to the muscles everywhere in the body all the way to the most distant **capillary arteries**.

The cells get their needed oxygen through the capillary arteries. They **need oxygen to produce energy** from carbon hydrates, fats and proteins which have been transported to them by the blood from the intestines or storage areas.

The heart **pulse** is ca. 60-70 times a minute. It takes less that 90 seconds on average for the blood to circulate through all blood vessels in the body. If the **heart stops** to beat, first the cells in the brain and then the cells all over the body begin to die. After some minutes it is not any more possible to **resuscitate** a person.

Blood is the liquid that circulates around the body. It contains different types of cells: red cells, white cells and platelets. **Red cells** are the carriers of oxygen and carbon dioxide. They include iron. **White cells** are important when the body fights against infection. **Platelets** make blood clots to stop bleeding. There are four **blood groups**: **A, B, AB, O**.



Health promotion

Physical work and **physical training** help to keep the body in a good condition. Also **diversified low calorie vegetarian food** is healthy and helps to keep the blood vessels open.

In the western world one of the most usual **death reasons** are the **heart and blood vessel diseases**. **Smoking , obesity and diabetes** increase their possibility. The possibility for a teen age smoker to die in heart attack (if he continues to smoke) is three times as large as for the nonsmoker.

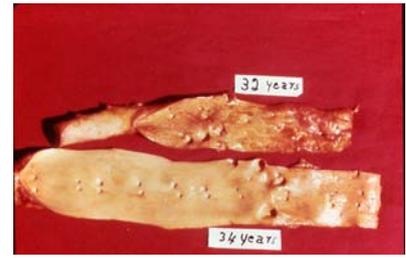
One reason is that smoking increases **fat and cholesterol formation** on the walls of the veins. The difference can be seen already in the veins of young smokers. Besides nicotine in tobacco contracts arteries, especially capillary arteries. Already that makes that **less blood** reaches distant areas as for example hands and feet and might result in **necrosis**.

The same is true of cells in the skin of the face. The smoker looks older than the non smoker because she has less blood in the skin and therefore gets much more easily **wrinkles**.

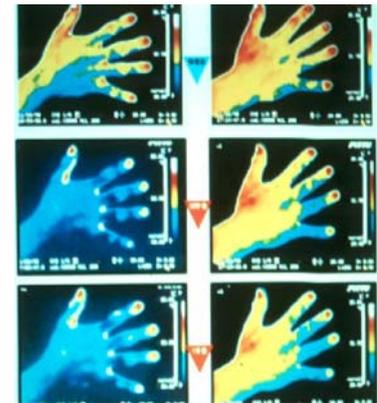
The fat cholesterol deposits in the veins and constriction in the capillary arteries **increase the blood pressure**. The higher the blood pressure the more power is needed to get blood all over the body. Also **caffeine and salt** increase blood pressure. **High blood pressure** in itself is a danger and increases the possibility of **heart attacks** and **strokes**.

Exercise has a different effect. Even if the blood pressure is high while the exercise continues, the blood pressure after the exercise tend to be lower than without exercise.

Effects of smoking



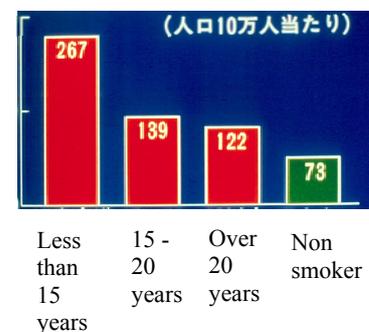
Veins of the 32 year old smoker and 34 year old nonsmoker.



Effect of the tobacco smoking to the temperature of the hand (red warmest, yellow middle, blue coldest; smoker to the left, nonsmoker to the right).



Amputated foot (92 % of the amputations are made to smokers, also diabetes increases the possibility.)



Mortality rate by a heart disease seen according to the age when the smoking was started.

What causes smokers to be less fit than non-smokers?

To achieve peak performance, your heart and lungs need oxygen-rich blood. When you inhale tobacco smoke, you introduce carbon monoxide into your system.

(Carbon monoxide is just one of the 3,000 -plus chemicals found in tobacco.) When carbon monoxide combines with hemoglobin, a substance in the red blood cells that enables the blood to carry oxygen through the body, the ability to transport oxygen is reduced. As a result, less oxygen is delivered to your body's cells and to your heart and lungs.

This decrease in oxygen will reduce your physical endurance, making it more difficult for you not only to do well in sports but also to do everyday things, such as walking up stairs.

http://my.clevelandclinic.org/healthy_living/smoking/hic_smoking_and_physical_activity.aspx

Long term effects of smoking on physical fitness and lung function: a longitudinal study of 1393 middle aged Norwegian men for seven years

Leiv Sandvik, *senior statistician*,^a
Gunnar Erikssen, *senior registrar*,^a
Erik Thaulow, *consultant*^a

Results:

Initial fitness was substantially lower among 347 smokers than among 791 non-smokers (1349 J/kg v 1618 J/kg), as was initial forced expiratory volume (3341 ml v 3638 ml).

Mean (95% confidence interval) decline in fitness over 7.2 years was 217 (185 to 249) J/kg among smokers compared with 86 (59 to 113) J/kg among non-smokers (P<0.001).

Corresponding declines in forced expiratory volume were 271 (226 to 316) ml in smokers and 116 (85 to 147) ml in non-smokers (P<0.001).

Differences between smokers and non-smokers remained practically unchanged after adjustment for age and level of physical activity.

Conclusion:

Decline in physical fitness and lung function among healthy middle aged men was considerably greater among smokers than among nonsmokers and could not be explained by differences in age and physical activity.

<http://www.bmj.com/cgi/content/full/311/7007/715>

Assignment 1.

These are 42 year old twins?

Which is a smoker and which do not smoke?



HIDEO ICHIKI D.D.S.

How can you see it?

- Hair (shiny)
- Skin (pale)
- Eyes (cataracts)
- Wrinkles (less)
- Teeth (color)

Assignment 2.

Try to find the pulse in the arteries:

- In your wrist (in the inner side of the wrist under your thumb)
- In your throat (on both sides of the throat beside the esophagus).
- In your ankles beside the heel
- In both sides of the stomach just where the foot begins.

Assignment 3.

Check your pulse (how many times you heart beats in one minute) when you are:

- Sleeping
- Sitting
- Walking
- After you have run 80 meters.

The more you need oxygen the more the heart beats.

Assignment 4.

Take the pulse from all your family members after they have been sitting in one place about 10 minutes.

- Your sisters
- Your brothers
- Yourself
- Your Mother
- Your Father

The basic rule is that men have lower beat than women, longer and stronger well trained people lower than shorter and less trained weaker people and children higher than adults. Is it also so in your family? (It need not be. Also if someone has fever, the higher the fever the higher the heart beat.)

Assignment 5.

How long time you are able to keep a 10 liter bucket full of water in the air?

What about your friends?
Are they better than you?

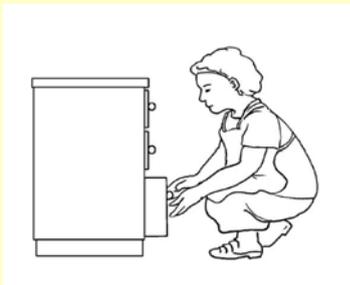
Classification of blood pressure for adults.

Category	svstolic, mmHg	diastolic, mmHg
Hypotension	< 90	< 60
Normal	90 – 120	and 60 – 80
Prehypertension	121 – 139	or 81 – 89
Stage 1 Hypertension	140 – 159	or 90 – 99
Stage 2 Hypertension	≥ 160	or ≥ 100

Raise heavy things in the the right way:



Take things from low in the right way:



Work on the right height:



<http://www2.edu.fi/materiaalipankki/index.php?id=74>

Assignment 6.

Blood pressure tells quite well what is the condition of the heart, arteries and veins. Usually high blood pressure means that there are obstacles in the arteries and veins and that the heart has to work extra hard to do its work.

What is the recommended blood pressure for adults?

- 90/60
- 105/70
- 120/80
- 135/90
- 150/100



Assignment 7.

In the human being there are more than 200 bones and 600 different muscles. They make about 40 % of the weight of the man. Which bones and muscles do you know by name?

- Skull
- Clavicle
- Ribs
- Hip-bone
- Thigh-bone
- Shin-bone and tibia
- Deltoid
- Biceps brachii
- Triceps brachii
- Biceps femoris
- Quadriceps femoris
- Soleus
- Tibialis anterior
- Tibialis posterior



Aune Greggias

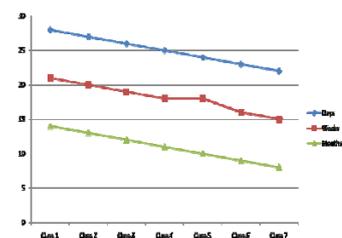
Is biceps an extensor or flexor?

Which muscles are stronger, extensors or flexors?

Assignment 8.

Training program can help you to get a better condition. Choose a place where you can run 80 meters. Take time and also pulse. Write them daily on a paper and look how your oxygen transport capacity grows when the training program continues.

Day one	Week one	Month one
Day two	Week two	Month two
Day three	Week three	Month three
Day four	Week four	Month four
Day five	Week five	Month five
Day six	Week six	Month six
Day seven	Week seven	Month seven



To get better results means usually increased training.

NUTRITION



Aune Creggas

Digestive system
Organic compounds
Chemical elements
Vitamins

Health Education & Tobacco Intervention Program in Nepal 2010



Aune Greggas

Digestive system

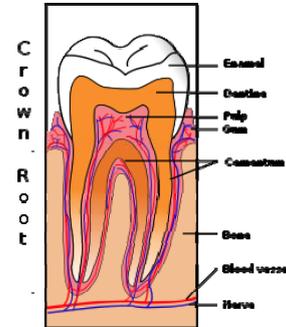
Biologically **food, water and air** are the physical requirements of all the living organisms. Every human being has all the equipment to use them for the different needs of the human body.

Food is processed in **the digestive system**.

The teeth cut up and grind the food. When it is grinded the **saliva glands of the mouth** add to the crunch **enzymes**. They are needed to break it up into that kind of chemical compounds which can be used by the body. When the food is swallowed, muscles take it through **the esophagus** to the stomach. In **the stomach** the chemical process continues with the enzyme **pepsin**. On the walls of the stomach there are also millions of **gastric glands** which secrete gastric juice, mainly **hydrochloric acid**.

All the processes of the digestive system are very well planned. However, **the teeth** has to be kept pure otherwise they will decay. It can be done by **brushing** them every day. Especially harmful are **sweets** and an **excess use of sugars**. The gums can also be destroyed by **tugging tobacco**. Also **the use of alcohol** has a detrimental effect on the mouth, esophagus and stomach. Alcohol does not effect only the spirit of a man, but also his digestive system. It has been found, that the use of alcohol **increases cancer** not only in these organs but also in other parts of the body.

