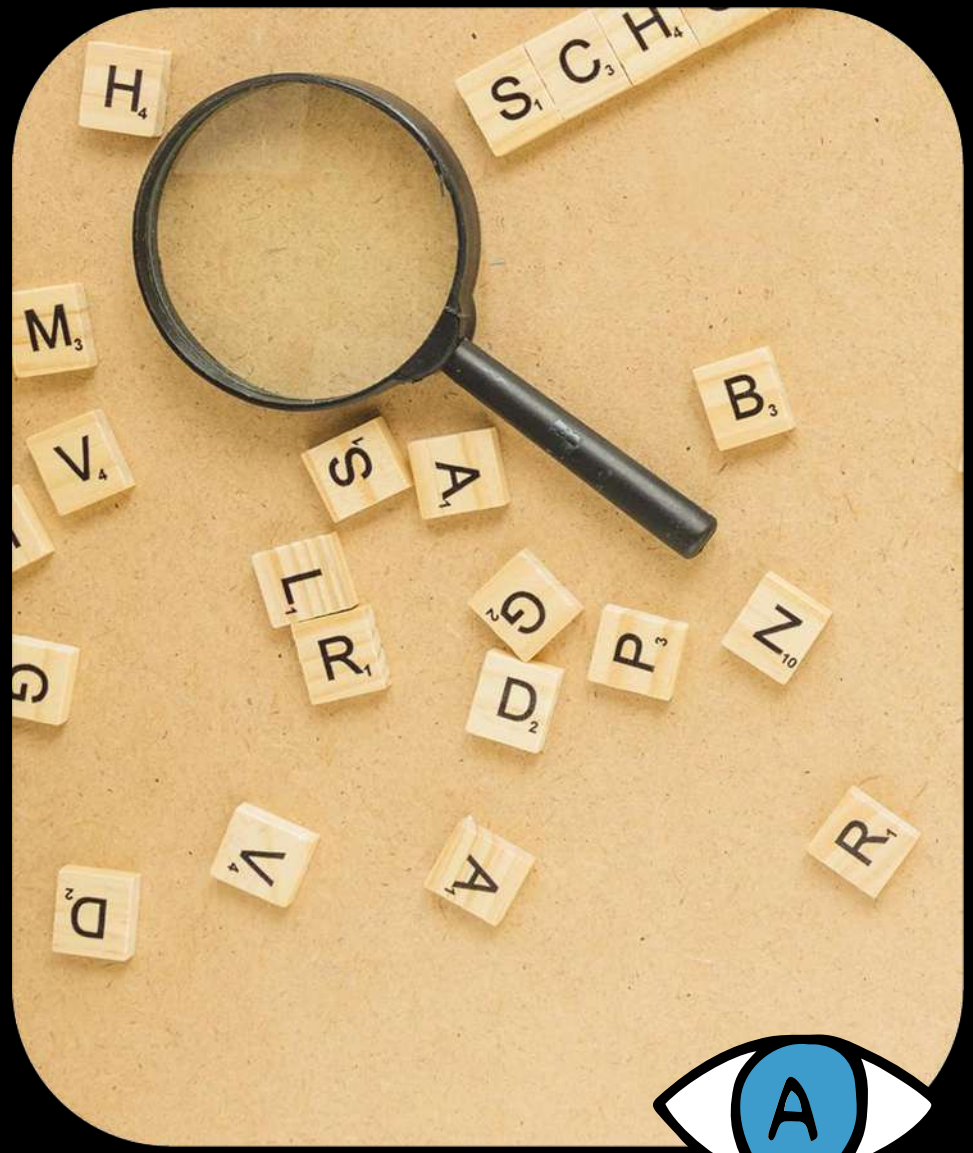
Unit -10

Physical Education



Course on

Training and Doping in Sports..!!

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10.2 **Training Load** : Over Load, Adaptation, and Recovery

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10.1 Concept and Principles of sports training

Now a days, as you know competition has increased in all the fields. Similar is the case with sports. Modern sports training has become **very scientific and systematic** with **well-designed equipment** and means for developing the performance of an athlete as per his/her abilities.

This is the reason why **proper training schedules** are now designed on an annual or Olympic period basis. In these periods, training is divided into different phases for better acquisition or adaptation of skills, and to attain optimum results during the main competition.

Concept of Training :

Training is the process of preparing human resources for performing a particular task or activity.

It designed to improve the sportsperson's fitness level and ability to perform in a given sport.

It includes corrective and restorative exercises, strength training, conditioning and cardiovascular training, sports specific techniques and drills, periodization, nutritional advice, mental and psychological training by a qualified trainer.

