BCC301 **SPORTS TRAINING**

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UNIT - 1
INTRODUCTION

Definition: Training is the process of preparation for some task, "Sports training is a pedagogical process, based on scientific principles, aiming at preparing sportsman for higher performances in sports competition".

"Sports training scientifically based and pedagogically organised process which through plagesed and systematic effect on performance ability and performance rediness being I sports perfection and performance improvement as well as in sports competition"

The term "Training" is widely used in sports But, there is some disagreement among coaches and sports scientists regarding the meaning of the word. Some experts understand that sports training is basically exercise, For performing physical exercises. The factors essentials are sports equipment and implements, verbal instructions, means of recovery, means of assessment of performance capacity, nutrition, psychological means etc., further, advanced training of sports persons significantly supported by several sports disciplines like sports medicine, sports psychology, Nutrition, Physiotherapy, sports physiology, sports biomechanics and other allied sciences. In addition, personality of the sportsman has to be improved in order to improve his performance. The personality of a person has several dimensions like physical, physiological, social and psychic. Hence to improve s\ports performance in addition to physical and physiological characteristics the social and psychic capacities of the sports persons also have to be improved.

AIMS OF SPORTS TRAINING

Sports training aims at improving the performance of sports persons. The sports performance depends, on several factors like constitution, condition, technique/co-ordination, tactics and personality.

1.. Constitution:

The constitution or physique is almost completely genetically determined and hence cannot be improve by training.

2.. Condition or physical fitness:

Fitness may be defined as "successful adaptation to the stressors of one's life style" Physical fitness is the sums of fine motor abilities namely strength, speed, endurance, flexibility (Mobility) and coordinative abilities. These five motor abilities and their complex forms like strength endurance, explosive strength, speed endurance, etc., are the basis pre-requisites for human motor actions. The most important aims of sports training is to improve and maintain the physical fitness or condition. Each sport requires different type and level of physical condition and hence different type of fitness training of condition is required.

3. Technical Skill:

The performance of the sports person is improved by acquisition of sports technical skill and this is the important aim of sports training. The role of technical skills in different sports is different. Further, the technical skills are important for economy and efficiency of simple movements like running, swimming, jumping, lifting and throwing.

4. Tactical efficiency:

The tactical efficiency consists of three elements.

i) Knowledge of competition, rules and possibilities of exploiting various internal and external factors for achieving best possible results. ii) Tactical abilities and iii) Tactical skills.

Tactical efficiency is different in different sports. This is more important in team games, combat sports and racket sports. In individual sports like throws, gymnastics, weight lifting etc., the role of tactics is limited. The contribution of tactics towards sports performance increases with the improvement in performance.

5. Personality:

Sports performance is the product of total personality of the sports person. The sports person depends heavily on his qualities of heal and heart. These qualities or abilities are classified into five groups as given

i) Beliefs, values, motives, interests, attitudes etc.,
ii) Cognitive abilities (eg.) perception, thinking memory etc.
iii) emotional abilities (eg.) regularity, sincerity, hard work.
iv) Habits (eg.) habits eating, sleeping, hygiene spending of leisure time etc.,

The above five qualities and abilities enable in sportsperson to compete successfully in a competition.

The sports training aims at improving these qualities through proper selection and implementation of various means and methods of training.

CHARACTERISTICS OF SPORTS TRAINING

1. Performance in a sports competition

Sports training aims at achieving high performance in sports competition. It is a process, which is spread over a long period of time. It is a competition and performance oriented process.

2. Planned and systematic:

In order to achieve high performance sports training is done in a planned and systematic manner. Sports training is always planned in the form of shorter and bigger training cycles (eg.) Micro cycle, Monocycle and Macro cycle. Planning of the process of sports training is systematic that is a system most suitable for achieving high performance.

3. Science:

At present different sciences are exploring different dimensions of human nature and human performance. The knowledge from different sciences has to be incorporated in the process of sports training. In other words sports training is based on scientific facts and principles.