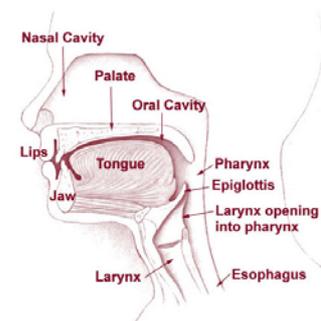
Teeth



<http://fi.wikipedia.org/wiki/Hammas>

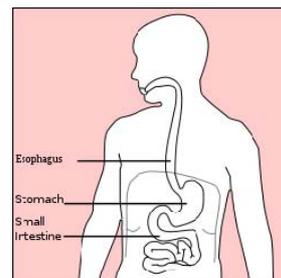
<http://fi.wikipedia.org/wiki/Hammas>

Mouth



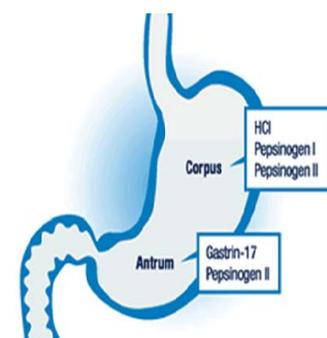
<http://en.wikipedia.org/wiki/Mouth>

Esophagus



<http://fi.wikipedia.org/wiki/Ruokatorvi>

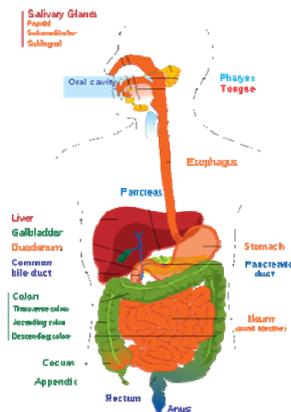
Stomach



http://www.biohit.com/upload/dia/img/gastropanel/stomach_med.gif

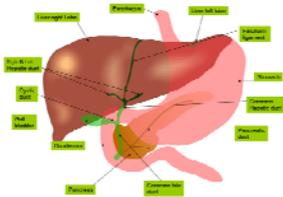
Digestive organ

http://en.wikipedia.org/wiki/Digestive_system



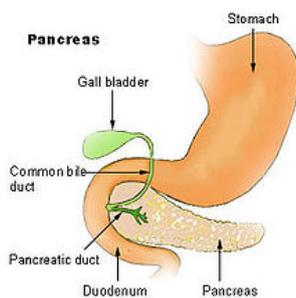
Liver

<http://en.wikipedia.org/wiki/Liver>



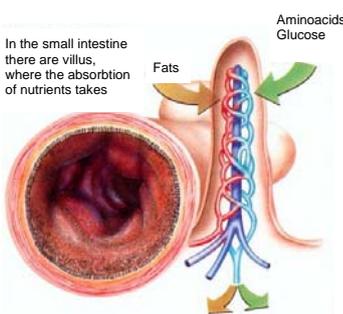
Pancreas and gall bladder

<http://en.wikipedia.org/wiki/Pancreas>



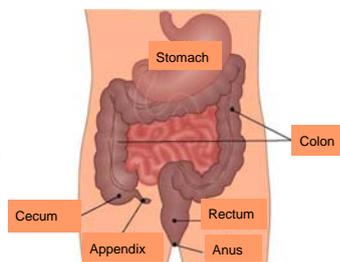
Small intestine

<http://www.metrika.net/mpelonen/sirety/tekstir/hms/ks/au012x.jpg>



Colon, rectum and anus

<http://www.terveyskirjasto.fi/amedia/ldk/ldk00247.jpg>



Alcohol and sugars are absorbed to the blood from stomach. The other food compounds are pushed through **the duodenum** to the **small intestine**. The small intestine is long (7-8 meters). It has millions of small projections, **small intestinal villi**, through which the nutrients are absorbed to the body. Also liver, pancreas, gut and large intestine are needed.

- **The liver** collects nutrients and stores them. For example, if the **blood sugar** is high, the liver takes **glucose** and changes it to **glycogen** and stores it. If the blood sugar is low, it takes glycogen and breaks it to glucose. **Glucose** is used in the body both by the brains and in the muscles. Among other nutrients stored in liver are **minerals, trace elements** and **vitamins A, D, K, B₁₂**.
- **The pancreas** secretes **insulin**. Insulin is needed to keep the **blood sugar level** constant. It aids glucose to be absorbed by the liver, muscles and cells. Insulin is secreted after meals high in sugars or carbon hydrates.
- **The gallbladder** stores **bile**, which is released when food containing **fat** enters the digestive tract. The bile emulsifies fats in partly digested food.

The liver is also a **detoxifier**. It breaks down or transforms substances like **metabolic waste, ammonia, nicotine, caffeine, drugs and chemicals** so that they can be excreted.

The liver also breaks **alcohol** to carbon dioxide and water. At the same time the liver itself is destroyed and becomes hardened (**liver cirrhosis**). Also those who use alcohol (**vine or beer**) daily can die because of it. For children alcohol is a **poison**: their liver is not able to break it. Besides WHO has declared alcohol as **first class cancer producing**.

Also the delicate balance of insulin production can be destroyed by **eating too much**. When the need for insulin is continually too large, the insulin glands in the pancreas will be burned out. One of the first symptoms is waist fatness (**MBS syndrome**). Later it may develop to **adult age diabetes**. In the **childhood diabetes** one of the first symptoms is constant thirsty. It need not be connected with the excess eating.

Bile sometimes crystallizes to **gallstones**. Especially **foods with lots of fats** can invite **intense abdominal** pain when the stones begin to move. Another reason for abdominal pain is **inflammation of the appendix**. The appendix is in the junction of small and large intestine. It is on the right side between the navel and the hipbone end. With intense pain in that area, do not wait but take the patient **straight to the hospital**.

There can be pain also in the large intestine during **diarrhea** or **constipation**. Most of the diarrheas come from bacteria or contaminated food. High **fiber** foods can prevent constipation.



Aune Greggas

Chemical elements

The main organic compounds in the living organisms are made of water, carbon hydrates, lipids, proteins and amino acids (RNA, DNA). These has been made of different chemical elements. It is through our food, liquids we drink or air we breathe that we get all the elements we need to keep up life. For living organisms four of them, oxygen, hydrogen, carbon and nitrogen, are the most important (96 %).

Oxygen (O): air (about 20 % of the air is oxygen), also water (H₂O) includes oxygen

Hydrogen (H): water H₂O (two hydrogen atoms and one oxygen atom), 70 - 90 % of fruits (oranges, apples) and vegetables (tomatoes, cucumber) is water.

Carbon (C): carbon (carbon hydrates) can be found in cereals (rice, wheat) and vegetables (potatoes, corn, carrots) and also in fruits (bananas)

Nitrogen (N): besides in the air (78 %) foods rich in protein such as peas, beans, lenses and also animal products have it.

Minerals

In the living organisms there are also other elements. Those needed only some grams (1-1,5 %) are called minerals or macronutrients. They are sodium (natrium), chlorine, magnesium, calcium and potassium (kalium), phosphorus and sulfur.

Sodium (Na): Salt (NaCl)

Chlorine (Cl): Salt (NaCl)

Magnesium: whole grain cereals, sesame seeds, almonds, nuts, green vegetables (chlorophyll), peas, beans, lenses

Calcium (Ca): milk products, soya, sesame seeds, fishes

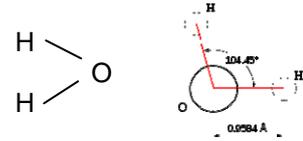
Potassium (K): citron fruits, bananas, green vegetables, potatoes, whole grain cereals, sesame seeds, almonds, nuts

Phosphorus (P): whole grain cereals, fishes

Sulfur (S): peas, beans, lenses, eggs, animal products

Water H₂O

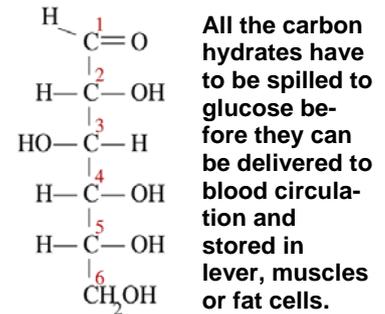
(two hydrogen atoms and one oxygen atom)



Carbon-hydrates C_m(H₂O)_n

(Compounds of carbon with hydrogen and oxygen)

glucose (C₆H₁₂O₆)



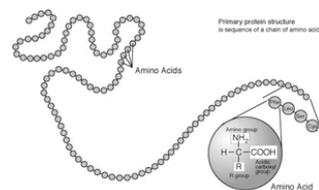
Lipids



Fats are made of glyserol (C₃H₈O₃) and long lipid acids (R>C₁₄).

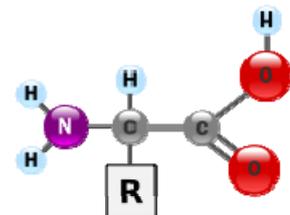
Proteins

Pepsin in the stomach breaks proteins to peptides.



Polypeptides are continual chain of amino acids.

Amino Acids



H = Hydrogen

N = Nitrogen

C = Carbon

O = Oxygen

R = side chain specific to each different amino acid. They are about 20 known amino acids.

Trace Elements

Iron (Fe)

Lustrous metallic grey, oxidized red



Zinc (Zn)

bluish pale grey

Copper (Cu)

pinky or beachy color, when oxidized greenish



Manganese (Mn)

silvery metallic

Iodine (I)

lustrous metallic gray, violet as gas

Chromium (Kr)

Silvery metallic

Selenium (Se)

dense purplish grey

Molybdenum (Mo)

gray metallic

Cobalt (Co)

hard lustrous gray metal

Silicon (Si)

Chrystalline, reflective with bluish-tinged faces



Fluorine (Fl)

Tan or yellow gas

Trace elements

There are about 120 different known chemical elements. Besides minerals - sodium (natrium), magnesium, phosphor, chlorine, sulfur, calcium and potassium (kalium) - in the living organisms there are lots of other minerals, which in the nutrition are called **trace elements or micronutrients**.

Even if there are only from micrograms to milligrams of trace elements in the human body, they are very important: These are: **iron, zinc, copper, manganese, iodine, chromium, selenium, molybdenum, cobalt, silicon, fluorine**.

Human body has most iron. It is very important part of the blood cells. **Zinc** is very important when healing scars and it is also needed when people are in stress situations. **Copper** is needed when blood cells are developing and in many other important functions in the body. **Manganese** is needed when children are growing and also in physical activity and it has to do with the fat metabolism. **Iodine** is needed for cell metabolism and lack of it hinders both intellectual and body growth. Lack of **chromium** might be reason for childlessness, it is also often connected with defects in sugar metabolism. **Selenium** is an antioxidant and helps muscles to get oxygen and keep the body cells in good condition, the lack of it increases the possibility to get infections, even cancer. **Molybdenum** helps copper in its work. **Cobalt** is a part of B¹² vitamin which is needed to make blood cells. Most **silicon** is in hair, skin and nails and it is needed when bones are growing. **Fluorine** is found in the bones and teeth, especially on the teeth mica (enamel), the hard cover which shields the teeth.

These trace elements are found in the following food:

Iron: whole grain cereals, soya, peas, beans, seeds, meat

Zinc: milk products, especially in cheese; whole grain cereals, especially in germs and bran; peas, sesame and sunflower seeds, nuts, meat

Copper: mushrooms, bran, spinach, sesame seeds, nuts, peas

Manganese: berries, carrots, soya flour, whole grain cereals, nuts

Iodine: salt with iodine, milk, sea fishes, sea algae

Chromium: sesame seeds, whole grain cereals, mushrooms, honey

Selenium: fish, meat, milk, eggs, whole grain cereals, mushrooms, sesame seeds, lenses, soya products

Molybdenum: peas, soya, whole grain cereals, green vegetables, eggs, potatoes

Cobalt: germs and bran

Silicon: whole grain cereals, vegetables

Fluorine: whole grain cereals, some fishes, potatoes, green vegetables, berries (strawberry)

Vitamins

Besides different chemical elements, which differ according to their nuclear structure, living organisms need special **organ compounds**, vitamins, to keep their functions going on. They are made of carbon, hydrogen and oxygen and some of them have also nitrogen or some other elements.

Vitamins are not needed in large amounts. Only some **micro- or milligram per day** is needed. They are named after Latin alphabet. The most important of them are A-vitamin, B-vitamins, C-vitamin, D-vitamin, E-vitamin and K-vitamin. B- and C-vitamins are water soluble and they are needed every day. A-, D-, E- and K-vitamins are fat soluble and they can be stored in the body for later use.

