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HEALTH ASPECTS OF PHYSICAL FITNESS

EXPOSE PRESENTED

BY

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## HEALTH ASPECTS OF PHYSICAL FITNESS

### Introduction :

Physical fitness is obtained through the practice of physical education exercises (sports). The sports referred to in relation to physical fitness is sports for all ; in which case adaptable physical activities should be practised depending on the predisposition of the individual (the morphology, aged, and period). In accordance with what has been said, this topic concerns all military personnel (the uncommissioned and the officers) and concerns all age groups without any particular interest on the competitive group.

The physical education activities, that permit someone to be considered physically fit, reinforce, modify or maintain the functioning of the vital organs and muscles of the body. It is this state of well being that is considered physical fitness where the pulmonary, the cardiac, the nervous, the digestive, the excretory and muscular work is favoured. We will consider the effects of frequent effort physical education exercises in relation to the vital organs of the body. Our topic is the health aspects of physical fitness.

It can only be possible to recognise the health aspects of physical fitness by examining the advantages of the practise of physical educational exercises on the main organs of the body.

### 1 – The Respiratory system.

Most of the energy required by the cells of the body is derived from chemical reactions which can only take place in the presence of oxygen ( $O_2$ ). The main waste product of these reactions is carbon dioxide ( $CO_2$ ). The respiratory system provides the route by which the supply of oxygen present in the atmospheric air gains entry to the body and it provides the transport system for these gases between the lungs and the cells of the body. The exchange of gases between the blood and the lungs is called external respiration while that between the blood and the body cells, internal respiration.

### Coefficient of Alveolar Exchanges.

A person who doesnot practise any form of physical education exercises needs five respiratory movements to renew completely the volume of air which is contained in the lungs. After a deep respiration he needs three. If the subject increases inspiration and also expiration, he needs just two movements to obtain the same results.

Sports or physical education increases the volume of inspired air in one movement which makes it possible for the subject to benefit from a better volume of gaseous exchanges at the level of the lungs with less respiratory movements.

The increase in the intake of air improves the oxygen supply into the blood system. The individual who practises physical education exercises frequently, get's less tired (during active work) because his blood accepts a greater amount of oxygen which is very necessary for oxydising pyruvic acid which is formed from the decomposition of glucose (energy used during work). This means that for the same quality of work a physically fit subject.

- needs fewer movements to obtain much air
- obtains a better efficiency (easy exchange) therefore an increase in the volume of oxygen consumed and  $\text{CO}_2$  (carbon dioxide) eliminated.
- The oxygen debts is therefore very low and the subject.
- Benefits an economy in the work done by the heart.

The physically fit subject developes an increase in the respiratory amplitude and moderate rythm so as to better purify the blood quickly. Exercises (physical education) reinforce the respiratory muscles and therefore increase the thoracic and pulmonary capacities therefore increasing the volume of residual air.

**See diagrams of lungs and aveoli in annexe I**  
**See diagram of gaseous exchange in annexe II**

### **The Circulatory System**

The Heart.

The centre of the circulatory system is the heart which is a roughly cone-shaped hollow muscular organ. The heart is the pumping station of the human body. It is a special engine (organ) which works simultaneously ; the right side pumping deoxygenated blood towards the lungs to be purified (with oxygen) and the left side pumping oxygenated blood to the body.

#### **a) Effects of Exercise (physical Education) on the heart itself**

As a result of exercises, the heart which is a muscle developes stronger fibres. This virtually means that the heart can therefore pump a greater volume of blood in one beat. Exercise also causes the cavities of the heart to increase therefore increasing the capacity to contain blood. The muscles of the ventricles thicken and are made stronger giving greater muscular contraction which permits more blood to be pumped in one heart beat (the stroke volume is increased) It therefore means that less blood remains in the heart after the ventricular systole. This phenomenon automatically permits a slower cardiac frequency ( rate of heart beat) for a greater volume of blood. This richly oxygenated blood is easily carried to

the cells and blood containing poisonous gas, ( $\text{CO}_2$ ) carbon dioxide, is carried away from the cells (see diagram on exchange of gases 2 ii.) A heart that has been used to exercise returns easily to normal after intense physical activity.