It consists of four parts :

1. **Conditioning training**
(strength training,
endurance training,
flexibility training)

2. **Training of technique**
(Technical preparation)

3. **Training of tactics**
(Tactical preparation)

4. **Psychological training**
(Mental preparation)

Principles of Sports Training :

In order to prepare a sportsperson for his/her highest performance in the desired tournament a certain process has to be followed; that is called training.

Sports training nowadays demands certain technicalities and to make the process simpler, yet effective, few principles should be kept in mind.

These principles facilitate a trainer in successfully employing an efficient training Programme.


PRINCIPLES OF SPORTS TRAINING
Principle of Continuity
Principle of Individual Differences
Principle of Cyclicity
Principle of Overload
Principle of Progression of load
Principle of Active Involvement
Principle of Specificity
Principle of General and Specific Preparation
Principle of Warm Up and Cool Down
Principle of Rest and Recovery
Principle of Ensuring Results
Principle of Periodization
Principle of Variety

1. Principle of Continuity :

Sports training is a regular phenomenon that should be done consistently, without irregular breaks.

Though, it is a continuous process that includes planned intervals, the breaks should not be long as that can reduce the capability of the sportsperson.

The important point to be kept in mind is that only an uninterrupted training can lead to an optimum/desired performance.

2. Principle of Individual Differences :

Every individual is different. Each one possesses different qualities and capabilities, and responds differently to exercise and training.

Some people handle higher volume of training while others may respond better to higher intensities. Therefore, a training plan must be constructed by keeping in mind the principle of individual differences.

While building a plan, a trainer must keep in mind the trainee's age (both chronological and athletic), gender, predominance of muscle fibre types and other related factors.

3. Principle of Cyclicity :

A training plan is constructed by incorporating various training cycles. These cycles are: micro, meso and macro; where micro is the shortest cycle which may last for 3-10 days.

Meso cycle is the medium duration cycle and may be done for 3-6 weeks.

Lastly, macro cycle, this is the longest duration cycle that lasts up to 12 months or a year. A macro cycle consists of different micro and mesocycles.

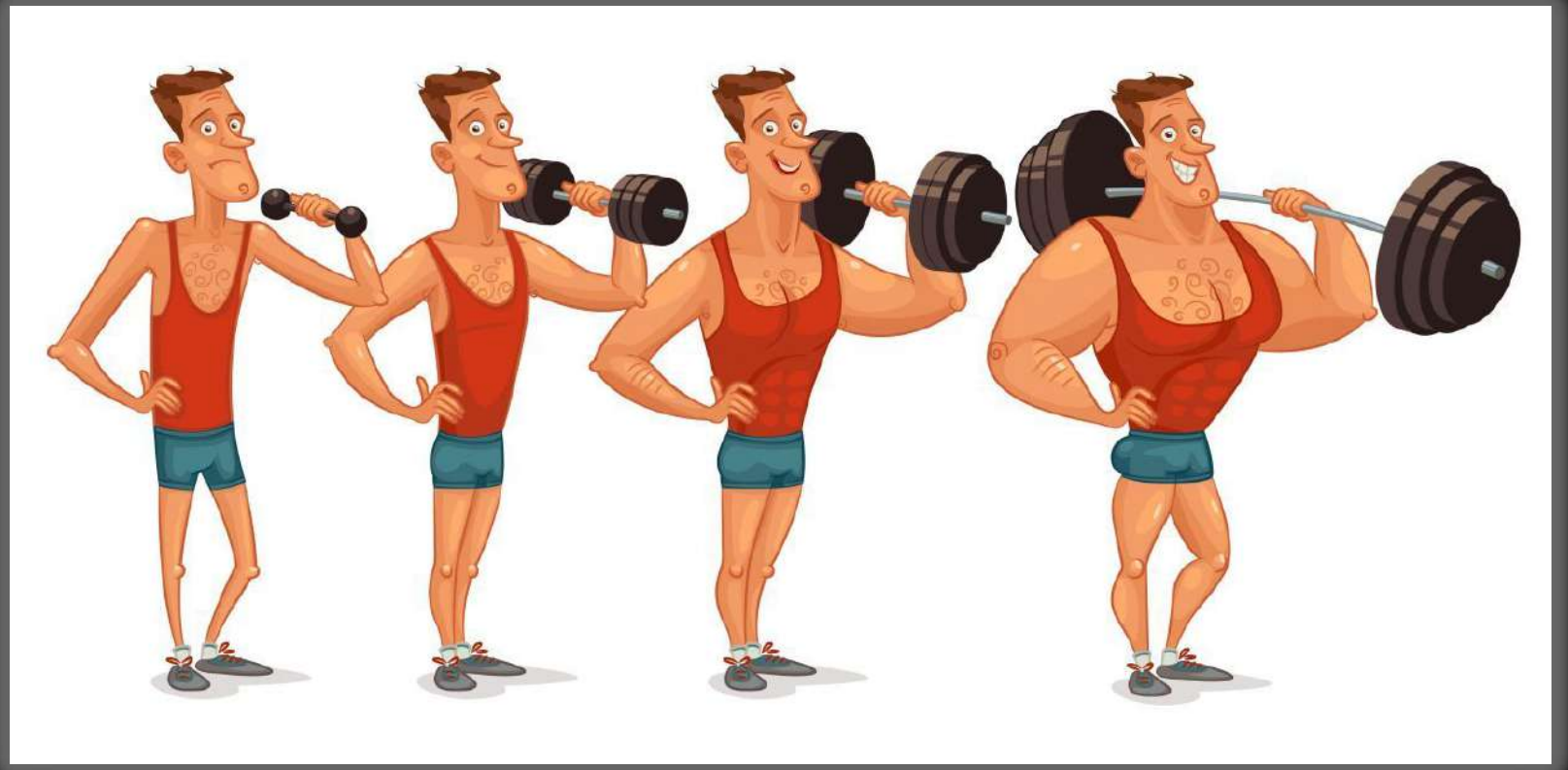
4. Principle of Overload :