A-vitamin (retinol) is needed for growth, growth of bones, for skin and mucous membranes and immunity and growth of eye retina. With defects of A-vitamin people have difficulties to see in the dark. **B-vitamins** are very important for nerve functions, in stress situations and in metabolism and to keep up the all the body functions, skin, intestines, muscles and heart. **C-vitamin** is an antioxidant and it is needed to growth, to resist diseases, to keep the skin in good, when healing scars and in growth of bones and tissues and also to absorb iron to body. **D-vitamin** is important for the metabolism of calcium and phosphor needed in the bones and teeth, and also to keep the resistance against different diseases high. **E-vitamin** is also an antioxidant and it is needed to keep the cell functions good. It also shields the cells from damage and of heavy metals and toxins. **K-vitamin** is needed for blood coagulation

These vitamins are found in the following foods:

A-vitamin: Red and green vegetables which include carotenoids: carrots, parsley, spinach, nettle, paprika, apricot, rose berries. It is found also in animal products, meat, cheese, eggs

B-vitamins (thiamin, niacin, pantothein, pyridoxin, folic acid ja biotin): whole grain cereals, especially in germ and bran, but also in peas, beans and nuts; (B2 and B12): milk products, eggs, fishes and animal products, B2 also in soya beans and almonds

C-vitamin: fruits, especially citrus-fruits (oranges, citrons), berries, paprika, potatoes, cabbage

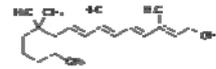
D-vitamin: fish oils, fishes, eggs, butter, cheese, mushrooms; ergocalciferol, which can be changed to D-vitamin can be found in vegetables

E-vitamin: vegetable oils, wheat germs and bran, whole meal cereals, soya, almonds, nuts, sesame seeds

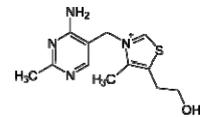
K-vitamin: bran, potatoes, green vegetables, especially cabbages, spinach, soya flour

Vitamins & need/day

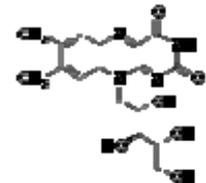
A-vitamin
800-900 mg



B1-vitamin
(thiamin)
1-1,7 mg



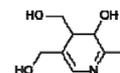
B2-vitamin
(riboflavin)
1,2-1,7 mg



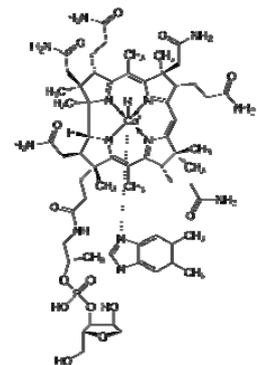
B3-vitamin
(niacin)
< 500 mg



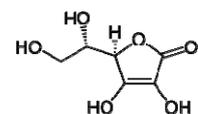
B6-vitamin
(pyridoksin)
1,1-1,5 mg



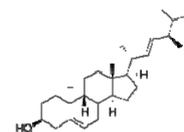
B12-vitamin
(cobalamin)
2 µg



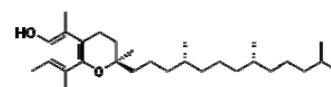
C-vitamin
(ascorbic acid)
60 mg



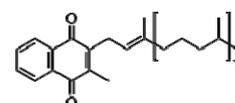
D-vitamin
5 mg



E-vitamin
8-11 mg



K-vitamin
is made in the large intestine



Tobacco Smoke



Tobacco, whether smoked, chewed or sniffed, contains nicotine, which is highly addictive, and contains over 19 carcinogens, and 4000 chemicals

ADAM

Some of the chemicals



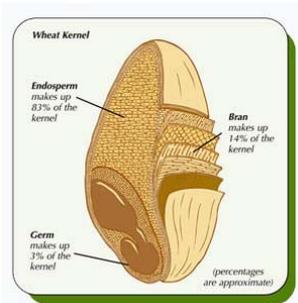
Where found



Common adverse effects of Tobacco smoking



Whole grain



Assignment 1

Let your teeth be examined. If there are holes, let them be repaid. Do not wait until you have aching teeth. To repair them then costs much more. To take the aching teeth away makes you feel better, but you lose very valuable tool which you have received as a birth-present.

Assignment 2

Find from your village an older man or woman tugging betel nuts or tobacco. How are their gums and teeth?

Assignment 3

Find from your village an older man or woman who has good teeth. What kind of living habit does they have? Have they been tugging tobacco or betel nuts or using lots of sweets or sugar?

Assignment 4

Eat linen seeds (without crunching them) or boiled red beats and see how long time the food needs to go through your digestive system (count to the time when you see the seeds or the red color in feces).

Assignment 5

Try to find where your appendix is (place your thumb to your navel and the fingers on the end of the hip bone on the right side of your body, the appendix is in the middle between them).

Assignment 6

If your feces is hard and you have difficulties to get the feces out, what would you do to help the situation? Which one in the following does not help in the situation?

- Drink more water
- Begin to choose food which have more fiber
- Mix bran with your food, for example to your bread
- Eat more vegetables and fruits
- Cook red beats and eat them
- Swallow linen seeds after they have been in water for some time
- Take ricine oil or some medicine
- Eat plenty of white rice and pasta or white flour bread

Assignment 7

Take 1 dl whole grain rice (rice with germs and bran still left) and 1 dl white rice (pealed and polished) and weight them. Which one is lighter?

You can also try to find the difference by washing the brown whole grain rice and white (refined) rice. Whole rice is much easier to wash, because it keeps on the bottom. White rice comes all the time to the surface of the water and is easily lost when washing it.

Why?

When the rice has been polished, all the minerals and trace elements (heavier than starches or carbon hydrates) which are in the germs and bran has been taken away. Germ has all the nutrients the developing organism needs, because the development of the new plant begins from it.

The same happens when white wheat flour is made (or refined). Even if iron is usually added to white wheat flour, all the other nutrients (minerals, trace minerals and vitamins) disappear.

Which have more nutrients whole grains cereals or refined grain cereals?



Citrus fruits (oranges)



Citrus-fruits, Avocado, Kiwi-fruit



Berries (strawberries, raspberries, blueberries)



Potatoes, tomatoes, cucumber, parsley, onions



Carrots, sweet corn and green beans



Paprika, gabbage, parsley, Tomatoes, chili, onions



Potatoes, tomatoes, garlic, lettuce

In all of these fruits and vegetables there are lots C-vitamins. In which there there is most?

Garlic includes A-, B-, C- and E-Vitamin and selen (more than any other plant), copper, magnesium, kalium and zink.

Assignment 8

Find and mark all the most important elements for living organisms in the periodic table of the chemical elements. Use different colors or marks for the **four most common elements**: Hydrogen (H), Carbon (C), Nitrogen (N), Oxygen (O); **Mineral elements (macronutrients)**: Natrium (Sodium) (Na), Magnesium (Mg), Phosphor (P), Sulphur (S), Chlorine (Cl), Kalium (Potassium) (K), Calsium (Ca); **Trace elements (micronutrients)**: (Manganese (Mn), Iron (Fe), Cobolt (Co), Copper (Cu), Zink (Zn), Selenium (Se), Krom (Kr), Iodine (I), Molybden (Mo), Fluorine (F), Silicon (Si).

Group →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
↓ Period																		
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra		104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo
	Lanthanides			57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
	Actinides			89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Assignment 9

Count, how large area cultivated land your family needs to feed your family with rice, potatoes, lentils, beans, peas and green vegetables. If you were using meat, the cultivated area should be 10 times larger.

Assignment 10

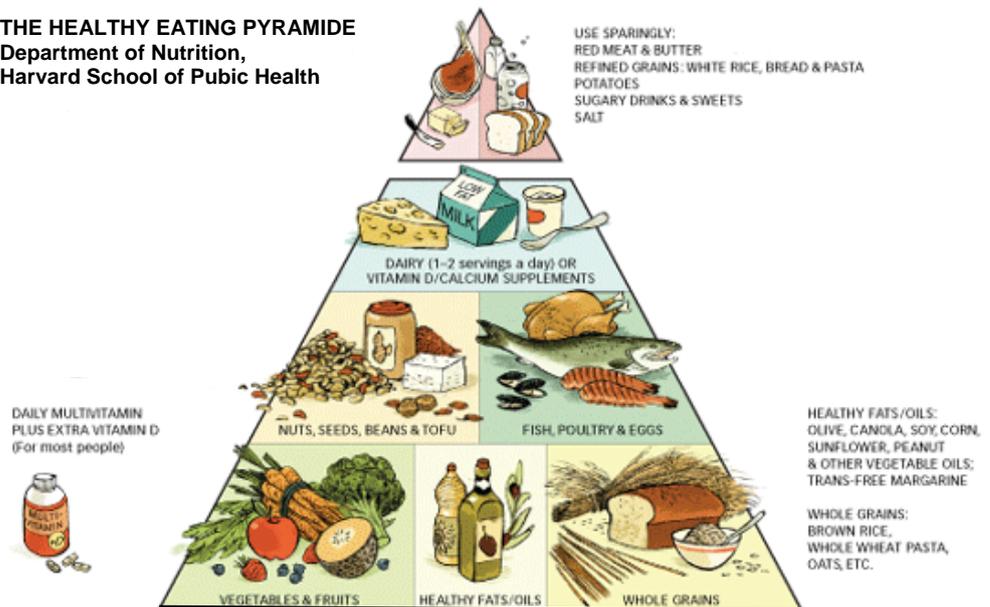
Choose nutritionally and ecologically best meal of the next foods:

- | | |
|-------------------------|-----------------------------------|
| white rice | brown whole grain rice |
| white wheat bread | whole grain wheat bread |
| peas, beans and lentils | pig or cow meat |
| fish and chicken | buffalo meat |
| fruits | sweet drinks with much sugar |
| eggs | nuts, sesame seeds, soya products |

Assignment 11

Cook a meal with high nutrition value. Try to follow the healthy eating pyramid:

THE HEALTHY EATING PYRAMIDE Department of Nutrition, Harvard School of Pubic Health



HYGIENE



Aune Greggas

Kidneys
Endocrine system
Immune system
Bacteria and virus
Ecosystems



Aune Greggas

Kidneys

The most important substance for life is water. Where there is no water there is no life. Every living cell needs water. All the different things in the cells flow in the water.

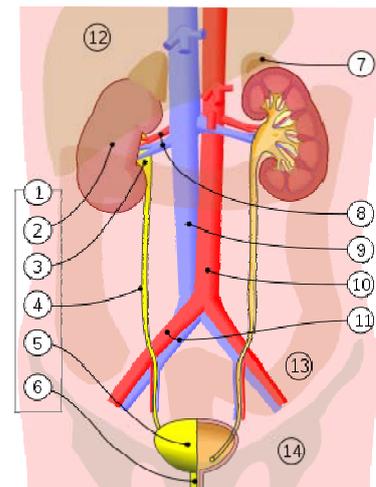
There is not water only inside the cell. There is lots of water in the body outside the cells. Blood is not only red and white blood cells and platelets. It includes also fluid of which water is the most important part. In the lymph, brains and spinal cord there is also lots water.

An average adult need about 2,5 liters water every day. Most of it he gets it by drinking and in food. Some of the needed water is made by the chemical reactions in the body. 1,5 liters water is lost every day in urine, 0,5-0,6 liters in sweat, 0,3-0,4 liters as vapor in breath and the rest in feces.

The water balance in the body is mostly controlled by the kidneys and adrenal glands. The amount of water the kidneys release as urine depends on the amount of salt in the blood. The kidneys try to keep the salt balance in the blood. If you drink lots of water, the kidneys secrete more water. If you drink little the kidneys restore the balance by holding on to more water in nephrons.

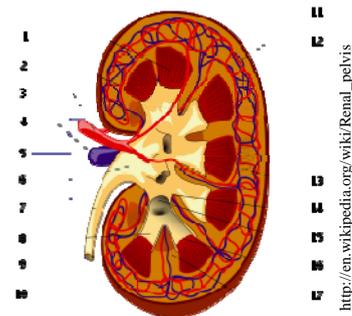
The salt balance is very important for the body. The food salt (NaCl) is not the only salt the body has. There are also some other salts: potassium, sodium, chloride and manganese. If the amount of salts grows too high, the thirst center in the hypothalamus in brains tells that you have to drink.

Urinary system



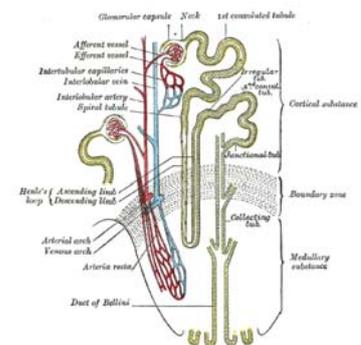
http://en.wikipedia.org/wiki/File:Urinary_system.svg

Kidney



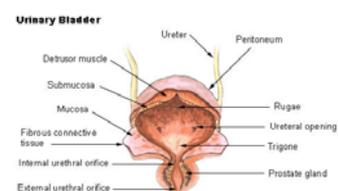
http://en.wikipedia.org/wiki/Renal_pelvis

Nephron



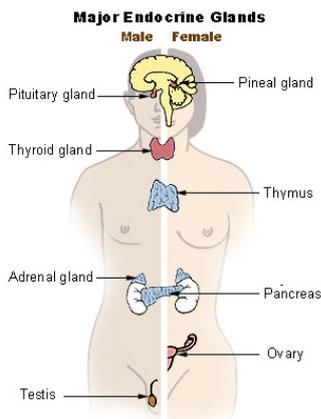
<http://en.wikipedia.org/wiki/File:Gray1128.png>

Bladder



http://en.wikipedia.org/wiki/File:Illu_bladder.jpg

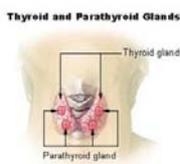
Endocrine glands



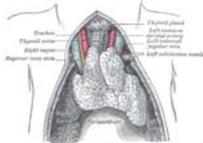
http://en.wikipedia.org/wiki/File:Illu_endocrine_system.jpg



<http://upload.wikimedia.org/wikipedia/>

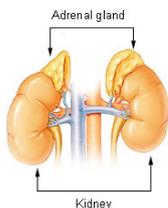


http://upload.wikimedia.org/wikipedia/commons/a/a3/Illu_thyroid_parathyroid.jpg

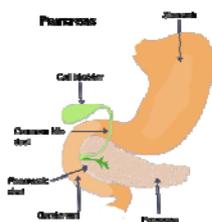


<http://en.wikipedia.org/wiki/File:Gray1178.png>

Adrenal Gland



http://en.wikipedia.org/wiki/Adrenal_gland



http://en.wikipedia.org/wiki/File:Illu_pancreas.svg

Endocrine system

There are several **endocrine glands** in the body. They secrete hormones to the blood. These can be steroids or amino acid –based. Usually each secreted hormone effects only one target organ.