Diagram to show possible increase in muscle (3i)

### **b) Effect of Exercise on the Blood**

The rate of the formation of lactic acid is slower in the subject that practises physical education exercises resulting in the lower lactate concentration (lactic acid is the waste produced in the muscle during activity). A considerable amount of exercise will help in the production of the red blood cells. Keep fit sports should be controlled and adopted to the participants or subjects because intensive or too much exercise bring about fatigue and overstrain, therefore the destruction of a good number of body cells. Fatigue can easily cause sports accidents, as torn muscles, sprains etc while well measured sporting activities favour the manufacture of red blood corpuscles.

Body cells urgently need a great amount of oxygen and food after exercise (especially intense exercises) than during rest. The urgent need comes as a result of :

- A decrease in the amount of oxygen in the blood.
- A decrease in the amount of blood sugar (glucose)
- The blood becomes more acidic due to the presence of  $\text{CO}_2$ , lactic acid and pyruvic acid.

The above situation is easily attained by subjects who do not practise physical education exercises regularly causing breathlessness and even suffocation.

### **Effects of Exercise on the Excretory System**

Exercise increases the amount of urine filtered at the level of the kidneys because the blood circulates faster and in abundance. Exercise also causes an increase in the activity of the liver improving the destruction of waste products of proteins (amino acids) and the reconstitution of blood sugar glucose from glycogen.

Exercise decreases the amount of salt in the body since much of it is excreted through sweat and urine.

When exercise becomes more violent, the kidneys are insufficient for the elimination of waste product so the skin helps to eliminate some of the waste products which are poisonous to the body. Water and salt are filtered from the blood vessels in the skin into the sweat glands and ducts and this is sent out through the body pores as sweat. Exercise therefore activates the secretion of the sweat glands.

See diagram of kidney in Annexe III

See diagram of the sweat glands pores in Annexe IV

### Effects of Exercise on the digestive system :

Exercise causes an increase in the consumption of food which will help to replace the energy used during exercise and the dead body cells. These foodstuffs include sugar, lipids, proteins, water and mineral salts, which have to replenish the body with the energy it has lost during exercise. Exercise ameliorates the appetite and consequently growth since more food can be consumed.

### Effects of Exercise on the Nervous System

#### a) Improved motricity

By practicing physical education one acquires the surety and precision of gestures and great motor speed. Exercise perfects motricity. Specialists of post-mortem examinations have noticed that the cerebral motor centre are more developed in the athlete than in the intellectual. Exercise or physical education therefore develops motor centres of the trained subject.

#### b) Improvement of the sensibility

The sensibility of touch (thermal tactile) is improved by the practise of physical educational exercises. The physically fit subject is more sensitive.

#### c) Improvement of will power

Exercise (Physical education) contributes to the development of good habits therefore the education of the will. Every muscular effort is effectively accompanied by an effort of the will. Sports especially competitive sports, trains the subject (athletes) to surpass or go above their limits: trying to run faster, jump higher, throw further etc therefore permitting endurance which can be done only through a strong will power; the will to accept to do more, to improve on what one already knows. The athlete or subject is trained to respect the rules of the sport and the other athletes or participants. This helps improve the character and behavior of the individual in the society. We can conclude that exercise stimulates.

### ADVERSE EFFECTS OF STOPPING OR NOT PRACTISING PHYSICAL EDUCATION

I will like here to give the adverse effects of the lack of the practise of physical education exercise. In the absence of sports, there is ;

- The risk of obesity
- With obesity comes highblood pressure
- Less exchange or difficulty in the exchange of gases therefore breathlessness
- Elimination and digestion are slowed down causing frequent constipation.