Load, in sports training, is known as the demand, that can be physical, physiological or psychological, put on the body to enhance the performance of the individual.

The key point to note, while planning a training session, is the load should be greater than the normal load to aid adaptation process and thus facilitate the performance enhancement

5. Principle of Progression of load :

This principle testifies that training load must be increased gradually in order to avoid any unwanted tension on the muscles of the individual by **increasing the load slowly** and in accordance with the capabilities of the sports person.



6. Principle of Active Involvement :

The performance of an athlete is not merely because of the coach's skills. A training plan results best and is effective only when the coach's knowledge blends with athlete's efforts.
This principle lays stress on the athlete's ready participation in the training design.

Also, this principle incorporates the "Law of Readiness" since this type of involvement prepares the athlete to perform upcoming tasks willingly.

7. Principle of Variety :

Training is along-standing process that can turn in to a boring end. Therefore, to avoid monotony and to make a training design successful, a coach must incorporate variety in to it.

The change can be made by introducing different exercises and drills, changing the time of the day of the session or training group etc.

But, it is important to keep in mind that the change must be done **according to the load and adaptation** process and also facilitate performance enhancement.

8. Principle of Specificity :

This principle lays emphasis on the notion "practice makes a man perfect”.
It further states that working on a particular muscle or fitness component will predominantly develop that part.

Therefore, to enhance a specific skill or component one must practise it to achieve desired outcomes.

E.g., a boxer must focus on punching and dodging skills whereas a basket baller must practise dribbling and shooting.

9. Principle of General and Specific Preparation :

In order to enhance sports performance both general and specific preparation of an athlete is required.

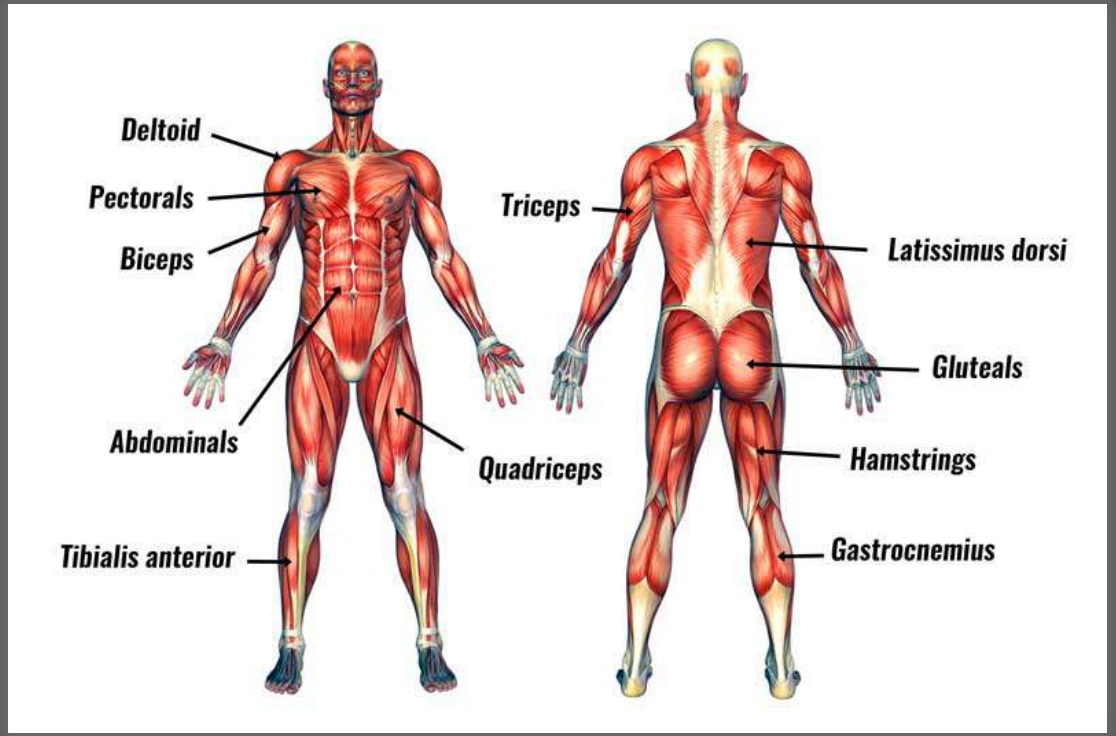
General preparation provides the base for the specific preparation. General preparation focuses on the development of overall fitness components whereas the specific preparation will enhance the functional capacity of the body systems which further improves the performance.