Pineal gland secretes **melatonin**. It is an **antioxidant** and monitors the circadian rhythm including inducement of drowsiness.

Pituitary gland secretes many hormones. One of them is a growth hormone **somatotropin**, which stimulates **cell growth**. Another is **thyrotropin** which stimulates **iodin absorbtion** in thyroid gland and thyroxin secretion in it. **Vasopressin** increases water permeability in the distal convoluted tubule and collecting duct of **nephrons**. In that way it promotes **water re-absorption** and decreases the amount of urine. It also secretes hormones needed in **female reproductive life**.

Thyroid and parathyroid glands are in the neck in front of esophagus. They secrete thyroxin and calcitonin. **Thyroxin** stimulates body oxygen and energy consumption, thereby increasing the **basal metabolic rate**. **Calcitonin** stimulates **osteoblasts** and thus **bone construction**.

Thymus is a specialized organ in the immune system.

The adrenal glands are on the top of kidneys and are often also called suprarenal glands. They secrete **glucocorticoids, mineralocorticoids and androgens**. **Cortisol** is released in response to **stress** and to a low level blood glucocorticoids. Its primary function is to **increase blood sugar**. **Aldosterone** increases reabsorbtion of sodium and water in the kidneys and so **increase blood volume and blood pressure**. **Androgens** are **male hormones**.

Pancreas secretes insulin and glugacon. **Glugacon** stimulates liver to **release glucose** to the blood. **Insulin** increases the rate of **glucose uptake** and metabolism by most body cells. Hyposecretion of insulin results in **diabetes**. The first symptoms of diabetes are often increased urinating and thirst, also excess eating..

Gonads include ovaries (female) and testes (male). **Ovaries** secrete **estrogen and progesterone**. Secretion of estrogen begins at puberty. Together with progesterone they establish the menstrual cycle. The **testes** of the male begin to produce **testosterone** at puberty. Gonad hormones play a key role in the development of female and male **secondary sexual characteristics**.

Immune system

The immune system is a complicated system that **defends** your body in the fight against **germs** and other invaders. In HIV this part of the body functions is deficient.

The body has a variety of barriers **to stop germs** entering to it.: skin, tonsils, adenoids, mucus in the digestive organs and airways, thymus, lymph glands, spleen.

In the **skin** Sebaceous glands ooze an oil that is poisonous to many bacteria. **Mucus** in the airways and lungs and in stomach, intestine and colon protect them from unsuitable substances and smoke particles as well as from germs.

Tonsils in the throat and **adenoids** in the nose release cells to fight any infection that reaches the throat. The **thymus** is a gland in the chest that turns ordinary **white blood cells** into special **T-cells** that fight **harmful microbes**. During the infection **lymph nodes** often swell up with white blood cells that have swallowed germs. The **spleen** not only destroys old red blood cells, but also helps to make **antibodies** and **phagocytes**.

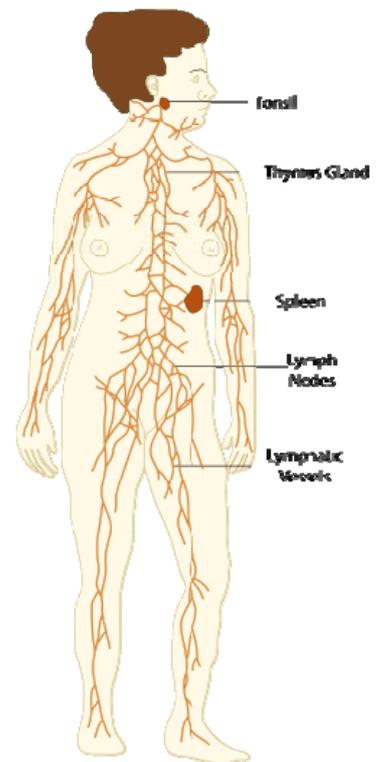
Phagocytes are big white blood cells that swallow up invaders and then use an enzyme to dissolve them. They are drawn to the site of an infection whenever there is **inflammation**.

Tonsils, adenoids, thymus and spleen belong to the **lymphatic system**. It is a network of tubes that drains the fluid all around the body's cells back into the bloodstream. These **lymph vessels** are filled with **lymph fluid** along with bacteria ja waste chemicals, drains from body tissues such as muscles. The **fluid circulation** is helped by muscle movements and heart beat. On the average at any time 1-2 liters of lymph fluid circulates in the lymphatic and body tissues.

In the lymph vessels there are **nodes**. These are filters that trap germs that have got into the lymph fluid. In the nodes white blood cells called **lymphocytes** neutralize and destroy germs. During a cold or any other infection the lymph nodes in the neck or the groin or under the arms may swell as lymphocytes fight germs.

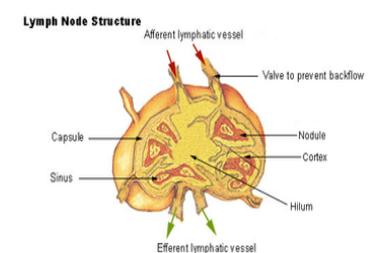
Some lymphocytes are able to memorize the organisms that have attacked the body. In the blood there are thousands of different kinds of lymphocytes that produce **antibodies** against a particular germ. Because of this **acquired immunity** there are many contagious infections that are not transmitted another time. This is also how **vaccination** works.

Lymphatic system



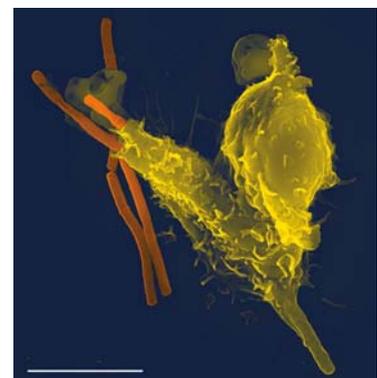
http://en.wikipedia.org/wiki/Lymphatic_system

Lymph node



http://en.wikipedia.org/wiki/Lymphatic_system

Phagocytes



<http://en.wikipedia.org/wiki/Phagocytes>

Scanning electron micrograph of a neutrophil (a phagocyte) phagocytosing anthrax bacilli (orange).

Bacteria diseases Tuberculosis (TB)



http://en.wikipedia.org/wiki/File:Mycobacterium_tuberculosis.jpg

Virus diseases Chicken pox



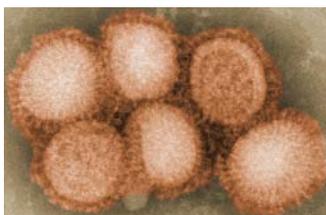
http://upload.wikimedia.org/wikipedia/commons/0/03/Child_with_chickenpox.jpg

Measles



http://upload.wikimedia.org/wikipedia/commons/3/3c/Morbillivirus_measles_infection.jpg

Influenza (Swine H1N1)



http://upload.wikimedia.org/wikipedia/commons/e/ea/H1N1_navbox.jpg

Bacteria and virus

All the germs in the body are not unwelcomed guests. There are lots of bacteria in the colon to decay the feces. However there are several bacteria and virus threatening the human beings which cause severe diseases:

Tuberculosis or **TB** is a common infectious disease in humans. The bacteria attacks the lungs but can also affect other parts of the body. It is spread through the air, when people who have the disease cough, sneeze, or spit. If left untreated, it kills more than 50% of its victims. The symptoms are a chronic cough with blood-tinged sputum, fever, night sweats, and weight loss.

Chickenpox is a highly contagious illness caused by a virus (VZV). It usually starts with vesicular skin rash mainly on the body and head rather than at the periphery and become itchy, raw pockmarks. Chicken pox is spread easily through coughs or sneezes of ill individuals or through direct contact with secretions from the rash. Following primary infection there is usually lifelong protective immunity.

Measles is also caused by a virus. Symptoms include fever, cough, runny nose, red eyes and a generalized rash. Measles is spread through respiration (contact with fluids from an infected person's nose and mouth, either directly or through aerosol transmission), and is highly contagious—90% of people without immunity sharing a house with an infected person will catch it. The infection has an average incubation period of 14 days (range 6–19 days) and infectivity lasts from 2–4 days prior, until 2–5 days following the onset of the rash.

Human immunodeficiency virus (HIV) is a retrovirus that causes **acquired immunodeficiency syndrome (AIDS)**, a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections. Infection with HIV occurs by the transfer of blood, semen, vaginal fluid, pre-ejaculate, or breast milk. The four major routes of transmission are unsafe sex, contaminated needles, breast milk, and transmission from an infected mother to her baby at birth.



Influenza is the most usual infectious disease caused by viruses which affect both birds and mammals. The most common symptoms of the disease are chills, fever, sore throat, muscle pains, severe headache, coughing, weakness/fatigue and general discomfort. In more serious cases, influenza causes pneumonia, which can be fatal, particularly for the young and the elderly.

Although often confused with common cold, influenza is a more severe disease and caused by a different type of virus. Influenza may produce nausea and vomiting, particularly in children, but these symptoms are more common in the unrelated **gastroenteritis**, which is sometimes called "stomach flu" or "24-hour flu".

<http://en.wikipedia.org>

Typically influenza is transmitted through the air by coughs or sneezes. Influenza can also be transmitted by direct contact with bird droppings or nasal secretions, or through contact with contaminated surfaces. Influenza viruses can be inactivated by **sunlight, disinfectants and detergents**. As the virus can be inactivated by **soap**, frequent **hand washing** reduces the risk of infection.



Pollination by a butterfly is a type of ecosystem service

Your tobacco destroys the lungs of the world...



Ecosystems

Aune Greggas

It is interesting to see how well everything functions in the human body. Every cell and every organ is helping each other. They help each other to get all the substances they need. They help each other to get rid of all the waste substances or things that threaten their existence. All what can be reused is reused. All possible waste and toxic substances are destroyed and removed from the body.

In a similar way humankind benefits from a multitude of resources and processes that are supplied by natural ecosystems. These benefits are known as **ecosystem services**. They include products like clean drinking water and processes such as the decomposition of wastes.

According to the United Nations 2004 **Millenium Ecosystem Assessment** ecosystem services can be grouped into four categories: **provisioning**, such as the production of food and water; **regulating**, such as the control of climate and disease; **supporting**, such as nutrient cycles and crop pollination; and **cultural**, such as spiritual and recreational benefits.

As human populations grow, so do the **resource demands** and our **global footprint**. Natural resources are not invulnerable and infinitely available. The environmental impacts derived from human activities, are becoming more apparent. Air and water quality are increasingly compromised. Rivers, lakes and oceans are being overfished. Pests and diseases are extending beyond their historical boundaries. Deforestation is exacerbating flooding downstream and diminishing the oxygen producing area of the globe.

Uganda

Uganda's tobacco industry is spawning an environmental disaster, as farmers turn to fruit trees for wood fuel to cure the tobacco leaves. Driving through tobacco growing areas, outside the Murchison Falls National Park one barely encounters natural forests. The native trees have been cut down and no efforts have been made to replace them.

Halima Abdallah
16 August 2010

<http://allafrica.com/stories/201008160901.html>

Indonesia



<http://en.wikipedia.org/wiki/>

Indonesia has drained over 1 million hectares of the Borneo peat swamp forests for conversion to agricultural land. Fires were used in an attempt to create agricultural lands, including large palm tree plantations to supply palm oil. The dried-out peat ignites easily. Therefore after drainage, fires ravaged the area, destroying remaining forest and large numbers of birds, animals, reptiles and other wildlife along with new agriculture and releasing enormous quantities of CO₂ into the atmosphere.

http://en.wikipedia.org/wiki/Borneo_peat_swamp_forests

How to promote health when a contagious disease spreads out in the area?

