

EXERCISE PHYSIOLOGY

-DEFINITION, SCOPE AND IMPORTANCE

EXERCISE: Is the performance of movements in order to develop or maintain physical fitness and overall health. It is often directed toward also the honing of athletic ability or skill. Frequent and regular physical exercise is an important component in the prevention of some of the diseases of affluence such as cancer, heart disease, cardiovascular disease, Type 2 diabetes and back pain.

TYPES: Depending on the overall effect on the body, there are three types namely:

FLEXIBILITY, AEROBIC and ANAEROBIC



EXERCISE TYPES

- **FLEXIBILITY:** these are exercises performed to improve the range of motion of muscles and joints.
- **AEROBIC:** rhythmic in nature, uses large muscle groups and can be maintained continuously. Here the working muscles draw on oxygen in the blood as well as fat and glucose to increase cardiovascular endurance (causes the heart to work harder than at rest) and muscle density.
- **ANAEROBIC:** involves intense or explosive sports or strenuous activity that leaves one gasping for breath. It can be done for a minute or two at a time, because it depends on limited supply of glycogen that is rapidly depleted, resulting in intense muscle fatigue.



BENEFITS OF PHYSICAL EXERCISE

- Maintaining physical fitness including healthy weight
- Building and maintaining healthy bones, muscles and joints
- Promoting psychological well-being.
- Reducing surgical risks
- Strengthening the immune system



PHYSIOLOGY

- Coined from these two words

“physis” meaning nature or origin

“logos” meaning speech or talking about something.

PHYSIOLOGY is the study of the mechanical, physical and biochemical functions of the body as a whole and of the structures found there in.

The under-listed are the divisions of physiology

- Endocrinology: of hormones
- Pathophysiology: mechanisms of disease
- Neurophysiology :nervous system and



EXERCISE PHYSIOLOGY

- It is what happens to the body as it exercises a single time, how these changes are brought about, what changes in function occur after repeated bouts of exercise and how these changes come to pass, and finally, what can be done to improve the body's response to exercise and its adaptation to training.
- It is the description and explanation of functional changes brought on by single(acute) or repeated bouts of exercise(chronic exercise or training), often with the objective of improving the exercise response.



EXERCISE PHYSIOLOGY CONTD.

- It is the identification of physiological mechanisms underlying physical activity, the comprehensive delivery of treatment services concerned with the analysis, improvement, and maintenance of health and fitness, rehabilitation of heart disease and other chronic diseases and/or disabilities, and the professional guidance and counsel of athletes and others interested in athletics, sports training and human adaptability to acute and chronic exercise.



SCOPE

- Deals with such areas as:
- -cardio-respiratory responses to exercise
- -muscle fiber types
- -metabolism and body composition assessment



PHYSICAL FITNESS

- It is the ability to function effectively and efficiently. It is associated with a person's ability to work effectively, enjoy leisure time, be healthy, resist hypokinetic diseases, and meet emergency situations.
- It is used in two close meanings:
 - general fitness(a state of health and well-being)and
 - specific fitness(a task- oriented definition) based on the ability to perform specific aspects of sports or occupations.



PHYSICAL FITNESS COMPONENTS

HEALTH-RELATED

- Body composition
- Cardiovascular endurance
- Muscular endurance
- Flexibility
- strength

SKILL-RELATED

- Agility
- Balance
- Coordination
- Power
- Reaction time
- Speed



RESPONSES AND ADAPTATIONS

- Exercise results in responses and adaptations depending on TIME, TYPE, INTENSITY and FREQUENCY.
- **TRAINING:** it is the systematic process with the objective of improving an athlete's fitness in a selected activity. It is a long term process that is progressive and recognizes the individual athlete's needs and capabilities. Training programmes use exercise or practice to develop the qualities required for an event.



RESPONSES

- These are the sudden, temporary changes in function caused by exercise. These functional changes disappear shortly after the exercise period is over. Examples are:
 - Increase in heart rate
 - Rise in blood pressure
 - Increase in breathing



ADAPTATIONS

- These are the persistent changes in structure or function following training that apparently enables the body to withstand repeated bouts of exercise. Adaptations are long term and are thus not seen until several weeks of training. Examples are:
 - Reduction of the heart rate for sub-maximal exercise load. This allows the heart to pump the same amount of blood to the working muscles at a lower energy cost for the heart.
 - Increased muscle size after strenuous weight lifting programme. The lifter exerts greater muscular force than before training.



WHY STUDY EXERCISE PHYSIOLOGY IN PE.

- To answer questions on WHY and HOW of things
- To select activities
- To get information about sex differences, age differences, the effect of exercise on male and female
- To explain types of exercise for different sexes, age groups etc.

ALL the above are observed for the:

- Enhancement of health, physical fitness of the general population
- Improvement of athletic performance