10. Principle of Warm Up and Cool Down :

Warm up and cool down play vital role in delivering optimum performance. These two are an unavoidable part of training design.

Warming up before a training session prevents muscle tenderness by increasing blood flow to the working muscles and therefore, prevents injury.

On the other hand, cooling down helps an athlete to return to normal level by transferring blood from the working muscles to vital organs. It also helps in removing waste products from the body.



Warming up:

It is a short term activity carried out prior to any severe or skilled activities. Warming up is an essential before a competition. Through such a workout we try to bring the group of muscles expected to take part in the activity to follow.

It is primarily preparatory activity in which physiological and Psychological preparation of an athlete is done for the main activity.

Types of Warm up:

(1) General Warm-up

(2) Specific warm-up

Method of warming up :

(a) **Jogging :** Every athlete should perform jogging or slow running for 5 to 10 minutes to increase the body temperature.

(b) **Simple exercise :** This is also a way of warming up. The exercise should be performed from simple to complex.

(c) **striding :** It means running the distance with long strides. The distance of running should not be more then 50 meters.

(d) **Stretching exercise :** Stretching is one of the most critical part which is stronger and healthier.

Limbering down or cooling down :

At the end of the training session or competition, athletes are normally advised to cool down.

This is done normally in the shape of a light but continuous activity such as jogging or walking for some time at the end of the event.

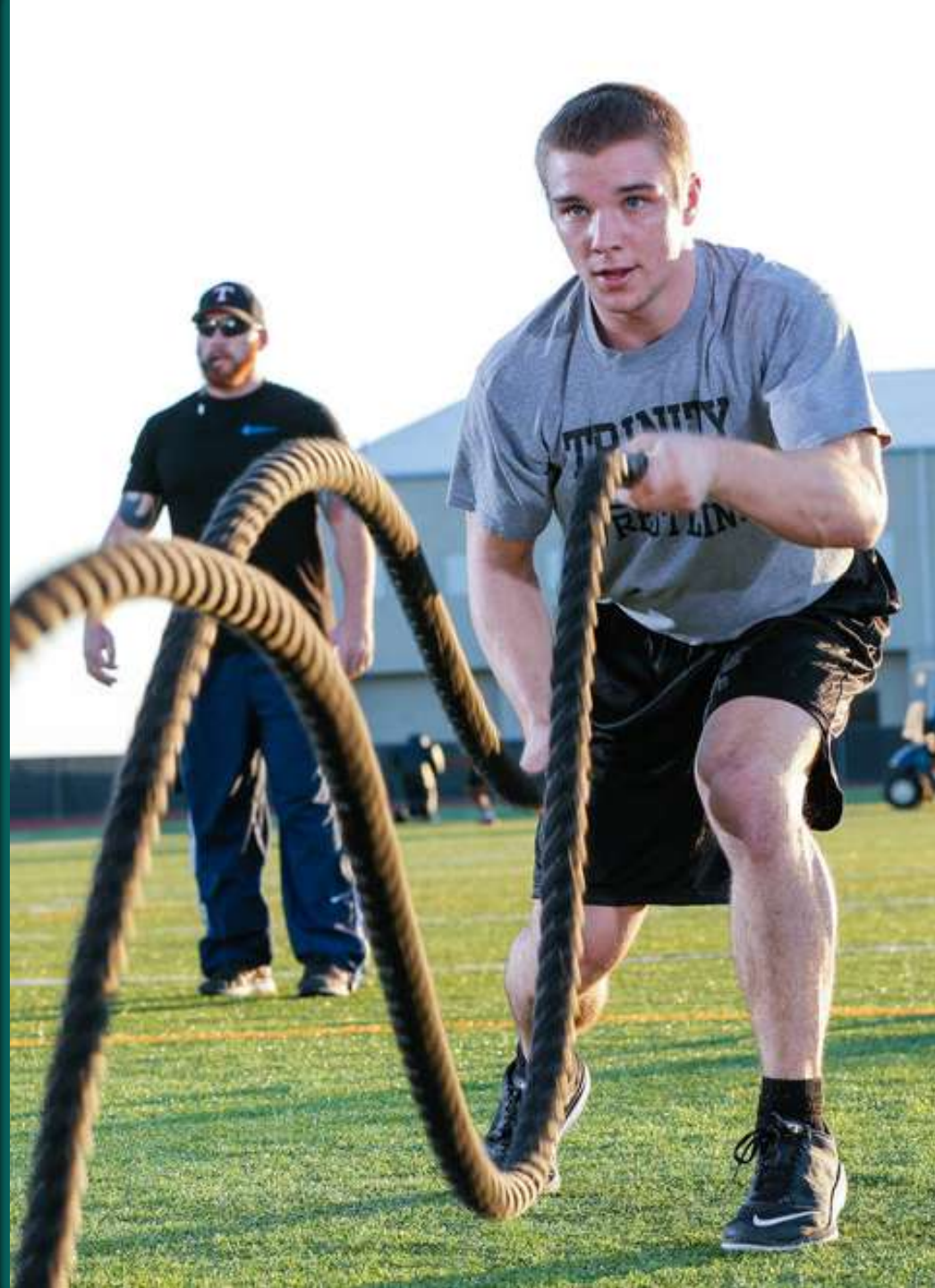
Such an activity after the competition of an event is called limbering down or cooling down.