1. **Use Narmaste greeting:**
Keep distance to other people and do not touch them when you meet them and talk with them
2. **Keep you hands clean:**
Wash you hands as often as possible. Soap or some antiseptic substance helps to get your hands clean.
3. **Do not touch your eyes with your hands:**
The eyes are very sensitive area in the body.
4. **Beware coughing people:**
Most of the contagious diseases like influenza is transmitted through the air by coughs or sneezes. Be aware of coughing people, and if you for example get the flue stay at home and do not cough to your hands but to a piece of paper or cloth.
5. **Guarantee that your immune system functions well:**
Drink a lot. Several vegetables include that kind of trace elements, minerals and vitamins which are important in fighting against contamination. Such are C-vitamin, zink etc. Unions, especially garlic, is known to be a good help when fighting against flu or stomach infections., also some other contagious diseases.
6. **Take a vaccination:**
In many countries polio, measles and many other for children dangerous contagious diseases has been won by giving the children a vaccination. Vaccination can be taken also against influenza if it can be expected that the person has a low power of resistance.



Aune Greggias

Assignment 1

Can you help your mother to clean up your home and surroundings from all the waste materials.

Collect

- all the things which can be composted to a compost
- everything which can be reused in one bag (bottles etc.)
- all wooden things to the fireplace
- all the waste plastic in one bag
- all the metallic things in a container
- All rubbish in in one container



Assignment 2

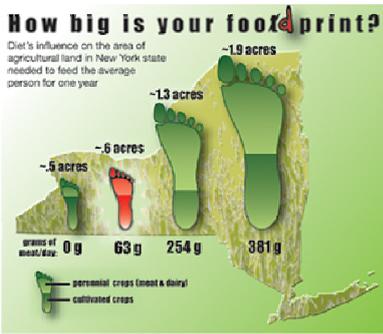
Check with your father your compost that no rats cannot go there and eat the food and other waste material which has been thrown there.



There is a difference between a compost and a rubbish heap. In the rubbish heap the anaerobic bacteria do the decaying work. In the compost the decaying work is aerobic and there are lots of worms. In the compost which can be bought there are a thermometers. With high temperature the decaying is quicker and the new made soil can sooner be picked up from the bottom of the compost. Compost soil is very good fertilizer for flowers and vegetables.

Garden compost can be open. On the bottom there is good to have brushwood and twigs. The compost needs oxygen, nitrogen, carbon and water to make good soil. If the same materials were placed in a closed plastic bag, it would make bad smelling methane of the same material.

Meat eating and need of area



Vegan, 0 g, 0,5 acres
 Vegetarian, 63 g, 0,6 acres
 Little meat, 254 g, 1,3 acres
 Much meat, 381 g, 1,9 acres

Alcoholic, 10 l, 0,25 ropani

Besides much meat user produces 1,7 ton more greenhouse gases as vegetarian!

Tree planting

Tree planting is not good only against deforestation but also to absorb carbon dioxide (one of the greenhouse gases) from the air.



How much carbon dioxide does a tree absorb?

The amount of CO₂ a tree will offset depends on many factors, such as the type of tree, where it is planted and the amount of room it has to grow. On average, one broad leaf tree will absorb in the region of 1 ton of carbon dioxide during its full life-time (approximately 100 years).

Assignment 3.

Take some fruit and vegetable rubbish in a plastic bag and close it. Follow it a couple of weeks. Open the bag when its contents is wet and slimy. Smell the strong gas metan which has been developed in the bag by an anaerobic decay.

Assignment 4.

Compare the amount and the color of the urine in the morning:

1. In a usual morning
2. When you have drunk one extra liter juice or boiled water in the evening.
3. When you have not been drinking for a day
4. When you have taken one little spoon extra salt.

Assignment 5.

Count how much large land area a person who eats lots of meat and 10 liters alcohol a year a year. Compare it to a vegetarian who do does not use alcohol. (1 acre is about 8 ropanis). Is the difference

Assignment 6.

Find tree seeds from the nature and plant them in a vessel. When they have grown a little take each one of them in different mug and let still grow. Discuss with your village development committee where in the your area new trees could be planted. Especially important places are all the open hillside slopes. The trees help to gather water and decrease the possibility of landslides. Plant them.

Assignment 7.

Would you like to make your surroundings healthier, streams cleaner and landscape more beautiful?

Arrange as a school class a day when all of you go together all around your home town/village with large plastic bags and collect all the rubbish away from the road sides & creeks and riversides.

Collect them with a stick or have a small plastic bag on your hands to keep it clean. Do not forget to wash afterwards your hands and cloths with soap very carefully. Dirty hands and cloths have lots of germs.



ACTIVATION



Aune Greggas

Nervous system
Brains
Senses
Thinking
Course of life

The Health Education & Tobacco Intervention Program in Nepal 2010

Nervous system

The **nervous system** makes the differentiation of the cells possible. It is an organ system containing a **network** of specialized cells called **neurons**. They **coordinate the actions** and **transmit signals** between different parts of the body. The nervous system consists of two parts, central nervous system and peripheral nervous system.

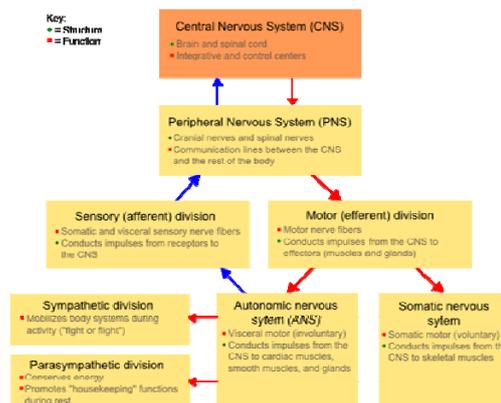
The **central nervous system** contains the **brain**, the **spinal cord** and the **retina**. The central nervous system is enclosed and protected by **meninges**, a three-layered system of membranes, including a tough, leathery outer layer called the **dura mater**. The brain is also protected by the **skull**, and the spinal cord by the **vertebrae**.

The **peripheral nervous system** is a collective term for the nervous system structures that do not lie within the central nervous system. It consist of **sensory neurons**, clusters of neurons called **ganglia**, and **nerves** connecting them to each other and to the central nervous system.

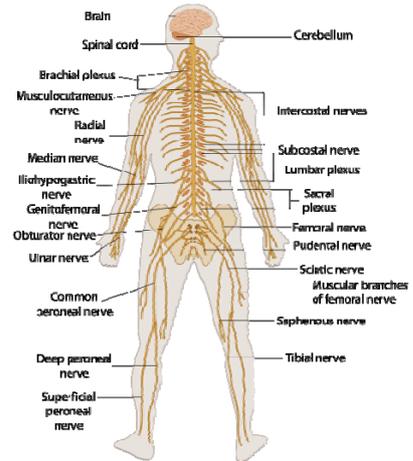
The peripheral nervous system has a **sensory** and **motor** division and a somatic and visceral part. The **somatic part** consists of the nerves that innervate the **skin, joints** and **muscles**. The cell bodies of somatic sensory neurons lie in dorsal root ganglia of the spinal cord. The **visceral part**, also known as the **autonomic nervous system**, contains neurons that innervate the **internal organs, blood vessels** and **glands**. The autonomic nervous system itself consists of two parts: the **sympathetic nervous system** and the **parasympathetic nervous system**.

A **nerve** conveys information through the neurons in the form of **electrochemical impulses**. The impulses are extremely fast with some **myelinated** neurons conducting at speed up to 120 m/s. The impulses travel from one neuron to another by crossing a **synapse**. In the synapse the message is converted from electrical to chemical and again to electrical.

According to their function the nerves are either **sensory** (impulses from the muscles to the brains) or **motor** (impulses from the brains to the muscles and glands).

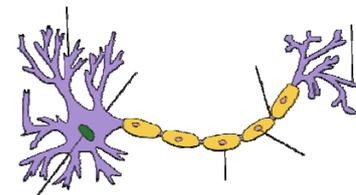


Nervous system



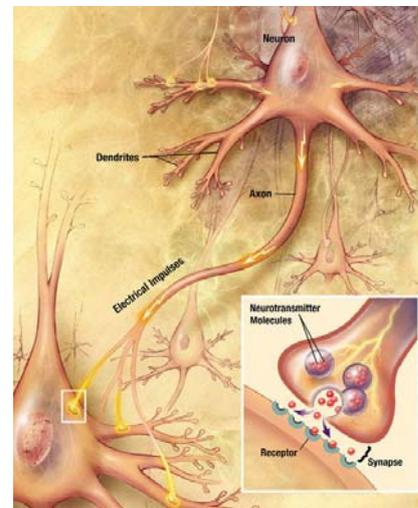
http://en.wikipedia.org/wiki/File:TE-Nervous_system_diagram.svg

Nerve cell



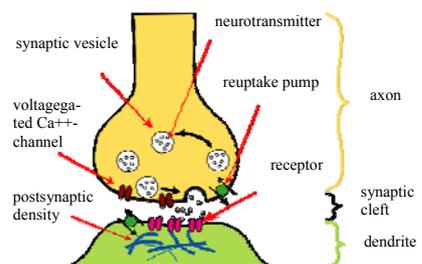
http://en.wikipedia.org/wiki/File:Neuron_Hand-tuned.svg

Synapses



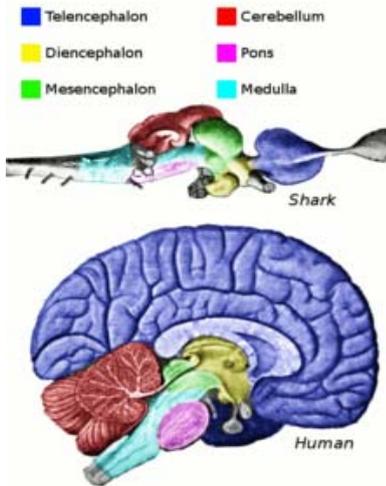
http://upload.wikimedia.org/wikipedia/commons/3/30/Chemical_synapse_schema_cropped.jpg

Transmission in a chemical synapse



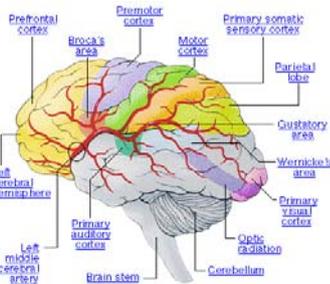
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Brains



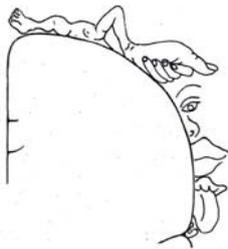
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Cortex functions



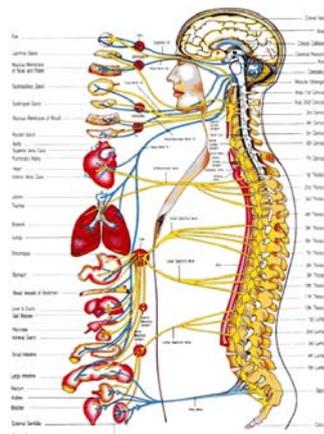
<http://www.rainbowskill.com/wp-content/uploads/2009/01/b2.gif>

Sensory cortex



http://en.wikipedia.org/wiki/File:Sensory_Homunculus.png

Autonomic nerve system



http://www.halecliniconline.com/UNDERSTAND_CHIROPRACTIC.php

Brains

The brain is the most complex biological structure known. Living brain tissue is pinkish on the outside and mostly white on the inside. The brain is the **center of the nervous system**. The brain controls the other organ systems of the body, either by **activating muscles** or by causing **secretion of chemicals** such as hormones. This centralized control allows **rapid and coordinated responses to changes in the environment**.

Neuroanatomists usually consider the brain to consist of six main regions: the telencephalon (cerebral hemispheres), diencephalon (thalamus and hypothalamus), mesencephalon (midbrain), cerebellum, pons, and medulla oblongata. Each of these areas in turn has a complex internal structure.

Medulla: contains many small nuclei involved in a wide variety of sensory and motor functions.

Pons: deal primarily with sleep, respiration, swallowing, bladder control, hearing, equilibrium, taste, eye movement, facial expressions, facial sensation, and posture.

Cerebellum: modulates the outputs of other brain systems, for example when learning how to ride a bicycle.

Mesencephalon: is considered part of the brain stem. It is closely associated with motor system pathways. Dopamine produced in the substantia nigra plays a role in motivation and habituation.

Diencephalon: The **hypothalamus** control sleep/wake cycles, eating and drinking, hormone release, and many other critical biological functions. The **thalamus** is involved in relaying information to and from the cerebral hemispheres, in motivation etc.