We should know that when a subject constantly practises physical education exercises, he is fine, feels light and these exercises ameliorate the functions as mentioned above. During training and specialisation courses, soldiers and policemen train hard, do tedious exercises which render them strong and fit. During this period they eat much to rebuild the worn out tissues and appetite is cultivated. After the training or refreshal courses, the kindled appetite remains and if the subject doesnot continue with keep fit sports the appetite remains and since there are no wornout cells to be replaced, the un used carbohydrates, proteins and fats are stored under the skin, especially at the belly, thighs and biceps. This causes an increase in the volume of the belly and muscles due to the accumulating fats, therefore obesity.

This phenomom of obesity causes two dangerous situations. This fats decrease the cavities in which the vital organs are found and some fat even settles on the organs thereby impeding their functioning.

On the other hand the fats increase the volume or mass of the boby. This causes a stretching of blood vessels especially the capillaries that have to get right to the skin. The fats also exert some pressure on the blood vessels therefore obstructing flow and thereby causing the heart to use more force inorder to send the necessary blood through the veins and capillaries and this causes hypertension which means an abnormal increase in blood presure.

2) The excess fats disturb common movement ; even walking, because the muscle of the thighs especially on the median side thicken increasing friction during movements.

The above mentioned difficulties are acquired very easily by soldier and police officers who during training and specialised or refreshal courses perform a lot of physical education exercises and after these courses and in the exercise of their duties ignore the importance of physical education.

Sports is also necessary because at adult hood, especially from 35 years the food we eat goes only for the repairs of worn out tissues or replacement of dead cells. The minerals are no longer used to build the bones because growth has ceased. The nutrients the body absorbs if they are not used through keep fit sports, the body will store them as explained above with its consequences.

## CONCLUSION

We can conclude therefore that exercise stimulates and helps all the major and vital functions of the human body ; respiration, circulation, excretion, digestion etc.

Well controlled exercise, with good dosage, favours resistance against illnesses and tiredness and contributes to the normal development of the skeletal bones.

It ameliorates articular suppleness, increases firmness of the ligaments and refreshes the memory. In short exercise is widely considered as a device for renewing the organism and therefore makes the individual young and handsome.

The above lecture will not be considered complete if we donnot take into consideration the soldier of the 21<sup>st</sup> century. Though the International Military Sports Council preaches friendship through sports, we still realise that the world is a boiling pot with coupe d'Etats, civil wars, full scale wars and terrorisme the common talk of the day. We also know that the 21<sup>st</sup> century is one of electronics and sophisticated war materials. One might be tempted therefore not to see the importance of sports since by the touch of a button a bomb or rocket is fired against the enemy target.

I will like here to draw the attention of every one that, it is on the contrary in this situation that physical and sports education which is synonym to physical fitness is very necessary. For example,

The jet bomber pilot who has to fly at a speed more than that of sound and at a high altitude, needs to be physically fit to withstand the conditions far up in the sky with the pressure, and a decrease in the amount of oxygen. He has to be very alert and take decisions in the fraction of a second. Such alertness can be attained only through physical education exercises

The soldier of the infantry nowadays needs strong muscles and a will power to be able to withstand the load of the anti amoured car rockets he has to carry and at times through jungles.

Even the sentry on guard at a fixed post, needs to be physically fit to stand alert for hours.

In conclusion ; sports should be an intergral part of military services.



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TOPIC :

Health Aspects of Physical Fitness.
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## Abstract

Physical fitness, obtained through the practice of physical education exercises (sports) improves and develops the main organs of the body, ameliorates excretion and digestion and also improves on the functioning of the nervous system.

The advantages of the practise of physical education exercises, sports, which is synonym to physical fitness are very many; which means that the subject who practises sporting activities is more healthy, than one who doesnot.

Discussed in the exposé will also be the disadvantages for the subject that doesnot practise sporting activities.

The whole exposé is in relation of the soldier of the 21<sup>st</sup> century

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