4. Coach as a Leader:

The coach has to be assessed, planned organised and implemented the sports training that is, a coach control everything. For this the coach has to take the help of sports scientists. The sportsperson should assume more responsibilities and he involved in planning implementation and assessment of training.

5. Development and exploitation of hidden reserves:

In spite of best intention and efforts, sportsperson cannot fully use his psychic and biological capacities to the maximum. Some reserves are always untapped. Even the sportsperson may not aware of the limits of his performance. The sports training aims at finding these hidden reserves and makes the sportsperson aware of it. Sports training aims at further development of these reserves and pushed to the ultimate limits of the performance of sportsperson that is, super human efforts.

6. Controlled daily routine:

The sportsperson has to adjust his other activities, that is, the training should take precedence over other activities and he has to do training once or twice a day with high effect. The sports person also possess a high sense of self discipline, a quality essential for all champions.

7. Educational process:

The sports training is basically, an educational and pedagogical process and it strives to develop all aspects of personality. Personality is essential for high performance. Therefore, personality development and performance development are two interrelated and interdependent aspects of sports training.

8. Process of perfection:

The sports training methods and means are not static and are being constantly improved, modified and new ones discovered by the sports science disciplines, implementing these means and methods in different forms and under different conditions makes valuable contributions. The process of scientific observation, experimentation, analysis and synthesis is important characteristics of sports training in modern age. Sports training, therefore is a continuous process of perfection, improvement and creation of means and methods improving sports performance and factors of performance.

PRINCIPLES OF SPORTS TRAINING

The principles of Law of training are formed on the basis of the knowledge gained from various sports science disciplines and successful practice and are the guidelines for coaches, teachers and sports persons for the formulation, implementation and control of sports training.

Principles of sports training

Basic Principles

Specificity overload reversibility

Intensity Density Extent

General Principles

1. Principle of formulation of training on the basis of prognostic performance and its structure
2. Principles of continuity of training.
3. Principles of progression of load.
4. Principles of uniformity and differentiation.
5. Principles of progressive specialization.
6. Principles of planned and systematic training.
7. Principles of cyclicity of training.
8. Principles of regulation of training.

Basic principles in training:

The specificity, overload and reversibility are basic to the theory and practice of physical development.

Specificity:

Specific adaptation to the stressor and the effect of stressor to an individual athlete. The nature of training load determines the training effect. An athlete needs training methods tailored to the specific demands of the event. The training load becomes specific when it has the proper training ration (of load to recovery) and structure of loading (of intensity of load).

Over Load:

If is necessary to provide progressive heightening of the stressor to oblige the body to seek a higher status of adaptation. Any improvement in fitness/performance requires an increased training load. That load is a stimulate to which the athlete's body reacts. If the load is greater than normal, the body becomes fatigued and its fitness level falls. If optional the athlete will be more fit after recovery (over compensation).

For sprinters 20 min continuous run is enough.

If 80% of wt, is used it may not affect the speed, whereas it improves muscular strength.

Id 65% of weight is used it may not much improve muscular strength but improve muscular endurance.

If 90% of weight is used it may affect the speed but improves muscular strength.

(a) Intensity:

It is the rate of doing work (or) It is the pace at which physical activity is done (or) It is the quality of the training load. Running speed is measured in mts/second, or stride rate/sec. Strength is measured is kg/pounds, jumps and throws are measured in height, distance (or) number of efforts.

(b) Density:

The temporal relationship between load and recovery phases in a training session is called density. It is also referred to as the rest period between two motor stimuli.

(c) Extent:

It is the sum of training in terms of time, distances weight etc., Ex. For long distance runner total distance covered in a measocycle = 5000 km. For a thrower the total tones lifted in a mesocycle = 50 tones etc.,

Law of reversibility:

The adaptation brought about by the training loads will gradually weaken when Intensity, Extent is reduced or Density is reduced. The training effect can reverse itself. If the training ends, the fitness challenging the fitness level plateaus. If the training ends, the fitness level gradually falls. Infact, the training load must continue to increase if the athlete's general and specific fitness are to improve. If the training load remains at the same level, the fitness rises for a time, then begins to fall. The training load must increase regularly (Progressive over load) for the performance level to improve, though the load may rise and fall (allowing recovery and compensation). Across a given period of time.