Telencephalon (cerebrum): Vision, forethought, planning, working memory, motivation, attention and executive control.

The **cerebral cortex** is the part of the brain that most strongly distinguishes mammals from other vertebrates, primates from other mammals, and humans from other primates. Most of the enlargement comes from a massive expansion of the **cortex**, focusing especially on the parts serving **vision** and **forethought**.

The other part of the brain that is greatly enlarged is the **prefrontal cortex**, whose functions relate to planning, working memory, motivation, attention and executive control. In humans, this enlargement of the frontal lobes is taken to an extreme. The hippocampus of mammals also has a distinctive structure.

Senses

Senses provide inputs for perception. The traditional five senses are sight, hearing, smell, taste and touch. Touch includes several senses: touch, pain, pressure and temperature. There are also some other senses which has to do balance, acceleration, co-ordination, direction etc.

Sight or vision: The eye has an ability to detect electromagnetic waves and to see colors, hues and brightness. There are two kinds of light sensitive cells in the retina: rod and cones. Rods can work even in dim light, but they cannot detect colours. Cones respond to colours.

Hearing: The ear contains a mechanism for hearing and balance. Pinnae (the ear flaps) collect and funnel the sounds in the ear. When the eardrum begins to vibrate three ossicle bones, the malleus (hammer), the incus (anvil) and the stapes (stirrup) in the middle ear, begin also to vibrate and transmit the vibration to a fluid of the cochlea (organ of hearing). The hair-like fibers in cochlea can detect mechanical motion of the fibers within a range of about 20 to 20,000 hertz. Hearing at high frequencies declines with age. The Eustachian tube connects the middle ear chamber to the back of the nose. It keeps the air pressure inside the ear equal to the pressure outside.

Smell: Human nose can tell the difference between more than 10,000 different chemicals. Inside the nose scent molecules are picked up by olfactory cells which send the signals to the part of the brain that recognizes smell. It is close to the memories and emotions.

Taste: Taste receptors detect food chemicals dissolved in saliva in the mouth. They are found mainly on the tongue's surface in taste buds. There are around 10,000 taste buds in the tongue. The basic tastes are sweet, salty, sour and bitter.

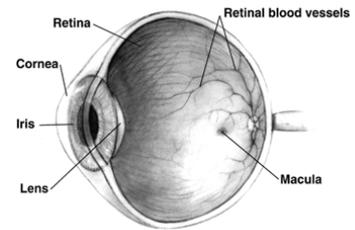
Touch: Nerve endings in the skin can detect touch, pressure, pain, heat and cold. There are more than 200,000 heat and cold receptors, 500,000 touch and pressure receptors and nearly 3 million pain receptors. Most receptors are found in hands and face, less on the back. Besides pain receptors in the skin there are pain receptors joints and bones and body organs.

Balance and acceleration allows an organism to sense body movement, direction, and acceleration and to attain and maintain postural equilibrium and balance.

Kinesthetic or co-ordination sense provides the parietal cortex of the brain with information on the relative positions of the parts of the body.

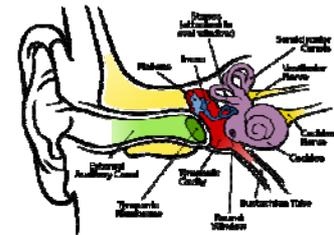
Direction is the ability to detect the direction one is facing based on the Earth's magnetic field. Directional awareness is most commonly observed in birds.

Vision (eye)



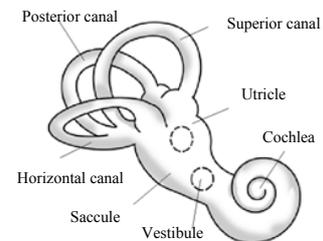
[http://upload.wikimedia.org/wikipedia/commons/e/ed/ Human_eye_-_cross-sectional_view_-_grayscale.png](http://upload.wikimedia.org/wikipedia/commons/e/ed/Human_eye_-_cross-sectional_view_-_grayscale.png)

Hearing (ear)



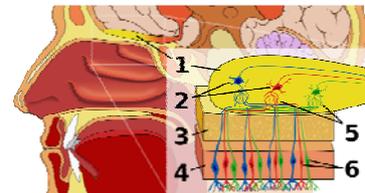
[http://en.wikipedia.org/wiki/ File:Anatomy_of_the_Human_Ear.svg](http://en.wikipedia.org/wiki/File:Anatomy_of_the_Human_Ear.svg)

(inner ear)



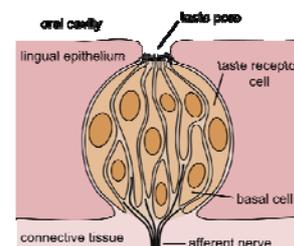
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Smell (nose)



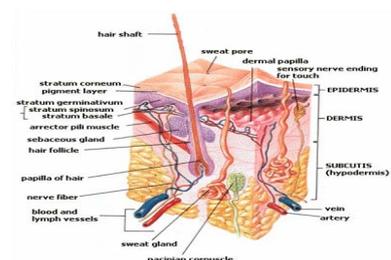
[http://en.wikipedia.org/wiki/ File:Olfactory_system.svg](http://en.wikipedia.org/wiki/File:Olfactory_system.svg)

Taste (tongue)



[http://en.wikipedia.org/wiki/ File:Taste_bud.svg](http://en.wikipedia.org/wiki/File:Taste_bud.svg)

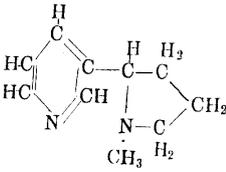
Touch (skin)



[http://upload.wikimedia.org/ wikipedia/commons/3/34/Skin.jpg](http://upload.wikimedia.org/wikipedia/commons/3/34/Skin.jpg)

Nicotine

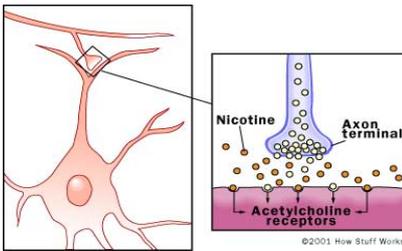
<http://www.quit-smoking-central.com/images/>



Nicotine is the psychoactive drug in tobacco beverages. In Nepal it is found in cigarettes, cigars, bidi, hand-rolled tobacco, masala, gutkha, khaimi, with areca nut etc.

Nicotine works by docking to a subset of receptors that bind the neurotransmitter acetylcholin.

While neurons typically release small amounts of acetylcholin in a regulated manner, nicotine activates cholinergic neurons in many different regions throughout your brain simultaneously. This stimulation leads to:



Increased release of acetylcholine from the neurons, leading to heightened activity in cholinergic pathways throughout your brain.

Stimulation of cholinergic neurons promotes the release of the neurotransmitter dopamine in the **reward pathways** of your brain.

Release of glutamate, a neurotransmitter involved in learning and memory.

Nicotine's effects are short-lived, lasting only 40 minutes to a couple of hours. This leads people to smoke or chew tobacco periodically throughout the day to dose themselves with nicotine.

Add to this the fact that you can become **tolerant** to nicotine's effects - you need to use more and more nicotine to reach the same degree of stimulation or relaxation - and you can see how people would quickly move from smoking one cigarette to a pack a day habit.

Other drugs which do the same are caffeine, cocaine, amphetamine, morphine and heroine.

Thinking

Most thoughts appear to take place in the **cerebrum** and different kinds of thoughts are linked to different areas. These are called **association centers**. Each half of the cerebrum is divided into four **lobes**: two of them are at the front (frontal and temporal lobe) and two at the back (occipital and parietal lobe).

The **frontal lobe** is linked to your personality and is the area in which your ideas form.

The **temporal lobe** is the area in which you hear and understand what people say to you.

The **occipital lobe** is the area in which you work out what you eyes are seeing.

The **parietal lobe** is where you register voices, touch, cold and pain.

The left side of the brain controls the right side of the body, the right side controls the left side of the body.

Memory

Memory is an organism's ability to store, retain and recall information. It has been thought that the brain stores information by creating new nerve connections. The three types of memory are: sensory, short-term and long-term.

Sensory memory is the impression that new information makes in the mind. It lasts for only a fraction of a second.

Short-term memory is information that the brain stores so long it is needed to work with it.

Long-term memory is the memory that lasts through life. There are memories which you learn by practicing. Some memories are memories of striking events in your life: you remember your first day in the school, breaking your leg etc. Some memories are facts and dates.

Mood

Mood is the state of mind, whether you are happy or sad, angry or afraid, overjoyed or depressed. Mood and emotions seem to be strongly linked to the structures in the center of the brain, where unconscious activities are controlled. Moods change when thalamus sets off automatic changes in the body through nerves and hormones.

There are several illegal drugs which can change the mood. Also caffeine, alcohol and tobacco do it. All of them are addictive and ceasing to use them gives withdrawal symptoms: irritability, anxiety and depression.

Course of life



What a person is and how she/he looks like is largely dependant of the heredity. The body characteristics are a mix of two sets of instructions - one from the mother's and another from the father's side.

These instructions are found in the 23 pairs of chromosomes (altogether 46 chromosomes), which are found in every cell in the human being. One set is from the mother and one set from the father. All the other pairs are similar but the 23rd pair is different in male cells. In it the chromosome from the mother is called X chromosome and the chromosome from the father is called Y-chromosome.

The chromosomes are made of DNA-bars. DNA is shaped in a double helix with linking bars. The bars of DNA are four special chemicals called bases: guanine, adenine, cytosine and thymine. The genes are sections of DNA. In every cell there are more than 30.000 genes.

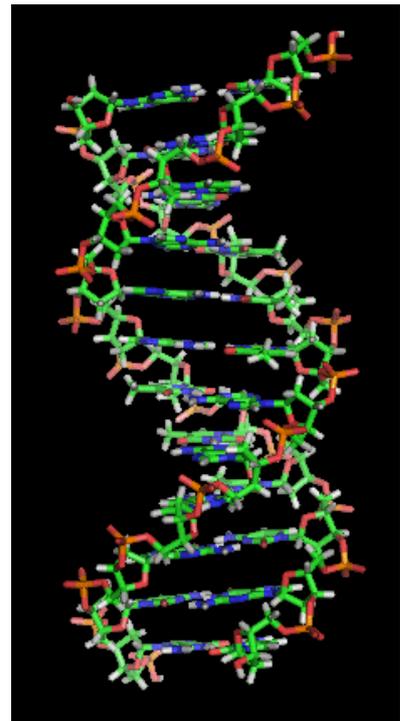
The genes decide, not only the color of the eyes, hair and skin but also many other physical and psychological features. However, they do not decide everything. Also the environment has its impact. A childhood with malnutrition and lack of activation might result in short of stature and low intellect. Also the use of tobacco, alcohol and drugs as a teen ager predicts difficulties and early death in the future.

Excellent hygiene, healthy nutrition, enough activation and exercise with basic trust are the best resources for a good life. Practicing them helps to get a longer healthy expected life time.



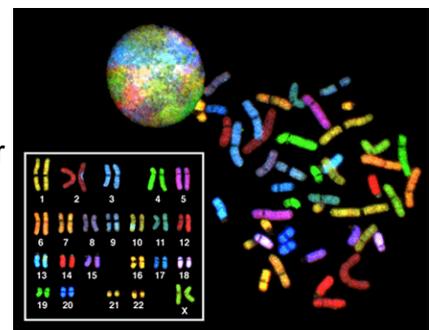
Life will be also happier.

DNA-orbit



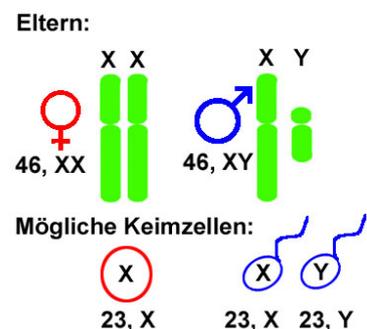
http://upload.wikimedia.org/wikipedia/commons/d/db/DNA_orbit_animated_static_thumb.png

A karyotype of male chromosomes



http://upload.wikimedia.org/wikipedia/commons/3/35/Sky_spectral_karyotype.png

Sex chromosomes with female (xx) and male (xy) parents & choices



Fight or flight

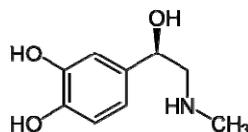
What happens when you become really angry or are afraid?