10.2 Training Load : Over Load, Adaptation, and Recovery

Training Load :

In sports training, the load is a major concern. Efforts should be made so that possible work can be **done with minimum effort.**

Load is defined as the amount of work done by an individual's body. It is the psychological and phsiological demand put on the body parts through motor stimuli resulting in improvement and maintenance of higher performance capacity. Sports training consists of **physical exercises.**



Overload :

During training of sports persons, load is given to the players according to their capacity. Whenever this load goes beyond the capacity of an individual, the physiological and psychological functions get disturbed.

Though this increased load does not affect the sportsperson immediately, if the administration of the overload continues for a longer period, it results in decrease of his/her performance.

The important signs and symptoms of over load are fatigue, decline in performance, loss of interest in sports, loss of concentration, lack of motivation, sleep disorder, loss of appetite and prone to injuries.

Adaptation Process and Training Load :

Adaptation is defined as the adjustment of physical and psychological functional systems to the training load.

Adaptation to a load results in the enhancement of performance capacity. Thus, a sports person is able to increase his/her performance as a result of adaptation process.

Adaptation process demands that a sports person maintains regularity in training. If a sportsperson is exposed to new and unfamiliar load in a systematic planned way the adaptation process will be faster.

Recovery :

Recovery is the ability to meet or exceed performance in a particular activity.

Recovery may include an active component (such as a post-workout walk) and/or a passive component (such as a post-workout hydrotherapy treatment).

Types of Recovery

1. Immediate Recovery :

The most rapid form of recovery, is immediate recovery which occurs during exercise itself.

2. Short Term Recovery :

It involves recovery between sets of a given exercise or between interval workouts.

3. Training Recovery :

It is used to describe the recovery between workout sessions or athletic competition.

If consecutive workouts occur (such as within the same day) without appropriate recovery time, the individual may be improperly prepared for the next training session.

10.3 Concept of Doping and its disadvantages :

(a) Meaning of Doping :

When an athlete uses banned substances or methods to improve performance in sports it is called as doping.

Example: Drugs and steroid used.

(b) Concept of Doping :

‘Doping’ is the word, which is used in the field of sports, when athletes use prohibited substances on methods to unfairly improve their sporting performance.

In general way, doping is the use of performance enhancing substance or methods by sports person to gain an advantage ever their competitors. In fact, some sport person take illegal substance to enhance their performance. The activity is known as doping.

The use of drugs are considered unethical by most international sports organizations. The anti doping authorities state that using performance enhancing drugs goes against the “spirit of sports”.