General Principles:

1. Principles of formulation of training on the basis of prognostic performance and its structure:

The aim of sports training is to achieve high performance in future. All aims, objectives, means, methods and measures for different stages of training are to be derived from the performance capacity essential to achieve the prognostic sports performance. The performance structure in combination of other factors like motor development, age, training state, periodisation etc, determine the training structure.

2. Principles of continuity of training:

Continuous and regular training leads to improvement of performance capacity and to long intervals between training sessions will lead the decreasing of performance capacity. For proper implement of the principles of continuity.

i) The sportsman must be educated about the importance of continuity of training and the negative effects due to break and irregular training. The training programme must be carried out independently by the sportsperson even the coach cannot be physically present. The sportsperson should be supplied with training schedule.

ii) When the stress is shifted to other performance factors, the previous performance factors over a period of time needs to be maintained.

iii) The state of overload always results in markedly low training volumes. Therefore, proper measures should be adopted to prevent the occurrence of overload.

iv) During sick or injury, the sportsperson has to continue his training with low load, intensity and volume in consultation with physician.

3. Principles of progression of load:

Training load is the principle stimulus for starting the psycho-physiological process of adaptation, which in turn lead to increase in performance capacity. If the same load is repeated again and again then it gradually loses its value as a stimulus for adaptation Higher performance will be achieved when the organism adapts to higher level of functioning. This possible only by increasing the load.

There are two methods in increasing the training load.

i) Linear method.

ii) Step method,

i) Linear method:

In this method the load is increased in every training session. This is possible only during the initial days of training.

ii) Step method:

Here the load is increased in steps i.e. after an increase in load it is maintained for some training sessions before increasing it again.

4. Principles of uniformity and differentiation:

Uniformity means that training for all should be based on the same principles and system, which have been worked out to achieve the prognostic sports performance in stages. The goals,

means, methods and organisation of training should be uniform. With the passage of time, however, the training should become increasingly individualized as per the individual factors.

i) Age (Biological and chronological)
ii) Sex, training age and training state
iii) Talent
iv) Psychic factors e.g. personality, temperament etc.,
v) Nature and volume of training impart.
vi) Performance and rate of performance improvement.
vii) Total load and possibilitics of recovery.
viii) Social and economical factors.

5. Principles of progressive specialisation:

Sports training should be a mixture of general and specific means and methods of training. To start with the training should be highly general development oriented but with the passage of time should give way to gradual increasing specialization

The general preparation in the initial years of training caused all round development, which is the base for future performance. It also helps to transfer of training effect. This general means of training in childhood also important for developing the various components of sports talent.

Specific means and methods level to faster improvement in sports performance. The total volume of general as well as of special preparation increase with the improvement in sports performance but their proportion to one another changes in favour of special preparation.

6. Principles of planned and systematic training:

Planning and systematic training are inter related in sports training. Planning has to be done on the basis of a system, which has been worked out in consideration of present available knowledge regarding best ways and means of achieving high performance through sports training.

There cannot be a fixed or stable system of training for all sports and sportsmen. The training system required for best results, will be different for persons and sports. There are some important rules, which are universally applicable are:-

i) General preparation should always precede special preparation.
ii) Less effective physical exercise should be used before more effective exercise.
iii) The interdependence and interrelationships existing among various performance factors should be fully exploited to achieve faster and better results.
iv) There are 'sensitive phases' during growth and development for the improvement of various performance pre-requisites.
iv) High load volume should precede high load intensity.

7. Principle of cyclicity of training:

The process of sports training is formulated in shorter and longer cycles and these cycles basically consists of a load phase and recovery phase. But the principles of cyclicity go beyound the cyclic nature of load dynamics.