- The heart begins to beat really hard
- The breath becomes deeper and quicker
- The face becomes pale or red or both
- The eyes become dilated
- The mouth becomes dry
- The blood circulation is inhibited in the stomach and intestine
- The muscles become tense
- The blood sugar level heightens
- The feet and arms are shaking or the whole body is shivering
- The sight to the sides disappears
- The hearing is disturbed
- The bladder may open (urine runs away)

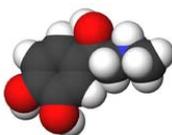
What is needed for these "fight or flight" –symptoms?

- Information of the danger to the cortex through sensory nerves
- The sympathetic nerve system arousal
- Information to hypothalamus and pituitary gland and from there to adrenalin glands
- Hormone (epinephrine or adrenaline) release

http://fi.wikipedia.org/wiki/Tiedosto:Adrenalin_-_Adrenaline.svg



<http://en.wikipedia.org/wiki/File:Epinephrine-3d-CPK.png>



Assignment 1

Take two small pins. Ask you friend touch with them the skin in your hand and in your back. How long from each other the pins are when you do not feel any more two but only one pin? (There are more nerve cells in the hands than in the back.)

Assignment 2

There are two kinds of light sensitive cells in the eye, nods (black and white) and cones (colors). Go from a bright room out in the dark courtyard. How long time does it take before you begin to see? (It takes about half an hour for the nods to get the maximal sensitiveness.)

Assignment 3

Nerve cell signals are partly electrical and partly chemical. What do happen if there has been a strong signal and it ceases? Stare for a while a bright light in a dark room. What do you see when you turn off the light? (Usually you will see an after picture which then disappears and you begin to see the opposite color, red-green etc.)

Assignment 4

Tobacco is known to give a very strong impulse, because it increases the release of acetylcholine in the synapses. What kind of "after picture" can be expected in the brain? Does this "after picture" make it easier to stop smoking?

Assignment 5



World Health Organization

World Health Organization (WHO) reports:

"Drug use is one of the top 20 risk factors to health worldwide and among the top 10 in development countries. Drug use disorders are associated with an increased risk of other diseases such as HIV/AIDS, hepatitis, tuberculosis, suicide, overdose deaths and cardiovascular disease. Injecting drug use is a major route of HIV and hepatitis transmission in many regions."

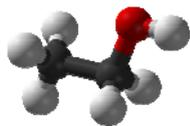
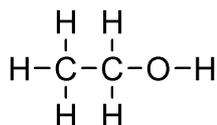
Do you accept that it is not good to use drugs?

Assignment 6.

There are people with brown and blue eyes. How is it possible that brown eyed parents can get a child with blue eyes? Brown (Br) is a dominant and Blue (Bl) recessive color:

Brown Male	&	Brown Female	=	Brown Child	or	Brown Child	or	Brown Child	or	Blue Child
Br + Bl		Br + Bl		Br + Br		Br + Bl		Br + Bl		Bl + Bl

Alcohol



<http://en.wikipedia.org/wiki/File:Ethanol-3D-balls.png>

Drinking alcohol is **ethanol**, also called **ethyl alcohol**. It is a volatile, flammable, colorless liquid. It is produced by fermentation of sugar by yeast. The chemical equation below summarizes the conversion: $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2 \text{CH}_3\text{CH}_2\text{OH} + 2 \text{CO}_2$. Ethanol's toxicity to yeast limits the ethanol concentration to approximately 15 % ethanol by volume. Higher percentages are reached by distillation.

Ethanol can be used for **fuel** or as an **antiseptic medicine**. Ethanol is used as an antiseptic in medical wipes and in most common antibacterial hand sanitizer gels at a concentration of about 62% v/v. Ethanol kills organisms by denaturing their proteins and dissolving their lipids and is effective against most bacteria and fungi and many viruses, but is ineffective against bacterial spore.

Ethanol has been used because of its intoxicating effect also in alcoholic beverages. It is a **powerful psycho-active drug with depressant effect on the central nervous system**. It has a complex mode of action and affects multiple systems in the brain. Pure ethanol will irritate the skin and eyes. Nausea, vomiting and intoxication are symptoms of ingestion. Long term use even of smaller amounts of ethanol by ingestion can result in serious liver damage.

BAC (g/L)	BAC (% v/v)	Symptoms
0.5	0.05%	Euphoria, talkativeness, relaxation
1	0.1 %	Central nervous system depression, nausea, possible vomiting, impaired motor and sensory function, impaired cognition
>1.4	>0.14%	Decreased blood flow to brain
3	0.3%	Stupor, possible unconsciousness
4	0.4%	Possible death
>5.5	>0.55%	Death



<http://www.eversuncensored.org/873/2007/01/07/smokers-beware-nepal-is-legislating-anti-tobacco-laws/>

Assignment 7

Use of alcohol as a drug has following effects:

- Impairs judgment and coordination
- Increases possibility for accidents (by falling, by car accidents, by being drowned or poisoned)
- Makes it dangerous to drive a car or to work with machines
- Increases the incidence of aggressive acts
- Increases domestic violence and child abuse
- Leads to addiction
- Has strong unpleasant withdrawal effect
- Increases depression and suicides
- Increases possibility to almost all cancers
- Continual use destroys before long the liver
- Those who use much alcohol beverages have shorter expected life time as those who do not use

Do you accept that it is better to use alcohol as **fuel** or an **antiseptic medicine** than as an intoxicating drink.

Assignment 8

One of two lifetime smokers will die of their habit. Half of these deaths happen in the middle age. Mixture of nicotine and carbon monoxide increases heart rate and blood pressure. It with extra cholesterol in veins can cause a heart attack or a stroke. The lungs will be destroyed and toes might be infected. Tugged tobacco is also a health hazard. Tobacco contributes also to a number of cancers.

Without tobacco your expected **healthy life time** will be much longer.

You surely want it!



<http://snus-news.blogspot.com/2010/06/nepal-bill-to-implem-tobacco-control.html>

SOCIAL LIFE



Aune Greggas

Child development
Sexual development
Marriage
Safe community

The Health Education & Tobacco Intervention Program in Nepal 2010

Child development

The first year of the child is a time of enormous development. It is when the **basic trust** will be established. If all the needs of the baby are taken care the trust will grow.

One of the first things after the birth - besides washing up the baby - is to let it suck the breast of the mother. It is good. Sucking begins and also increases milk production. The more often and strongly the baby is allowed to do it, the better for the future milk production.

Breast feeding is very beneficial. The breast milk includes all the nutrients the baby needs. The composition of the breast milk changes according to the needs of the baby. The milk produced in the first days is different from the milk produced later. Breast feeding promotes the health of the child and protects the child for many microbes and diseases. It is good to continue breast feeding also after the baby begins to eat solid food.

The **physical development** is not the only thing which takes place during the first year. The contact with the mother and father and other family members is the basis for the **intellectual development**. It is good to have an eye-contact with the baby. It is good play with the child. It is good to talk and also learn to listen to the baby.

When the baby is about one year old it takes the first steps and also says the first words. Already before that the baby learns to **crawl**, draw himself up and to take steps when supported. Also the speech becomes earlier with the **bubble**: ma-ma, ba-ba, ge-ge-ge etc. This kind of baby-talk is a step in the development of the speech.

Physical and intellectual development goes side by side with **emotional development**. It includes understanding your own feelings and understanding of the feelings of the others, empathy, controlling or your own mood and humor, ruling over your own desires and motivation.

Motivation makes learning interesting, gives targets and helps in the later achievements. This can be done by giving the child feelings of success.

Shortly:

1-3 months: Searching for trust.

3-6 months: Participating and expecting familiar things.

6-9 months: Imitating, trying new things.

10-12 months: Conquering the world. He learns to control his body. He learns to communicate.



Loved and cared
from the first day
by all in the family



Encouragement to life skills by



Play



Traditions



Education



Special abilities



Pictures on this page: Aime Greggas

When growing up the child needs love, boundaries and encouragement to life skills. The balance between these three areas is very important.

Love means that the child is loved and accepted as he is. It does not mean, that he is accepted only if he succeeds to fulfill the expectations of the environment. It does not mean, that he gets everything he wants. It means that he can feel that he is able to make other people happy.

Boundaries help the child to learn the rules of co-existence. A responsible parent gives clear boundaries to the behavior of the child and also looks after that they are followed. The idea is that when the self-command and abilities of the child grow, he can take the responsibility himself.

Encouragement to life skills is that part of education which helps the child to learn the abilities, structures, orders and habits which are needed in the life. It also helps the child to understand the relationships between people.

It is possible to learn to show love.

- It can be shown by **eye-contact** by looking into the eyes of the child and the young people when you are talking with him.
- Also **touch** is needed. After the child has been exploring its surroundings, he usually returns back and wants to sit for a while on the lap of the parents. Also for the older children a touch is a very important message of interest and love.
- **Active being together** (quality time) is very important for the development of young people and learn them to share their feelings.

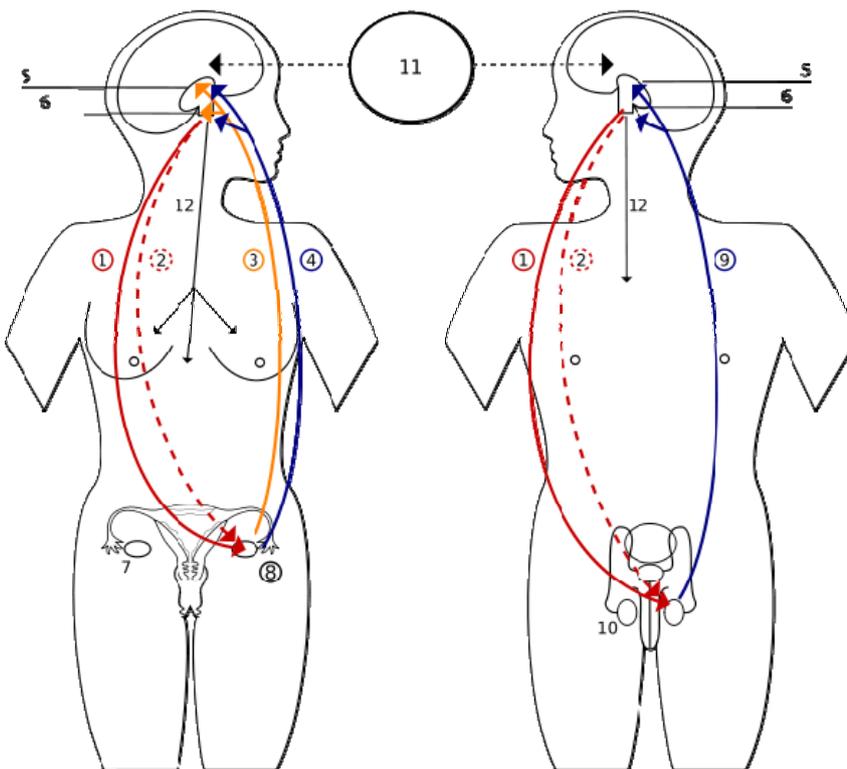
Sexual development

Puberty is a process of physical changes by which a child's body becomes an adult body capable of reproduction. Puberty is initiated by the hormone signals from the brain to gonads, testicles (boys) and ovaries (female).

The greatest changes take place just before or at the time of the **quick growth period**. Females have it earlier than males, at the age of 9,5-14,5 years. Males have it later, usually beginning at the age of 10,5-16 years and finishing at the age of 13,5-17,5 years.

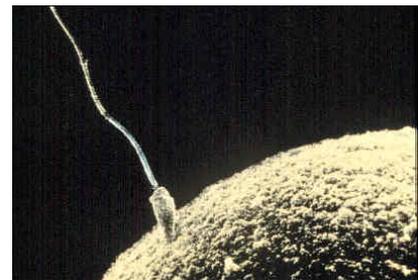
The largest **physical changes**, are called secondary sex characteristics. Best seen in the females is the growth of the breasts and in the males the growth of the penis and testicles. Body hair growth increases. The males get facial hair (beard). Their voice becomes deeper. For the girls the hips widen and the beginning of menstruation tells that they are capable to give a birth to a baby.

Emotional changes are also significant. They as well as the physical changes are caused by the hormones. Each hormone has its own special emotional effect. Testosterone is a male hormone (androgen). Estrogen and progesterone are the most important female hormones. FSH and LH (from the pituitary gland) are needed to ripen and release each month a new ovum from the ovaries. If the ovum is not fertilized by a male sperm, it will be departed by menstruation. Prolactin (PRL) is needed for milk production.