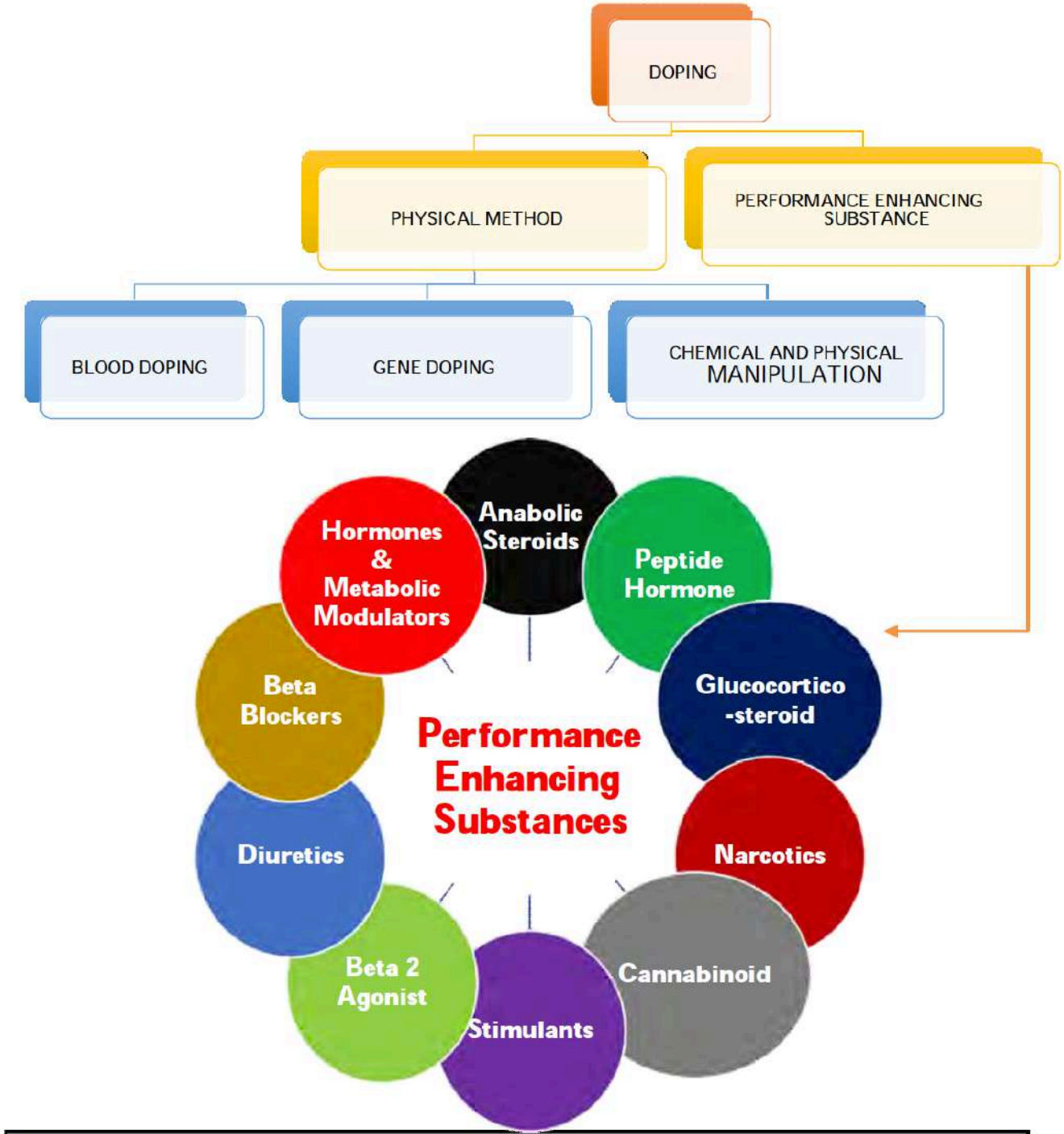
Prohibited Substances Methods

PROHIBITED SUBSTANCE

- Stimulants
- Anabolic steroids
- Steroid
- Beta-2
- Diuretics
- Drugs
  - Cafine