In sports training there are three types of training cycles: (i) Macrocycle (ii) Mesocycle (iii) Microcyle.

i) Macrocycle :

This is considered the longest cycle of training. Its duration can be from 3 to 4 months to 12 months or even longer.

Aims of Macrocyle:

(a) Achievement of top form at a particular time (i.e. in a particular competition
(b) Increase of performance capacity to high level.

In a macrocycle the last mesocycle is formulated to ensure recovery and relaxation to the next macrocycle.

In high performance training stages the macrocycle has both the aims and as a result it is formulated on the principles of periodisation. The various mesocycles are so formulated and arranged that the macrocycle is clearly divided into three periods namely (1) Preparatory (2) Competition and (3) Transitional period. Macrocycle, in case of a single periodisation, is a yearly cycle of training and in case of double or triple periodisation there are two or three macrocycles in a year.

In initial stages of training the macrocycle aims at systematic development of performance capacity in order to achieve high performance in the high performance training stage. The motor development principles have strong determining influence on the formation of Macrocycle in basis and advanced training stages.

2. Meso - cycle:

Mesocycle is a training cycle of medium duration. It is composed of a definite arrangement of 3-6 microcycle or weekly cycles. Aims of mesocycle can logically be achieved in 3-6 weeks.

Aims of Mesocycle:

i) Learning or perfection of technical skill or skills.

ii) Improvement of motor ability or abilities.

iii) Maintenance and stabilisation of performance factors improved in the previous mesocycle.

iv) Achievement of top form or direct preparation for a competition.

v) Recovery and relaxation.

Important points for formulation of mesocycle:

i) For psychic and physiological adaptation minimum duration of mesocycle should be 4 weeks.

ii) In a mesocycle, aiming at improvement of performance capacity, stress should lay on one or two factors while maintaining the other factors. In the text mesocycle the stress can be shifted to some other factors. In the next mesocycle the stress can be shifted to some other factor or factors while ensuring the maintenance of others.

iii) In meso-cycle, aiming at direct preparation for a competition, the training should aim at achieving top form and not improving the performance factors in an isolated manner.

iv) In the first half of the mesocycle, the volume of load should be increased while maintaining or slightly increasing the load intensity. In the second half, the load intensity should be increased while maintaining or decreasing the volume of load.

3. Micro-cycle:

It is the smallest training cycle and consists of 3 to 10 days and if the duration is seven days it is called as weekly cycle. The duration of microcycle in case of trained sportsman is normally from 5-10 days. The last training session or day of a microcycle aims at recovery and relaxation. A micro-cycle is much closer to the day-to day training process and hence enables optional loading of sportsman.

8. Principles of regulation of training:

A coach should always know what effect the training is producing on the performance of the sportsman. If necessary the sports training should be changed or modified to ensure proper and effective development of performance. This is possible through continuous regulation of sports training.

For effective regulation of sports training the following three things are essential.

i) Training plans giving the aims, sub aims, load dynamic, means methods etc., of different phases and periods of training.

ii) Training documents containing in a precise form of the information's about load, means, methods etc., of training. Competition protocols and documents are also essential.

iii) Information about the level as well as rate and direction of improvement of performance and performance perquisites.

BASIC PHYSICAL CHARACTERISTICS

There are five major physical fitness components which are useful for both sedentary and sportsmen. They are,

(a) Speed
(b) Strength
(c) Endurance
(d) Flexibility
(e) Co-ordination.

Each sportsman has these qualities to a certain degree. But these qualities are not sufficient to master/specialize an event. The other sub (or) Minor components are,

(f) Strength Endurance
(g) Speed Endurance
(h) Explosive Strength

(a) Special strength
(b) Special speed and
(c) Special Endurance

According to basis principles of training i.e., specificity, overload and reversibility the definition of overload chosen by frank dick, depends upon the particular physical characteristics that need to be developed for example.