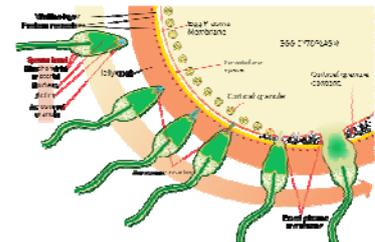
<http://en.wikipedia.org/wiki/Puberty>

Sperm and ovum



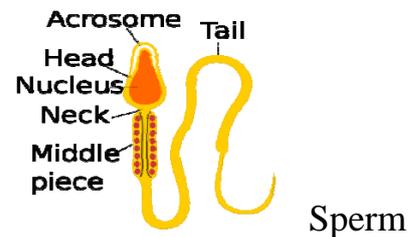
<http://en.wikipedia.org/wiki/Spermatozoon>

A sperm cell fusing with an ovum.



<http://en.wikipedia.org/wiki/Spermatozoon>

The process of fertilizing ovum (top to bottom).



<http://en.wikipedia.org/wiki/Sperm>

The effect of gonad hormones in puberty

- 1 Follicle-stimulating hormone - FSH
- 2 Luteinizing hormone - LH
- 3 Progesterone
- 4 Estrogen
- 5 Hypothalamus
- 6 Pituitary gland
- 7 Ovary
- 8 Pregnancy - hCG (Human chorionic gonadotropin)
- 9 Testosterone
- 10 Testicle
- 11 Incentives
- 12 Prolactin - PRL

Stages for love

ADMIRE

- How you talk
- How you look at me
- You are a nice person

Encourages both to show their best sides.
Self-esteem grows and development continues.
It is not painful to finish the relationship.

FRIENDSHIP

- Touch

Sharing secrets and dreams
Personalities at their best.
The relationship can finish without deeper grief.

PETTING

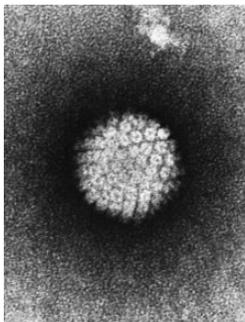
- Kissing
- Touching the face
- Petting the body

You are my chosen.
If the relationship is broken, feelings of grief and depression

INTERCOURSE

Total acceptance and confidence
If the relationship is broken, very deep grief and desperation.

Human papilloma virus (HPV)



Human Papilloma virus infection can result later in cancer.



Marriage

In Nepal there is a habit that the parents choose a partner to their children. The parents have followed for a long time the development their child and they usually see when he/she is ready to carry the responsibilities of a parenthood. Usually they also succeed to choose a right person who fits well to their child.

Nowadays this is not true in all cases. Many young people leave their home villages and go to long away areas and cities to study and to work there. The parents do not any more know the people with which their children live and use their time. Sometimes the parents are worried about their children.

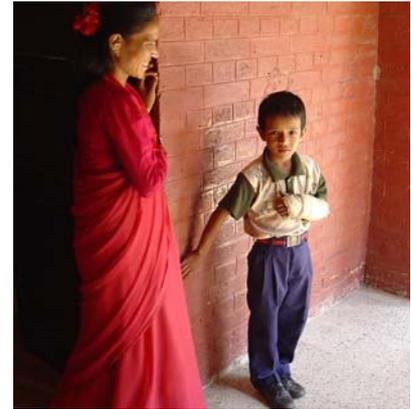
One reason is, that the young people are not prepared to everything they meet. They might meet other young people who are studying and working as they are, and find themselves in a love affair with them. The steps of love tell how deep the breaking of relationship is felt in each step.

However, there are not only emotions and possibility to become a parent, which have to be thought. If the other partner has had many relationships, and the sex has been unprotected, there is a possibility to get venereal diseases. They can be bacterial as Chlamydia, Gonorrhea, Granuloma inguinale and Syphilis; fungal as Candidiasis or viral as Hepatitis, Herpes simplex, Papilloma virus and HIV.

All of these diseases are painful and none wants to have them. HIV can lead to AIDS. In Nepal 0,5 % of the 15-49 year old people carry HIV. It is too much for a disease which is incurable.



Safe community:



Pictures on this page: Aune Greggas

Secure good care



Safe community

Community has quite much to do with the health of a private person. The government can make that kind of laws that protect the people. So has been done when the laws against tobacco has been done. These laws have had a very clear effect in the smoking of people and decrease the amount of people who will get later diseases which result from the use of tobacco.

It is also possible for the community to give that kind of traffic laws that will save many people's life. In many countries for example travelling on the ceiling of the bus is forbidden.

Traffic security can be made better also by building better roads, and different roads for cars and motorcycles and pedestrians, make the crossings so that the cars moving to different directions do not meet each other and so on.

It is also possible to take care of your own safety. When riding motorbike or bicycle, it is good to have a helmet and in the car to use safety belt. In that way many difficult accident will not any more be life threatening.

There are also many safety things which are good to know when using fire, and with the use of electrical apparatus. There is a reason to keep all the toxic materials away from the places where children can find them.

It is our right of precedence to make our surroundings as safe as possible and live as healthy as possible. If we do so, our life is much happier than otherwise, And not only our own life, also the life of our children.

Protect the bridges

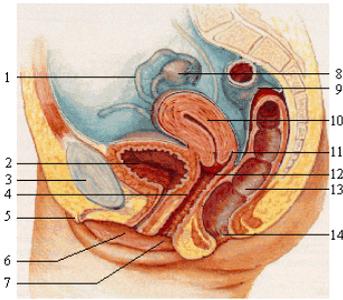


Electrical lines low!



Remember helmet

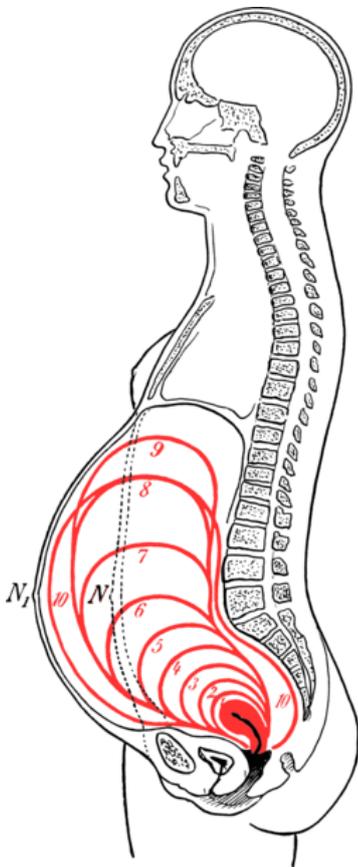
Uterus



1: fallopian tube, 2: bladder, 3: pubic bone, 4: g-spot, 5: clitoris, 6: urethra, 7: vagina, 8: ovary, 9: sigmoid colon, 10: uterus, 11: fornix, 12: cervix, 13: rectum, 14: anus

<http://en.wikipedia.org/wiki/Uterus>

Pregnancy



<http://fi.wikipedia.org/wiki/Raskaus>

Fetus



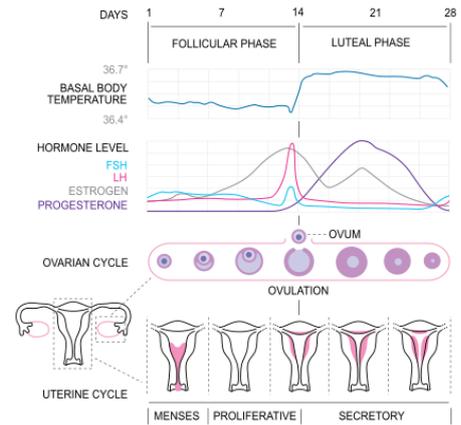
Fetus 8 weeks after fertilization

<http://en.wikipedia.org/wiki/Pregnancy#Abortion>

Assignment 1.

Girls:

Follow your basal body temperature and mood cycle from menses to menses. The most possible time for ovum fertilization is in the middle of the cycle. Usually the mood is lowest just before the menses and during it. It is very important to take care of the personal hygiene at that time.



<http://en.wikipedia.org/wiki/Menstruation>

Assignment 2.

Boys:

What is the most effective way to protect against venereal diseases, HIV and unexpected child births:

- a) Not to have sex
- b) To have sex only with your own wife
- c) The use of condom
- d) Free sex with condom



<http://en.wikipedia.org/wiki/Condoms>

Assignment 3.

How many months does the pregnancy take from the fertilization to the birth?

Fertilization:

A boy or a girl

5. weeks:

Heart beat can be seen by ultra voice

10.-13. weeks:

Breathing like movements

20.-21. weeks:

The mother can feel the movements of the baby

40. week:

Ready to be born



<http://en.wikipedia.org/wiki/Fetus>

Assignment 4.

Have you seen any of these in a child with a mother who smokes or uses alcohol: Tobacco: small birth size, early birth, sudden infant death syndrome. Alcohol: FAS (fetal alcohol syndrome) and FAE, malformations in the head (small head) and face, hands and fingers, in the feet, heart, and kidneys, in the skeleton and nerves, development disturbances, mentally handicap. Hope you have not and will never see.



The WHO Framework Convention on Tobacco Control (FCTC) is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. It represents a paradigm shift in developing a regulatory strategy to address addictive substances.

The WHO FCTC was developed in response to the globalization of the tobacco epidemic.

The core demand reduction provisions in the WHO FCTC are contained in articles 6-14:

- Price and tax measures to reduce the demand for tobacco, and
- Non-price measures to reduce the demand for tobacco, namely:

- Protection from exposure to tobacco smoke;
- Regulation of the contents of tobacco products;
- Regulation of tobacco product disclosures;
- Packaging and labeling of tobacco products;
- Education, communication, training and public awareness;
- Tobacco advertising, promotion and sponsorship; and,
- Demand reduction measures concerning tobacco dependence and cessation.

The core supply reduction provisions in the WHO FCTC are contained in articles 15-17:

- Illicit trade in tobacco products;
- Sales to and by minors; and,
- Provision of support for economically viable alternative activities.

The Convention entered into force on 27 February 2005 - 90 days after it had been acceded to, ratified, accepted, or approved by 40 States.

Assignment 6.

After the birth of a child the mother needs rest. If the women are expected to begin the hard physical work straight after the birth of the child, the womb of the mother may fall down. It is quite usual in Nepal. This sickness is called uterus prolapse. It is very painful. There are many women who have had to live with it the rest of their life.

Do you know that uterine prolapsed can be healed? Can it be healed without operation in the hospital?



Aime Greggas

Hopefully the mother need not do this kind of work after the birth of the baby.

Assignment 7.

The WHO Framework Convention on Tobacco Control (WHO FCTC) is the first treaty negotiated under the auspices of the World Health Organization. It was adopted by the World Health Assembly on 21 May 2003 and entered into force on 27 February 2005. It has since become one of the most widely embraced treaties in UN history. It has 168 Signatories. Member States that have signed the Convention indicate that they will strive in good faith to ratify, accept, or approve it, and show political commitment not to undermine the objectives set out in it. Nepal signed the WHO Framework Convention on Tobacco Control treaty on December 2, 2003 and ratified it on November 7, 2006.



http://www.who.int/fctc/en/

What has been done in Nepal in 2004 (o) and now (x)?

Tobacco Bans and Restrictions

	Banned	Restricted	Regul.	Unknown
Advertising in certain media		o		
Advertisement in certain location				o
Sponsorship or promotion				o
Sales to minors				o
Smoking in government buildings	o			
Smoking in educational institutes	o			
Smoking in hospitals	o			
Smoking in busses and taxis			o	
Smoking in restaurants				o

Requirements and Regulations

	Required	Regul.	Unknown
Advertising health warnings/messages			o
Age verification for sales			o
Package health warning/message		o	
Ingredient/constituent information on package label			o

Other Provisions

	Yes	No	Unknown
National tobacco control committee			o



Aune Greggas

Happy and Healthy in Nepal

CONTENTS

1 Life essentials

Living being-Cell-Skin-Pulmonary system-
Health threats

2 Exercise

Musculoskeletal system-Blood
circulation-Health promotion

3 Nutrition

Digestive system-Chemical elements-
Minerals-Trace elements-Vitamins

4 Hygiene

Kidneys-Endocrine system-Immune
system-Bacteria and Virus-Ecosystems

5 Activation

Nervous system-Brain-Senses-
Thinking-Course of life

6 Social Life

Child development-Sexual development—
Marriage-Safe Community

HAPPY AND HEALTHY IN NEPAL



Aune Greggas

Life Essentials

Exercise

Nutrition

Hygiene

Activation

Social Life

Health Education and Tobacco Intervention Program in Nepal 2010