METHODS

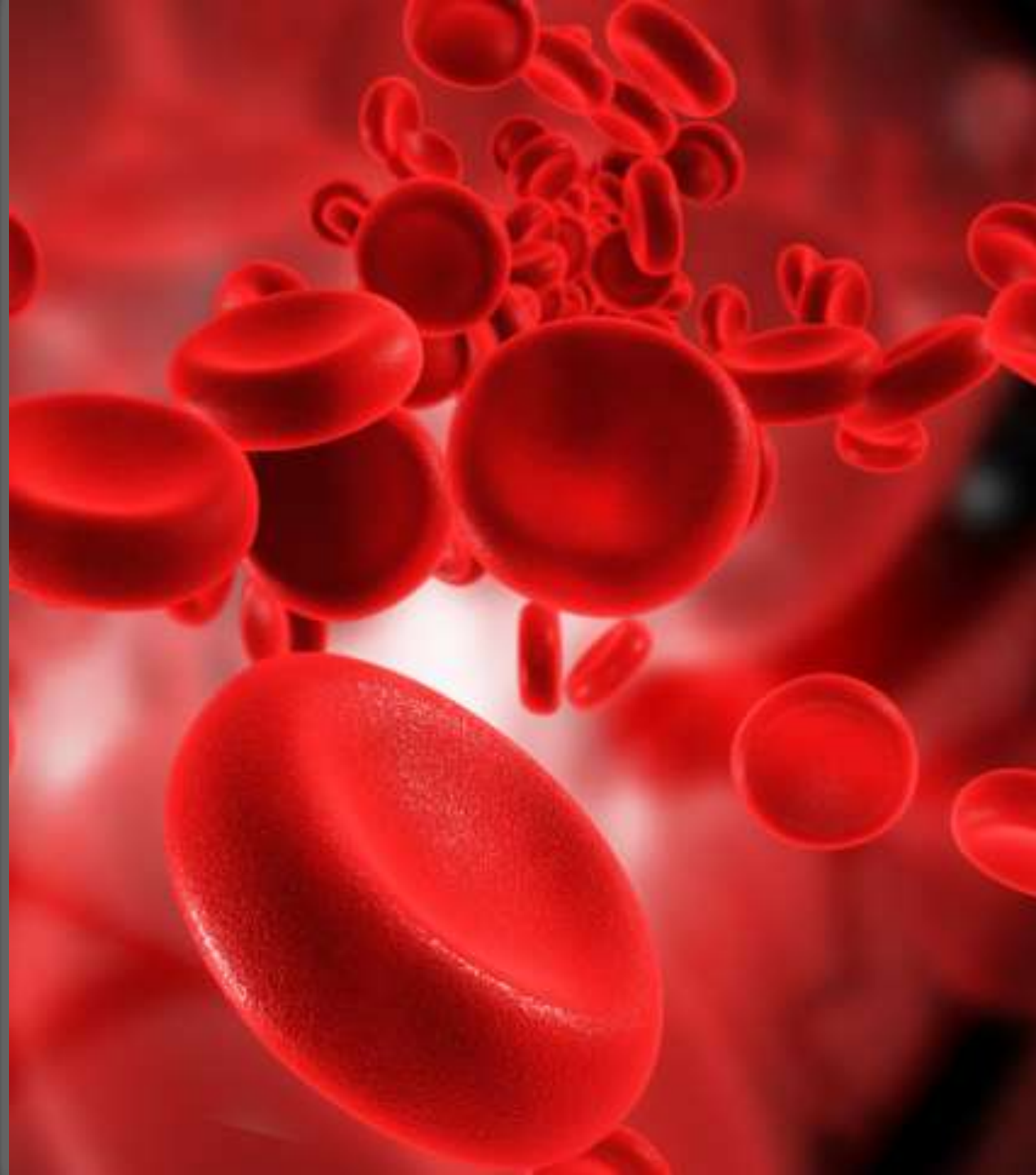
- Blood Doping
- Gene Doping
- Control on Sample


DOPING
PHYSICAL METHOD
PERFORMANCE ENHANCING SUBSTANCE
BLOOD DOPING
GENE DOPING
CHEMICAL AND PHYSICAL MANIPULATION
Anabolic Steroids
Peptide Hormone
Glucocortico -steroid
Narcotics
Cannabinoid
Stimulants
Beta 2 Agonist
Diuretics
Beta Blockers
Hormones & Metabolic Modulators
Performance Enhancing Substances

1. Blood Doping :

It is an attempt to enhance sports performance by infusing oxygenated blood into an athlete before an event.

This leads to increased red blood cell count resulting in higher oxygen carrying capacity and thus, improving endurance.