1. Strength: Overload is increasing the load (in weight) itself.
2. Strength:
3. Heart endurance (or) Aerobic endurance: Overload is increasing the amount of time that the person can continue a study rate of work, which makes very low demands on strength.
4. Speed endurance overload is increasing the number of repetations of the exercise per unit of time in the presence of endurance factors.
5.
6. Elastic strength: Overload is the increasing of a load while the speed of movement is maintained.
7. Molality

For specificity the Author explains that, specificity is clear when works to increase fitness towards some level of excellence, whereas the non-athletic work to compensate for the damage his lifestyle is causing, thus, the lorry driver should do a few abdominal (or) back muscle exercise to improve the muscle some in these areas

Reversibility interpreted for the non athletic or athlete will given an indication of how much exercise is required each week to maintain a reasonable degree of fitness. For non-athletes they go for 2-3 units per work for training and athlete do often, i.e. 2-3 units per day and 5 to 6 days per weeks.

FITNESS AND TRAINING

The following are some general points on fitness and training for both athlete and non-athlete.

1. When beginning a programme of exercise one must work first on hears endurance (Aerobic endurance) then progress to other areas. However. Before beginning any programme both athlete and non-athlete should have a check-up. Exercise will cause no harm unless perhaps there is a history of illness, in which case medical advice may be sought.
2. Children will not damage a healthy heart by exercising. When they are tired they stop.
3. Stifiness following exercise is not serious. Only a sharp pain during the next bout of exercise may be cause for alarm. This might be a slight muscle pull, and rest followed by Jogging will return things to normal. If the pain persists a physiotherapist must be consulted
4. There is no such thing as 'Cover training'. One may appear to lose quality in training, but that will be related to the effect of all one's various stressors. Rather than reduce training, evaluate the other areas in your life.

5. Too much training does not shorten life, but it should help one enjoy one's allotted span.
6.
7. People do not 'go to fat' when they finish serious training. The fact is that their appetites often stay high while their energy expenditure is now low and consequently, weight increases. Also, muscle tone is lost and various areas begin to sag.
8. Training does not make a person muscle bound. This is an obscure expression but presumably it refers to those who train for bodybuilding. Incredible physical dimensions only occur if athletes deliberately set out to hypertrophy the size of various muscles. Normal exercise programmes do not have this effect. In fact by reducing for around the muscle, and improving muscle tone, a more attractive definition of the limbs will result.
9. Exercise machines are not necessary for the non-athletes, but may motivate him to train. Inexperienced users may risk injury and should choose machines with card.
10. 'Isometrics' should not be used indiscriminately, especially by 35 year over. They may over load the heart.

WEIGHT TRAINING

All progressive weight training systems have been based upon the research done by Thomas Delorme Delorme found that

1) Strength is build through high resistance with fewer repetitions.
2) Endurance is build throw low resistance and high repetitions.
3) One cannot be substituted for the other.

PHYSIOLOGICAL PRINCIPLES AND STRENGTH TRAINING THROUGH WEIGHT TRAINING:

1) Over load principles:

To increase the strength an over loading of the muscle beyond normal most occur. As the muscle adapts to this over load, it must be further over loaded.

2) Specificity of training is very important:

To achieve the maximum transfer of training the same movements relative or the movements of the events should be performed through their entire range of motion.

3) Muscle libers grow larger with increased strength but the number of fibers does not increase. There is also a growth of connective tissues.
4) Strength, endurance, flexibility and power increase through regular weight training.
5) For total strength weight must be lifted in a slow continuous movement in order for all nerve impulse to reach the entire muscle group at once. This maximum muscular tension causes the muscle to go through a fast, forceful concentration an increase in speed will decrease the muscle's ability to product high tensions.
6) Capilarization is increased through training to aid in making muscle golycogen and nutrients more available to the fibers for energy and for a quicker elimination of waste materials (Lactic acid) from the muscle. Quicker removal of these waste products will delay the onset of fatigue and also will provides easier access if oxygen to the fibers.
7) Muscle protein will increase and muscle for will decrease.
8)
9) The rate of strength gain will slow as the muscle approaches its maximum strength potential.
10) The muscular system is composed of both white and red muscle fibres. The white have limited blood supply, produce rapid powerful contractions, fatigue easily and are designed for speed. The red are approximately three times slower than the white, have greater blood supply, do not fatigue easily, and are sustained endurance. Because of this both music fibers need to exercise. The slow movement which are involved in maximum strength gain need to be augmented by quick or power lifting in order for both sets of muscle calls to gain maximum strength.

11) Best results, from weight training come from 4 to 5 sects of repetitions. When several exercises are used for one part of the body, 3 sets may be used.
12) Weight training, if property done will increase speed, flexibility, and help to prevent injury.

SAFETY AND TECHNIQUE:

Weight training can be very dangerous and load to serious injury if one is not careful to pay strict attention to several important rules of safety and technique.

1) Always through a complete warm up pattern before lifting.
2) Always work in pairs. Use a spotter to help with the weights to avoid accidents.
3) Make sure that the lifting is done in an area that is side and free form objects that might cause an accident.
4) Absolutely no horseplay or showing off.
5) Don't hurry and be careless. It may lead to injury to the lifters and others. Take between 1 to 3 minutes between sets to get the maximum safety results.
6) Always chock collars before lifting to make sure they are secure..
7) Never talk to or distract a person who is doing an exercise.
8) Do not drop the weights on the floor for safety reasons and also to prolong the life of the equipment.
9) Use good judgment at all times.

TECHNIQUE:

1) Lift only what one can handly. Never do more than the workout calls for.
2) Keep the body in alignment and maintain good posture. Poor posture leads to injury.
3) Always do lifts with full arm or leg extension. It is important that one use full range of motion to achieve maximum strength gains.
4) Alternate exercise An upper body exercise should be followed by a lower body exercise worked.
5) Use the legs for lifting or picking up a weight. Do not use the back.
6) Breathe normally. A good rule of thump to follow is to inhale on the recovery and to exhale while lifting the weight.
7) If the athlete up property and the exercise and done correctly, maximum strength will be gained with a minimum risk of injury.

A PROGRESSION OF EXERCISES FOR EACH EVENT:

SPRINTS AND HURDLES
Branch press
Biceps curl
Standing press
Upright rowing
Squat
Toe raises
Leg curl
Bouncing split squat
Sit ups

MIDDLE DISTANCE AND DISTANCE
Bench press
Standing press
Upright rowing
Biceps curl
Leg curt
Toe raises
Squat
Sit ups

HIGH JUMP AND TRIPLE JUMP
Bench press
Standing press
Upright rowing
Bicep curl
Leg curl
Squat
Toe rises

SHOT AND DISCUS
Inclined bench press
inclined lateral raises
Wrist curl
Bent arm pull over
Standing press
Bicep curl
Upright rowing

Jump separt	Phone hyper extension
One - leg press	Squats

CIRCUIT TRAINING

It is a very popular and effective variation for the improvement of strength endurance. In circuit training several exercises are done one after the others. Completing of one set of each exercise in rotation is called one round. There are normally three or more rounds in circuit training. In circuit training there are generally 8-12 exercises. Apart from the improvement of strength endurance, circuit training can be used for the improvement of technical and tactical elements or for the improvement of conditional abilities. The exercises in a circuit are arranged in such a manner that different muscle groups are exercised in rotation. A specific circuit, however can consist of several exercise involving the same muscle groups.

Circuit training can be done according to any of the circuit methods of conditioning i.e,

When continuous, method is followed then all the exercises are done one after the other without break or the required number of circuits are completed without any pause. In interval method incomplete rest is given after each station or exercise. In between the round 3-5 minutes recovery is normally give.

(A circuit training programme for general strength 39 sec. Work at each station followed by 45 sec rest).