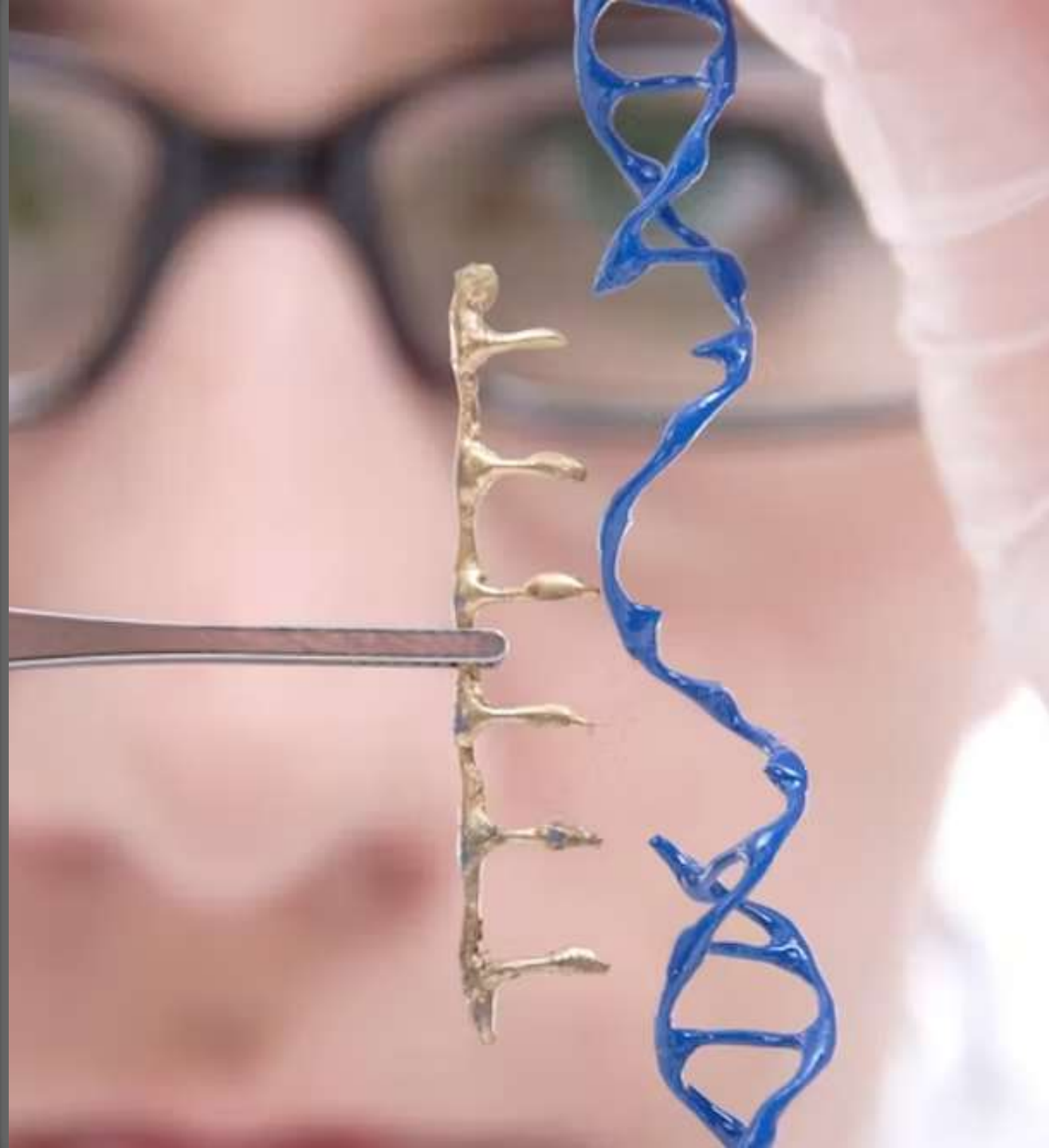
2. Gene Doping :

It is the practise of transferring genes, or genetically altered cells, into an athlete as a possible method of enhancing sporting performance.

It plays a vital role in the growth and development of musculo-skeletal structure.

Side effects of Gene Doping :

- Heart failure
- Cancer
- Leukemia
- Immune Dysfunction



3. Chemical and Physical Manipulation :

It include an attempt **to tamper the integrity or validity of the samples** collected during doping control procedure.

Also, intravenous injections of more than 100 ml per 12 hours are prohibited. The only exception is, if the athlete is dependent on the drug for medical treatment.

Side effects of chemical and physical manipulation :

- Infection in urethra, bladder or kidney
- Cardiac Issues

Doping Controlling Agencies –

- WADA-World anti doping agency
- NADA-National anti doping agency

Prohibited Substances and Methods :

S. No.	Substances	Side effects
1.	Stimulants	Cause Insomnia, anxiety and aggression. It directly effects the central Nervous system (CNS) and cardio vascular system.
2.	Narcotics	Loss of balance and co-ordination, cause drowsiness, vomitting, Constipation. It may cause fainting.

3.	Anabolic Steroids	Can cause blood pressure, Sudden heart Attack, Mood swing, aggression depression. It may also cause baldness and impotency in males,
4.	Beta Blockers	Reduces endurance, headache and weak digestion
5.	Cannabinoids	Reduces concentration and co-ordination, reduces lung capacity.
6.	Diuretics	Causes dehydration, drowsiness and mineral imbalance.
7.	Beta-2 Agonists	Cold hands, insomnia, depression etc.

Disadvantages of Doping :
Physiological Effects of Doping

- Acne
- Baldness
- Liver damage
- Premature closure of the growth centres of long bones (in adolescents) which may result in stunted growth
- Increased aggressiveness and sexual appetite, sometimes resulting in abnormal sexual and criminal behaviour
- Depression, and in some cases, suicide.

Gender Specific Effects (Males) :

- Breast tissue development
- Shrinking of the testicles
- Impotence
- Reduction in sperm production

Gender Specific Effects (Females) :

- Deepening of the voice
- Cessation of breast development
- Growth of hair on the face, stomach and upper back
- Abnormal menstrual cycles