A circuit training programme should be carefully worked out and should be continued for several weeks after which it should be changed if required. The exercises and their sequence should be determined first according to the aim. For better organization of circuit training, it is advisable to fix the time of each station (e.g) 30 sec, or 45 sec. The resistance and frequency of movement should also be taken care of.

Here and leopold, (1986) suggest, The following load factors for rain effective circuit training programme with special exercises.

No. of exercises	- 8 - 12
Intensity	- 30 - 50%
Speed of movement	- Not less than that of competition
Movement frequency	- 40 - 70% of maximum when the duration is 45 sec.
Repetitions/duration	- 20 - 40 repetitions/30 - 90 sec
Recovery in between	- Short and incomplete. It should and when the heart rate
fails to	120 - 140 b/min.
Sets/stations	and when the heart rate falls to 120 -140 b/min.
Total volume	- High for trained. Youth the total repetitions
	should be from 600 - 800

INTERVAL TRAINING

Interval method is perhaps the most versatile method for improving endurance of various types. In interval method the exercise is done at medium (Extensive) and higher (Intensive) intensity with intervals of incomplete recovery. Interval method is based on the following principle. Work should be with suffered special and duration so that the heart rate goes upto 180 b/min. After this there should be a recovery perios and when the heart rate comes down to 120-130 b/min the work should be started again. The training load in internal method, therefore, can be controlled by checking the heart rate.

The effect of interval method is determined by the variables of interval method which are the following:

D - Distance / Duration
I - Intensity
R - Repetition
T - Time duration for recovery
A - Activities Changing recovery
S - Set

Which is called as the name "DIRTAS" By proper manipulation of the above mentioned variables. The interval method can be used in saved wave each leaving different physiological and they are.

(a) Intensive Interval method and (b) Extensive interval method

Interval method, by proper manipulation of the variables (DIRTAS) can be used for the improvement of any type of endurance or any prerequisite of endurance. Some examples of Interval method for different purpose are given below.

(A) For Aerobic Capacity:

This variation is recommended by zaciorskiji (1971). The load parameters should be as follows:

Duration = Not more than 90 sec.
Intensity = 75 - 85%
Repetitions = optimum
Time for recovery = 45 - 90 % sec, (Nit exceeding 3-4 min in any case).
Activity during recovery = Jog/Walk
Set - 2-3

(B) For Lactic Acid Tolerance:

Duration	= 20 secs to 2 minutes
Intensity	= about 90%
Repetitions	= 3 - 4
Time for recovery	= Progressively decreasing the recovery time as 7,5,43 respectively
Activity during recovery	= Walk / Jog
Set	= 2 -3

(C) Interval Sprinting:

Distances	= 50 mts to 150 mts.
Intensity	= 80% - 85%
Repetitions	= 8-12
Time for recovery	= 2-3 min in between Repetition and 5-10 min. in between set.
Activity during recovery	= Jog
Set	= 2

For Ex :

Fix the distance as 50 mts sprinting. For 100, 200 mts. Sprinters, they should go for 2 laps in 400 mts, track of each 50 mts sprinting and 50 mts. Jogging for 400 mts. Sprinters they should go for 4 laps in 400 nuts. Jogging set contest of a lap running when the HR corners down to 120-130b/min start the next repetition.

SPEED PLAY or FARTLEK:

'Fartick' is a Swedish word which means speed play. This method has become very popular with distance runners. In Fartlck the change of place or speed is not pre planned. The sportsman changes his pace and activity according to his desire and the place and surface on which he is running. Even though it is very strenuous. It is more appealing to the sportsman it is very strenuous. It is more

appealing to the sportsman because, first nothing is imposed on him and secondly because it is done on a terrain which is more natural and pleasing, e.g. golf courses., forest, etc. The terrain or route selected should be a natural one with enough variations. All the types of the training may be combined in various ways in speed play. When carried out property, this type of training develop not only develop physiological factors such as aerobic, anaerobic and speed but also the psychological factors which are essential for performance and training. The heart rate fluctuate between 140 - 180 beats per minutes.

Pressure Training:

Pressure training as the name implies is to put pressure on the player. It is more or less skin to functional training except that no direct opposition is put against the player under pressure

(eg) : Two man pressure training in football

Three man pressure training in football.

PLYOMETRICS:

It refers to exercises that enable a muscle to reach maximal strength in as short a time as possible in other words "Explosive reactive power training" is known as plyometrics.

Plyometric Training:

The origin of the term plyometrics is thought to be derived from the greek word "Plyomotrics" meaning to argument or to increase or from the greek root words "Plio" and "Matric" meaning more and measure respectively (chu, 1983) ; Ganvetta 1981; Wiltk ocker, 1970). Today phyometrics powerful muscular contractions in response to repid, dynamic loading or strctching of the involved muscles.

Plyometric movement or performed in a wide spectrum of sports in which power is useful. For example consider the football lineman coming out of the stance the volleyball player jumping up high above the net to block the return. The high jumper at take-off and the baseball batter swinging at a pitch. The basketball player shooting the ball and then quickly jumping backup to get the rebound or tip-in can benefit from plymotrics. The platform diver who need more height at the take-off can enhance performance through plyometrics. The tennis player or the basketball to make the play will also benefit from plymetric training,. Most sports, can be played more skillfully when athletes have the power that combines strength and speed. Plyometrics is one of the best ways to develop explosive power for sports.

Phyometric exercise are thought to stimulate various changes in the neuromuscular system, enhancing the ability of the muscle groups to respond more quickly and powerfully to slight and rapid changes in muscle length. An important feature of plyometirc training apparently is the conditioning of the neuromuscular system to allow for faster and more powerful changes of direction for example going from down to up in jumping of moving the legs first anteriorty the posteriorly in running. Reducing the time needed for the change in direction increase speed and power. Although specific exercise designed to enhance quick explosive movement have been taught for some time only in the decade has a system emerged which emphasizes "explosive reactive power training. This new system of athletic training is known as plyometrics".

The general guidelines to be followed by athlete and instructor before plyometric training can be initiated.

Thet are,

1. Phyometric training should be specific to the goals established for the athlete.
2. Sports skills should be broken down and trained in their smaller components and then rebuilt into co-ordinated movement pattern.
3. The quality of work is more important than the quantity of work.
4. Greater the amplitude of intensity, greater the recovery time.
5. Plyometric training may have its greatest benefit at the conclusion of the normal work out or

practice
session.
6. When proper technique can no longer demonstrated, maximum volume has been achieved and the exercise
must be stopped.
7. In the preparatory phase, exercise of low motor complexity and intensity should dominate.
8. The competitive phase, exerse of higher motor complexity and intensity should dominate.
9. The phyometric training programme should be progressive in over load.

'Many styles and definitions of jumping have been used to describe training and evaluating athletic performance". Vertical jumping ability is essential for all sports games, particularly, volleyball, basketball, handball, swimming, and athletics. Only through jumping we can enhance the explosive strength qualities of particular muscles.

Par course:

Per course is a technique for improving cardiorespiratory endurance that basically combines continuous training and circuit training. This technique involves jogging a short distance from station to station and performing a designated exercise at each station according to guideline and directions provided on an instruction board according to guideline and directions provided on an instruction board located at, that station. Per course circuits provide on an excellent means for gaining some benefit while incorporating some of the benefits of calisthenics. Par course circuits are found most typically in parks or recreational areas within metropolitan areas.

Per course is a training technique that combines continuous training with exercises done at stations along the course.

Massed and distributed practice:

In massed practice the skill to be mastered is repeated over an extended period. For example a set of rugby backs might. Spend two hour session just running the line. The alternative to massed practice is distributed practice, where practice of the skill to be mastered is interspersed with other training. Massed practice has the advantage that the athlete will probably forget less between practices, but also the disadvantage of leading to boredom. Too much massed practice with a young or inexperienced athlete runs the risk of demotivating and potentially losing them to the sport.